

HOME HEALTH NURSE-MANAGED HEART FAILURE PROTOCOL
TO REDUCE HOSPITAL READMISSIONS:
A QUALITY IMPROVEMENT PROJECT

by
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ABSTRACT

Heart disease is Montana's leading cause of death with an average of 2,245 annual deaths, or 158.9 per 100,000, from 2014 through 2021 (CDC, 2022). Hospitalizations and unplanned readmissions for HF are costly for healthcare systems and decrease patient quality of life. Home health nursing services have been proven to decrease unplanned HF readmission rates (Bamforth et al., 2021, Li et al., 2021, Maliakkal & Sun, 2014, & Spall et al., 2017). However, the evidence consistently points to a lack of specificity regarding home health nurse duties (Bamforth et al., 2021, Li et al., 2021, & Spall et al., 2017). This review examined the most recent systematic reviews and meta-analyses to find evidence supporting a HF-specific nurse-led protocol, including medication titration and initiation to reduce readmission rates compared to usual care or home health without a disease-specific protocol. In conclusion, a HF-specific, nurse-led protocol is not identified or discussed within the literature. Other chronic illness management has been improved by implementing nurse-led medication standing orders (Shaw et al., 2014). This project will examine the rate of readmissions once a cardiologist-approved HF protocol for patients receiving in-home care has been implemented.

CHAPTER ONE

REVIEW OF THE LITERATURE

Introduction

Background

Heart failure (HF) cost the United States \$30.7 billion in 2012 and was reported on about 380,000 death certificates in 2018 (CDC, 2023). By 2030, the annual cost is projected to increase by 127% to \$70 billion (Reinhardt et al., 2022). HF is most common in those 65 and older, making HF patients more likely to be Medicare participants (CMS, 2023). The Centers for Medicaid and Medicare Services' Hospital Readmissions Reduction Program (CMS, 2023) recognizes HF's severity, prevalence, and cost. CMS reduces hospital payment by up to three percent based on 30-day unplanned readmission rates to ensure hospitals strive to provide the best evidence-based care. A three percent loss in revenue to many Southwest Montana facilities in underserved areas is devastating considering the dire financial status of local and national healthcare systems post-COVID-19 pandemic. In conjunction with financial hardship, Southwest Montana facilities' natural surrounding geography compounds the barriers to reducing hospital readmissions.

Southwest Montana has a magnitude of factors constraining access to healthcare. The mountainous terrain and vast distances between communities negatively impacts timely access to healthcare facilities, especially for rural populations. Long, harsh winter conditions contribute to transportation difficulties, creating further delays in care. Of the fifty-six counties in Montana, the Health Resources and Services Administration (Montana DPHHS, 2023) has designated fifty-

two as Health Professional Shortage Areas (HPSA). The combination of geographical barriers and provider scarcity creates an exceedingly vulnerable climate for Montana's HF population. According to the Center for Disease Control and Prevention's (CDC, 2018) most recent report, heart disease is the number one leading cause of death in Montana. Providing home health nursing care mitigates patients' stress of maintaining reliable transportation and decreases the time HF patients may wait to be assessed and treated.

Nurse-led, home-based interventions to reduce HF readmissions have been well-researched and proven effective in many studies (Bamforth et al., 2021, Li et al., 2021, Maliakkal & Sun, 2014, & Spall et al., 2017). The most recent systematic review reported net savings per HF patient receiving home care services was \$3810 (\$3682-\$3937; 95% confidence interval) (Spall et al., 2017). The patient's home is the most frequent setting where interventions such as education on effective disease management strategies and self-regulation of HF signs/symptoms occur (Pedroni et al., 2023). Nurse home visits positive impact on HF readmissions has been noted across varying populations and income levels, from the low socioeconomic South suburbs of Chicago (Maliakkal & Sun, 2014) to the vast array of middle to high-income areas across the United States (Li et al., 2021). Home health nursing also decreases HF-specific mortality, all-cause mortality, and HF-specific symptoms that negatively impact quality of life (Bamforth et al., 2021 & Maliakkal & Sun, 2014). Shaw et al. (2014) reported a positive effect on outpatient management of chronic conditions such as diabetes, hypertension, and hyperlipidemia with nurse-managed protocols, including medication initiation and titration. Current literature supports home health as an effective intervention for HF patients; however, the lack of defining

the specifics, quality, and complexity of home health nurse interventions is a consistent limitation (Bamforth et al., 2021, Li et al., 2021, & Spall et al., 2017).

This project aims to define and investigate the efficacy of a specific nurse-led intervention for HF within the home health nurse scope of practice: a HF protocol, approved by cardiologists and ordered by internal medicine (IM) providers, including medication initiation and titration to manage acute illness in patients' homes and reduce readmission rates. Given the statistically significant effect home health interventions have on reducing HF readmissions, the aim of this project is to reduce readmission rates even further with this disease-specific protocol.

Methods

This scoping review aimed to answer the research question “Does nurse-led home health interventions decrease HF readmissions?” and to examine the evidence supporting a nurse-managed, disease-specific protocol that allows pharmacologic intervention by a nurse in the home. International articles published in English within the last decade by well-known reputable sources were included in the search. Retrieving articles from the last decade included additional systematic reviews and meta-analyses discussing the positive financial impact of home health for HF patients and outcomes related to nurse-managed protocols for outpatient disease management (Shaw et al., 2014 & Spall et al., 2017). The databases searched included CINAHL, PubMed, World of Science, and Cochrane Library. Searched keywords and phrases included home health, nursing, primary care, congestive heart failure, heart failure, nurse-led protocol, nurse-managed protocol, and readmission.

Inclusion Criteria Due to the broad scope of home health and interventions, studies examining HF-specific and all-cause readmissions and mortality in adult-only populations were

included. Articles distinguishing differing levels of HF disease were also included because the proposed intervention does not discriminate based on how advanced an individual's cardiac disease has become. All articles within this scoping review were appraised utilizing Melnyk & Fineout's (2019) rapid critical appraisal tools and evidence table. Inclusion criteria and search strategies for each included article were deemed appropriate.

Exclusion Criteria Evidence examining pediatric populations was excluded from the search. If an article was published more than ten years ago, it was excluded to provide only up-to-date evidence. Studies assessing qualitative data, such as patient satisfaction, were excluded as this project only aims to measure quantitative outcomes regarding HF readmissions.

