

FEASIBILITY OF USING THE TARGET: HF TELEPHONE FOLLOW-UP TOOL
IN A PRIVATE PRACTICE-BASED HEART FAILURE TRANSITIONAL
CARE PROGRAM

by

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As members of the DNP Project Committee, we certify that we have read the DNP project prepared by Lydia Marie Moor, titled Feasibility of Using the Target: HP Telephone Follow-Up Tool in a Private Practice-Based Heart Failure Transitional Care Program and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.

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To my father Larry Thatcher and my grandfather Dick Thatcher:

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TABLE OF CONTENTS

LIST OF FIGURES	8
LIST OF TABLES	9
ABSTRACT	10
INTRODUCTION	12
Background and Context of Problem	13
What is Heart Failure?	13
Classifications of Heart Failure	13
Problem Statement and Significance	15
Significance to Healthcare	16
Transitional Care Model Programs and Interventions	16
The AHA Get with the Guidelines Target: HF Telephone Follow-up Tool	18
Significance to Advanced Practice Nursing	21
Epidemiology of Heart Failure in Arizona: Defining the Local Problem	22
Purpose, Aims and Objectives	24
Stakeholders Identified	24
Study Questions	25
Conceptual and Implementation Framework	26
Naylor Transitional Care Model	26
Key Concepts	29
Self-Care Management	29
Application of Frameworks to Problem and Aims	31
Synthesis of Evidence	32
Appraisal of Evidence Methods	33
Synthesis of Evidence Overview	34
Strengths	34
Weaknesses	36
Gaps	37
Limitations	38

TABLE OF CONTENTS – *Continued*

METHODS	52
Design	52
Setting	52
Participants	52
AHA Target: HF Telephone Follow-up Tool	53
Evaluation Methods	54
Data Collection	55
Tools, Methods and Analysis	55
Ethical Considerations	55
Respect for Persons	56
Beneficence	56
Justice	57
RESULTS	57
Data Analysis and Outcomes	57
Aim 1	58
Question 1.	58
Question 2.	59
Question 3.	59
Question 4.	59
Question 5.	59
Aim 2	60
Question 6.	60
Aim 3	61
Question 7.	62
DISCUSSION	71
Summary of Evidence	71
Relationship of Results to Frameworks	72
Naylor Transitional Care Model	72

TABLE OF CONTENTS – *Continued*

Concept of Self-Management	73
Relationship of Results to Aims	74
Relationship of Results to Other Evidence	75
Impact of Results on Practice	77
Strengths and Limitations	79
Conclusions	81
Dissemination	82
OTHER INFORMATION	83
Resources and Cost Analysis	83
APPENDIX A: AMERICAN HEART ASSOCIATION (AHA) TARGET: HF TELEPHONE FOLLOW-UP TOOL.....	84
APPENDIX B: PATIENT CONSENT TO PARTICIPATE IN DNP PROJECT.....	93
APPENDIX C: OLD PUEBLO CARDIOLOGY (OPC) LETTER OF SUPPORT FOR DNP PROJECT.....	95
APPENDIX D: AIM 1 AND AIM 2 DATA COLLECTION EXCEL SPREADSHEETS.....	98
APPENDIX E: THE UNIVERSITY OF ARIZONA INSTITUTIONAL REVIEW BOARD APPROVAL LETTER.....	100
REFERENCES.....	102

LIST OF FIGURES

<i>FIGURE 1.</i>	Naylor transitional care model.....	29
<i>FIGURE 2.</i>	Five-stage model of naturalistic decision-making.	31
<i>FIGURE 3.</i>	Boxplot of Old Pueblo Cardiology (OPC) call duration in minutes.	61

LIST OF TABLES

TABLE 1.	<i>Evidence for telephone follow-up in HF patients.</i>	41
TABLE 2.	<i>OPC patient demographics information.</i>	58
TABLE 3.	<i>Aim 1: OPC patient willingness to participate in STS.</i>	60
TABLE 4.	<i>Aim 2: Telephone call duration in minutes.</i>	60
TABLE 5.	<i>Aim 3: Description of self-care management needs.</i>	62
TABLE 6.	<i>Potential OFI in OPC patient education.</i>	69
TABLE 7.	<i>Potential OFI in OPC medications for HF management.</i>	70

ABSTRACT

Background: To reduce heart failure (HF) costs, the Centers for Medicare and Medicaid Services (CMMS) Hospital Readmissions Reduction Program (HRRP) cut reimbursements by 3% to the hospitals with high readmission rates. The American Heart Association (AHA)'s transitional care model program called Target: HF includes a structured telephone support (STS) tool, the AHA Target: HF telephone follow-up tool. It identifies barriers and breakdowns in HF self-management and encourages mechanisms to support HF patients.

Methods: This retrospective quality improvement Doctorate of Nursing Practice (DNP) project evaluated the feasibility of using the Target: HF telephone follow-up tool in a private cardiology practice, Old Pueblo Cardiology in Tucson, Arizona. Eligible patients were transitioning home following recent HF hospitalization. Project aims were to 1) describe patient willingness to participate in STS with rates of consent, contact, and tool completion, 2) calculate the telephone call time, and 3) assess self-management needs. Naylor's Transitional Care Model and the Five-Stage Model of Naturalistic Decision Making were theoretical frameworks guiding this DNP project.

Results: A total of five patients participated. They averaged 84 (SD 8.245) years old, were 4.6 (SD 3.647) months post discharge, and five (100%) had normal left ventricular ejection fractions (LVEF). Patient engagement was 100% (n = 5) for consent, contact, and follow-up tool completion rates. The average call duration was 26.8 (SD 9.418) minutes. The greatest self-management needs were: none (0%) had a weight diary, one (20%) was not on fluid restrictions, weighed themselves on day 1 after discharge and knew their dry weight, three (60%) weighed themselves daily, engaged in exercise/daily physical activity, drank alcohol regularly, and knew

symptom triggers to call to cardiologist. Medications were not always indicated.

Contraindications prevented medication taking by two (40%) for ACE-inhibitors and beta-blockers, and one (20%) patient for hydralazine/nitrates and potassium supplements.

Conclusions: The Target: HF telephone follow-up tool is feasible in OPC patients. Opportunities for improvement (OFI) include screening and managing risks and symptoms for weight monitoring and alcohol habits, increasing engagement and collaboration for low sodium diet and exercise/physical activity, reinforcing when to call the cardiologist, and fostering collaboration to improve taking medication rates in patients with contraindications.

INTRODUCTION

Heart failure (HF) is expensive to treat in the United States (US). Health care costs for treating HF exceed \$30 billion annually and are projected to reach \$106.4 billion per year by 2030 (Heidenreich et al., 2011). To reduce costs, the Centers for Medicare and Medicaid Services (CMMS) began the Hospital Readmissions Reduction Program (HRRP) on October 1, 2012, which cuts CMS payments by up to 3% to hospitals with the highest 30-day risk-standardized unplanned readmission rates for six conditions, including HF (CMS, 2019). In response, many hospitals developed transitional care programs; but by 2014, 30-day readmission rates had declined only 2.5% to 17% (Chamberlain, Sond, Mahendraraj, Lau, & Siracuse, 2018; Fletner et al., 2014; Medicare Payment Advisory Committee, 2016). The Naylor Transitional Care Model (TCM) uses advanced practice nurses (APNs) to provide a continuity of HF care coordination starting within 24 hours of admission and extending beyond discharge using telephone, home, and clinic follow-up interventions (Hirschman & Bixby, 2014). Utilizing a private practice-based TCM, this doctoral project explored the feasibility of implementing the American Heart Association's (AHA) Target: HF telephone follow-up tool in recently discharged HF patients to describe patient willingness to participate in telephone follow-up, calculate AHA Target: HF telephone follow-up tool time, and assess patient self-care management needs related to patient education and medications for HF management (DeBoe, 2017; AHA, 2017a).

Background and Context of Problem

What is Heart Failure?

Heart failure (HF) is a progressive, chronic disease that results in death within five years of diagnosis for nearly 50% of HF patients (American Heart Association [AHA], 2019; Loehr, Rosamond, Chang, Folsom, & Chambless, 2008). HF occurs when the heart is unable to pump enough blood and oxygen to maintain healthy organ function (CDC, 2019). As the heart fails, it compensates by stretching, pumping faster, constricting arteries to increase blood pressure, and keep blood central within the body's core to perfuse the heart and brain at the expense of more peripheral organs such as kidneys (AHA, 2019). These compensation measures eventually fail to maintain healthy organ perfusion, particularly to kidneys (AHA, 2019). In response, biochemicals are produced in the body that cause cardiac remodeling to enlarge the heart through ventricular stretching and cardiac muscle hypertrophy (AHA, 2019). The impact of these changes on cardiac function and patient symptoms during activity vary between individuals and are categorized in classification systems that often guide treatment recommendations (AHA, n.d.a).

Classifications of Heart Failure

One HF classification system is based on cardiac ejection fraction (EF) - or the amount of blood pumped with each cardiac contraction - which is normally between 50-70% (AHA, 2019). When EFs are greater than or equal to 50% in HF patients, the patient is said to have preserved ejection fraction (HFpEF; AHA, 2019). HF patient's with EFs between 41% and 49% are considered borderline (AHA, 2019). When EFs decline to less than 40%, patients have HF with reduced ejection fraction (HFrEF; AHA, 2019). Left ventricular systolic dysfunction (LVSD) is

defined as documentation of an EF of less than 40% or narrative description of moderate or severe systolic left ventricular dysfunction (AHA, 2018).

HF is further classified by severity of symptoms using the New York Heart Association (NYHA) Functional Classification (AHA, 2017b). Subjective patient descriptions of their symptoms in relation to physical activity are classified into one of four categories (AHA, 2017b). Class I is associated with no fatigue, palpitation, or dyspnea that limits physical activity (AHA, 2017b). Class II begins when the patient is comfortable at rest, has slight activity limitation caused by the symptoms listed above with ordinary physical activity (AHA, 2017b). Class III also describes patients as comfortable at rest, but symptoms become severe with less than ordinary activity (AHA, 2017b). Lastly, class IV patients experience symptoms at rest and discomfort increases directly with vigor of physical activity (AHA, 2017b). The NYHA classification also includes an assessment based on objective assessments (AHA, 2017b). These objective classifications are labeled A, B, C, & D and mirror the same definitions described above based on limitation of physical activity and patient symptoms (AHA, 2017b).

These classifications in symptom severity and ejection fraction help diagnosticians describe HF in a standardized manner. Clinical practice guidelines, such as the *2017 ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure* utilize these standardized classifications to define optimal HF treatment and improve patient outcomes such as reduced readmission rates, lower mortality, and reduced health care costs (Yancy et al., 2017). This standardized approach, called guideline-directed medical therapy, helps promote continuity as HF patients transition out of the hospital post-discharge.

Problem Statement and Significance

Unfortunately, effective post-discharge transitions and self-care management are commonly impeded by barriers or breakdowns in healthcare for HF patients. These breakdowns often occur during patient assessment, patient and caregiver education, handoff communications, and following hospital discharge (AHA, 2017c). Breakdowns associated with patient assessment are related to unrealistic optimism of the patient's ability to manage their HF - especially if there are comorbid conditions with impaired physical or cognitive function, complex treatment regimens, need for the support of caregivers to understand or assist with treatment, or poor record keeping (AHA, 2017c). Breakdowns in patient or family education occur when the discharge instructions are complex, contradictory, or not relevant (AHA, 2017c). Non-adherence to treatment needs to be understood to promote self-care management (AHA, 2017c). Instructions are optimal when they include specific patient-tailored details to help the patient incorporate the new self-care management interventions within their routines and resources (AHA, 2017c). Handoff communication breakdowns result in patients leaving the hospital without required equipment or health information, optimal medication reconciliation, needed support to address variations in baseline functionality, and needed follow up (AHA, 2017c). Lastly, breakdowns following hospitalization include issues such as not knowing who to contact if health conditions change, significant barriers to arranging or keeping follow-up appointments, lack of understanding on how to obtain equipment, information or medications, and/or medication errors (AHA, 2017c). There is insufficient support to assist patients in overcoming these barriers to effective self-care management post-discharge because hospital services commonly stop at the point of discharge. Private practice-based cardiology APRNs can lead HF

transitional care programs and interventions that support transitioning HF patients and reduce their barriers to effective self-care management (David, Britting, & Dalton, 2014; Delgado-Passler & McCaffrey, 2006).

Significance to Healthcare

Advanced practice registered nurses (APRNs), especially adult gerontology acute care nurse practitioners (AGACNP) who work in cardiology private practice, are optimally positioned to work with HF while they are in the hospital and after they transition out into community self-care management because they can provide a continuity of evidence-based guideline-directed medical therapy (David, Britting, & Dalton, 2014). They can also utilize TCM programs and interventions such as structured telephone support (STS) to help the patient improve their self-care management and prevent poor outcomes. These concepts are explored further in the following sections.

Transitional Care Model Programs and Interventions

The Hospital Readmissions Reduction Program (HRRP) launched in October 2012 and reduced CMS reimbursement to hospitals with the highest rates of unplanned 30-day risk-standardized re-admission rates for six common medical conditions, including HF (CMS, 2019). Hospitals responded by developing TCMs composed of intervention bundles (Feltner et al., 2014). The most common types of interventions described in these TCMs are home visiting programs, STS, telemonitoring, outpatient clinic-based services, patient education, and other such as peer support, nutritional consults, or care coordination of recommended follow up (Feltner et al., 2014; Vesterlund, Granger, Thompson, Coggin, Chuck, & Oermann, 2015).

Home visiting programs are usually led by non-physician clinicians such as nurses or pharmacists who provide self-care education, physical exams, and services such as physical therapy, medication reconciliation, or care coordination services (Feltner et al., 2014). STS utilizes a structured questionnaire or decision support tool to make scheduled telephone calls with a specific goal to use the tool to monitor the patient, provide patient education, and address self-care management concerns (Feltner et al., 2014). Telemonitoring (TM) is the use of remote monitoring tools to collect and transmit physiologic patient data (Feltner et al., 2014). Outpatient clinic-based intervention is less structured than STS but can utilize a clinician (usually a nurse) or multi-disciplinary service to provide unstructured support to address patient needs, either during or after office hours (i.e. a patient hotline) (Feltner et al., 2014). Educational interventions often include self-care management training either before, during, and/or after discharge using a variety of methods, and may include outcome monitoring phone calls (Feltner et al., 2014). Typically, structured education provided by telephone or telemonitoring is not considered part of an educational intervention (Feltner et al., 2014). Lastly, other interventions include offering peer support, quality control audits on discharge to skilled nursing facility (SNF), nutritional consults, end-of-life planning services, and case management services to pre-schedule follow up appointments with specialists or primary care providers within seven days of discharge (Feltner et al., 2014; Jacobs, 2011; Vesterlund et al., 2015).

A systematic review with meta-analysis of these interventions showed a high intensity home visiting program reduced 30-day all-cause readmission rates by 66% [RR 0.34 (95% CI 0.19 – 0.62); number needed to treat (NNT) = 6] and these gains were sustained at 25% lower risk at three and six months [RR 0.75 (95% CI 0.68 - 0.86), NNT = 9] (Feltner et al., 2014).

Additionally, multi-disciplinary HF clinic interventions (that included provider access) reduced all-cause readmissions with a high strength of evidence by 30% [RR 0.70 (95% CI 0.55 - 0.89); NNT = 8] (Feltner et al., 2014). STS reduced HF specific readmission at 3 to 6 months only with high strength of evidence by 26% [RR 0.74 (95% CI 0.61 – 0.90); NNT 14] but did not significantly reduce all-cause readmissions (Feltner et al., 2014). Home visiting programs, multidisciplinary HF clinics and STS all reduced patient mortality; however, TM and education did not reduce readmissions or mortality (Feltner et al., 2014). The highest mortality benefit was seen with multidisciplinary HF clinic intervention where risk of dying was reduced 44% [RR 0.56 (95% CI 0.34 – 0.92); NNT = 18] followed by STS which reduced risk of dying by 26% [RR 0.74 (95% CI 0.56 – 0.97); NNT = 27] (Feltner et al., 2014). A systematic review of multi-component transitional care programs concluded that optimal programs aimed at reducing readmissions and patient mortality, should include advanced practice leadership, STS, and home visiting programs with face-to-face communication on the interventions that reduce risks of poor outcomes (Garcia, 2017).

The AHA Get with the Guidelines Target: HF Telephone Follow-up Tool

On January 1, 2016, the American Heart Association and American Stroke Association launched a public recognition reward process for participating hospitals called *Get with the Guidelines*, which includes programs for HF and stroke. Two types of measures were established as part of these guidelines: 1) quality measures, which are care and process recommendations moderately supported by science to help HF patients, and 2) achievement measures, which are processes and care recommendations strongly supported by science to improve HF patient

outcomes (AHA, n.d.a; AHA, n.d.b). To qualify for an award, participating hospitals need to demonstrate 75% compliance over 12 months on at least four HF quality measures including:

- Aldosterone antagonist at discharge for patients with HFrEF $\leq 35\%$ or documented moderate/severe dysfunction without contraindication or intolerance
- Angiotensin receptor-neprilysin inhibitors (ARNI) at discharge
- Hydralazine/nitrate at discharge for African American HF patients with left ventricular systolic dysfunction (LVSD) without contraindication or intolerance
- Cardiac resynchronization therapy device-defibrillator or biventricular pacemaker prescribed or placed at discharge for patients with EF $\leq 35\%$, QRS duration of 120 ms or more and left bundle branch block or QRS duration at least 150ms with any QRS morphology without contraindication, intolerance or objection
- Implantable cardiac defibrillator (ICD) counseling or ICD placed or prescribed at discharge
- Pneumococcal vaccination
- Anticoagulation for atrial fibrillation or atrial flutter
- DVT prophylaxis in non-ambulatory HF patients by end of hospital day two.
- Influenza vaccination during flu season
- Follow-up visit within seven days or less. (AHA/ASA, 2017, p. 1-2; AHA, n. d.)

Participating hospitals also need to demonstrate compliance rates of achievement measures:

- ACE/ARB or ARNI at discharge for patients with LVSD without documented contraindications.

- Evidence-based specific beta blockers such as bisoprolol, carvedilol, metoprolol succinate CR/XL at discharge
- Measure left ventricular (LV) function before arrival, in hospital or planned after discharge
- Post-discharge appointment for HF patients documented with specified location, date and time (AHA, n.d.a).

Multiple strategies and clinical tools are available on the AHA *Get with the Guidelines Target: HF* website to assist acute care hospitals in implementing these guideline standards including an *AHA Target: HF telephone follow-up tool* (Appendix A) (AHA, 2017a; AHA, 2018). This clinical tool is intended to be used as a flexible quality improvement tool for comprehensive follow-up on HF patients recently discharged from acute care (AHA, 2018). Because follow-up within seven days is associated with reduced readmission and improved quality of life, this tool is intended to be used for early follow-up, often defined as either 24- or 48-hours post-discharge before the seven-day post-discharge clinic visit (AHA, 2018; Lee, Yang, Hernandez, Steimle & Go, 2016). The AHA Target: HF telephone follow-up tool is aimed at improving patient self-care management of disease management strategies and medications (AHA, 2018). The use of the AHA Target: HF telephone follow-up tool in recently discharged HF rural acute care patients in Kentucky showed that it significantly increased patient knowledge ($F=15.6$; $p<0.001$), self-efficacy maintenance ($F=10.7$; $P=0.002$), and self-efficacy confidence ($F=10.8$; $P=0.002$) as measured by the Atlanta Heart Failure Knowledge Test and the Self-Care of Heart Failure Index (Fuller, 2018). It was also correlated with a 20% reduction in 30-day readmission rates (Fuller, 2018). However, there is a paucity of literature validating this tool. This quality improvement

project will evaluate the feasibility of using the AHA Target: HF telephone follow-up tool in a private practice-based transitional care program.

Significance to Advanced Practice Nursing

As of August 2019, there are 270,000 nurse practitioners (NPs) in the United States (AANP, 2019). Advanced Practice Registered Nursing (APRN) underwent important changes with the publishing of the *Consensus Model for APRN Regulation: Licensure, Accreditation, Certification and Education* on July 7, 2008 (APRN Consensus Work Group & National Council of State Boards of Nursing APRN Advisory Committee, 2008). This document set forth a model for APRN regulation to be fully implemented by 2015 (APRN Consensus Work Group & National Council of State Boards of Nursing APRN Advisory Committee, 2008). In this model, APRNs select a role, such as nurse practitioner, and then a population, such as adult gerontology or family practice (APRN Consensus Work Group & National Council of State Boards of Nursing APRN Advisory Committee, 2008). This model was applied in a *Statement on Acute Care and Primary Care Certified Nurse Practitioner Practice* by the National Organization of Nurse Practitioner Faculties (NONPF) and established that the future educational preparation for APRNs would either be acute care or primary care focused within a designated population (NONPF, 2012). NONPF further specified:

“The primary care CNP does not have the educational preparation to care for the unstable complex acute or critical patient but does have the preparation to stabilize the acute patient and manage patients with multisystem chronic conditions. Likewise, the acute care CNP does not have the educational preparation to provide comprehensive, continuous care but does have the preparation to document the need for preventives services within the context of caring for patients with unstable, critical and complex conditions.” (NONPF, 2012, p. 4).

In response, many hospitals have adjusted their employment models to meet these new regulatory requirements for NPs and mandated acute care certification for NPs who wish to hold hospital privileges. As of 2019, most NPs, 72.6%, provide primary care and 87.1% are certified in primary care (AANP, 2019). Only 41.7% of full time NPs hold hospital privileges (AANP, 2019). As of 2019, only 3.1% of NPs are adult-gerontology acute care certified (AANP, 2019). This changing trend in APRN regulation and corresponding hospital credentialing has profound implications for transitional care programs. Suddenly, the role of managing unstable and/or complex HF in both inpatient and outpatient settings is fully in the scope of practice for the acute care NP. Acute care NPs are the optimal advanced practice nurse to serve the transitioning HF patient population through the development of APRN-led TMCs (David, Britting, & Dalton, 2014; Delgado-Passler & McCaffrey, 2006).

Epidemiology of Heart Failure in Arizona: Defining the Local Problem

In 2016, cardiovascular disease was the leading cause of death in Pima County, Arizona accounting for 29.1% of total deaths and is comparable with other state incidence rates and the 31.8% national rate (Arizona Department of Health Services [ADHS], 2016; AHA, 2019b). As of 2017, the age adjusted morbidity prevalence rates for chronic HF as measured by hospital discharge reporting on emergency room visits showed a prevalence of HF in Pima County to be 41.6 cases per 100,000 persons (ADHS, 2017). This rate is slightly lower than the Arizona statewide rate of 56.7 cases per 100,000 persons (ADHS, 2017). In general, HF morbidity rates in Pima County fluctuate in parallel with Arizona statewide rates and there is an increasing trend toward higher age-adjusted HF morbidity since 2010 (28.9 cases per 100,000 and 48.2 cases per 100,000 respectively; ADHS, 2017). The 2007-2010 Medicare beneficiary data again

demonstrates the parallel performance between Tucson and Arizona statewide rates on several HF indicators: 1) All-cause readmissions within 30 days of discharge for Medicare beneficiaries was at 16.7% in Tucson and 17.0% statewide, 2) Risk-adjusted 30-day mortality for Medicare beneficiary patients hospitalized with HF was 10.8% in Tucson and 10.5% statewide, and 3) Percent of patients hospitalized with HF who received recommended care was 92.8% in Tucson and 93.6% statewide (The Commonwealth Fund, 2014). The Medicare claims data collected from July 1, 2015 to June 30, 2018 shows that two hospitals in Tucson, Arizona rank “worse than the national average” with a death rate of 11.5% for HF patients (Medicare.gov, 2019). Clearly, usual care treatments are not changing HF patient outcomes in Tucson, Arizona, or nationally.

Old Pueblo Cardiology (OPC) is a local comprehensive cardiology private practice in Tucson, Arizona that provides preventive, diagnostic, and treatment care to patients with cardiac conditions, including HF (Goldberg, 2019). Each month, OPC cardiology provides transitional care for approximately 20 to 40 HF patients. OPC encourages patients to call them if they are having HF symptoms in order to prevent readmissions; but patients often present to the hospital without calling which increases readmission rates because the local practice culture is to admit and then consult the cardiologist. OPC does not formally measure their readmission rates. For OPC to improve their patients’ outcomes - readmission, self-care management, and mortality - in a “worse than national average rate” hospital environment, they are developing a private practice-based TCM led by their AGACNP (Goldberg, 2019). Prior to this DNP project, OPC did not use structured telephone support (STS); but OPC was interested in exploring the feasibility of using STS guided by the AHA Target: HF telephone follow-up tool. Before

dedicating resources to STS intervention, they wanted to assess their patient's willingness to participate, determine how long it took to complete the tool, and better understand their patient's self-care management needs relating to HF education and medication management.

Purpose, Aims and Objectives

The purpose of this project was to evaluate the feasibility of using the AHA Target: HF telephone follow-up tool with HF patients recently discharged from acute care into the care of providers at OPC in Tucson, Arizona. This project was part of greater effort to build toward an APRN-led HF transitional care program based within the OPC private cardiology practice, where care is provided both in acute care and community settings. The specific aims were:

- Aim 1: Describe patient willingness to participate in telephone follow-up by reporting consent rates, contact rates, and follow-up tool completion rates.
- Aim 2: Calculate the AHA Target: HF telephone follow-up tool time.
- Aim 3: Describe patient self-care management needs related to patient education and medications for HF management using the AHA Target: HF telephone follow-up tool.

Stakeholders Identified

Old Pueblo Cardiology (OPC) is a private cardiology practice in Tucson, Arizona with two cardiology providers - a physician and doctoral-prepared AGACNP. Both providers see patients in the community and acute care settings; however, the AGACNP primarily rounds on the acute care patients for the practice as part of their transitional care program to prevent hospital readmissions. The OPC providers recruited and consented patients (Appendix B) for early telephone follow-up which occurred at the times they interacted with the patient and not necessarily at scheduled times for a DNP student to be present for consent. After the provider

obtained consent, the provider then documented the contact information for the DNP student to complete the telephone call. The commitment of the rounding providers was crucial to the success of this intervention and analysis. OPC pledged its support of this project (Appendix C) and worked diligently with the DNP student to ensure the methods were feasible with their current practice and bridge to their existing support staff for promotion of intervention sustainability post-project. When it was possible, the DNP student initiated the call from an OPC telephone number to promote patient confidence with the student's affiliation and access the patient's OPC medication list to reduce patient burden during medication review. Appointments made to complete the survey did not count as call attempts. Lastly, patients had to be willing to participate in the telephone follow-up for the intervention to be successful at assessing patient self-care management needs using the AHA Target: HF telephone follow-up tool. Beyond the scope of this DNP Project, OPC selects the future stakeholders, such as office support staff or the AGACNP, to continue the follow-up calls and promote sustainability.

Study Questions

Aim 1: Describe patient willingness to participate in telephone follow-up by reporting consent rates, contact rates, and follow-up tool completion rates.

- Question 1: For HF patients recently discharged from acute care and followed by Old Pueblo Cardiology, what percent of patients consent for telephone follow up?
- Question 2: What percentage of patients who consent to be contacted for telephone follow-up are successfully contacted within three attempts?
- Question 3: What is the average number of phone call attempts needed before the patient is successfully contacted?

- Question 4: What percentage of patients who are contacted complete the follow-up tool?
- Question 5: What percentage of discharged HF patients complete the follow-up tool?

Aim 2: Calculate AHA Target: HF telephone follow-up tool time.

- Question 6: How long does it take to complete the AHA Target: HF telephone follow-up tool in minutes?

Aim 3: Describe patient self-care management needs related to patient education and medications for HF management using the AHA Target: HF telephone follow-up tool.

- Question 7: What are the HF self-care management elements on the AHA Target: HF telephone follow-up tool with the greatest needs for additional educational or medication management interventions?

Conceptual and Implementation Framework

Naylor Transitional Care Model

The Mary Naylor Transitional Care Model (TCM) is a nurse-led, patient-centered, TCM developed at the University of Pennsylvania (New Courtland Center for Transitions and Health, n.d.). The TCM is designed to promote healthcare continuity and improve patient outcomes in at-risk populations who are transitioning from one healthcare setting and team to another--such as occurs when HF patients are discharged from hospital to home (New Courtland Center for Transitions and Health, n. d.). TCMs are led by an advanced practice registered nurse (APRN) who specializes in the care of older adults with multiple chronic conditions (Naylor & Sochalski, 2010). This APRN functions as a central coordinator providing comprehensive in-hospital assessment and transitional planning with on-going follow-up after the patient returns home -

including telephone support and home visits (Naylor & Sochalski, 2010). The APRN engages patients, their families, and their caregivers in creating a tailored evidence-based plans of care that emphasizes identification of troublesome symptoms and self-care management promotion to improve patient health outcomes (Naylor & Sochalski, 2010). While there is significant overlap of components, the Naylor TCM has both implementation and conceptual models which are outlined below (Hirschman, Shaid, McCauley, Pauly, & Naylor, 2015; Naylor, Hirschman, Toles, Jarrin, Shaid, & Pauly, 2018).

The implementation of TCMs are composed of several components (Naylor et al., 2018). The first component is *delivering services from hospital to home* and consists of in-person visits, starting at hospital admission, with home visits and telephone support starting within 24 hours of hospital discharge and continuing weekly for one month before decreasing (Naylor & Sochalski, 2010; Naylor et al., 2018). The second component is *screening* patients to identify at risk patients to enroll in the program (Naylor et al., 2018). The third is *relying on APRNs* to manage patients during acute illness exacerbations. The fourth is *promoting continuity* by using the same clinician across care sites to prevent breakdowns in care. The fifth is *coordinating care* between different settings, community providers, caregivers, and patients with direct communication to primary care providers, appropriate referral initiation, and follow ups coordination and monitoring. The sixth is *collaborating* with patients, their caregivers, and their care team to ensure there is consensus in treatment plans. The seventh is *maintaining relationships between patients and caregivers* across at least two different settings either visiting in-person or on the telephone. This component also encourages the use of at least five tools to promote trust, engage patient and family, teach communication techniques, facilitate shared decision making, utilize motivational

interviewing or goal setting with patients and families, and organize team meetings. The eighth is *engaging patients and caregivers* and ensures that plans of care align with their preferences, values, and goals. The ninth is *symptom and risk management* by the provider who by assesses patient risk factors and uses medication or symptom management tools. The last component is *educating or promoting self-care management* through interventions that increase capacity for self-care management. Implementations of TCMs do not incorporate all components 96% of the time; in fact, the average program has 4.4 adaptations (40% of implementations lack one to three components, 43% lack four to six components, and 17% lack seven to nine components) (Naylor et al., 2018). The three most commonly adapted components were all contextual and included: not delivering services from hospital to home, relying on APRNs, or promoting *care continuity* between sites.

The conceptual framework of the TCM has nine components (Figure 1) (Hirschman et al., 2015). The *screening* component identifies patients who are highest risk for poor outcomes. The *staffing* component uses APRNs to manage patients throughout their acute illness exacerbations. The *maintaining relationships* component consists of building and promoting trusting relationships between the patient, their family and caregivers, and their healthcare team. The *engaging patients and caregivers* component focuses on ensuring plans of care are based on the preferences, values, and goals of the patient and their caregivers. *Assessing and managing risks and symptoms* component focuses on symptom identification and monitoring that impacts patient risk of adverse outcomes. The *educating/promoting self-management* focuses on building appropriate identification and response to worsening symptoms. The *collaborating* component builds consensus with plans of care across the care team. *Promoting continuity*

includes having the same clinician provide care between the hospital and home to prevent breakdowns in care. The last component is *fostering coordination* through communication and relationships between healthcare sites and community-based providers.

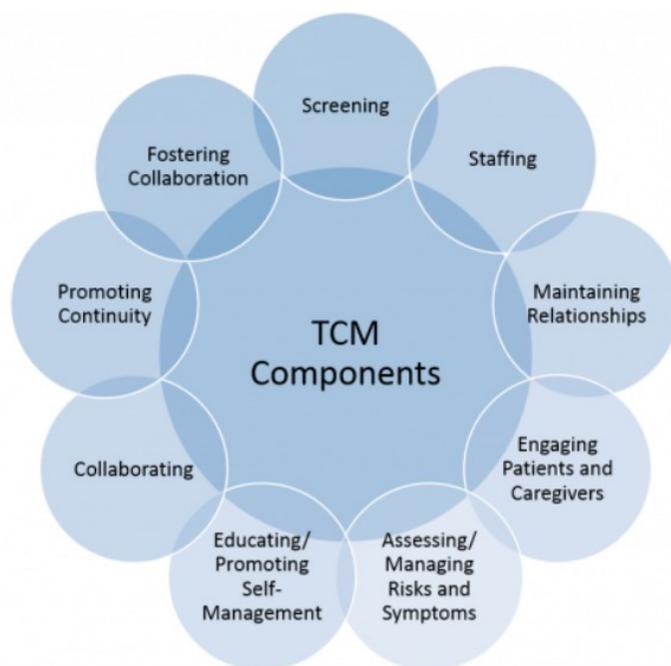


FIGURE 1. Naylor transitional care model. (Nine components make up the conceptual TCM model. There is significant overlap between the conceptual model and implementation model and improved patient outcomes is theorized to be optimized when implementation minimizes adaptations. Schematic from “About the TCM: Research, Practice and Policy,” in New Courtland Center for Transitions and Health at University of Pennsylvania School of Nursing, n. d.)

Key Concepts

Self-Care Management

The concept of self-care management as used in HF is from the *Five-Stage Model of Naturalistic Decision Making* and was derived from two models: Orem’s self-care model and a model of naturalistic decision-making (Riegel, Carlson, Moser, Sebern, Hicks, & Roland, 2004). In the *Five Stage Model of Naturalistic Decision Making*, there are three important self-care concepts: 1) Self-care maintenance: patient’s decision to engage in behaviors that promote

physiologic stability, 2) Self-care management: patient's active use of problem-solving skills to make decisions responding to their signs or symptoms, and 3) Self-care confidence: patient's confidence to assert their control over their health conditions and treatments (Riegel et al., 2004). Self-care confidence increases as self-care maintenance and management increase (Riegel et al., 2004). Additionally, there are five stages needed to improve health through self-care: 1) symptom monitoring and treatment adherence, 2) symptom recognition, 3) symptom evaluation, 4) treatment implementation, and 5) treatment effectiveness (Riegel et al., 2004). High levels of self-care management combined with high self-care confidence account for 43.4% variance in HF inpatient costs ($F = 3.98, p < 0.001$) (Lee, Carlson, & Riegel, 2007). That increase in self-care management behavior also translates to improved outcomes. Older adults with higher than average self-care management behaviors had lower risks of events such as mortality, hospitalization, or emergency room admission [HR 0.44 (CI .22 – 0.88); $p < 0.05$] than patients with below average self-care management behaviors (Lee, Moser, Lennie & Riegel, 2011).

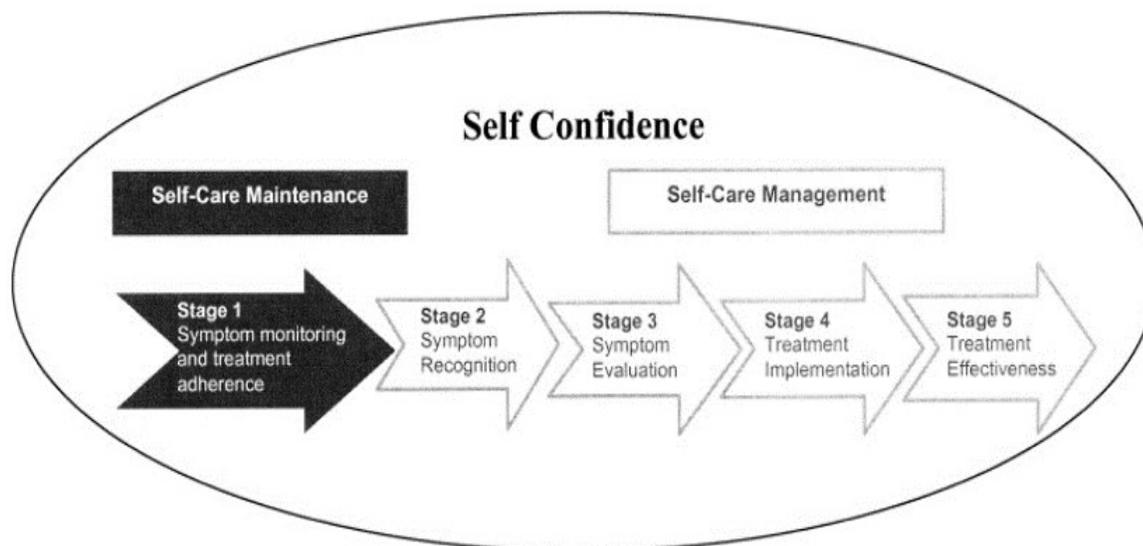


FIGURE 2. Five-stage model of naturalistic decision-making. (Self-care is made up of five stages and three concepts that when combined outline the process HF patients engage in to improve their health outcomes. Copied from “Psychometric Testing of the Self-care of Heart Failure Index,” by B. Riegel, B. Carlson, D. K. Moser, M. Sebern, F. D. Hicks, and V. Roland, 2004, *Journal of Cardiac Failure*, 10(4), 350-360.)