Results

Six articles met inclusion criteria: three systematic review and meta-analysis combination articles, one meta-analysis, one scoping review, and one cohort study. Two systematic review/meta-analysis combination articles (Bamforth et al., 2021; Spall et al., 2017) reported significant evidence of post-discharge interventions supporting a reduction in mortality and readmissions. The third examined how nurse-led medication titration protocols positively affected outpatient chronic disease management by lowering hemoglobin A1C, systolic and diastolic blood pressures, total cholesterol, and low-density lipoprotein cholesterol (Shaw et al., 2014). The meta-analysis by Li et al. (2021) examined 25 randomized control trials (RCT) researching how nurse-led transitional care interventions decreased all-cause and HF-specific readmissions compared to usual care. The scoping review included seven systematic reviews totaling 166 studies analyzing a broad scope of multi-component interventions aimed at HF disease management (Pedroni et al., 2023). The articles in this review met inclusion criteria

because out of the 166 studies, 118 examined in-home, nursing interventions. Maliakkal & Sun's (2014) cohort study included HF patients receiving Medicare benefits and provided evidence showing statistical significance of home health care reducing hospital readmissions, adverse symptoms, and increases in medication compliance, diet and fluid restrictions. In general, the results of this scoping review support home health nursing as an effective post-discharge intervention to reduce hospital readmissions and mortality in HF patients.

Reduction in All-Cause and HF-Specific Mortality Bamforth et al. (2021) reviewed 31 total RCTs (24 explicitly looking at HF), researching post-discharge interventions' impact on decreasing all-cause and HF-specific mortality. Their review found statistical significance in support of nurse-led home visits reducing HF-specific and all-cause hospitalization and mortality in eight HF RCTs (Bamforth et al., 2021). In 2017, Spall et al. conducted a systematic review to compare the effectiveness of different subgroups within the realm of transitional care services regarding the mortality of HF patients. These subgroups included telemonitoring, telephone support, pharmacist interventions, nurse home visits, case management, and disease management clinics. Nurse home visits significantly decreased mortality relative to usual care, telephone support, pharmacist interventions, telemonitoring, and education alone. This systematic review also reported nurse home visits were more effective than HF management clinics at decreasing mortality (Spall et al., 2017).

Reduction in All-Cause and HF-Specific Readmissions and Hospitalizations A meta-analysis of 25 RCTs totaling 8,422 HF patients reviewed whether nurse-led transitional care interventions, including home health, case management, and disease management clinics, reduced all-cause and HF-specific readmissions (Li et al., 2021). The review revealed a nine

percent reduction in all-cause readmissions and a 29% reduction in HF-specific readmissions with a moderate level of certainty. The systematic review conducted by Spall et al. (2017) also assessed readmission rates within the subgroups of the transitional care interventions aforementioned. Their results revealed that nurse home visits substantially reduced all-cause readmissions, whereas telemonitoring, telephone support, and pharmacist interventions did not decrease readmission at a significant level. Compared to nurse case management and HF-specific clinics, nurse home visits were the most effective at reducing all-cause readmissions (Spall et al., 2017).

Nurse-Managed Medication Protocol One area lacking within the databases is literature discussing or supporting a home health nurse-managed medication protocol. The only supportive data found is within a systematic review from Shaw et al. (2014) analyzing the effects of nurse-managed protocols in outpatient settings for chronic disease management. This review included 18 studies in which a nurse followed a protocol allowing for medication titration for better disease management. The study found that these nurse-driven protocols positively affected chronic illnesses such as diabetes, hypertension, and hyperlipidemia. Because nurse-managed medication protocols were successful in overseeing other chronic illnesses, this project aims to understand how a home care nurse protocol can impact the management of HF.

Discussions and Conclusions

HF is a costly disease and a leading cause of morbidity and mortality in the United States. As the United States population ages, costs associated with HF readmissions will only become a more prominent and challenging problem. Establishing nurse home visits as a routine practice at the time of hospital discharge can create a source of financial stability within our healthcare

system, locally and nationwide. Medicare is the primary insurance provider for the HF population, and unfortunately, HF is the most common admission diagnosis among all Medicare beneficiaries. Hospital readmissions and admission into skilled nursing facilities are the most expensive options for post-hospitalization care. A study examining over 930,000 patients after HF-specific hospitalization revealed notable expenditure on both 30-day episodes (with a median of \$13,330 and an interquartile range of \$9,912 to \$22,489) and 90-day episodes (with a median of \$21,658 and an interquartile range of \$12,423 to \$37,630). The initial index hospitalization for HF accounted for approximately seventy percent of the total cost for 30-day episodes and about forty-five percent for 90-day episodes. Sixty-one percent of spending during days 31-90 was attributed to post-acute care (Reinhardt et al., 2022). As this review revealed, nurse home visits are cost-effective, proven interventions to reduce readmissions and mortality among this population. Implementing a provider-ordered, nurse-managed protocol to reduce delays in care can potentially reduce readmissions and overall healthcare costs.

No current literature describes a HF-specific home health nurse-managed medication initiation and titration protocol. However, it is known that home care reduces delays in care, patient harm, and readmission rates. Home health nurse-led protocols could have significant implications for future research, and clinical practice and policy. Combining the scope of practice and assessment skills of nurses with providers' ability to prescribe standing protocols appropriately could substantially impact the quality of life and readmission rates of HF patients receiving home care. An overarching goal of home health service is to provide comprehensive and customized care for chronically ill patients within the comforts of their homes. By giving home health nurses the autonomy to implement timely therapies based on a provided-ordered

protocol, HF patients could have improved quality of life by avoiding hospitalization.

Subsequently, a reduction in healthcare expenditure could also occur.

CHAPTER TWO

QUALITY IMPROVEMENT PROPOSAL

Introduction

HF affects over 64 million people globally, with an estimated incidence rate of 2-3 cases per 1000 in Europe and North America. In the United States alone, there were 12,783,478 hospitalizations specifically for HF between 2002-2013, averaging over a million annually. The cost of healthcare per HF patient is approximately \$26,424.12 per year, with the majority of the cost coming from inpatient care and hospitalizations (Savarese et al., 2022). Nurse-led home health care is a cost-effective, evidenced-based intervention proven to reduce HF readmissions (Bamforth et al., 2021, Li et al., 2021, Maliakkal & Sun, 2014, & Spall et al., 2017). Reducing HF readmissions promotes high-quality, sustainable, and efficient patient care by improving patient outcomes, ensuring regulatory compliance, and creating financial stability within healthcare systems. Local Southwest Montana facilities are committed to improving the quality of care for the HF population. They are looking to implement a physician-ordered, disease-specific, home health nurse-led protocol to reduce HF readmissions further. The addition of this protocol could reduce delays in care by allowing nurses to treat acute exacerbations within the patient home based on objective assessment data.

Problem Statement

The problem is unplanned HF hospital readmissions complicated by delays in care due to geographic isolation and provider scarcity, and our approach targets streamlining care for this population in their home. By allowing nurses to manage HF symptoms in the comfort of patients'

homes, this intervention could reduce readmissions by improving efficiency and access to care. Home health nursing care is already an evidence-based intervention to reduce readmissions. This nurse-led protocol implementation aims to delineate a specific piece of home healthcare to improve the quality of HF care locally and extend these findings to others nationally and globally.