Application of Frameworks to Problem and Aims

Old Pueblo Cardiology (OPC) is building toward a transitional care program that implements many of the components of the Naylor TCM model. Their program begins during hospital admission when they are consulted and their APRN, a doctoral-prepared AGACNP, manages the patient’s acute illness and transitions them back home with follow up to promote continuity and coordinate care. Currently, the HF patients are scheduled for a clinic visit within seven days of discharge; however, there is no telephone or home follow-up conducted between the hospital discharge and the follow-up clinic visit. This project examined the feasibility of implementing a STS follow-up to increase the OPC program’s contextual adherence to the TCM model. Currently, OPC provides coordinating and collaborating care with many community providers such as cardiac rehab, primary care, pulmonologists, and nephrologists. OPC is currently building towards a goal of implementing at least five strategies or tools that help to

build and maintain relationships with their patients and is considering adding the AHA Target: HF telephone follow-up tool as one of these strategies. This DNP student anticipated that the results of this DNP project would demonstrate that this STS tool engaged the OPC patients; however, many studies show poor engagement rates with telephone follow-up as is discussed in the synthesis of evidence below. However, the AHA Target: HF telephone follow-up tool focuses patient education on self-care--both maintenance and management - that are recommended by the AHA for HF patients (Riegel et al., 2009). These behaviors include weight and swelling monitoring, fluid restriction, low-sodium diet, exercise/physical activity, social habits relating to drug, alcohol, and tobacco use, signs and symptoms of worsening HF or emergent conditions (AHA, 2017a) (Riegel et al., 2009). Because of the important role that guideline-directed medical therapy plays in improving HF outcomes, the AHA Target: HF telephone follow-up tool also includes a medication for HF management section, that screens for access to these medications along with patient education on medication taking self-care management (AHA, 2017a) (Riegel et al., 2009). Various questions on the AHA Target: HF telephone follow-up tool focus on different stages of self-care. For example, “Do you have a weight diary?” (p. 1) is a self-maintenance question about stage one symptom monitoring and treatment adherence while “Have you filled your prescriptions as ordered?” (p. 4) is a self-care management question about stage four treatment implementation (AHA, 2017a).

Synthesis of Evidence

This synthesis of evidence sought to answer the question: Do HF patients in the United States (I) who receive telephone follow-up post hospitalization (C) compared to current standard

of care (O) have improved health outcomes such as reduce rates of readmission (T) in studies from the last 10 years?

Appraisal of Evidence Methods

A search of two databases CINAHL and PubMed was completed for research and quality improvement articles published between January 01, 2009 and August 01, 2019. Systematic reviews and meta-analysis articles worldwide were included, but individual study articles were restricted to populations of HF patients within the United States to increase generalizability to the quality improvement for the population in Arizona.

The CINAHL search was conducted using search phrases “CHF or congestive heart failure or heart failure” AND “telephone follow up or phone call,” AND “readmission or rehospitalization or readmittance or re-hospitalization or re-admission or re-admittance” with filters for full text, English language, research article, all adult, USA. This search returned eight articles, five met criteria for inclusion leaving three excluded.

The PubMed search included the MESH terms “patient readmission,” AND “heart failure” AND “telephone” with filters of full text, ten years, and English. This search returned 19 results, 12 articles were excluded because they either did not meet inclusion criteria or they were repeated results from the CINAHL search; thus, seven additional articles reviewed from this search. The evidence tables were created from the review of the 12 articles that met the inclusion criteria (Table 1). Article types include four pre-to-post experimental designs, two randomized controlled trials, one case control study, three prospective interventional studies, and two systematic reviews with meta-analysis.

Synthesis of Evidence Overview

Strengths. Transitional care interventions (TCI) with telephone follow up decreased risk of readmission by 8% (Vedel & Khanassov, 2015). Vedel and Khanassov (2015) demonstrated in their systematic review and meta-analysis of mostly high quality articles that high intensity interventions reduced risk of readmission by 14% [RR 0.86 (95% CI 0.78-0.98); $p = 0.003$] especially in patients over the age of 75 [RR 0.83 (95% CI 0.76-0.92); $p = 0.003$]. There was a reasonably low number needed to treat ratio which was associated with TCI using telephone follow up resulting in one readmission prevented within every 52 patients treated (Vedel & Khanassov, 2015). However, high intensity interventions are not necessarily better than moderate intensity interventions, as moderate intensity interventions showed a 22% reduction in readmission rates [RR 0.78 (95% CI 0.70-0.90); $p = 0.003$] when implemented less than 6 months from patient discharge (Vedel & Khanassov, 2015). Early telephone follow-up within the first seven days of discharge was associated with nearly the same 30-day readmission rates [adjusted OR 0.85 (95% CI 0.69-1.06)], as the readmission rates observed when the first follow-up contact was within a clinic visit [adjusted OR 0.85 (95% 0.73-0.98)] (Lee, Yang, Hernandez, Steimle & Go, 2016). The difference in the confidence intervals surrounding these odds ratios is thought to be due to low rates of initial telephone contact (12%), compared to initial clinic visit (60%) (Lee et al., 2016) The point estimates were the same for both clinic and telephone follow-up which suggests that the intervention that matters most is the follow-up while the method of contact was less meaningful (Lee et al., 2016). The researchers concluded that early follow-up within seven days of discharge decreases 30 day readmission rates [19% (95% CI 6% - 30%)] and their data again confirmed that a moderate intensity intervention (1 or 2 contacts in 30 days)

was more effective [0.85 (95% CI 0.73 - 0.98)] than a high intensity intervention (>2 contacts in 30 days) [0.87 (0.70 - 1.07)] on reducing 30-day readmission rates after hospitalization for HF (Lee et al., 2016). Other lower quality studies also support the conclusion that telephone follow-up interventions reduce readmission rates (Brandon, Schuessler, Ellison, Lazenby, 2009; Jacobs, 2011; Kalesta, Lemay, & Cohen, 2015; Sales et al., 2013; Vestlund, Granger, Thompson, Coggin, Chuck, & Oerman, 2015).

TCI with telephone follow-up may reduce mortality. A randomized control trial showed that a lower intensity telephone follow up intervention resulted in fewer days until cardiac death when compared with the usual care group ($p=0.005$) or a high intensity intervention ($p=0.191$) (Dracup, Moser, Pelter, Nesbitt, Southard, Robinson, & Cooper, 2014). The systematic review and meta-analysis by Pandor and colleagues (2013) also demonstrated reduced all-cause mortality rates in an analysis of all but one study analyzing STS programs with human to human interaction (HH) [HR 0.75 (95% CI 0.59-0.96)], home telemonitoring with 24/7 availability [HR 0.49 (95% CI 0.26 - 0.88)] and office availability [HR 0.62 (95% CI 0.42 - 0.89)]; however, this result was not statistically significant when all studies were included.

TCI with telephone follow up might improve self-care; however, the evidence is lacking. Self-care scores among a TCI with telephone follow up intervention group increased significantly (95.9 to 128; $p<0.001$) compared to the usual care control group whose scores did not change (Brandon et al., 2009). Additionally, self-care scores also increased in another TCI with telephone follow-up intervention groups at 3- and 12-months to be significantly better than control groups ($p<0.05$); however, these differences were lost by 24-months (Dracup et al., 2014). The results of this review clearly suggests that TCIs with telephone follow-up in HF

patients is an important component of preventing HF readmissions and may provide added benefit to improve mortality and self-care behaviors (Brandon et al., 2009; Dracup et al., 2014; Pandor et al., 2013; Vedel & Khanassov, 2015).

Weaknesses. Still, the evidence for TCIs with telephone follow does not show consistent outcome benefits in this review of evidence. Contrary to the readmission benefits shown in meta-analysis and case control studies, randomized controlled studies showed that an educational intervention with telephone follow-up does not reduce rates of readmission [HR for 180 day all-cause readmission 1.03 (95% CI 0.88 - 1.20) $p = 0.74$] or rates of re-hospitalization ($p = 0.058$), and does not decrease days until death or first hospitalization ($p = 0.167$), or self-care scores at 24 months (control vs. high intensity, $p = 0.095$; control vs. lower intensity, $p = 0.116$) (Dracup et al., 2014; Ong et al., 2016).

In fact, more intervention can be harmful. In one randomized controlled trial, increasing telephone follow-up beyond two phone calls made two weeks apart to at least two times a week until teach back occurred (mean 5.3 ± 3.6 calls) resulted in nearly double the amount of follow-up clinic visits in the higher intensity intervention group (23.8%) compared with the lower intensity (11.5%) and control groups (12.9%; $p = 0.001$) (Dracup et al., 2014). The authors hypothesized that the high intensity intervention resulted in higher clinic visits because the patients were encouraged multiple times per week to review their daily logs and symptoms with their physicians (Dracup et al., 2014). Increased visits were not associated with improved outcomes for mortality, readmission, or self-care behaviors when compared with the lower intensity interventions and sometimes with usual care (Dracup et al., 2014).

Gaps. Clearly, there is a need for additional research to determine the true effect of TCI with telephone follow up on patient outcomes of mortality, readmission, and self-care. One gap in the methods of many TCI with telephone follow-up studies is the heterogeneity of interventions that often includes bundles of various educational interventions or care coordination interventions (Brandon et al., 2009; Dracup et al., 2014; Duffy et al., 2010; Kalista, Lemay & Cohen, 2015; Ong et al., 2016; Sales et al., 2013; Vesterlund et al., 2015). The bundling of interventions muddies the interpretation of results such that it becomes unclear if the improvement in outcomes is due to the substance of the intervention (assessment, education or care coordination) or the method of intervention (clinic vs telephone vs no proactive follow up). Additionally, many studies carefully select their patient population to ensure high intervention completion rates. One study started with a sample of 100 patients, successfully contacted 80 patients, consented 62 patients, then additionally screened for patients who had HF for less than 6 months, were capable of self-care, and maintained phone access (Brandon et al., 2010). This resulted in the study enrolling 20 patients: 10 intervention patients, and 10 controls patients (Brandon et al., 2010). The generalizability of this elite and optimized population is nearly impossible to replicate and raises greater questions regarding the feasibility of implementing TCIs with telephone follow up in a generalized population of recently hospitalized HF patients. The results of these studies also do not provide insight from the patient's perspective; so, it is unknown if these interventions satisfied or met patient needs, which is a common problem in about a third of readmitted patients (Naylor, Brooten, Campbell, Maislin, McCauley, & Schwartz, 2004).

This synthesis of evidence also includes gaps in complete scientific knowledge on this topic imposed by the inclusion criteria. This review does not incorporate evidence older than ten years old as readmission rates and HF care has changed significantly since the launch of the *Get with the Guidelines Campaign*. It also does not include literature from outside of the United States, which is appropriate due to the regulatory climate differences between countries and health care models. It is limited to English language articles, which does introduce bias. It is also limited to published research articles found within these two searched databases, which excludes some data that may be valuable such as DNP projects or dissertations.

Limitations. The effects of telephone follow-up on HF outcomes for specific population subsets remains poorly studied and reported in the literature. Several important limitations in understanding how telephone follow-up interventions affect outcomes are outlined.

Controlling for readmission risk factors as confounders is important for interpreting study results, yet as Pandor and colleagues (2013) described in their systematic review, many telephone follow-up studies fail to describe the criteria for determining HF, much less the demographic confounders that influence outcome results. Risk factors for readmission, worsening NYHA classification, and all-cause mortality include standard-care treatments [HR 3.7 (95% CI 1.1-12.0); $p = 0.030$], hypertension [HR 3.0 (95% CI 1.1- 8.0); $p = 0.030$], cigarette smoking [HR 124.2 (95% 1.2-13,324.8); $p = 0.43$], and age greater than 65 [HR 3.0 (95% CI 1.1- 8.0); $p = 0.030$] (Sales et al., 2013). Another important confounder to consider is HF stage as some telephone follow-up interventions were found to be more effective in patient groups with early HF (NYHA classes I and II) than with advanced HF (NYHA class III) (Brandon et al., 2009). It is unknown how telephone follow-up interventions are tolerated in cognitively impaired

patients, functionally limited patients, patients with multiple co-morbidities, or ages over 85-years-old (Vedel & Khanassov, 2015).

Failure to control for levels of patient engagement can affect outcomes. Disengaged patients may represent the highest risk population for readmission as evidenced by one study that reported the 23% of patients that did not answer questions had a 27% higher risk of readmission, compared to the 21% who answered questions at least once (Inouye et al., 2015). Ong and colleagues (2016) described limited patient engagement with their interventions. Even setting a low bar threshold of only 50% adherence to intervention, their reported adherence levels for 1) telemonitoring reached 55.1% at 6 months and 51.7% at 180 days and 2) telephone coaching reached 61.4% at 30 days and 68.0% at 180 days (Ong et al., 2016). Kalista, Lemay and Cohen (2015) described failed intervention completion on 30% of their patients because the patients either died or were readmitted before the intervention could be completed. Contacting patients is another commonly reported issue in telephone follow-up studies. One study was only able to contact 20% of their sample with only 62% of the sample consenting for further intervention (Brandon et al., 2009). Another study reported response rates of 76% to at least one call (Inouye, Bouras, Shouldis, Johnstone, Silverzweig & Kosuri, 2015). Still another reported a 35% patient refusal rate (Duffy, Hoskin, & Dudley-Brown, 2010). Ong and colleagues (2016) reported the baseline survey characteristics of responders differed from the characteristics of non-responders.

In summary, TCIs using telephone follow-up interventions with HF patients improve outcomes of readmission, mortality and self-care. In a systematic review with meta-analysis, STS reduced HF specific readmission by 26% with evidence showing only 14 patients needed to be treated before one benefited (Feltner et al., 2014). Yet, recent evidence from randomized

controlled trials in the United States suggests these interventions, especially higher intensity interventions, may not significantly improve outcomes and may cause harms such as increased clinic visits. Current evidence suggests timing of follow-up is optimized within seven days of discharge, but does not differentiate the substances of interventions from the methods of interventions due to bundling. Therefore, it is unclear what combinations of substance and follow-up methods improve HF outcomes most effectively. Additionally, patient engagement and confounding risk factors are often poorly described in studies with common trends including higher readmission rates in non-participating patients. It is not clear if the interventions are addressing patient needs or increase patient satisfaction. Consequently, it is reasonable to examine the feasibility of implementing TCIs within a target population by describing consent rates, adherence rates, and self-care management needs before devoting resources to study the effects of a more comprehensive, bundled, transitional care program on a target patient population's outcomes.

TABLE 1. Evidence for telephone follow-up in HF patients.

PICOT Question: Do HF patients in the United States (I) who receive telephone follow-up post hospitalization (C) compared to current standard of care (O) have improved health outcomes such as reduce rates of readmission (T) in studies from the last 10 years?

Reference	Question Design Outcome	Setting & Sample	Interventions & Duration	Methods Analysis	Key Findings	Notes
Brandon, A. F., Schuessler, J. B., Ellison, K. J., & Lazenby, R. B. (2009). The effects of an advanced practice nurse led telephone intervention on outcomes of patients with heart failure. <i>Applied Nursing Research</i> , 22(4), e1-e7. doi:10.1016/j.apnr.2009.02.003	<p>Question What are the demographics for HF clinic patients? Does an APN-led telephone-enhanced disease management program decrease readmissions and increase QOL and self-care behaviors (SCB) in HF patients? Are there relationships between the demographic and outcome variables?</p> <p>Design Pre-Post Prospective experimental design</p> <p>Outcomes <u>Primary:</u> HF-related hospital readmissions <u>Secondary:</u> QOL and self-care behaviors (SCB)</p>	<p>Setting Rural Alabama</p> <p>Sample N=20 Age 60(49-69) Married African Americans primarily I: more women than C: more men NYHA II Income of \$20,000</p>	<p>I: HF education inpatient followed by 7 telephone appointments to monitor symptoms and reinforce education.</p> <p>C: Usual Care</p> <p>Duration 12 weeks</p>	<p>MLHFQ for QOL 29 item scale by Artinian et al (2002) for SCB</p> <p>Analysis by Cronbach's alpha with ANOVA on intervention and Pearson's r correlation were used to analyze demographics with outcomes.</p>	<p>Outcomes <u>Primary: Readmission</u> Significant interaction for I and C over time F= 7.627 (P=0.013)</p> <p><u>Secondary: SCB</u> Significant interaction for I and C over time (P<0.001) Mean SCB score I: 95.9→128 C: unchanged</p> <p><u>QOL</u> Significant interaction overtime for I and C F=5.899, P=0.026; mean scores pre/post I: 52.1→33.4 C: 51.1→57.7 Note: the physical dimension QOL score improved in I declined in C. All groups equally improved in emotional dimension.</p> <p>Higher NYHA severity patients had lower QOL</p>	<p>Theory: Orem's self-care deficit theory</p> <p>Very small sample sizes Started with 100 patients, 80 patients were contacted, 62 consented, and only did the study with 20 who had HF for 6 months, were capable of self-care, and maintained telephone access. 10 in I and 10 in C groups. Note: Study is inherently biased towards patients who are motivated and able to improve self-care, thus not generalizable to general clinic population.</p> <p>The NYHA groups I and II showed the most improvement in the Intervention group but did not show improvement if NYHA was class III. Authors suggested their intervention may</p>

TABLE 1 – *Continued*

Reference	Question Design Outcome	Setting & Sample	Interventions & Duration	Methods Analysis	Key Findings	Notes
						be most effective in early HF patients.
Dracup, K., Moser, D. K., Pelter, M. M., Nesbitt, T. S., Southard, J. S., Paul, S. M., Robinson, S., & Cooper, L. S. (2014). Randomized, controlled trial to improve self-care in patients with heart failure living in rural areas. <i>Circulation</i> , 130, 256-264. doi:10.1161/CIRCULATIONAHA.113.003542	<p>Question What is the impact of an education intervention with face to face sessions and telephone follow up calls on HF readmission and mortality in rural HF patients?</p> <p>Design Randomized Controlled Trial</p> <p>Outcomes <u>Primary:</u> Readmission <u>Secondary:</u> Mortality Role of modifiers (HF type, age, sex) on outcomes</p>	<p>Setting 12 clinics or hospitals in Nevada, California and Kentucky.</p> <p>Sample N=614 Age 66±13.0 58.7% male, 56.6% married 65% incomes <\$40,000 85.4% NYHA II or III with 61.3% adequate literacy. Only difference: LITE group has less hypertension</p>	<p>I: 50-minute education session followed by: <u>Group 1:</u> Fluid watchers LITE received 2 phone calls 2 weeks apart reinforcing education. <u>Group 2:</u> Fluid watchers PLUS received an audiotape of the education and twice weekly follow up calls until teach back occurred, mean 5.3±3.6 calls.</p> <p>C: <u>Group 3:</u> Usual Care</p> <p>Duration 2 years September 2006 to December 2010</p>	<p>9 item European HF Self-Care Behavior scale; Charlson Comorbidity Index; 20 Item HF Knowledge Scale; Short Test of Functional Health Literacy in Adults</p> <p>Only research nurse was not blinded.</p> <p>80% Powered to detect difference with N=212 each group.</p> <p>Analysis by linear mixed-models analysis with Bonferroni correction for multiple comparisons (P<0.017 is significant.). Also Cox proportional hazards and survival curves w/ Wald statistics</p>	<p>Outcomes <u>Primary:</u> No difference in hospitalization (P=.058). <u>Secondary:</u> Mortality was significantly lower in the LITE 7.5% vs. control 17.7% vs PLUS 11.9% (P=0.003); PLUS did not show mortality benefit vs control (P=0.172). Cardiac mortality: 12.5%. Non-cardiac mortality 8%. <u>Other comparisons:</u> Significant for LITE had fewest clinic visits (11.5%) vs control (12.9%) and PLUS (23.8%) P=0.001. Self-care scores were significantly better (P<0.05) in I than C at 3 and 12 months, but not significantly better at 24 months.</p>	<p>Theory: None</p> <p>Withdrawal rates: Lowest in C: 13.6% Highest in I LITE: 19.2% 98% of enrolled sample was retained for analysis of outcomes at 2 years.</p> <p>Interestingly, authors hypothesized that the PLUS group's increase in physician visits was due to a more intensive review of their daily logs on multiple telephone sessions with encouragement to discuss symptoms with their physicians. This translated to the highest hospitalization rates, although the difference was not significant.</p>