Organizational Microsystem Assessment

The two stakeholders, an IM provider team and home health agency, are vested in pursuing expanded use of the HF-specific nurse-led protocol. The project will take place within the IM site. This group consists of twenty-three physician assistants, physicians, and nurse practitioners caring for roughly 13,567 total patients. The geographic reach spans over 3 separate locations within the county and has the potential to impact the quality of life among many HF patients. Data from the electronic health record (EHR) revealed 4 HF readmissions from January 1, 2022 through December 31, 2022. This IM team has had a total of 8 HF readmissions from January 1, 2023 through December 1, 2023. The financial impact of these 8 readmissions could total over \$210,000 based on data from Savarese et al. (2022). IM data also revealed cardiology as the most completed specialty referral.

During the initial meeting with IM leadership and the home health agency, IM leadership expressed the need for providers to become familiarized, comfortable, and educated on this home health agency's nurse-led protocol to reduce HF readmissions further. Lead providers specifically stated there may be providers resistant to adopt this protocol into their care plans and felt it may be better received with some supporting data from a health professional outside of the home health agency. The home health agency formulated this protocol based on evidence-based

guidelines for HF and obtained endorsement from local cardiologists before its implementation. This HF protocol has already been successfully deployed on a national scale in other service areas of the home health agency. The impetus behind introducing this protocol to IM providers was to enhance the quality of life for HF patients by optimizing the efficiency of home health nursing care, and to reduce the overall health care expenditure associated with HF.

The observed and stated workflow has room for improvement. When an IM provider initiates a home health referral, the patient and family are presented with options from local agencies. Healthcare professionals are not allowed to influence patients towards one agency over another, but they can offer objective information about the services provided by each agency. If a heart failure patient chooses the designated home health agency under this protocol, the agency sends it via fax to the IM nursing department. Subsequently, the nursing staff completes the patient information on a physical copy of the protocol and submits it to the provider for a signature. The nurse then returns it via fax to the home health agency, which implements it as a standing order. This method of ordering and implementation introduces unnecessary vulnerabilities within the Swiss Cheese Model for error by relying on paper orders in a technologically advanced world. Not having a record of the signed protocol within the IM electronic health record (EHR) could lead to miscommunication between the two healthcare entities. Integrating the protocol into the Electronic Health Record (EHR) is the most efficient implementation approach. The clinic manager has submitted a ticket with IT; however, their current workload has extended the expected timeline for ticket completion to approximately 3-5 months. If the protocol is built into the EHR during the timeframe of this project, another PDSA cycle will begin to study the new EHR workflow.

Quality Improvement Model The Plan Do Study Act (PDSA) quality improvement (QI) model was chosen for this project because its cyclical framework allows for reevaluation of implemented changes. The PSDA model aligns well with the overall plan for implementing this practice tool to improve workflow and patient outcomes because healthcare should be as dynamic and fluid as patients and their diseases to ensure quality care is continuously delivered. The planning stage involved meeting with stakeholders to assess the data, current workflows, and provider engagement. The hypothesis formulated during the planning stage was that by collecting and presenting HF readmission rates from the previous year to the providers, the stage will be set to introduce the provider-ordered, home health nurse-led HF-specific protocol. The data set will be narrowed to include only established IM patients with HF, and the reports will be de-identified to reduce bias.

The action, or do, step for this project will entail presenting the data (readmission rates among HF patients with and without the protocol) to IM providers at monthly staff meetings. The proposed workflow for implementing the protocol will be part of the presentation. All questions and concerns will be discussed and addressed in the moment if time allows. For items requiring follow-up with IM leadership, the QI project team will discuss solutions and email updates to the group of providers at biweekly intervals. The QI project team comprises a graduate student, two IM lead providers, and the clinic manager. The study process will be conducted continuously and assessed at monthly intervals as the readmission rates are collected and categorized based on whether the patients are receiving usual care (i.e., no home health) or home health care with or without the HF-specific protocol. An assumption is that as PDSA cycles continuously run each month to improve provider workflow, the number of providers ordering

the HF-specific protocol will increase. As barriers are reported or discovered, the act portion of each PDSA cycle will address the concerns and adjust workflows at biweekly intervals and as needed. The cyclical structure of PDSA allows for process flexibility to ensure protocol implementation is successful and sustainable.

Specific Aims & Purpose Statement The purpose of this QI initiative is to streamline communication between home health nurses and IM providers to decrease delays in care and ultimately reduce readmission rates among vulnerable HF patients. Initially, the aim is to have active protocols ordered for twenty-five percent of joint IM & HH HF patients by January 31, 2024. As a result, the purpose is to achieve the secondary patient outcome-focused goal of reducing HF-specific readmissions by greater than or equal to twenty-five percent by January 31, 2024. While PDSA cycles are in full force over the subsequent month, the aim is to have active protocols ordered for fifty percent of joint IM & HH HF by February 29, 2024. As a result of increasing protocol utilization, the goal is to see a fifty percent or greater reduction in HF-specific readmissions among established IM and HH patients by February 29, 2024. Although it is beyond the timeline allocated for this project, the ultimate goals of this QI initiative are to achieve seventy-five percent engagement of IM providers ordering the protocol for HF patients established with HH, and a greater than or equal to a seventy-five percent reduction in HF-specific readmissions by December 31, 2024. Long-term goals were not included in the table as the timeline is out of this project's scope.

Methods

Implementation Summary The site of the improvement project is an IM clinic in which the focus population will be all providers caring for HF patients. By monitoring provider and

staff workflow involved with the nurse-led protocol, we will identify barriers or areas of improvement. At monthly meetings, a verbal survey containing the following questions will be initiated: “Have you ordered the HF protocol on a patient? Are you experiencing trouble ordering the protocol? Do you find ordering the protocol to be a seamless process?”. Because these meetings are held virtually, a show of hands will constitute as “yes” responses. QI project team will keep record of the total “yes” responses. Providers will be requested to send any extra feedback to IM leadership via email instead of discussing it during the meeting, considering the time limitations. IM leaders decided against implementing a formal survey due to the time constraints and heavy workload of IM providers.

The QI project team will assess provider feedback along with trends in readmission rates and the number of active protocols ordered during biweekly meetings to remedy concerns and discuss project trajectory. Qualitative data received from IM providers will be categorized into 3 anticipated themes aligning with why providers support or decline protocol use. These themes include time constraints, registered nurse scope of practice, and self-management preference. Feedback will be categorized as oppositional or supportive under each theme. Updates generated during these meetings will be sent out from IM leadership via internal email to the providers and nursing staff at least biweekly or earlier. Issues requiring immediate attention will be addressed by QI project team with the intent to resolve within twenty-four hours. Recent readmission data and proposed solutions for ease of workflow will be reiterated at subsequent monthly meetings over the timeframe allotted for this project, about 2.5 months.

Intervention & Implementation The proposed practice change of implementing a home health nurse-led protocol will allow potentially life-saving care to be delivered on demand within

HF patient homes. This tool will reduce delays in communication between IM providers, who work Monday – Friday, and home health nurses, who are on call twenty-four hours a day, 7 days a week by allowing treatment of acute HF exacerbation symptoms at the time of initial discovery, rather than waiting for IM providers to respond to home health nursing. Our strategy is to simplify providers' workflow of protocol implementation while presenting readmission data to reiterate its impact on patient outcomes through tracking readmission rates.

The preparatory phase for this project consists of stakeholder meetings, writing of this proposal, developing an intervention initiation and evaluation plan, and obtaining Institutional Review Board (IRB) approval to conduct this project. The QI project leader has completed this phase and obtained IRB approval to continue. Initial steps include collecting retrospective HF readmission data, developing a provider-focused presentation about the protocol, and formulation of verbal survey questions to monitor provider engagement and ease of workflow. The QI project leader will complete these initial tasks by December 14, 2023. The QI project team will meet before the first provider meeting, scheduled on January 16, 2024, to review the provider-focused project and protocol presentation. The proceeding meetings are scheduled for February 20, 2024, and March 19, 2024. The home health agency is scheduled to provide readmission data for IM HF patients under their care by the 15th of each month. The clinical lead providers consist of a Physician Assistant and a Doctor of Osteopathic Medicine with combined clinical experience totaling over 30 years. The clinic manager has maintained this position for over 2 years and has over ten years of healthcare experience.

This project has no fiscal budget as it is being completed solely on graduate student time and dedicated stakeholder employment hours. No purchases are being made in order for this

project to be completed and there is no funding received. The proposed timeline of the intervention implementation and evaluation stages is from January 1, 2024 – February 29, 2024. Anticipated barriers for achieving the project timeline include, but are not limited to, stakeholder or student illness, rescheduling of monthly provider meetings, and technological difficulties in obtaining data. Anticipated barriers for protocol implementation include provider pushback, technological difficulties in ordering protocol, shortages among nursing and support staff to assist providers, and misinterpreted communication.

Evaluation & Analysis Process evaluation will be ongoing to allow providers to verbalize feedback when convenient. Providers will be given instructions to contact the QI project team anytime, from January 16, 2024 through March 26, 2024, via email with concerns, experiences, or suggestions regarding workflow. Maintaining a written record of qualitative feedback within the company's internal email ensures accurate records are kept for the QI project team to discuss strategies for improvement. Assessment of received feedback and discussion of solutions will occur at biweekly QI project team meetings and monthly provider meetings. All communication to IM providers and nursing staff will be sent from leadership within company email at a minimum of biweekly intervals. Improvement of provider workflow will be measured by the percentage of established IM HF patients under the care of stakeholder B home health with the protocol ordered, and by a qualitative review of provider feedback. Qualitative data pertaining to workflow process improvement can be gauged by quantitative increase in “yes” responses to the survey question “Do you find ordering the protocol to be a seamless process?”. Readmission data provided by the home health agency will compare a de-identified list of HF patients with and without the protocol in place. Readmission data for the entire IM group’s HF population,

regardless of subscribed home health service, will be obtained via the EHR at monthly intervals for comparative analysis.

HF readmission rates will be evaluated retrospectively on a 30-day basis because this is how the reports are generated in the EHR and also how stakeholder B home health will generate their report. Reviewing this data retrospectively negates any potential influence this project may have on what type of care patients receive. The IM EHR quantitative reports will be generated by the QI project leader and director of business development within stakeholder B home health. This quantitative data will be compared to the corresponding thirty-day period from the previous year, as well as the most recent thirty-day period. Statistical analysis of the comparative data will be presented at each provider meeting.

Safety & Confidentiality All patient data (i.e.: readmission rates) will be accessed on IM's campus from a secure, password-protected computer and EHR. Reports can be exported to password-protected files if need be, and will be stored on a password-protected computer hard drive with required facial recognition for access. Readmission reports are generated with patient information de-identified. Stakeholder B's report of HF patients will also be de-identified. If a readmission occurs, it will be noted, but no patient-identifying information will be revealed. Because data will be collected retrospectively, this project has no influence on which patient will receive specific care. For this reason, there is no informed consent needed from patients. Both stakeholders are in full support of seeing this project to fruition. Montana State University's Mark & Robyn Jones College of Nursing and the IRB agree this project qualifies as QI, not human subject research. No patients are assigned to specific or new treatments, the protocol contains standard and tested clinical practice guidelines for treating HF, and no change to

standards of HF care will be created. The data collected is observational and retrospective.

Automatically generated, de-identified HF readmission reports will be viewed and accessed from the password secure EHR on Stakeholder A's campus by the QI project leader. As previously mentioned, if reports need to be exported, they will be downloaded to a password-protected file onto a computer hard drive requiring facial recognition for access. Stakeholder B home health reports will be emailed to the QI project leader's personal email address which will only be accessed on a password-protected computer requiring facial recognition to log on. The QI project leader will change their email address password on the 1st of each month for additional security. No protected health information or personally identifiable information will be removed from either Stakeholder's site.

CHAPTER THREE

QUALITY IMPROVEMENT MANUSCRIPT

Contribution of Authors and Co-Authors

Manuscript in Chapter 3

Author: Kayla Jean Culligan

Contributions: Conducted review of literature, developed project proposal, obtained IRB approval, organized intervention implementation and data collection, analyzed data, and wrote manuscript.

Co-Author: Alice Running

Contributions: Supported and guided primary author in all aspects of contributions listed above and helped edit written product.

Co-Author: Amanda Lucas

Contributions: Provided second editorial revisions of written work.

Manuscript Information

Kayla Jean Culligan, Alice Running, and Amanda Lucas

Journal of the Association of American Nurse Practitioners

Status of Manuscript:

- ☒ Prepared for submission to a peer-reviewed journal
- ☐ Officially submitted to a peer-reviewed journal
- ☐ Accepted by a peer-reviewed journal
- ☐ Published in a peer-reviewed journal

Abstract

Heart disease has persistently ranked as the leading cause of death in the United States since 1950 (CDC, 2023b) and remains the top cause in Montana over the last decade (CDC, 2023a). Within the targeted population for this project, heart failure (HF)-specific readmissions showed an increasing trend. Previous research underscores the efficacy of home health (HH) nursing services in reducing unplanned HF readmissions (Bamforth et al., 2021; Li et al., 2021; Maliakkal & Sun, 2014; Spall et al., 2017). However, there's a consistent gap in specifying HH nurse protocols that could result in reduced HF readmissions (Bamforth et al., 2021; Li et al., 2021; Spall et al., 2017).

This project aimed to assess readmission rates after implementing a cardiologist-approved, home health nurse-managed HF protocol for in-home care patients. The primary objective of this Quality Improvement (QI) initiative was to enhance communication between home health nurses and internal medicine (IM) providers, thereby reducing care delays and decreasing hospital readmission rates among vulnerable HF patients. The focus of the intervention was to optimize the provider's ordering process, creating easily identifiable orders for the home health agency to activate a disease-specific protocol. Descriptive statistics comparing HF readmission rates before and after protocol implementation. Additionally, qualitative information highlights the dedication and involvement related to navigating a project of this magnitude.