TABLE 1 – *Continued*

Reference	Question Design Outcome	Setting & Sample	Interventions & Duration	Methods Analysis	Key Findings	Notes
Duffy, J. R., Hoskins, L. M., & Dudley-Brown, S. (2010). Improving outcomes for older adults with heart failure: A randomized trial using a theory-guided nursing intervention. <i>Journal of Nursing Care Quality</i> , 25(1), 56-64. doi:10.1097/NCQ.0b013e3181ad0fbd	<p>Question What is the feasibility and the effect of a home health-based telephone follow up program on HF patient outcomes?</p> <p>Design Prospective Interventional Study</p> <p>Outcomes <u>Primary:</u> Resources To run the program <u>Secondary:</u> Patient refusal rates Staff perception</p>	<p>Setting 3 home health agencies in Maryland</p> <p>Sample N=32 Age 81 (SD 7.2) 59.5% women NYHA III and IV</p>	<p>I: A weight scale and symptom log were given to the patient and a nurse assigned for 60 days with home visits and telephone follow-ups that used a script for symptom analysis, education and emotional support.</p> <p><u>Activity on calls:</u> Key HF symptoms 96% Patient availability 94% Patient participation 87% Patient receptiveness 82% Symptom Recognized 72% Emotional support Patient 47% Caregiver 13%</p> <p>C: No comparison</p> <p>Duration 6 weeks</p>	<p>OASIS form Short Portable Mental Status Questionnaire Living with Heart Failure Questionnaire Home Care Client Satisfaction Instrument Revised</p> <p>No statistical analysis</p>	<p>Outcomes <u>Primary:</u> Resources to run the program/patient Mean telephone visits: 7 Mean Time spent at home visits: I: 77 visits 49.94 min C: 87 visits 37.18 min Mean Time home + tele: I: 168 hours C: 105 hours</p> <p>Cost estimate at (\$30/hr): I: \$5040 C: \$3120</p> <p><u>Secondary:</u> Patient refusal rates 35% Intervention obstacle to normal routine: 37% disagreed; 30% neither agreed or disagreed; 23% agreed and 6% strongly agreed</p>	<p>Theory: Quality Caring Model</p> <p>Conclusion: Telephone follow ups did not decrease home time and contributed to staffing challenges.</p> <p>Operational Barriers: New leadership support Medicare regulations: To qualify for nursing, patients need to be “homebound, “immobile and need ADL assistance.</p>
Inouye, S., Bouras, V., Shouldis, E., Johnstone, A., Silverzweig, Z., & Kosuri, P. (2015). Predicting readmission	<p>Question Does an automated multi-call follow-up program for tracking self-reported general health in HF patients</p>	<p>Setting Discharged patients from Charleston Area Medical Center in Charleston, West Virginia</p>	<p>I: Discharged HF patients received 2 anticipated automated follow-up calls on days 2 and 9 following discharge. Questions</p>	<p>Follow up questions based on AHA/ACC guidelines</p> <p>Pearson’s chi-square test of independence</p>	<p>Outcomes <u>Primary:</u> 30 Day Readmission 22% were readmitted within 30 days of discharge.</p>	<p>Theory: None</p> <p>Patients who trended a decline had readmission rates that were double neutral or</p>

TABLE 1 – Continued

Reference	Question Design Outcome	Setting & Sample	Interventions & Duration	Methods Analysis	Key Findings	Notes
of heart failure patients using automated follow-up calls. <i>BMC Medical Informatics and Decision Making</i> , 15(1), 22. doi:10.1186/s12911-015-0144-8	<p>predict 30-day readmission?</p> <p>Design Prospective Interventional Study</p> <p>Outcomes <u>Primary:</u> 30-day readmission</p> <p><u>Secondary:</u> Response rates</p>	<p>Sample N=1095 Patients 18+, English speaking with a valid phone number and index visit with diagnosis HF.</p>	<p>assessed patient’s self-reported general health status, medications, follow-up appointments, weight gain (and maintenance of a sodium diet on second call only).</p> <p>C: No comparison</p> <p>Duration December 2010 and September 2012</p>		<p>Admission rates were highest for the patients who reported that they felt “worse/much worse” at 43%, than patients who felt the same 24% or better 13% (P<0.0001). Patients with a negative trend had readmission rate of 37% and significantly predicted readmission (P<0.0001).</p> <p><u>Secondary:</u> <u>Response rates</u> 76% responded to at least 1 call 47% responded to the general status question in 2 calls</p>	<p>improved patients, but negative response rates on the second call only were associated with triple the admission rate.</p> <p>23% of patients did not answer the questions at least once, and this population had a higher rate of readmission 27% compared with 21% who answered questions at least once.</p>
Jacobs, B. (2011). Reducing heart failure hospital readmissions from skilled nursing facilities. <i>Professional Case Management</i> , 16(1), 18-26. doi:10.1097/NCM.0b013e3181f3f684	<p>Question Do telephone follow up calls to SNFs 48 hours after hospital discharge reduce readmission rates for HF patients?</p> <p>Design Pre-Post Experimental Design</p>	<p>Setting United Hospital St Paul, Minnesota</p> <p>Sample N=not reported nor demographics discussed.</p>	<p>I: Discharge order sets were used for HF patients. Case managers made follow-up calls to SNFs 48 hours post discharge to verify orders for daily weights with follow up parameters for 3 lbs/day or 5 lbs/wk, low salt diet, diuretic reconciliation, and</p>	No statistical analysis	<p>Outcomes <u>Primary: 30 day readmission rates</u> 30%-->17%</p>	<p>Theory: None</p> <p>Lessons learned from the study included: SNFs had variation in daily weight monitoring and reporting practices Some SNFs did not have low sodium diets available. Follow-ups were not always made or</p>

TABLE 1 – *Continued*

Reference	Question Design Outcome	Setting & Sample	Interventions & Duration	Methods Analysis	Key Findings	Notes
	<p>Outcomes <u>Primary:</u> 30-day Readmission rates</p>		<p>follow up with a provider in 3 to 5 days</p> <p>C: Pre-group was Usual Care</p> <p>Duration July to December 2009</p>			<p>timely.</p> <p>Projected savings to the hospital was \$32,000/year based on saved readmission LOS</p>
<p>Kalista, T., Lemay, V., & Cohen, L. (2015). Postdischarge community pharmacist–provided home services for patients after hospitalization for heart failure. <i>Journal of the American Pharmacists Association</i>, 55(4), 438-442. doi:10.1331/JAPhA.2015.14235</p>	<p>Question Does a community pharmacist-provided home health service improve medication adherence and reduce 30-day HF related readmission?</p> <p>Design Pre-Post Experimental Design</p> <p>Outcomes <u>Primary:</u> 30-HF-related readmission</p> <p><u>Secondary:</u> Medication adherence</p>	<p>Setting Home health agency Visiting Nurse Services of Newport and Bristol Counties in Portsmouth, RI</p> <p>Sample N=10 Age 81.3 ± 7.3 years Mean medications 15.9 ± 5.3, 7 NYHA III 3 NYHA IV</p>	<p>I: Initial home visit of 45-60 minutes followed by two 10 minutes phone calls to re-administer the adherence questionnaire and monitor for readmissions within 30 days.</p> <p>C: Pre-group was Usual Care</p> <p>Duration December 2013 to April 2014</p>	<p>Morisky 8-Item Medication Adherence Questionnaire.</p> <p>Descriptive statistics were used for baseline characteristics of patients. Matched paired t-tests were used for medication adherence scores with P<0.05 considered significant.</p>	<p>Outcomes <u>Primary: 30-Day readmission</u> 10% compared to 38% normal for the agency over same time period.</p> <p><u>Secondary:</u> Mean difference 1.0 (0.5-1.5, P=0.004) from initial visit to last follow up. 5 of 7 patients improved in their medication adherence scores from initial visit to follow up.</p>	<p>Theory: None</p> <p>Note: 3/10 patients were not able to complete the follow up because 2 were admitted, (one for a HF associated condition.) The other patient died of MI.</p> <p>Repeated Measures bias could be responsible for improvement in measured medication adherence. No method was employed to validate the self-reported adherence with actual improvement in medication adherence.</p>

TABLE 1 – *Continued*

Reference	Question Design Outcome	Setting & Sample	Interventions & Duration	Methods Analysis	Key Findings	Notes
<p>Lee, K., Yang, J., Hernandez, A., Steimle, A., & Go, A. (2016). Post-discharge follow-up characteristics associated with 30-day readmission after heart failure hospitalization. <i>Medical Care</i>, 54(4), 365-372. doi:10.1097/MLR.0000000000000492</p>	<p>Question Does the timing and type of post-discharge follow-up impact risk of 30-day readmission in HF patients?</p> <p>Design Nested matched case-control study</p> <p>Outcomes <u>Primary:</u> 30-day readmission</p>	<p>Setting Large integrated healthcare delivery system in Northern California</p> <p>Sample N=11,985 Adults with a primary diagnosis of HF discharged home without hospice care.</p>	<p>I: Statistically analyzed 3 types of follow up: -Initial Follow up within 7 days of discharge in person (usually by a provider). - Initial Follow up between 8-30 days of discharge in person - Initial Follow up with telephone contact (usually by nurse or pharmacist) Cases were readmitted patients</p> <p>C: No follow up or for matched controls unadmitted patients matched for the interval of case readmission.</p> <p>Duration January 1, 2006 to June 30, 2013</p>	<p>Each follow-up pattern was compared to no follow-up within 30 days using student t-test.</p> <p>Further logistic regression models were created for each exposure of interest, which was matched to a nested control and then analyzed for frequency, timing and type of follow up and adjusted for covariants such as mortality.</p>	<p>Outcomes <u>Primary: 30-Day Readmission</u></p> <p>Overall 30-day readmission rate was 13.2% Any follow up lowered risk of 30-day readmission (P<0.01). Follow up within 7 days of discharge as associated with 19% lower adjusted odds of readmission OR 0.81 (0.70-0.94)</p> <p>Follow up within 8-30 days was not associated with readmission 0.99 (0.82-1.19).</p> <p>Follow up with initial telephone contact was associated was not significantly associated with lower odds of 30-day readmission. 0.85(0.69-1.06).</p>	<p>Theory: none</p> <p>From initial N of 11,985, 70% patients had follow up and 50% had contact in 7 days. 84% had clinical visit follow up, 16% had telephone calls. Most telephone calls were from nurses or pharmacists. This means that the confidence interval was wider for the analysis of contact by telephone and of lower power to detect true differences.</p> <p>The point estimate of the odds ratio for initial contact by telephone and by clinic in person, which may imply that follow up, by either telephone or clinic, is what benefits patients—even more than the type of provider or follow-up method.</p>

TABLE 1 – Continued

Reference	Question Design Outcome	Setting & Sample	Interventions & Duration	Methods Analysis	Key Findings	Notes
Ong, M. K., Romano, P. S., Edgington, S., Aronow, H. U., Auerbach, A. D., Black, J. T., . . . Fonarow, G. C. (2016). Effectiveness of remote patient monitoring after discharge of hospitalized patients with heart failure: The better effectiveness after Transition–Heart failure (BEAT-HF) randomized clinical trial. <i>JAMA Internal Medicine</i> , 176(3), 310-318. doi:10.1001/jamainternmed.2015.7712	<p>Question What is the effect of a care transition intervention of pre-discharge education and post-discharge telephone nurse coaching with home telemonitoring on all cause 180-day hospital readmission?</p> <p>Design Randomized Controlled Trial</p> <p>Outcomes <u>Primary:</u> All cause 180-day readmission <u>Secondary:</u> 30-day readmission, mortality, health-related QOL</p>	<p>Setting 6 academic hospitals in California</p> <p>Sample N=1437 50+ Adults hospitalized for HF (mean 73 y/o). 46% Female 22% African American</p>	<p>I: Health coaching with 9 telephone calls and telemonitoring with equipment for weight, blood pressure, heart rate and symptoms for 6 months post discharge. Referrals to providers on pre-determined criteria.</p> <p>C: Usual Care</p> <p>Duration October 12, 2011 to September 30, 2013</p>	<p>Data from hospital and state/national sources QOL survey with MLHRQ</p> <p>Multivariate regression with intent to treat. Confounder testing and non-parametric data transformation. 2 and 3 level models for evaluation of data in medical centers and with repeat measures.</p> <p>Goal N=1500; 80% power to detect a relative reduction of 28% in primary outcome with p=0.05. Underpowered for secondary outcomes.</p>	<p>Outcomes <u>Primary:</u> All cause <u>readmission 180 days</u> 50.8% I vs 49.2% C HR 1.03 95% CI (0.88-1.20); P=0.74 No significant difference</p> <p><u>Secondary:</u> 30 day readmission HR 1.03 (0.83-1.29); P=0.77</p> <p>No change in 30 or 180 day mortality.</p> <p>Significant Difference in QOL: Mean 180 day QOL 30.4 with mean I: 28.50 and C 32.63; P=0.02</p>	<p>Theory: None</p> <p>Average number of telephone calls per patient was 6.</p> <p>Limited patient engagement with interventions: Adherence to telemonitoring greater than 50% was 55.1% at 6 months and 51.7% at 180 days. Telephone coaching adherence greater than 50% was 61.4% at 30 days and 68.0% at 180 days.</p> <p>The survey non-respondents and respondents differed in baseline characteristics</p>
Pandor, A., Thokala, P., Gomersall, T., Baalbaki, H., Stevens, J. W., Wang, J., . . . Fitzgerald, P. (2013). Home telemonitoring or structured telephone support programmes after recent discharge in patients with heart failure: Systematic r	<p>Question What is the clinical effectiveness and cost of home telemonitoring and structured telephone support strategies compared with usual care for recently discharged (<28 days) HF patients?</p>	<p>Setting multinational</p> <p>Sample N=3060 articles found, N=21 included Inpatient adults with HF discharged home Mean age 57-79 years. Male participants 46% to 99%</p>	<p>I: Included RCTs or controlled observational cohort studies with telemonitoring medical support (TM) either 24/7 or during office hours or structured telephone support (STS) with human to human (HH)</p>	<p>Search Methods: 14 databases searched with relevant hand-searching and expert contacts.</p> <p>Methodological quality was varied, and reporting was poor in included studies.</p>	<p>Outcomes <u>Primary:</u> All-cause <u>Mortality</u> reduced insignificantly with: TM 24/7 [HR 0.49 (0.20-1.18)] TM Office Hours [HR 0.76(0.49-1.18)] STS HH [HR 0.77 (0.55-1.08)]</p>	<p>Theory: none Removing one study, a Home-HF study, reduced heterogeneity. And results showed statistical significance for: <u>All-cause Mortality:</u> TM 24/7 [HR 0.49 (0.26-0.88)] using one study and TM during</p>

TABLE 1 – *Continued*

Reference	Question Design Outcome	Setting & Sample	Interventions & Duration	Methods Analysis	Key Findings	Notes
review and economic evaluation. <i>Health Technology Assessment (Winchester, England)</i> , 17(32), 1-207. doi:10.3310/hta17320	<p>Design Systematic Review</p> <p>Outcomes <u>Primary:</u> All-cause mortality <u>Secondary:</u> All-cause hospitalization HF-related hospitalization Cost</p>		<p>or human to machine (HM) contact within 28 days of discharge home from inpatient.</p> <p>C: Usual Care</p> <p>Duration Studies before January 2012.</p>	Systematic review and meta-analysis analysis completed when data was complete. Markov model was used to evaluate cost-effectiveness.	<p><u>Secondary:</u> <u>All-cause hospitalization</u> TM with medical support during office hours [HR 0.75(0.49-1.10)] was most effective, STS did not appreciably change Hazard ratios <u>HF-related hospitalization</u> Greatest effect was STS HH [HR 0.77(0.62 to 0.96)] while others showed minimal effect. <u>Cost:</u> TM during office hours was cheaper £11,873 per quality-adjusted life-year (QALY) while STS was more expensive £228,035 per QALY compared to TM during office hours</p>	<p>office hours [HR 0.62 (0.42-0.89)]. and STS HH [HR 0.75(0.59-0.96)].</p> <p>The studies included were not testing the aggregate results of a single standardized intervention, but rather an aggregate of similar interventions. Data was often poorly reported and inclusion criteria for determining HF presence was poorly outlined in included studies.</p>
Sales, V. L., Ashraf, M. S., Lella, L. K., Huang, J., Bhumireddy, G., Lefkowitz, L., Feinstein, M., Kamal, M., Caesar, R., Cusick, E., Norenberg, J., Lee, J., Brenner, S.,	<p>Question What is the effect of using a trained volunteer to provide education with telephone follow-up in reducing 30-day readmissions in CHF patients?</p>	<p>Setting New York Methodist Hospital</p> <p>Sample N=137 Adults, Age mean 73 years; 58% F Hospitalized with</p>	<p>I: Education on dietary and pharmacologic management of CHF by trained student volunteers with follow up calls starting 48 hours later and continuing weekly for</p>	<p>Fisher exact test for categoric variables and t-test for continuous variables</p> <p>Powered for 25% 1 month readmission rate in control group, but study control</p>	<p>Outcomes <u>Primary: 30-Day readmission</u> I: RRR of 63% ARR 12% 19%-->7% P<0.05 <u>Secondary:</u> <u>Worsening HF NYHA classification</u></p>	<p>Theory: none</p> <p>Standard-care treatment, hypertension, age over 65, and cigarette smoking increased risk for readmission, worsening NYHA</p>