Section 1 Clinical Problem

Heart disease has been the leading cause of death in the United States since 1950 (CDC, 2023b). Heart failure (HF) cost the United States \$30.7 billion in 2012 and was reported on about 380,000 death certificates in 2018 (CDC, 2023a). By 2030, the annual cost is projected to increase by 127% to \$70 billion with the majority of cost originating from hospitalizations and the care rendered within the 30 and 90-day post-acute period (Reinhardt et al., 2022). Locally, heart disease has ranked as the leading cause of death in Montana for the last decade (CDC, 2023a). Within the population of focus for this project, HF-specific readmissions were on the rise. The internal medicine (IM) team collaborating on this project experienced over a one-hundred percent increase from 2022 to 2023 in HF readmissions within their HF patient population. The solution proposed in this project included implementing a home health (HH) nurse-driven HF protocol approved by the local cardiologist.

Section 2 Review of the Literature

Home health nursing services have been proven to decrease unplanned HF readmission rates (Bamforth et al., 2021, Li et al., 2021, Maliakkal & Sun, 2014, & Spall et al., 2017). However, the evidence consistently points to a lack of specificity regarding HH nurse duties (Bamforth et al., 2021, Li et al., 2021, & Spall et al., 2017). A literature review revealed a HF-specific, nurse-led protocol is not identified or discussed within the literature. Because other chronic illness management has been improved by implementing nurse-led medication standing orders (Shaw et al., 2014), this project examined the rate of readmissions once a cardiologist-approved HF protocol for patients receiving in-home care was implemented.

Section 3 Conceptual Framework

The Plan Do Study Act (PDSA) quality improvement (QI) model was chosen for this project because its cyclical framework allows for reevaluation of implemented changes. The PSDA model aligned well with the overall plan for implementing this practice tool to improve workflow and patient outcomes because healthcare should be as dynamic and fluid as patients and their diseases to ensure quality care is continuously delivered. Throughout the project, the PDSA framework consistently proved effective for assessing changes to the HF protocol ordering process and guiding the next steps to improve.

Section 4 Aims and Purpose of Project

The overall aim was to reduce local HF hospital readmission rates by implementing a specific home health intervention. The purpose of this QI initiative was to streamline communication between home health nurses and IM providers to decrease delays in care and ultimately reduce hospital readmission rates among vulnerable HF patients. The short-term aim was to have active protocols ordered for twenty-five percent of joint IM & HH HF patients by January 31, 2024. As a result, the intent was to achieve the secondary patient outcome-focused goal of reducing HF-specific readmissions by greater than or equal to twenty-five percent by January 31, 2024. Midterm goals for this project were to have active protocols ordered for fifty percent of IM & HH HF patients by February 29, 2024. As a result of increasing protocol utilization, the goal was to see a fifty percent or greater reduction in HF-specific readmissions among established IM and HH patients by February 29, 2024. Although it is beyond the timeline allocated for this project, the ultimate goals of this QI initiative are to achieve seventy-five

percent engagement of IM providers ordering the protocol for HF patients established with HH, and a greater than or equal to a seventy-five percent reduction in HF-specific readmissions by December 31, 2024.

Section 5 Methods

Section 5.1 of Methods - Context

The IM group, consisting of twenty-three physician assistants, physicians, and nurse practitioners, is responsible for the care of approximately 13,567 patients. Operating across three separate locations within the county, the group conducts all monthly provider meetings virtually. These meetings serve as a platform for discussions on project progress, modifications to the ordering process, and data collection. The unique geographic reach of the IM patient panel spans urban and rural areas within the county, making it a crucial component of this project. The virtual nature of the monthly meetings ensures efficient communication and engagement across all locations, allowing the initiative to effectively address the needs of urban and rural HF patients.

Section 5.2 of Methods – Intervention and Practice Change

The main intervention in this project aimed to enhance and streamline the IM providers' ordering process for the HF protocol while simultaneously creating a clear and easily distinguishable order for the HH agency to activate the protocol. The first Plan Do Study Act (PDSA) cycle involved having all providers sign a paper copy of the protocol for each patient, faxed along with a printed copy of the EHR's home health referral order. However, the QI team quickly recognized inefficiencies and increased error potential in this process. There was potential for this step to be entirely missed due to having to remember to fill out and fax an

additional piece of paper. This extra step created more work for the providers and the practice support staff responsible for faxing said orders to HH. After a discussion with HH, the QI team deemed this plan inefficient because of the excess work placed on both stakeholders and increased paper use.

Acknowledging the convenience and effectiveness of electronic ordering, both stakeholders jointly decided to allow providers to sign one paper copy of the protocol for use with multiple patients for a year. This started the second PDSA cycle and eliminated multiple protocols being signed, but there was still no clear way to relay which patients would have the HF protocol activated. Editing the electronic home health order to include an option to select the HF protocol was the clear winner for improving the ordering process, but IT informed the team it would take at least six months to complete based on their backlogged work. Due to IT constraints, free text commenting was adopted as this would transfer from the electronic order to the printed version. Providers were asked to type “OK to use HF protocol” in the comment section of the order. We moved forward with this ordering process, knowing the risk of inconsistent verbiage being utilized when typing free text. However, this method did not work out due to a mishap with forgetting to free text.

By mid-February the third PDSA cycle started after the QI team lead reached out to an administrative superior for further guidance and assistance. Through collaborative efforts with the Chief Medical Information and Technology Officer (CMITO), a clickable option was successfully incorporated directly into the existing HH referral order. After thoroughly discussing the potential ramifications for other departments that utilize this same order, the QI team and CMITO identified the HF option for IM use only to pilot the edit first.

This modification created a clearly identifiable section on the faxed paper copy received by the HH agency, specifying whether the HF protocol was to be activated. Importantly, these practice changes did not alter medical decision-making or clinical practice guidelines. Instead, they introduced an evidence-based tool and streamlined the ordering process to ensure accurate communication between the stakeholders. This ordered process is the workflow in which the project ended. The PDSA cycles varied in length and ran from late December 2023 to mid-March of 2024 with 2 weeks for final data collection and analysis.

Section 5.2 of Methods – Measures

To safeguard patient confidentiality, a representative from the HH agency provided monthly numerical statistics, presenting the current count of joint IM and HH HF patients under or not under the care of the HF protocol. Additionally, the report included details on how many of these patients were readmitted to the hospital. Simultaneously, the QI project leader collected monthly de-identified reports from the IM electronic health record (EHR) highlighting the number of HF readmissions for the entire IM patient population and specifying the discharge disposition. These reports also pinpointed the IM campus where the patient was established. This broader scope provided quantitative data regarding whether readmitted HF patients were discharged to home health, home with selfcare, or an unspecified category listed as other.