TABLE 1 – *Continued*

Reference	Question Design Outcome	Setting & Sample	Interventions & Duration	Methods Analysis	Key Findings	Notes
Sacchi, T. J., Heitner, J. F. (2013). Utilization of trained volunteers decreases 30-day readmissions for heart failure. <i>Journal of Cardiac Failure</i> , 19(12), 842-850. doi:10.1016/j.cardfail.2013.10.008	Design Prospective Interventional Study Outcomes <u>Primary:</u> 30-day readmission rates for CHF <u>Secondary:</u> Worsening NYHA classification Mortality-all cause	primary diagnosis CHF, 95% were NYHA II or III. 76% discharged home.	one month. C: Usual Care Duration June to December 2010	readmission was only 19% with 4 lost to follow up, so study may be underpowered.	-standard care HR 3.7(1.1-12.0) P=0.30 -65+ and Older HR 3.0(1.1-8.0) P=0.030 -Hypertension HR 3.0(1.1-8.0) P=0.033 <u>Mortality-All Cause</u> Cigarette smoking 124.2(1.2-13,324.8) P=0.43	classification and all-cause mortality in multivariate analysis. NYHA classification was assessed over the phone by student volunteers so may not be accurate.
Vedel, I. & Khanassov, V. (2015). Transitional care for patients with congestive heart failure: A systematic review and meta-analysis. <i>Annals of Family Medicine</i> , 13(6), 562-571. doi:10.1370/afm.1844	Question What is the impact of transitional care interventions (TCI) on acute health services by patients with CHF? Design Systematic review (SR) and Meta-analysis Outcomes <u>Primary:</u> Risk of readmission <u>Secondary:</u> Risk of ED visits	Setting Multinational Sample N=11,423 articles searched. N=41 articles in SR; CHF patients discharged from inpatient to home with target outcomes Mean age 57.9-81.0 years old 65.6% patients were men.	I: TCI: <i>Low Intensity:</i> -telephone or clinic follow up visits without home visits. <i>Moderate Intensity:</i> Home visits or combined telephone and clinic visits without home visits or telecare with distance monitoring. <i>High Intensity:</i> Combinations of home visits with other types of home visits or telecare with direct contact (home visits, telephone follow up, or video visits). C: Usual Care	Search Methods Searched 4 databases and reference lists. Abstracts then full text screened for inclusion criteria. Coding resolved by consensus. A taxonomy was used to classify studies by 3 researchers to a level of intensity and quality. Stratified analysis by Intensities of TCI was performed to determine interaction between intensity and duration using categorical variables.	Outcomes <u>Primary:</u> Risk of Readmission RR: 0.92(0.87-0.98) I ² =50% (P=0.006) TCI reduces risk of readmission by an average of 8%. With NNT: 52:1 <u>Secondary:</u> Risk of ED Readmission RR: 0.71 (0.52-0.98) I ² =58% (P=0.004). TCI reduces risk of ED readmission by 29%. With NNT: 9:1 High intensity interventions reduce risk of readmission RR 0.86(0.78-0.94) in	Paucity of evidence exists for patients over 85 years old and who have cognitive impairments, functional impairment, or with many comorbid conditions. These conditions may affect the effect of TCI on outcomes. Review only included English and French articles. 35 trials were high quality, 6 were of fair quality. No systematic asymmetry in funnel plot of standard errors

TABLE 1 – *Continued*

Reference	Question Design Outcome	Setting & Sample	Interventions & Duration	Methods Analysis	Key Findings	Notes
			Duration <i>Interventions:</i> 1-24 months <i>Search:</i> 1995 (Beginning of TCI) to February 6, 2014	Relative risk and I ² statistic were calculated using random-effects models. Reported results using PRISMA	populations over 75 years old RR 0.83 (0.76-0.92) regardless of duration but Moderate intensity reduces readmissions RR 0.78(0.70-0.90) with durations >6 months. (P=0.003)	vs logarithms of risk ratios; thus, no reason to suspect a reporting bias in the trials. Further analysis on ED readmissions could not be done by duration because the majority of studies were less than 6 months. Quality of studies and TCI interventions were independent of each other P=0.066 per Fisher exact test.
Vesterlund, M., Granger, B., Thompson, T. J., Coggin, C., Chuck, & Oermann, M. H. (2015). Tailoring your heart failure project for success in rural areas. <i>Quality Management in Health Care</i> , 24(2), 91-95. doi:10.1097/QMH.000000000000055	Question Does an integrated plan of care consisting of 6 interventions including follow-up phone calls 48 hours after discharge decrease 30-day readmission rates in rural HF patients? Design Pre-Post Experimental Design Outcomes <u>Primary:</u> 30-Day Readmission rate	Setting Southside Community Hospital, Virginia Sample N= 61 Mean age 75.9 50.8% Men	I: Integrated plan of care: 1) Detailed HF education 2) HF discharge packet 3) nutrition education 4) case management 5) PCP appointments 5 to 7 days after discharge and cardiology appointments 2 weeks after discharge. 6) Follow-up phone call 48 ours post discharge To reaffirm appointments and use teach back tool for symptoms, needs, and questions.	Descriptive statistics for demographics χ^2 test was used for relative risk ratio for HF teaching.	Outcomes <u>Primary:</u> <u>30 Day Readmission</u> Pre to Post: 20.9%--> 13.2% <u>Secondary:</u> <u>Relative Risk Ratio for Readmission if No HF teaching</u> Patients who did not receive teaching were 7 times more likely to be readmitted than those who received teaching (P=0.007)	27% of patients did not receive a nutrition consult. 6.5% did not receive HF discharge teaching, however 100% of these patients were readmitted. Of the 8 readmissions, 4 had Medicare, 3 were self-pay and 6 were age 80+.

TABLE 1 – *Continued*

Reference	Question Design Outcome	Setting & Sample	Interventions & Duration	Methods Analysis	Key Findings	Notes
	<u>Secondary:</u> Risk of admission based on teaching		C: Pre-group was Usual Care Duration July 15 to October 31, 2014			

METHODS

Design

This single center quality improvement (QI) DNP project was designed to examine the feasibility of using the AHA Target: HF telephone follow-up tool among adults with HF prospectively; however, it was modified to a retrospective design due to lack of recently discharged eligible patients during the data collection interval.

Setting

Old Pueblo Cardiology (OPC) is a comprehensive cardiology private practice in Tucson, Arizona.

Participants

The doctoral-prepared AGACNP who works at OPC participated in the project by screening the hospitalized patients for eligible participants. Eligible participants in this study were English-speaking OPC patients diagnosed HF and discharged from an acute care hospitalization to home. In the original design, the patient volume was estimated by OPC to be 20 to 40 people; however, no patients with HF were hospitalized during the data collection interval in November 2019, so the AHA Target: HF telephone follow-up tool was tested on five retrospective OPC patients who were previously hospitalized with HF in 2019. As no patients could be consented while in the hospital per the original design, the AGACNP from OPC contacted the five patients via telephone for consent. They were given the opportunity to choose if they wanted to participate or not and reassured that there would be no consequences if they chose not to participate. Patients were reassured that if released, their information would be protected to HIPAA standards and if they chose not to participate, their information would not be

released. Non-consenting patients would not be named and marked as declined in data collection spreadsheets. Only patients who consented to participate had a release of contact information (name, phone number) to be called by this DNP student for STS follow-up using the AHA Target: HF telephone follow-up tool.

AHA Target: HF Telephone Follow-up Tool

Hospitalized OPC patients were screened by OPC's AGACNP for study eligibility. To protect the confidentiality of the patient, the AGACNP did not release the identity of eligible patients until after the patient consented and voluntarily gave their name, phone number, and optional best time to call, which was recorded on the consent form (Appendix B). Originally the plan was for patients who did not consent, to be marked on the paper consent sent form to tracking feasibility. All consents were retained by the AGACNP at the OPC clinic. Within UA Box Health, a secure HIPAA compliant cloud storage location to store and share sensitive data, an Excel file was created to store the master list of eligible patients (University of Arizona College of Nursing, 2019). The master list included a new row for each eligible patient with columns for name, telephone number and best time to call on consented patients. The DNP student checked the list daily during the project's prospective period of 30 days with intent to call patients within 72 hours of discharge.

At the conclusion of the 30 days there were no prospective patients, thus the DNP student pivoted to a retrospective design with an extended timeline. The OPC electronic health record, eClinicalWorks, was programed to randomly generate a list of five patients who had an ICD-10 code for HF and a recent hospitalization. The AGACNP then called the five patients to ask if they were willing to participate in a DNP student quality improvement project and obtained

consent. Up to three attempts would be made to contact the patient by the DNP student. Upon successful telephone contact, the DNP student reaffirmed they were willing to complete the AHA Target: HF telephone follow-up tool and verified the OPC AGACNP signed that patient consented, then the student co-signed the consent as confirmation of the patient's consent to participate. Call attempts were documented. Patient engagement with the AHA Target: HF telephone follow-up tool was marked yes or no depending on if the patient (or delegated caregiver) chose to complete the survey. The total call time was recorded in minutes and was estimated to take 10 to 20 minutes prior to the DNP project. The answers to the questionnaire were recorded electronically and saved to the UA Box Health account. Only the DNP student and OPC's AGACNP had access to the UA Box Health to preserve patient privacy. The DNP student called the five patients from a secure private office at OPC using their landline. Reconciled medication lists were also available during calls in the OPC office for the DNP student, to assist in tailoring the AHA Target: HF follow-up tool to the individual patients.

Evaluation Methods

This QI project utilized descriptive statistics calculated with SPSS (version 26.0) using data from Microsoft Excel spreadsheets stored in UA Box Health. Aims 1 and 3 were described as mean percentages of patients. Aim 2 was described using mean and median minutes and frequencies. When applicable, data was analyzed with report outputs for total counts, maximum, minimums, medians, means, standard deviations, variance, and 95% confidence intervals.

Data Collection

Tools, Methods and Analysis

Data collection took place using the patient consent form, excel spreadsheets, and an electronic version of the AHA Target: HF telephone follow-up tool. As discussed above, the consent forms were obtained by the AGACNP and kept in a locked drawer in OPC. Medication lists were also retained by OPC. The data recorded in Excel spreadsheets and on the electronic version of the AHA Target: HF telephone follow-up tool for each consenting patient was saved within UA Box Health to securely protect patient confidentiality and remain HIPAA compliant. The data from aims 1 and 2 was entered into the Excel spreadsheet (Appendix D). The AHA Target: HF telephone follow-up tools was saved in UA Box Health as individual files named according to the Excel spreadsheet row and patient name. Upon completion of the thirty days of data collection, the data from the AHA Target: HF telephone follow-up tool was manually aggregated into a second de-identified Excel spreadsheet in UA Box Health. This sheet was used to calculate total counts and mean percentages of patients who reported a self-care management need for additional educational or medication management intervention. The self-management needs were reported with counts and percentages with other data being reported with additional descriptors as applicable and described above in the evaluation methods section. All calculations were done using either Excel or SPSS.

Ethical Considerations

Ethical considerations for this DNP project included considering three key ethical principles: Respect for persons, beneficence, and justice.

Respect for Persons

The primary principle in human subject's research or quality improvement related to respect for persons is autonomy. Eligible patients have the right to decide to participate in the project without coercion (Terry, 2015). The patient consent letter clearly described that there are no consequences to declining consent. This project was approved by the University of Arizona Human Subjects Protection program (Protocol No. 1910100339) to ensure that it possessed minimal risk to the human subjects it involved because it utilized appropriate methods to document informed consent where it is applicable, and employed data management techniques to ensure privacy and safety for project participants (Terry, 2015) (Appendix E).

Beneficence

Ethical projects require respect for the principle of beneficence, which means the project must benefit patients (Terry, 2015). This project was supported by evidence that suggests that STS in the context of TCM programs increases self-care management, reduce readmissions, and decrease mortality. While it was not possible to make the telephone calls without release of patient information, the patient was given the opportunity to write their own information to be released on the consent form, so that they knew exactly what information would be available to the student. They will also retained the right not to answer questions on the AHA Target: HF telephone follow-up tool if they did not want that information released. To increase the benefit to the patient, the patient data collected during this study was made available to the patient's acute care nurse practitioner for review as part of their symptom and risk assessment. The patient also potentially benefited from increased education regarding self-care management and medication management. Paper copies of the consent forms were retained by OPC in a locked drawer. All

other information was uploaded into UA Box Health, a secure HIPAA compliant cloud storage location to store and share sensitive data (University of Arizona College of Nursing, 2019).

Justice

Lastly, the principle of justice requires that selection of patients is fair, thus all patients who were eligible were approached for consent and called if they chose to consent for intervention participation (Terry, 2015).

RESULTS

Data Analysis and Outcomes

During the 30 days of data collection in November 2019, no OPC patients were hospitalized with HF; therefore, the inclusion criteria was broadened to retrospectively capture a five OPC patient sample from a database of all OPC patients discharged home following hospitalization with HF in 2019. As described in Methods, eClinicalWorks was programed to produce an output of five random patients who had ICD-10 codes for HF and a recent hospitalization. These five patients became the sample for this DNP project. The five eligible OPC patients were contacted by the OPC AGACNP and consented over the telephone to be contacted by the DNP student. Using a telephone in the OPC office during office hours, the DNP student confirmed patient consent prior to proceeding with data collection. As discussed in methods, contact rates and call times using the computer clock were recorded in Excel spreadsheets, answers to the AHA Target: HF telephone follow-up tool were recorded electronically on the PDF form, and all files saved to the secure UA Box Health. Following data collection, data was deidentified, collated into SPSS (version 26) data analysis files, variables were defined, and outputted into tables and a box plot as shown in Appendix F. Output was then

organized into tables and figures as shown in the body of this paper organized by aims and questions. Demographic information regarding the five OPC patients collected using the AHA Target: HF telephone follow-up tool is listed below (Table 2). Table 2 shows OPC patients are advanced in age with the mean age 84 years old (SD 8.246 years) and 4.6 months (SD 3.647 months) post discharge from hospitalization with HF. All OPC patients (100%) did not have home care or assisted care and had HF with preserved LVEF.

TABLE 2. *OPC patient demographics information.*

Descriptive Data Variables	N	Range	Min	Max	Median	Mean	95% CI	SD	Variance
Months since discharge with HF	5	9	2	11	3	4.6	0.7 - 9.13	3.647	13.3
Age in years	5	20	77	97	81	84	73.76 - 94.24	8.246	68
Frequency Data Variables	N	n (%)							
Has home care	5	0 (0%)							
Has assisted care	5	0 (0%)							
LVEF <40%	5	0 (0%)							

Note. OPC = Old Pueblo Cardiology; N= Number of Patients; Min = Minimum; Max = Maximum; 95% CI = 95% Confidence Interval; SD = Standard Deviation; LVEF = Left Ventricular Ejection Fraction

Aim 1

Aim 1 was to describe patient willingness to participate in telephone follow-up by reporting consent rates, contact rates, and follow-up tool completion rates as percents (Table 3).

Question 1. For HF patients recently discharged from acute care and followed by OPC, what percent of patients consent for telephone follow up? Even though OPC estimated they normally transitions 20 to 40 HF patients per month, there were no HF patients recently discharged from acute care and followed by OPC during data collection in November 2019. Therefore, this data reflects an extended retrospective sample of five patients from the list of total HF patients who were discharged in 2019. Encouragingly, 100% (5 out of the 5) of the eligible patient sample contacted by OPC's AGACNP consented to be contacted via telephone.

Question 2. What percentage of patients who consent to be contacted for telephone follow-up are successfully contacted within three attempts? During data collection, 100% (5 of the 5) or all of the consented patients were successfully contacted by the DNP student to validate consent and complete the AHA Target: HF telephone follow-up tool.

Question 3. What is the average number of phone call attempts needed before the patient is successfully contacted? All five (or 100%), of the consented patients were contacted with one phone call attempt, thus the average number of phone call attempts before successful patient contact was one call. Prior to data collection, it was determined that setting a follow-up appointment time to call back would not count as a second call attempt. One of the five patients was at the store during the first call, so a follow up appointment was set for two hours later and not counted as a second attempt.

Question 4. What percentage of patients who are contacted complete the follow-up tool? All five (or 100%), of contacted patients completed the AHA Target: HF telephone follow-up tool. None of the patients opted to delegate any portion of the interview, but multiple patient's spouses also participated in the interview indirectly as the patient would talk with their spouse and then summarize their conversation to the DNP student. Many patients also talked about how their daughters helped them; however, the daughters were not present nor delegated to during the interviews.

Question 5. What percentage of discharged HF patients complete the follow-up tool? No patients were lost to follow up. All five (or 100%), of the discharged patients completed the AHA Target: HF telephone follow-up tool.

TABLE 3. *Aim 1: OPC patient willingness to participate in STS.*

Question	Variable	n (%)
1	% of eligible patients consented to be contacted	5 (100%)
2	% of consented patients contacted	5 (100%)
3	% of patients contacted in one call attempt	5 (100%)
4	% of contacted patients who complete the AHA Target: HF telephone follow-up tool	5 (100%)
5	% of eligible patients who complete the AHA Target: HF telephone follow-up tool	5 (100%)

Note. OPC = Old Pueblo Cardiology; STS = Structured Telephone Support

Aim 2

Aim 2 was to calculate AHA Target: HF telephone follow-up tool time (Table 4 & Figure 3).

Question 6. How long does it take to complete the AHA Target: HF telephone follow-up tool in minutes? Telephone calls were all made by the DNP student using a phone from OPCs office on one day between 1150 and 1430. The mean call time was 26.8 minutes and close to the median time of 27 minutes (Table 4). The standard deviation was 9.418 minutes. The minimum time of 15 minutes was consistent with the anticipated call time of 10 to 20 minutes; however, most patients wanted to tell stories about their hospitalization and had side conversations with their spouses as discussed in the section for question four. The stories and side conversations lengthened the interviews significantly with one call completed in a maximum time of 36 minutes.

TABLE 4. *Aim 2: Telephone call duration in minutes.*

Variables	N	Range	Min	Max	Median	Mean	95% CI	SD	Variance
Call duration in minutes	5	21	15	36	27	26.8	(15.11-38.49)	9.418	88.7

Note. N= Total Number of Patients; Min = Minimum; Max = Maximum; 95% CI = 95% Confidence Interval; SD = Standard Deviation

As shown in the boxplot below (Figure 3), the call times are normally distributed.