In an attempt to specify the total number of HF patients within the IM patient population, the QI team encountered challenges due to the structure of the autogenerated, de-identified reports. The totals for each diagnostic code under the category of heart failure surpassed the overall number of patients under the care of the IM group. Upon clarification from the CMITO, it was confirmed that if a patient had multiple diagnoses, such as right-sided heart failure, left-

sided heart failure, diastolic heart failure, and systolic heart failure, that patient was reported multiple times, specifically four times in this example.

The QI team had the intention of gathering valuable insight from IM providers concerning the ongoing process improvement of the ordering practice during and in between monthly meetings. This qualitative data was to be systematically categorized into three predetermined themes: time constraints, HH nursing practice, and self-management preference. Subsequently, the feedback was to be further subcategorized as supportive or oppositional to these themes. However, the IM providers did not provide any feedback despite being encouraged at each monthly meeting. Decisions regarding the improvement of the ordering process were a collaborative effort between the QI team and the CMITO. Measurement of the ordering process success was measured by an increase in the number of active HF protocols among joint IM and HH HF patients.

Section 5.3 of Methods – Analysis

A comparative analysis of monthly HF protocol use and hospital readmissions data, as provided by the HH agency, was conducted for January, February, and March 2024 (see Figure 1 at the end of this chapter). In January, there were zero joint IM and HH HF patients and, subsequently, no active protocols or readmissions. For February, there were 2 joint IM and HH HF patients, 2 active protocols, and zero readmissions. March resulted in continued use of the 2 established HF protocols and zero readmissions.

Comparing HF readmission rates and discharge dispositions among the entire IM patient population from January, February, and March of 2023 to the same months of 2024 served as a quantifiable metric presented to IM providers during monthly meetings (see Figure 2 at the end

of this chapter). January of 2024 data revealed 2 HF readmissions within the entire IM patient population whereas January of 2023 had zero readmissions. In February of 2024, 2 readmissions occurred, and comparably 2 readmissions also occurred in 2023. March of 2024 totaled zero HF readmissions and 3 readmissions occurred in March 2023. See Figure 3 at the end of this chapter for a visual depiction of 2024 readmission data compared to 2023. This comparison revealed roughly the same amount of HF readmissions for both years; a total of 4 HF readmissions for the first three months of 2024 and 5 for the first three months of 2023.

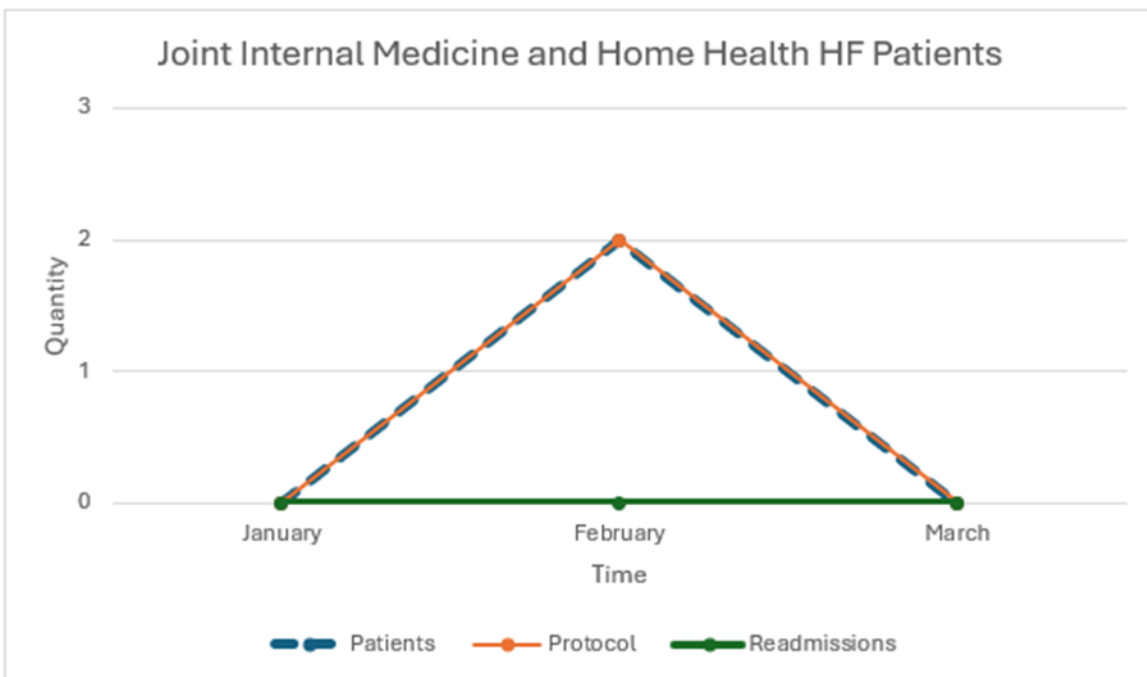


Figure 1. The total number of jointly cared for HF patients, the number of active HF protocols, and total readmissions for January, February, and March.

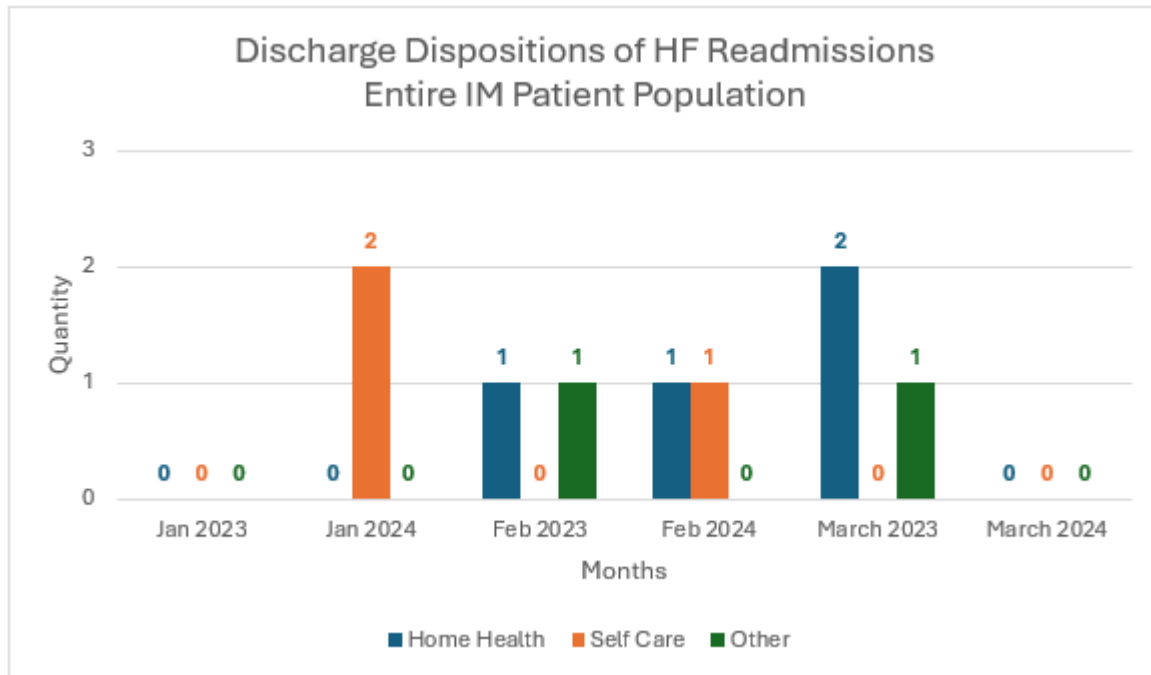


Figure 2. A comparison of HF readmission discharge dispositions in January, February, and March of 2023 and 2024.