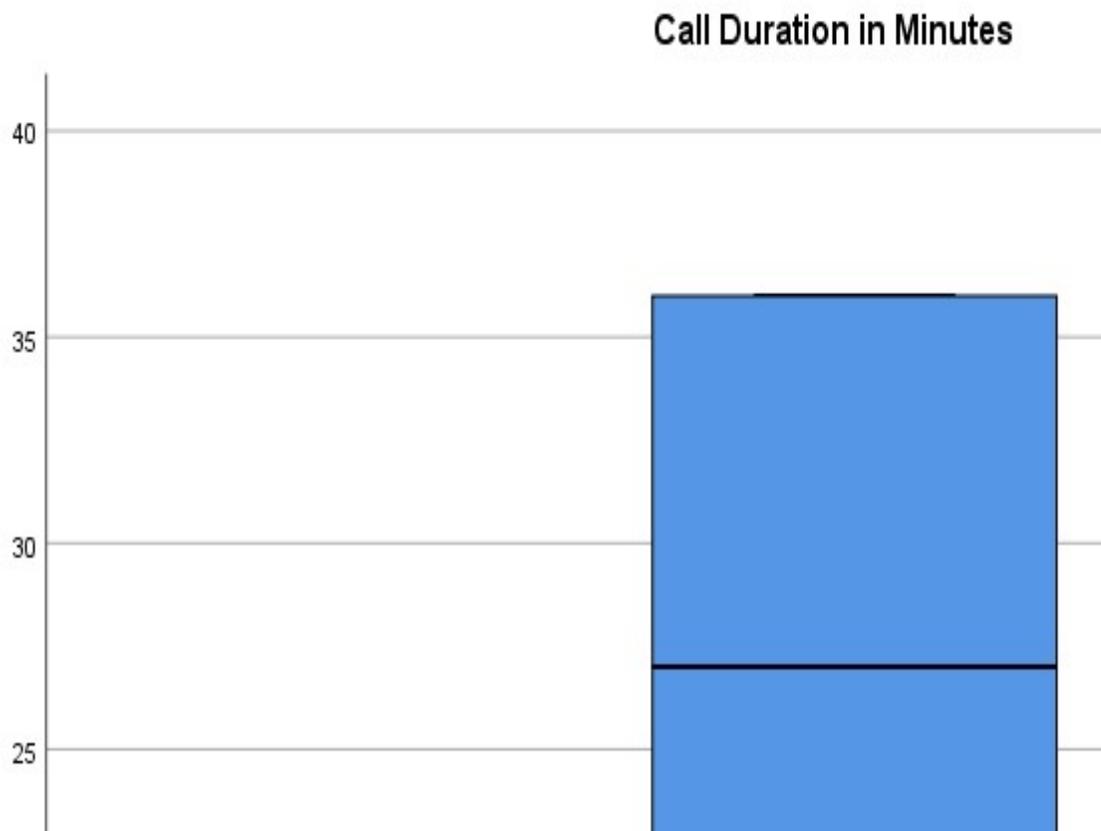


FIGURE 3. Boxplot of OPC call duration in minutes. (Calls were largely normally distributed with a mean of 26.80 minutes close to the median of 27 minutes. There was minimal Skewness at -0.200 and Kurtosis at -2.304.)

Aim 3

Aim 3 was to describe patient self-care management needs related to patient education and medications for HF management using the AHA Target: HF telephone follow-up tool and the results are summarized then explained extensively below under Question 7 (Tables 5, 6, & 7).

Question 7. What are the HF self-care management elements on the AHA Target: HF telephone follow-up tool with the greatest needs for additional educational or medication management interventions?

The greatest self-management needs for OPC patients regarding educational or medication needs were: none (0%) had a weight diary, one (20%) was not on fluid restriction and another did not weigh themselves on day 1 after discharge and knew their dry weight, three (60%) did weigh themselves daily, engaged in exercise/daily physical activity, drank alcohol regularly, or knew how to use dry weights as warning symptoms to call to cardiologist. All five of five (100%) patients were taking medication when indicated and no contraindications. Medications were not always indicated and contraindications were common which lowered medication taking rates in two (20%) patients for ACE-inhibitors and beta-blockers, and one (20%) patient for hydralazine/nitrates and potassium. Comprehensive results are listed below in Table 5 for all five patient answers. Asterisks mark potential opportunities for improvement (OFI) which are listed in Tables 6 and 7.

TABLE 5. *Aim 3: Description of self-care management needs.*

Variables	Yes	No	NA
	n = 5 (%)	n = 5 (%)	n = 5 (%)
Patient Education			
<i>Weight monitoring</i>			
Has weigh scale at home	5 (100%)	0 (0%)	0 (0%)
Advised to buy a scale	5 (100%)	0 (0%)	0 (0%)
Can see scale numbers *	4 (80%)	1 (20%)	0 (0%)
Weighs self daily *	3 (60%)	2 (40%)	0 (0%)
Knows dry weight *	1 (20%)	4 (80%)	0 (0%)
Captured dry weight day 1 after DC *	1 (20%)	4 (80%)	0 (0%)
Has weight diary *	0 (0%)	5(100%)	0 (0%)
Was ever given a weight diary *	1 (20%)	4 (80%)	0 (0%)
Describes how/when to check weight *	4 (80%)	1 (20%)	0 (0%)
Describes why daily weights are important	5 (100%)	0 (0%)	0 (0%)
Able to teach-back weights self-care management	5 (100%)	0 (0%)	0 (0%)

TABLE 5 – Continued

Variables	Yes	No	NA
	n = 5 (%)	n = 5 (%)	n = 5 (%)
Patient Education			
<i>Fluid restriction</i>			
Describes why fluid restriction is important	5 (100%)	0 (0%)	0 (0%)
Articulates fluid restriction amount correctly	3 (60%)	0 (0%)	2 (40%)
Able to teach-back fluid restriction self-care management	5 (100%)	0 (0%)	0 (0%)
<i>Low-sodium diet</i>			
Follows a low-sodium diet *	2 (40%)	3 (60%)	0 (0%)
Reviewed low-sodium diet self-care management for HF	5 (100%)	0 (0%)	0 (0%)
Able to teach-back low-sodium diet self-care management	5 (100%)	0 (0%)	0 (0%)
<i>Exercise/physical activity</i>			
Engaged in daily physical activity*	3 (60%)	2 (40%)	0 (0%)
Engaged in any exercise*	3 (60%)	2 (40%)	0 (0%)
Describes why exercise/physical activity is important	5 (100%)	0 (0%)	0 (0%)
<i>Habits</i>			
Current smoker	0 (0%)	5 (100%)	0 (0%)
Smoking cessation counseling ordered	0 (0%)	0 (0%)	5 (100%)
Consumes alcohol*	2 (40%)	3 (60%)	0 (0%)
Alcohol cessation counseling ordered*	0 (0%)	0 (0%)	5 (100%)
Uses illicit drugs	0 (0%)	5 (100%)	0 (0%)
Drug cessation counseling ordered	0 (0%)	0 (0%)	5 (100%)
Able to teach-back on cessation of smoking, alcohol, illicit drugs self-care management	5 (100%)	0 (0%)	0 (0%)
<i>Signs and symptoms</i>			
Able to list ways to know HF is worsening	5 (100%)	0 (0%)	0 (0%)
Able to teach-back who to call with worsening HF symptoms	5 (100%)	0 (0%)	0 (0%)
<i>Weight/swelling</i>			
Knows to call cardiologist if gains 4 pounds over dry weight*	3 (60%)	2 (40%)	0 (0%)
Knows to call cardiologist if swelling in feet, ankles, stomach, waking from sound sleep, or increased night urination*	4 (80%)	1 (20%)	0 (0%)
Able to teach-back on weight/swelling self-care management	5 (100%)	0 (0%)	0 (0%)
<i>Breathing</i>			
Has experienced worsening shortness of breath*	3 (60%)	2 (40%)	0 (0%)
Knows to call cardiologist if worsening shortness of breath, orthopnea, or dry cough	5 (100%)	0 (0%)	0 (0%)
Currently has worsening shortness of breath	5 (100%)	0 (0%)	0 (0%)
<i>Other symptoms</i>			
Knows to call cardiologist if tired, less energy, poor appetite, early satiety, uneasy, or "something is not right"	5 (100%)	0 (0%)	0 (0%)
Knows to go to the emergency room or call 911 if struggling to breath and unrelieved shortness of breath at rest, new or worsening chest pain, especially unrelieved by one dose of nitroglycerine, persistent palpitations, lightheadedness that does not resolve, or passing out.	5 (100%)	0 (0%)	0 (0%)
Able to teach-back self-care management for other symptoms	5 (100%)	0 (0%)	0 (0%)

TABLE 5 – Continued

Variables	Yes	No	NA
	n = 5 (%)	n = 5 (%)	n = 5 (%)
Medications for HF Management			
Medication reconciliation completed	5 (100%)	0 (0%)	0 (0%)
Can afford to buy medications	5 (100%)	0 (0%)	0 (0%)
Has filled prescriptions as ordered	5 (100%)	0 (0%)	0 (0%)
Has a prescription drug plan	5 (100%)	0 (0%)	0 (0%)
<i>Diuretic</i>			
Taking a diuretic (water pill)?	5 (100%)	0 (0%)	0 (0%)
Has contraindication side effects from diuretic	0 (0%)	5 (100%)	0 (0%)
Reviewed diuretic self-care management for HF	5 (100%)	0 (0%)	0 (0%)
Patient is an appropriate candidate for diuretic self-care management	5 (100%)	0 (0%)	0 (0%)
Reviewed indications for extra diuretics/potassium and when to call cardiologist	5 (100%)	0 (0%)	0 (0%)
Able to teach-back diuretic self-care management	5 (100%)	0 (0%)	0 (0%)
<i>ACE inhibitor/ARB/ARNI for patients with reduced LVEF < 40%</i>			
Taking an ACEI/ARB/ARNI? *	3 (60%)	2 (40%)	0 (0%)
Has contraindication side effects from ACEI/ARB/ARNI *	2 (40%)	3 (60%)	0 (0%)
Reviewed ACEI/ARB/ARNI self-care management for HF	3 (60%)	0 (0%)	2 (40%)
Able to teach-back ACEI/ARB/ARNI self-care management	3 (60%)	0 (0%)	2 (40%)
<i>Beta-blocker for patients with reduced LVEF < 40%</i>			
Taking a beta-blocker? *	2 (40%)	2 (40%)	1 (20%)
Has contraindication side effects from beta-blocker*	2 (40%)	2 (40%)	1 (20%)
Reviewed beta-blocker self-care management for HF	2 (40%)	2 (40%)	1 (20%)
Able to teach-back beta-blocker self-care management	2 (40%)	2 (40%)	1 (20%)
<i>Aldosterone agonist for patients with reduced LVEF < 40%</i>			
Taking an aldosterone antagonist?	0 (0%)	0 (0%)	5 (100%)
Has contraindication side effects from aldosterone agonist	0 (0%)	0 (0%)	5 (100%)
Reviewed aldosterone agonist self-care management for HF	0 (0%)	0 (0%)	5 (100%)
Able to teach-back aldosterone agonist self-care management	0 (0%)	0 (0%)	5 (100%)
<i>Hydralazine/nitrate for African American patients with reduced LVEF < 40%</i>			
Patient is African American	1 (20%)	4 (80%)	0 (0%)
Taking a hydralazine/nitrate? *	0 (0%)	1 (20%)	4 (80%)
Has contraindication side effects from hydralazine/nitrate*	1 (20%)	0 (0%)	4 (80%)
Reviewed hydralazine/nitrate self-care management for HF	0 (0%)	0 (0%)	5 (100%)
Able to teach-back hydralazine/nitrate self-care management	0 (0%)	0 (0%)	5 (100%)
<i>Warfarin or other anticoagulant (if indicated for patients with chronic/recurrent Atrial fibrillation or mechanical valve)</i>			
Indication present	5 (100%)	0 (0%)	0 (0%)
Taking warfarin or other oral anticoagulant?	5 (100%)	0 (0%)	0 (0%)
Has contraindication side effects from anticoagulant	0 (0%)	5 (100%)	0 (0%)
Reviewed anticoagulant self-care management	5 (100%)	0 (0%)	0 (0%)
Able to teach-back anticoagulant self-care management	5 (100%)	0 (0%)	0 (0%)
<i>Potassium/magnesium supplements</i>			
Taking potassium/magnesium supplements? *	4 (80%)	1 (20%)	0 (0%)
Has contraindication side effects from supplements *	1 (20%)	4 (80%)	0 (0%)
Reviewed supplement self-care management	4 (80%)	0 (0%)	1 (20%)
Able to teach-back supplement self-care management	4 (80%)	0 (0%)	1 (20%)

TABLE 5 – Continued

Variables	Yes	No	NA
	n = 5 (%)	n = 5 (%)	n = 5 (%)
Medications for HF Management			
<i>Lipid lowering medication if patient has cardiovascular disease (CVD), peripheral vascular disease (PVD) or cerebrovascular accident (CVA)</i>			
Indications present	3 (60%)	2 (40%)	0 (0%)
Taking lipid-lowering medications	3 (60%)	0 (0%)	2 (40%)
Has contraindication side effects from lipid-lowering medications	0 (0%)	3 (60%)	2 (40%)
Reviewed lipid-lowering medications self-care management	3 (60%)	0 (0%)	2 (40%)
Able to teach-back lipid-lowering self-care management	3 (60%)	0 (0%)	2 (40%)
<i>Omega 3 fatty acid supplementation</i>			
Indications present	0 (0%)	5 (100%)	0 (0%)
Taking omega 3 fatty acid?	0 (0%)	0 (0%)	5 (100%)
Reviewed Omega-3 medications self-care management	0 (0%)	0 (0%)	5 (100%)
Able to teach-back Omega-3 self-care management	0 (0%)	0 (0%)	5 (100%)
Other Questions			
Scheduled for a follow-up appointment	5 (100%)	0 (0%)	0 (0%)
Has transportation to and from the hospital/OPC clinic	5 (100%)	0 (0%)	0 (0%)
Had other questions about diet, activity, medications, HF	0 (0%)	5 (100%)	0 (0%)
Further action needed post follow-up call	0 (0%)	5 (100%)	0 (0%)

Note. Variables from AHA Target: HF Telephone Follow up Tool; NA = Not Applicable; * = Potential Opportunity for Improvement at OPC; OPC = Old Pueblo Cardiology; HF = Heart Failure; LVEF = Left Ventricular Ejection Fraction; ACEI = ACE Inhibitor; ARB = Angiotensin Receptor Blocker; ARNI = Angiotensin Receptor Neprilysin Inhibitor; DC = Discharged from the hospital.

Regarding weight monitoring, all OPC patients (100%) were aware weights were an important aspect of HF self-monitoring and incorporated weight monitoring into their routines. One patient stated they could not see the scale numbers, but their primary care doctor recommended a scale that reads the numbers to them, which they said helped significantly. Two patients (40%) reported they weighed themselves several times a month, but they did not weigh themselves daily. Three patients (60%) did weigh themselves daily. All patients (100%) described their weight as stable, and denied symptoms of frequent swelling, water retention, orthopnea, or shortness of breath. Only one of the five patients (20%) knew what a dry weight was or obtained one after their last hospitalization. Also, only one patient (20%) had ever been given a weight diary. All patients (100%) denied keeping a weight diary themselves with one

patient (20%) reporting that her daughter sometimes wrote down her weight. All patients (100%) reported they do not write down their weights at all because they are stable; however, multiple patients said they did not know their weight could be such an important indicator of fluid retention related to their heart function. One patient exclaimed they were so focused on their blood pressures that they did not know that monitoring their weight could impact their symptoms of fluid retention. Education was reviewed on dry weights and daily weight monitoring to all patients (100%) by the DNP student during the phone call and they were all (100%) successful in providing teach-back. OFIs in patient education are present in engaging patients and their families in assessing and managing risk and symptoms related to weight monitoring and are described in Table 6 at the end of this section.

Only two patients (40%) reported they followed a low sodium diet. Three patients (60%) did not follow a low sodium diet. One of these patients described their biggest barrier to following a low sodium diet was that they liked to eat Italian food. Another patient stated that they did not have any control over their diet as they used a food delivery service to bring prepared meals, which did not have a low sodium diet option. The third patient stated they did not think that they needed to follow a low sodium diet. A fourth patient, who reported following a low sodium diet, stated they struggled with high blood pressures and headaches, so was surprised when they learned that limiting the amount of sodium in their diet was a strategy to help them obtain better blood pressure control. Education was reviewed with all patients on the importance of low sodium diets in HF self-management and all patients achieved teach back. An OFI is to increase engagement of patients and their caregivers on the importance of following a

low sodium diet and collaborating with them to find local resources for low sodium food delivery when food services are used (Table 6).

Three of the patients (60%) engaged in exercise or daily physical activity. Two patients (40%) reported they were not able to engage in any sort of physical activity or exercise. One of the two patients who reported no daily physical activity or regular exercise said their main barriers were physical deconditioning with fall risk, lack of driver's license, and daily assistance to help them exercise. They said they used a walker and could do their ADLs in the house, but only walked up the street when their daughter visited. They reported not having transportation to go to an exercise or fall prevention class. They said their daughter helped them with necessary transports. Another patient who also used a walker walked around the cul-de-sac for exercise and was engaged in physical therapy twice a week. They described their major barrier to exercise was their arthritis and foot pain. A third patient stated they struggled with their physical activity and exercise due to having a pinched nerve and cancer so they were not at their baseline conditioning or energy level. They said they now use a cane, but they try to walk 15 minutes a day and do the shopping. Another patient said their left knee was bad, but they do leg exercises. The fifth patient was active, and said they exercised three days a week for an hour, golf, and chase the dog around. The role of exercise and physical activity in HF self-management was reviewed with all patients by the DNP student and all patients were able to provide teachback. Potential OFI include engaging not only patients, but also their families in the importance of physical activity and exercise so it is seen as a necessity. Additionally, four out of five (80%) of patients discussed how comorbid diseases limited their physical activity and exercise capacity. Assistive devices were used by three out of five (60%) of patients. Often the exercises that

patient's described were related to strength building and did not include cardiovascular exertion. Engaging patients and their families in methods to increase cardiovascular exercise that also address their co-morbid limitations could help prevent deconditioning and improve HF self-management (Table 6).

Two patients (40%) reported daily consumption of alcoholic beverages. Both patients were aware of the recommendations not to drink with cardiovascular disease and described their drinking as minimal, limited to one drink per day. Education to avoid alcohol to reduce progression of cardiovascular disease were discussed with both patients. Neither patient was part of an alcohol cessation program. Potential opportunities for improvement include routine screening for alcohol use, reinforcement of assessment and management of risks and symptoms associated with drinking alcohol, and referrals for alcohol cessation in patients interested in further assistance with alcohol cessation.

A review of symptoms and patient knowledge regarding when to contact the cardiologist revealed that two out of the five (40%) patients did not know to call the cardiologist when they experienced increasing weight beyond four pounds above their dry weight, swelling in their feet, ankles, or stomach region, or nighttime waking or need to urinate. Patients were able to provide teachback after the DNP student reviewed these points. Several patients told stories about how they had called OPC's AGACNP for assistance with symptoms they found concerning, such as chest pain or increased swelling, and were very satisfied with the assistance they received reporting that their symptoms resolved. A potential OFI includes ensuring that providers regularly review the symptoms that indicate worsening HF and encouraging them to maintain their relationship by calling OPC for further cardiology care recommendations (Table 6).

TABLE 6. *Potential OFI in OPC patient education.*

Assessing/Managing Risk and Symptoms: Weight Monitoring
Seeing scale numbers
Weighing self daily
Dry weight: capturing and knowing baseline dry weight day one after discharge
Weight diary: giving and incorporating into patient and provider routines
Describing how/when to check weight
Engaging Patients and Caregivers: Increase Collaboration for Low Sodium Diet
Following a low sodium diet: resources for low sodium food delivery
Engaging Patients and Caregivers: Increase Exercise and Physical Activity
Engaging patients in physical activity/exercise
Overcoming comorbidities and other barriers such as deconditioning and transportation
Screening and Assessing/Managing Risks and Symptoms: Habits
Alcohol consumption: screening and ordering for alcohol cessation counseling
Maintaining Relationships: Knowing When to Call the Cardiologist
If gains 4 pounds over dry weight
If swelling in feet, ankles, stomach, waking from sound sleep, or increased night urination
If worsening shortness of breath

Note. Based on the Naylor Transitional Care Model and AHA Target: HF telephone follow-up tool. OFI = Opportunity for improvement

There are several findings from the interviews related to medication for HF management that are potential OFI in cardiac care at OPC. All five patients, 100%, reported that they were on diuretics and demonstrated knowledge in diuretic self-management. However, two patients, 40%, reported that they were not taking an ACE Inhibitor/ARB/ARNI due to contraindications in side effects. One patient who is currently undergoing cancer treatments, reported contraindication symptoms of hypotension and dizziness while taking lisinopril that occurred when the hospital restarted this medication. He states he still felt lightheaded in the morning and his ACE inhibitor was currently on hold during his cancer treatments due to these symptoms. The other patient who did not take an ACE Inhibitor was the same patient who did not take a potassium/magnesium supplement due to contraindicated hyperkalemia secondary to kidney disease. These medications were stopped by this patient's nephrologist. Beta-blockers and were also commonly held, with two patients, 40%, holding these medications due to contraindicated side effects such as

hypotension, dizziness, syncope, and bradycardia. Contributing factors to these side effects include cancer, atrial fibrillation, and chronic pain on multiple pain medications. All five patients in this sample, 100%, did not have reduced LVEF at the time of the interview, which meant that some of the medications listed in the Target: HF telephone follow-up tool were not indicated in all patients. When patients did not have an indication for a medication, it was noted as ‘Not Applicable’ with subsequent fields for taking, contraindicated, reviewed or teach back marked as ‘Not Applicable.’ Only patients who had indications, were taking a medication, or had contraindications to a medication were marked as ‘Yes’ or ‘No;’ thus, the ‘Not Applicable’ medications were not counted in the potential OFI because the current care was appropriate. The potential OFIs related to improving taking medication rates given the high rates of contraindications includes fostering collaboration between OPC and other providers to treat comorbid conditions limiting optimal goal directed medical therapy for HF (Table 7).

TABLE 7. *Potential OFI in OPC medications for HF management.*

Fostering Collaboration to Improve Taking Medication Rates For:

ACEI/ARB/ARNI
 Beta-blocker
 Aldosterone agonist
 Potassium/magnesium supplements

High Rates of Reported Contraindication Side Effects Such As:

Hypotension
 Dizziness
 Syncope
 Bradycardia
 Chronic kidney disease

Note. Based on the Naylor Transitional Care Model and AHA Target: HF telephone follow-up tool. OFI = Opportunity for improvement

Lastly, patients told many stories during the interview about their experiences during HF hospitalizations and/or transitions. One patient reported he was frustrated with physicians at the hospital because many of them had foreign accents and were difficult for him to understand.

Multiple patients expressed wishes for increased coordination and collaboration between providers. One example came from a patient who said some of their providers recommended surgery, but other providers said they did not need surgery and they did not know what to do. One patient described similar challenges in coordinating care for their multiple comorbidities. They started running everything a provider recommended by the OPC providers to ensure OPC had the opportunity to collaborate and his care was coordinated. All the patients interviewed had future follow-up appointments and described maintaining their relationship with OPC as an important part of their HF self-management. Overall, OPC patients were very receptive to telephone follow-up care with structured telephone support. The intervention fostered interesting and informative opportunities to develop OPC's TCM and enhance HF patient education and self-management knowledge.

DISCUSSION

Summary of Evidence

Because there were no prospective OPC patients during the 30-day data collection period, the results of this DNP project suggest OPC's HF program is effective for keeping HF patients optimized and out of the hospital. While not able to confirm feasibility prospectively, the results from this DNP project support the feasibility of using the AHA Target: HF telephone follow-up tool with OPC patients following discharge for HF hospitalization because all patients consented, were easily contacted within one attempt, and completed the tool. The call duration varied between 15 and 36 minutes with a median duration of 27 minutes and standard deviation of 9.418 minutes. The biggest OPC patient needs to enhance HF self-management include: 1) increasing assessment and management of risk and symptoms related to weight management, 2)

engaging patients and caregivers in ways to increase collaboration with local resources for following a low sodium diet, 3) engaging patients and caregivers on methods and local resources to increase cardiovascular exercise and physical activity, 4) enhancing screening, assessment, and management of risks and symptoms related to alcohol consumption habits, 5) increasing relationship maintenance though knowing when to call the cardiologist, and 6) fostering collaboration to increase rates of patients taking optimal goal directed medical therapy when they have contraindications and/or comorbidities.

Relationship of Results to Frameworks

This section reviews the relationship of results to the DNP project frameworks: the Naylor TCM and concept of self-management from the *Five-Stage Model of Naturalistic Decision-Making* framework.

Naylor Transitional Care Model

Without the Naylor TCM and the anecdotes OPC patients provided during telephone interviews, the results of this DNP project would have lacked context for meaningful implementation recommendations to improve OPC's HF patient transitions and outcomes such as preventing readmissions. For example, the finding that a patient was not following a low sodium diet was not associated with a cause until the patient related an anecdote describing a perceived lack of dietary options for pre-prepared meal deliver services. As both a conceptual model and implementation model, The Naylor TCM frames the AHA Target: HF telephone follow-up tool findings conceptually. For example, Screening, one of the nine Naylor TCM conceptual components, is the conceptual heading for the AHA Target: HF tool question that asked about the patient's ability to follow low sodium diet recommendations (AHA, 2017a)

(Naylor et al., 2018). The other applicable components include educating/promoting self-management conversations about dietary options to optimize health and engaging patients and their caregivers in local resources to help meet patient dietary and health needs (Naylor et al., 2018). Together, the quantitative data, qualitative anecdotes, and Naylor TCM framed the potential OFIs outlined in Tables 6 and 7. It should be noted that implementing STS on its own does not mean that OPC has a HF TCM program, rather using STS as part of many interventions based on the nine conceptual components is what builds a true HF TCM program (Naylor et al., 2018). This DNP project provides several recommendations based on results of the data collected towards implementing STS and advancing the HF TCM program development at OPC.

Concept of Self-Management

The results from this DNP project reaffirm a one-size fits all approach to HF is not ideal and provides support for tailoring self-management strategies to individual patient needs (Bos-Touwen et al., 2015). The AHA Target: HF telephone follow-up tool's medications for HF management section makes an attempt at individualization by adding the statement "(if applicable to this patient)" after each drug class and defines applicability for the majority of medications as "if the patient has reduced LVEF (LVEF<40%)" (Appendix A) (AHA, 2017a). This attempt at individualization made the AHA Target: HF telephone follow-up tool usable with OPC patients who all had preserved LVEF; but diminished the applicability of the interview to the OPC patients. Despite this weakness, utilizing the AHA Target: HF telephone follow-up tool provided important insights into potential self-management OFI as outlined in Tables 6 and 7. Continued use of the Target: HF telephone follow-up tool is recommended to evaluate self-

maintenance and self-management knowledge of OPC patients as the individualization is possible due to the “(if applicable to this patient)” statements (AHA, 2017a).

Using the *Five-Stage Model of Naturalistic Decision-Making* framework to conceptually address the potential OFIs increases the strength of intervention planning and ensures patient needs are comprehensively addressed (Riegel et al., 2004). The primary self-management need outlined in this DNP project was to increase self-maintenance teaching on assessing and maintaining symptoms of weight gain, swelling, and daily weights. It also reinforced the need for self-management teaching on knowing the criteria when to call the cardiologist. Hopefully, combining weight self-maintenance and weight self-management patient education helps OPC patients develop self-confidence with their HF self-management skills (Riegel et al., 2004). Self-management concepts are present in the AHA Target: HF telephone follow-up tool, conceptual frameworks on self-management, the educating/promoting self-management component of the Naylor TCM, and Naylor TCM implementation framework (AHA, 2017a) (Bos-Touwen et al., 2015; Riegel et al., 2004). This consistency provides a tidy link throughout this project and for implementing potential OFI for future practice.

Relationship of Results to Aims

The aims of this project are again listed below:

- Aim 1: Describe patient willingness to participate in telephone follow-up by reporting consent rates, contact rates, and follow-up tool completion rates.
- Aim 2: Calculate the AHA Target: HF telephone follow-up tool time.
- Aim 3: Describe patient self-care management needs related to patient education and medications for HF management using the AHA Target: HF telephone follow-up tool.

As outlined in the results section, the results of this DNP project answer the aims of this project sufficiently to conclude that the tool is feasible and usable in transitioning OPC HF patients. As discussed in the strengths and limitations section, the change from prospective to retrospective data collection lengthened the interval between discharge and the interview, which may affect frailty and toleration of the intervention due to respondent fatigue. It is recommended that future quality improvement projects over a longer duration of months also include metrics to validate toleration and/or respondent fatigue in a prospective sample. Also, as discussed in the strengths and limitations section, the population in the retrospective sample may be biased towards engaged patients, so future projects should also validate that engagement levels remain high in prospective interventions. This DNP project showed the Target: HF telephone follow-up tool is an intervention the highly engaged OPC patients are willing to participate in at 100% with one phone call attempt, takes on average approximately 27 minutes to complete, and reveals OPC patient self-care management needs.

Relationship of Results to Other Evidence

Surprisingly, the results of this DNP project revealed higher levels of patient engagement at 100% than is found in other evidence which showed contact rates at 20%, consent rates for further interviewing at 62%, and contact rates within one call attempt at 76% (Brandon et al., 2009; Inouye et al., 2015). A published DNP project by Fuller utilized the AHA Target: HF telephone follow-up tool in rural Kentucky patients recently hospitalized and diagnosed with new HF, did not measure or report contact or consent rates and utilized a convenience sample. Even using a convenience sample of 15 patients, they found a 13% attrition rate from enrollment to study completion due to two readmissions (Fuller, 2018). They did report that the project was

extended, and the goal had to be lowered from 25-30 patients to 15 patients (Fuller, 2018). Still another prospective DNP project using STS by Hart (2018) showed that of 62 eligible inpatients with HF, only 36 patients consented to telephone follow-up, five were not called, and 10 completed a total of five follow up calls resulting in a 32% completion rate. Many STS projects, such as Hart's DNP project, did not use the AHA Target: HF telephone follow up tool so it is difficult to find directly comparable studies (Hart, 2018).

Patient samples from the two DNP projects described above revealed a very different patient population from OPC patients in Tucson, Arizona. Both sample means for patient age were 17 years younger than the DNP sample mean for this DNP project with lower rates of 40% disability and 33% retirement (Hart, 2018; Fuller, 2018). Additionally, 20% of the Kentucky sample were current smokers and 66.7% of the mid-Atlantic sample were current/former smokers compared to 0% in the OPC sample (Hart, 2018; Fuller, 2018). Also, 80% of the Kentucky sample were NYHA class III and IV HF, which is significantly worse than all of OPC patients in this DNP project who had normal LVEF function and no reporting of current dyspnea (Fuller, 2018). Hart did not measure and report NYHA classes (Hart, 2018). Neither the Hart nor Fuller DNP projects reported time to complete the AHA Target: HF telephone follow-up tool. Their study also included other interventions and screenings, which may have impacted their results (Fuller, 2018). Both Hart and Fuller DNP projects also revealed largely stable weights, but the Fuller project found that 100% of the readmitted patients were positive for edema at one or three of their time measurements over 150 days (Fuller, 2018). Even though it is unclear if the increases in knowledge ($F = 15.6$; $p < .001$), self-efficacy maintenance ($F = 10.7$; $P = 0.002$), and self-efficacy confidence ($F = 10.8$, $P = 0.0002$) were related to the AHA Target: HF telephone

follow-up tool or other interventions, Fuller's DNP project does provide additional evidence beyond this DNP project that the AHA Target: HF telephone follow-up tool represents an opportunity to improve HF self-management (Fuller, 2018). Hart's DNP project shares the same weakness because it also utilized additional patient education and custom telephone follow-up scripts but did show a reduction to 19% in the intervention groups readmissions beyond controls 44.2% ($p= 0.004$; Hart, 2018). Therefore, this DNP project provides some initial data not previously described in the literature and additionally supports other evidence that using STS, specifically the AHA Target: HF telephone follow-up tool, is feasible and beneficial to transitioning HF patients for increasing self-management and potentially lowering readmissions.

Impact of Results on Practice

Using STS following hospital discharge is feasible and sustainable given the low volume of OPC patients hospitalized with HF during this DNP project. Building the AHA Target: HF telephone follow up tool into scheduled practice routines following hospital discharge could prove very useful for reinforcing HF patient education, medication self-management, auditing for optimal goal directed therapy, and expediting early detection of signs and symptoms of worsening HF or medication side effects.

To optimally sustain the use of the AHA Target: HF telephone follow-up tool in practice, OPC needs to plan enough time to use the tool with their patients and be mindful to prevent respondent fatigue. Respondent fatigue is more likely to occur in long surveys, with complex, and open-ended questions such as the AHA Target: HF telephone follow-up tool and can degrade the quality of responses and participation rates (O'Reily-Shah, 2017). The AHA Target: HF telephone follow-up tool is time consuming at an average call duration time of 27 minutes. This

may not be tolerated by the frailest patients who fatigue quickly; perhaps, it might be less accepted in patients with lower LVEF; however, the mean age this study was 84 years old, and was still accepted with 100% participation and completion rates. One method of implementing this tool into OPC practice routines would be to schedule 30-minute telephone follow-up appointments to reduce the amount of clinic follow-up appointments, while maintaining a closer patient-provider relationship during transitions from the hospital. When physical exam is not necessary, telephone follow-up may benefit the frailest patients by reducing caregiver burden associated with transportation to the OPC clinic because 60% of OPC patients reported needing family assistance with transportation. The AGACNP may want to schedule the telephone follow-up appointments with patients while they are inpatients to encourage them to participate, ensure they are expecting the telephone call, and the AGACNP's schedule permits the telephone call duration. Telephone calls could be delegated to a medical assistant but staffing the AGACNP to make these calls is more consistent with the Naylor TCM model, promotes continuity, and helps the patient and AGACNP maintain their relationship across the transition from inpatient to outpatient (Naylor et al., 2018). Future quality improvement projects with a longer data collection duration could prospectively pilot scheduled structured telephone support following hospitalization.

Additional practice considerations include ensuring care plans adequately address all the causes of hospitalization. During the interview, qualitative comments from patients suggested their last hospitalizations for HF exacerbation were related to secondary comorbidities such as cancer, infections, travel, valvular dysfunctions, and/or abnormal heart rhythms. Consequently, limiting OPC's HF program to only uncomplicated HF goal directed therapies may not be

enough to prevent hospitalizations with HF exacerbations secondary to other comorbidities. In order to prevent these HF exacerbations during co-illnesses, OPC could enhance their TCM program with practice changes that foster collaborative relationships with other specialist providers to achieve optimal HF treatment and minimizing side effects. One way to accomplish this would be to build routines or mechanisms to transfer knowledge between specialist providers, primary care providers, and the patient that support knowledge flow both to and from OPC (Aguirre-Duarte, 2015). In fact, TCMs focus on developing ongoing regular visits utilizing home visits, STS, and clinic visits to optimize health outcomes (Naylor & Sochalski, 2010). The American Cardiology Association also recognizes the need for cardiologists to work with other specialists to optimize HF outcomes and supports building joint consensus guidelines for common clinical problems (Wong, 2016). Additionally, fostering collaboration with palliative care in patients with advanced age or heart failure could also increase quality of life.

Lastly, the AHA Target: HF telephone follow-up tool focuses primarily on HF with reduced LVEF; but all five OPC HF patients had preserved LVEF. This suggests that while the AHA Target: HF telephone follow-up tool was feasible and useful, future quality improvement projects using other structured telephone support tools focusing on early stages of HF, preserved LVEF, or strategies to optimize common comorbidities maybe more feasible and useful with the OPC patient population. Until a better tool can be determined, the AHA Target: HF telephone follow-up tool can be utilized to build a HF STS program into OPCs TCM HF program.

Strengths and Limitations

There were many strengths in this DNP project. One strength was the commitment by OPC to build a TCM program for their HF patients. Their AGACNP was dedicated to this DNP

project and volunteered time to find eligible patients, consent them for this project, and provide current medication lists. Another strength is the engagement of OPC patients. If this small sample is representative of the patient population at OPC, then their patients are engaged in their health self-management and actively foster a collaborative relationship with the providers at OPC because participation rates were 100%.

There are also several limitations in this DNP project. The change from prospective to retrospective data collection limits the generalizability of the results to all OPC inpatients because the methods for identifying eligible patients for retrospective data collection are biased toward selecting engaged patients who are also established outpatients. The initial prospective methods were expected to prevent this bias by capturing all OPC inpatients, who may or may not be established OPC outpatients, to see if they would be willing to follow up post-hospitalization. In fact, it was expected that some patients would not be engaged enough to follow-up as evidenced by several questions in the first aim that seek to capture engagement rates. However, the retrospective methods results were biased towards engaged patients. This bias occurred because the list of eligible patients was produced from a query of established outpatients in the OPC eClinicalWorks electronic health record with ICD-10 codes for HF and a flag for recent hospitalization. In other words, the list of eligible patients was already filtered to select patients who were engaged enough to be established OPC outpatients which may have contributed to the surprising results of 100% patient engagement. This difference also might be due to the provider-based nature of this DNP project as other projects and studies have been acute care based (Fuller, 2018; Hart, 2018; Inouye et al., 2015; Vesterlund et al., 2015). Lastly, given the advanced age of the patients, the request by their regular cardiologist might have encouraged their engagement.

Additionally, the mean number of months since hospital discharge was not very recent at 4.6 months and standard deviation of 3.647 months. The generalizability of the results of this DNP project to recently discharged patients is limited because there may be differences in the frailty of the remotely sampled patients to recently discharged patients. Future prospective quality improvement projects with longer durations results may reveal differences in the engagement levels, which could be attributed to differences in frailty given the extended timeline between discharge and STS interview in this DNP project. Nevertheless, positive reception of STS using the AHA Target: HF telephone follow-up tool, suggests it is worth implementing into routine practice at OPC.