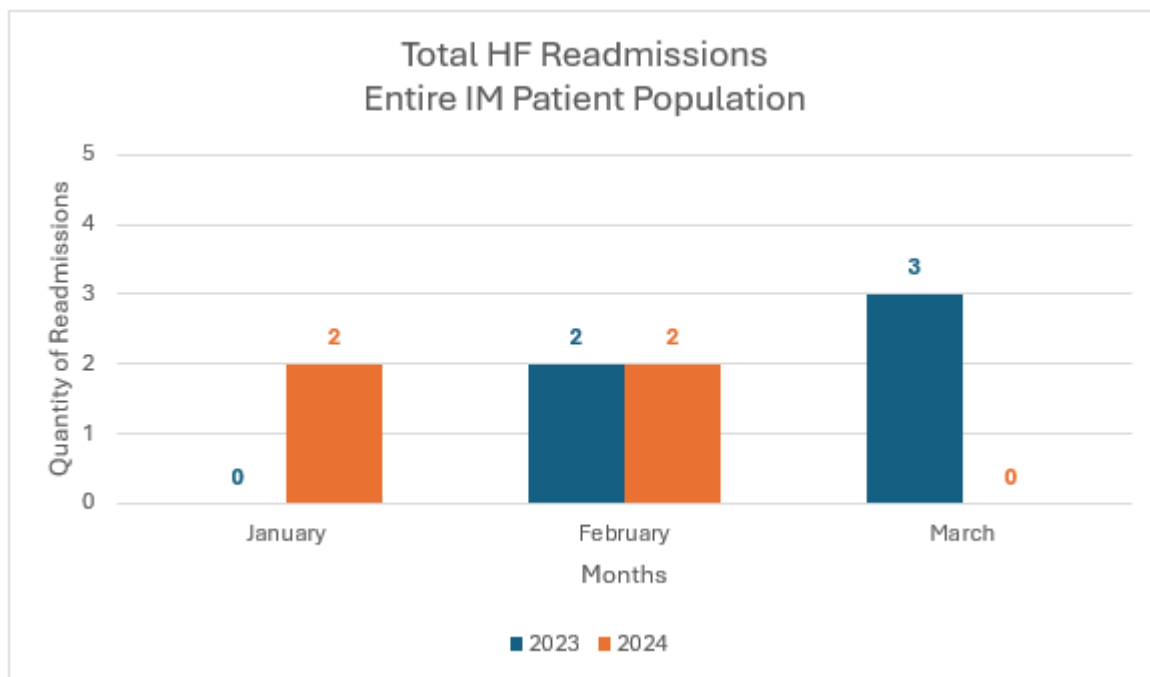


Figure 3. The total number of HF readmissions within the entire IM group in January, February, and March of 2023 compared to 2024.

Section 6 Results

For the month of January, there were no joint HF patients between the two stakeholders. Subsequently, there were no active HF protocols or readmissions to track. Within the IM patient population as a whole, there were two HF readmissions discharged to home with self-care in January. During the monthly IM provider meeting, there were no subjective comments from providers either in support or opposition of the protocol's use. There was also no commentary regarding the ordering process, as no providers had attempted to order the protocol. The QI team did not deduce a specific reason as to why no protocols were ordered, and the hindrance of not being able to access patient charts prevented the team from seeing if any patient had been referred to home health. For the month of January, the ordering process was still to type a free text comment specifying HF protocol use into the EHR HH referral order.

By the middle of February, the EHR HH referral order included the option to select the HF protocol. There was a total of 2 jointly cared for HF patients; both had an active HF protocol in place, and there were zero hospital readmissions. The increase in active HF protocols could be attributed to the improved ordering process and continued reminders during monthly meetings about the option to order said protocol. While there was no definitive qualitative feedback from IM providers, as a team they were more engaged and interested in the project's progress during the February meeting.

March was the only full month in which the EHR HH referral order included the clickable option to select the HF protocol. Given the steady number of active protocols, one could infer the improved ordering process has positively impacted provider workflow.

Section 7 Discussion

Evidence of HH reducing HF readmissions was consistent with the literature reviewed prior to this project. HH is a standalone, evidence-based intervention that reduces HF exacerbations and hospitalizations (Bamforth et al., 2021; Li et al., 2021; Maliakkal & Sun, 2014; Spall et al., 2017). The presumption of the disease-specific protocol increasing the efficacy of HH could not be deemed statistically significant from this project's data, given the small data set, but a solid foundation has been built for this work to be continued by the stakeholders and perhaps with the assistance of another student.

This project's largest takeaways and key findings did not lie within the hard data regarding readmissions originally set out to be discovered. The barriers, miscommunication, and lack of communication during this project supported the known need for increased effective communication between HH agencies and IM groups locally and nationally. The HF protocol served as another tool to streamline IM providers' plan of care by providing HH nurses with a clearly laid out protocol to manage HF exacerbations at the time of onset. This is just one piece of the puzzle set out to improve communication among interprofessional organizations that ultimately want to provide the best care possible and keep patients in their homes and out of the hospital.

One factor that impacted the results was initially being informed any change to the EHR would take at least 6 months. If the QI project team had reached out to the CMITO earlier, rather than the information technology department, the HH referral in the EHR could have been edited earlier. This would have allowed for more data collection, more active HF protocols, and potentially better patient outcomes for the local HF population.

Section 7.1 Discussion - Limitations

A significant limitation of this specific project lies in the constrained timeframe allotted for both implementation and data collection. The challenges were compounded by the inherent complexity associated with collaborating within a large health system and the delays encountered in obtaining necessary changes to the EHR. Consequently, the project fell short of its original intent to collect data over three months, allowing for only one full month of quantitative protocol and readmission data collection.

Collaboration among the IM leaders was compromised due to the fact that they were concurrently working with three Doctor of Nursing Practice (DNP) students on three separate QI projects. Specifically, one of these projects involved a similar HH nurse-managed protocol through the same stakeholder but targeted a different disease process. This situation led to apparent confusion for both stakeholders, as the two DNP students leading these individual projects focused on significantly different interventions. Meetings were often scheduled with all three students present and resulted in rushed discussions. To counteract the large group meeting sizes, the QI project lead intentionally organized separate bi-weekly virtual meeting times with IM. However, IM recommended to the other two students that they should join these virtual meetings.

Communication emerged as a significant limitation in this project. Emails directed to both stakeholders often went unanswered or experienced delays spanning weeks. In response, the QI project lead implemented proactive measures, scheduling virtual bi-weekly meetings and adopting a professional persistence approach balanced with patience in re-contacting via email. Despite these efforts, there were instances when the QI leader had to resort to unannounced in-

person visits with the other QI team members to secure the necessary attention and answers required to propel the project forward.

The scope of this project was constrained by the decision to track solely de-identified patient data, limiting the investigation to the HF protocol ordering process. The autogenerated reports were also limited to patients sixty-five years and older. While there were instances where the QI project lead was asked to follow up on patient-specific information related to an HF readmission discharge, doing so would have surpassed the bounds established by the International Review Board (IRB) approval obtained prior to implementation.

Section 7.2 Discussion - Recommendations

For future projects with similar interventions, it is recommended to explore obtaining IRB approval to access patient-identifiable information. This step could provide a deeper understanding of discharge positions other than HH. There is potential for an entire project dedicated to analyzing the reasons why patients refuse HH services or exploring the criteria that deem patients safe for self-care at home. Both of these topics of interest mentioned by IM members of the QI team. Subsequent DNP students could build on the foundation of this project, focusing on refining the ordering process or assessing the protocol's effectiveness in reducing HF readmissions.

Section 8 Conclusion

In conclusion, the evidence presented throughout this project supports the notion that home health emerges as a potent and effective tool in mitigating heart failure readmissions. The implementation of a home health nurse-led protocol, guided by the principles of quality

improvement and collaboration with stakeholders, has demonstrated tangible positive outcomes as demonstrated by zero readmissions during the month of February with 2 active HF protocols. This project supports the need for continued research regarding HH nurse-led disease-specific protocols. The emphasis on proactive patient care in the home environment, coupled with streamlined communication between home health nurses and healthcare providers, has proven instrumental in reducing readmission rates among vulnerable heart failure patients. This project underscores the potential impact and significance of home health interventions as a valuable strategy in the ongoing efforts to enhance patient outcomes and promote sustainable healthcare practices.

CHAPTER FOUR

ADVANCED NURSING ESSENTIALS REFLECTION

The Doctor of Nursing Practice (DNP) program at Montana State University is a comprehensive and advanced academic endeavor designed to equip nursing professionals with the necessary skills and knowledge to excel in advanced clinical practice and healthcare leadership. One of the key aspects of the DNP program is its emphasis on meeting the American Association of Colleges of Nursing (AACN, 2021) core competencies for advanced education, which represent the outcomes expected of graduates. Throughout my years completing this program, I can confidently say I have met these competencies and will elaborate on some specific examples.

The AACN's DNP Essentials encompass various domains, such as scientific underpinnings for practice, organizational and systems leadership, clinical scholarship, and information systems and technology. The program has facilitated my understanding and integration of these essentials through rigorous coursework, practical experiences, and scholarly inquiry. The core curriculum was undertaken during the initial semesters and expanded the depth and breadth of how I viewed healthcare systems.

Specifically, an assignment during the Design and Delivery of Healthcare Systems course challenged us to depict a step-by-step workflow process and delineate estimated time frames for completion. While completing this assignment, I worked in Arizona during the COVID-19 pandemic in an area ravaged by the virus. This particular assignment resonated with me daily as I worked under extreme circumstances regarding lack of resources, staffing, physical space, and emotional well-being, all while trying to conceptualize how I could improve the current system.

As I lead a quality improvement (QI) project at the end of the DNP program, this assignment remains at the forefront of my thoughts as I conceptualize a cascade of system-wide effects created by editing one order in an electronic health record.

Implementing and evaluating a QI project to address a local increase in heart failure readmissions has been instrumental in solidifying my understanding of the AACN's (2021) DNP Essential Domain 7 of leading and proactively coordinating resources to ensure safe, equitable, cost-effective, and efficient care at a system-level practice. This hands-on experience has allowed me to apply theoretical knowledge to real-world scenarios, enhancing my clinical and leadership skills. The collaboration required between two stakeholders to ensure we met our goal of reducing readmissions created a dynamic that required tenacious leadership skills and effective communication. Through this process, I learned a lot about myself as a clinical leader and gained perspective into the persistence required on all accounts to see a project of this magnitude through. The initial DNP core course series provided the background knowledge for me to demonstrate proficiency in directing quality improvement, systems management, and interprofessional collaboration as a clinical leader.

The core and advanced practice didactic courses, coupled with the completion of a QI project, created positive implications for my career as a doctoral-prepared family nurse practitioner. Through the application of evidence-based practices, current practice guidelines, and the systematic evaluation of outcomes, I have developed a heightened awareness of the complexities within healthcare systems and the patients I care for. The program has informed my ability to navigate and lead in dynamic and evolving healthcare environments, aligning with the DNP Essentials related to organizational and systems leadership.

Additionally, the QI project has strengthened my commitment to clinical scholarship and the integration of research into practice. As a doctoral-prepared nurse practitioner, I am better positioned to critically appraise and apply research findings to improve patient outcomes. This aligns with the AACN's (2021, pp. 28) DNP Essential 1.3, "Demonstrate clinical judgment founded on a broad knowledge base". By translating evidence into practice and ensuring my clinical decisions are grounded in the latest and most relevant research, I have expanded my knowledge base beyond my registered nurse (RN) training. A key aspect of my RN training that has only grown more sophisticated through completing the DNP program is the ability to treat patients as individuals by differentiating their personal pathophysiology and experiences of diseases rather than a group of diagnoses.

Furthermore, the project's emphasis on addressing a local practice problem underscores the importance of advocacy and policy development. I have gained valuable insight into nurse practitioners' role in influencing healthcare policies to enhance patient care. This aligns with Montana State University's DNP Essential related to influencing healthcare policy and advocacy for population health and AACN's (2021, pp. 35) domain 3.4, "Advance equitable population health policy." By developing an awareness of our local heart failure population's interconnectedness within the local healthcare systems, I could focus on a quality improvement project that advocated for better patient care by reducing heart failure-associated hospital readmissions.

In conclusion, the DNP program, encompassing both coursework and the practical application of knowledge in the QI project, has allowed me to meet the DNP Essentials comprehensively. The experience gained in implementing and evaluating the QI project has

significantly impacted my career as a doctoral-prepared nurse practitioner, enhancing my abilities in clinical practice, leadership, and the translation of evidence into practice. This holistic approach to the DNP program has equipped me with the skills and mindset necessary to excel in the ever-evolving healthcare landscape.

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