Conclusions

In conclusion, the AHA Target: HF telephone follow-up tool is feasible and useful to use in OPC's transitioning HF patients. The OPC patients are older and highly engaged patients beyond the usual patients found in other evidence on STS following hospitalization, but they tolerated the 27-minute STS calls and all completed the AHA Target: HF telephone follow-up tool. Their greatest self-management needs are best understood and met within the context of the Naylor TCM and self-management concepts and reported with potential OFIs in Tables 6 and 7. Briefly, these potential OFIs include 1) increasing the assessment and management of risks and symptoms related with weight monitoring, 2) increasing patient and caregiver engagement on low sodium diets, exercise and when to call the cardiologist, 3) increasing the screening for alcohol habits and engaging patients on managing risks and symptoms related to alcohol intake, and 4) fostering collaboration with patients, caregivers, and other providers to improve medication taking rates on goal directed medical therapies when there are contraindications and

comorbidities. Recommendations for the AHA Target: HF telephone follow-up tool's continued use in practice by the AGACNP were reviewed and will strengthen OPCs HF TCM program, including finding opportunities to build STS into scheduled practice routines following discharge. Telephone follow-up appointments, with or without video, could be billed and reimbursed using CMS published CPT codes as discussed below in the dissemination section to improve HF patient outcomes and readmission rates for OPC patients (Nelson & Pulley, 2015). Further quality improvement projects are needed to evaluate the effect of future practice changes on patient outcomes.

Dissemination

The official framework for the translation of TCMs include four domains: “the innovation, the adopting organization, the dissemination infrastructure, and the external environment;” therefore, dissemination is considered a very important activity to TCM advancement (Naylor & Sochalski, 2010, p. 1). There is a need to continue to bring feasibility and evidence of successful TCM literature to key stakeholders - namely private sector purchasers and public payers of healthcare costs (Naylor & Sochalski, 2010). In 2013, CMS published transitional care CPT codes, 99495 and 99496, that allow APRNs or physicians to bill for telephone or e-mail contact within 48 business hours of hospital discharge, face-to-face visits with healthcare providers within 14 days of hospital discharge (or seven days for higher complexity patients), and coordination services such as discharge summary review, scheduling of follow up, medication management, and/or patient education (Nelson & Pulley, 2015). These codes provide a viable revenue source to support future TCM interventions and quality improvement studies. The information described in the results of this study support the feasibility

of implementing TCM at OPC and other cardiology practices. This author intends to publish the results of this quality improvement project to aid in providing support for other private practice-based cardiology clinics interested in developing TCMs with STS the AHA Target: HF telephone follow-up tool.

OTHER INFORMATION

Resources and Cost Analysis

Costs associated with this project were minimal. The consent costs were \$3.99 for paper and \$20.99 for ink. The use of UA Box Health was free to University of Arizona students and faculty. The statistical analysis software SPSS 26.0 student version for 6 months cost was \$34.95. No additional costs were required for telephone access for the student. Student and APRN time was volunteered. Total cost was \$59.93.

APPENDIX A:
AMERICAN HEART ASSOCIATION (AHA) TARGET: HF TELEPHONE FOLLOW-UP
TOOL

TARGET:HF™

GENERAL INFORMATION	
Discharge date: (mm/dd/yyyy)	
Patient name:	
Date of birth: (mm/dd/yyyy)	
Primary care physician:	
Cardiologist:	
Homecare? <input type="checkbox"/> YES <input type="checkbox"/> NO	Assisted Care? <input type="checkbox"/> YES <input type="checkbox"/> NO
Labs ordered/done prior to first follow-up call or appointment?	<input type="checkbox"/> YES <input type="checkbox"/> NO
	Date: (mm/dd/yyyy)
PATIENT EDUCATION	
INTRODUCTION: My name is _____ . I am calling from [INSERT HOSPITAL NAME]. I am doing a follow-up courtesy call to see how you are doing.	
Weight monitoring	
Do you have a scale at home that you can use to weight yourself?	<input type="checkbox"/> YES <input type="checkbox"/> NO If no: Comments _____
<i>[If patient answered no, advise the patient to buy a scale]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<i>[If patient answered yes to having a scale]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO
Can you see the numbers on the scale?	<input type="checkbox"/> YES <input type="checkbox"/> NO
Have you been weighing yourself daily?	<input type="checkbox"/> YES <input type="checkbox"/> NO
Dry weight (at home, 1 st day after discharge)	
Did you take your dry weight 1 day after discharge?	<input type="checkbox"/> YES <input type="checkbox"/> NO
Do you have a weight diary?	<input type="checkbox"/> YES <input type="checkbox"/> NO
	<i>If no, was the patient provided with a weight calendar during this visit?</i> <input type="checkbox"/> YES <input type="checkbox"/> NO
Do you understand how and when to check your weight? <i>[Tell patient that he/she should check weight every AM, after first void, prior to PO intake; with same amount of clothing on]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO
Do you understand the important of measuring and recording your daily weights? <i>[Tell patient that daily weights are important to self-monitor for fluid retention]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO
Confirmed understanding by Teach Back? <i>[The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]</i>	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments:



JULY 2017 | PAGE 1

STRONG THE FAILURE: OUT OF HEART FAILURE:
AMERICAN HEART ASSOCIATION



TARGET:HF

TARGET:HF™

Fluid restriction (if applicable to this patient)	
Do you know why it is important to restrict your fluid intake?	<input type="checkbox"/> YES <input type="checkbox"/> NO
How many liters/cups of fluid do you consume a day? <i>[Tell patient that he/she should keep fluid intake to less than 2 L/day of fluid to lessen fluid overload and improve breathing.]</i>	<input type="checkbox"/> 1.5 L <input type="checkbox"/> 6 cups <input type="checkbox"/> 2.0 L <input type="checkbox"/> 8 cups <input type="checkbox"/> N/A <input type="checkbox"/> N/A
Confirmed understanding by Teach Back? <i>[The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]</i>	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments:
Low-sodium diet	
Are you following a low sodium diet? If yes, what is your sodium limit per day?	<input type="checkbox"/> YES <input type="checkbox"/> NO (reason):
Review low-sodium diet expectation in relation to patient's individual scenario (i.e., eats out, likes ethnic foods, is thirsty, uses salt when cooking, reads labels, someone else cooks, etc). <i>[Discuss "Salty Six food group"]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO
Confirmed understanding by Teach Back? <i>[The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]</i>	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments:
Exercise/Physical Activity	
Are you engaging in daily physical activity?	<input type="checkbox"/> YES <input type="checkbox"/> NO (reason):
Are you engaged in any exercise?	<input type="checkbox"/> YES <input type="checkbox"/> NO (reason):
Review importance of physical activity and exercise	<input type="checkbox"/> YES <input type="checkbox"/> NO
Habits	
Are you currently a smoker? <i>[A smoker is defined as someone who has smoked any time in the past year]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<i>[If patient answers yes]</i> Did you provide the patient with smoking cessation counseling?	<input type="checkbox"/> YES <input type="checkbox"/> NO
Do you consume alcohol? <i>[Patients with heart failure should be advised not to consume alcohol]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO Counseling ordered: <input type="checkbox"/> YES <input type="checkbox"/> NO
Do you take any illicit drugs? <i>[If yes, patients should be advised to stop using illicit drugs]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO Counseling ordered: <input type="checkbox"/> YES <input type="checkbox"/> NO
Confirmed understanding by Teach Back? <i>[The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]</i>	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments:



TARGET:HF™

Signs and symptoms	
List the ways you know your heart failure is getting worse? If the signs or symptoms (above) get worse, what will you do? Whom will you call? <i>[Discuss practical ways to determine worsening symptoms]</i>	Factors (list): _____
<i>[Review with patient the contact information for whom to call in case they experience signs of symptoms of heart failure]</i>	PCP name: _____ Phone number: _____ Cardiologist: _____ Phone number: _____ APN/PA: _____ Phone number: _____
Weight/swelling	
Do you know what to do if you gain more than 4 pounds from your dry weight? <i>[Tell the patient that he/she should contact his/her physician if he/she gains excessive weight]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO
Do you know what to do if you notice more swelling in the feet, ankles, or stomach region? Or if you wake up suddenly from a sound sleep or are urinating at night (more than previously)? <i>[Tell the patient that he/she should contact his/her physician if he/she gains excessive weight]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO
Confirmed understanding by Teach Back? <i>[The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]</i>	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments: _____
Breathing	
Have you experienced worsening in shortness of breath? <i>[Review with patient what to do if they experience: -More shortness of breath than usual -Difficulty breathing when lying down -A dry hacking cough]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, when?: _____ <input type="checkbox"/> Review provided
Have you experienced worsening in shortness of breath?	<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, when?: _____
Other symptoms	
<i>[Review with patient what to do if they are feeling more tired/have less energy, have a poor appetite/early satiety, or are feeling uneasy; or "something is not right"]</i>	<input type="checkbox"/> Completed
Patient should go to the emergency room/call 911 if:	
<i>[Explain to patient that they should go to emergency room or call 911 if they experience any of the below symptoms: -Struggle to breathe or have unrelieved shortness of breath at rest]</i>	<input type="checkbox"/> Completed



JULY 2017 | PAGE 3

TAKING THE FIGHT OUT OF HEART FAILURE
AMERICAN HEART ASSOCIATION



TARGET:HF

TARGET:HF™

-New or worsening chest pain or chest pain that is not reduced with 1 dose of nitroglycerine -New or worsening confusion or having trouble thinking clearly -Persistent palpitations (racing heart) -Lightheadedness that does not quick resolve -Passing out]	
Confirmed understanding by Teach Back? [The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments:
Medications for Heart Failure Management	
Medication Reconciliation Completed <input type="checkbox"/>	Comments:
Can you afford to buy your medications?	<input type="checkbox"/> YES <input type="checkbox"/> NO (reason): _____
Have you filled your prescription(s) as ordered?	<input type="checkbox"/> YES <input type="checkbox"/> NO (reason): _____
Do you have a prescription drug plan?	<input type="checkbox"/> YES <input type="checkbox"/> NO (reason): _____
Diuretic (if applicable to this patient)	
Are you taking a diuretic (water pill)?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNSURE
[Provide patient education regarding the use/indication for this drug: water pill to remove excess water from legs, feet, lungs, and stomach]	<input type="checkbox"/> Patient education provided <input type="checkbox"/> Patient education not provided due to medical contraindications to diuretic
If patient is not on diuretics, indicate why (contraindications).	Patient had side effects that include:
Confirmed understanding by Teach Back? [The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments:
ACE-inhibitor, angiotensin receptor blocker or angiotensin receptor neprilysin inhibitor if patient has reduced LVEF (LVEF <40%) (if applicable to this patient)	
Are you taking an ACEI, ARB, or ARNI?	<input type="checkbox"/> YES <input type="checkbox"/> NO [If YES to ARNI, ensure that patient is NOT also taking an ACEI or ARB]
[Provide the patient with education on how ACEI, ARB, or ARNI can serve to relax blood vessels, making it easier for heart to pump]	<input type="checkbox"/> Patient education provided <input type="checkbox"/> Patient education not provided due to medical contraindications to ACEI, ARB, or ARNI
If patient is not on ACEI, ARB, or ARNI, indicate why (contradictions).	Patient had side effects that include:
Confirmed understanding by Teach Back? [The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments:
Beta-blocker if patient has reduced LVEF (LVEF<40%) (if applicable to this patient)	

TARGET:HF™

Are you taking a beta blocker? <i>[If patient has reduced LVEF (EF<40%), preferred evidenced based data beta blockers are carvedilol, metoprolol succinate (XL) and bisoprolol]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<i>[Provide the patient with education on how a beta blocker can help the heart pump better over time, and can block the body's response to certain substances that damage heart muscle]</i>	<input type="checkbox"/> Patient education provided <input type="checkbox"/> Patient education not provided due to medical contraindications to beta blocker
<i>[If patient is not on a beta blocker, indicate why (contraindications).]</i>	Patient had side effects that include:
Confirmed understanding by Teach Back? <i>[The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]</i>	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments:
Aldosterone antagonist if patient has reduced LVEF (LVEF<40%) (if applicable to this patient)	
Are you taking an aldosterone antagonist? <i>[If patient has reduced LVEF (EF<40%), need to closely monitor K and Cr]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<i>[Provide the patient with education on how an aldosterone antagonist helps to block sodium and water reabsorption, helps prevent further damage to heart, and that at low doses (6.25-25mg/day) is not used as a water pill.]</i>	<input type="checkbox"/> Patient education provided <input type="checkbox"/> Patient education not provided due to medical contraindications to aldosterone antagonist
<i>[If patient is not on an aldosterone antagonist, indicate why (contraindications).]</i>	Patient had side effects that include:
Confirmed understanding by Teach Back? <i>[The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]</i>	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments:
Hydralazine/nitrate for African American patients with reduced LVEF (LVEF<40%) (if applicable to this patient)	
Are you taking hydralazine/nitrate? <i>[If patient has reduced LVEF (EF<40%), and is of black race]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<i>[Provide the patient with education on how hydralazine/nitrate can help open up the vessels of the heart, and makes it easier for the heart to pump.]</i>	<input type="checkbox"/> Patient education provided <input type="checkbox"/> Patient education not provided due to medical contraindications to hydralazine/nitrate
<i>[If patient is not on hydralazine/nitrate, indicate why (contraindications).]</i>	Patient had side effects that include:
Confirmed understanding by Teach Back? <i>[The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]</i>	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments:
Warfarin or other anticoagulant (if indicated for patients with chronic/recurrent AFib or mechanical valve)	
Are you taking warfarin or other oral anticoagulant? <i>[Provide the patient with education on how warfarin or other anticoagulants can help to prevent stroke by serving as a blood thinner.]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO
	<input type="checkbox"/> Patient education provided <input type="checkbox"/> Patient education not provided due to medical contraindications to warfarin or other anticoagulant



JULY 2017 | PAGE 5

TAKING THE PULSE: OUT OF HEART FAILURE
AMERICAN HEART ASSOCIATION



TARGET:HF

TARGET:HF™

<i>If patient is not on warfarin or other anticoagulant, indicate why (contraindications).</i>	Patient had side effects that include:
Confirmed understanding by Teach Back? <i>[The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]</i>	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments:
Potassium/magnesium supplements (if applicable to this patient)	
Are you taking potassium/magnesium supplements?	<input type="checkbox"/> YES <input type="checkbox"/> NO
<i>[Provide the patient with education on how warfarin or other anticoagulants can help to prevent stroke by serving as a blood thinner.]</i>	<input type="checkbox"/> Patient education provided <input type="checkbox"/> Patient education not provided due to medical contraindications to potassium/magnesium supplements
<i>If patient is not on potassium/magnesium supplements, indicate why (contraindications).</i>	Patient had side effects that include:
Confirmed understanding by Teach Back? <i>[The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]</i>	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments:
Lipid-lowering medication if patient has cardiovascular disease (CVD), peripheral vascular disease (PVD), or cerebrovascular accident (CVA) (if applicable to this patient)	
Are you taking lipid-lowering medications?	<input type="checkbox"/> YES <input type="checkbox"/> NO
<i>If patient is not on lipid-lowering medications, indicate why (contraindications).</i>	Patient had side effects that include:
Confirmed understanding by Teach Back? <i>[The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]</i>	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments:
Omega 3 fatty acid supplementation (if applicable to this patient)	
Are you taking omega 3 fatty acids?	<input type="checkbox"/> YES <input type="checkbox"/> NO
Confirmed understanding by Teach Back? <i>[The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]</i>	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments:
Diuretic self-management	
Is the patient an appropriate candidate for diuretic self-management?	<input type="checkbox"/> YES <input type="checkbox"/> NO
<i>[Review when it is appropriate to take extra diuretics +/- potassium based on weight gain and other symptoms]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<i>[If weight gain persists > 2 days, advise the patient to call provider]</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO
Confirmed understanding by Teach Back? <i>[The patient or family member can verbalize your instructions back to you in their own words to confirm understanding.]</i>	<input type="checkbox"/> Yes <input type="checkbox"/> Patient needs reinforcement Comments:
Other questions	
Have you scheduled a follow-up appointment?	<input type="checkbox"/> YES <input type="checkbox"/> NO Comments:



JULY 2017 | PAGE 6

TAKING THE PULSE: OUT OF HEART FAILURE:
AMERICAN HEART ASSOCIATION



TARGET:HF

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Do you have transportation to and from the hospital?		<input type="checkbox"/> YES <input type="checkbox"/> NO
Do you have any other questions related to:		Comments: <input type="checkbox"/> Diet <input type="checkbox"/> Activity <input type="checkbox"/> Medications <input type="checkbox"/> Other concerns (list): _____
GENERAL INFORMATION		
General comments: _____		
Further action needed post follow-up call?		<input type="checkbox"/> YES <input type="checkbox"/> NO
If yes, what follow-up action is needed/performed?	<input type="checkbox"/> Notify doctor	Name: _____
		Number: _____
		Date: _____
		Time: _____
		<input type="checkbox"/> Call in prescriptions to pharmacy Pharmacy name: _____ Pharmacy phone number: _____
	<input type="checkbox"/> Call patient regarding _____	
	Set up appointment with doctor	Doctor name: _____
	Call in [] days for:	
	Other:	
Telephone:	Person interviewed:	<input type="checkbox"/> Patient <input type="checkbox"/> Other (name/relation): _____
Attempts to contact:		
Date:	Time:	Initials:
Date:	Time:	Initials:
Date:	Time:	Initials:
RN name (print): _____		
RN signature: _____		
Date:	Time:	

TARGET:HF™

TEMPLATE TELEPHONE FOLLOW-UP INTERVIEWER INSTRUCTIONS

COMPLETE FOLLOW-UP FORM (See below).

ITEMS REQUIRING FURTHER INTERVENTION:

CONTACT PROVIDER FOR:

- 01 Unfilled prescriptions
- 02 Questions on medications

CONTACT SCHEDULER FOR:

- 01 Follow up appointment

CONTACT NURSE FOR:

- 01 Questions on diet, activity, weight monitoring
- 02 Further evaluation of worsening symptoms
- 03 Follow-up on weight monitoring



JULY 2017 | PAGE 8

TAKING THE FAILURE OUT OF HEART FAILURE
© AMERICAN HEART ASSOCIATION



TARGET:HF

APPENDIX B:

PATIENT CONSENT TO PARTICIPATE IN DNP PROJECT

Consent to Participate in Old Pueblo Cardiology/University of Arizona Doctoral Student Project

Dear Old Pueblo Cardiology patient,

Old Pueblo Cardiology and the University of Arizona College of Nursing are working together on a nursing student doctoral project: Feasibility of The Using AHA Target: HF telephone follow-up tool in a Private Practice-based Heart Failure Transitional Care Program. Your participation in this project is encouraged as it will provide you with additional patient education on how to manage your heart failure to promote your health and prevent readmissions to the hospital. Additionally, your participation in this quality improvement project will help Old Pueblo Cardiology better understand and respond to the educational needs that you and other recently discharged heart failure patients have prior to the first follow-up clinic visit.

Should you choose to participate, a nursing doctoral student will call you at a phone number of your choice during the week following your discharge and ask you questions recommended by the American Heart Association regarding your knowledge of strategies to manage your heart failure and medications. The interview will take about 10 to 20 minutes to complete and includes a review of important heart failure self-care management education tailored to your responses. Your answers will be available to Old Pueblo Cardiology providers to review in your follow up visit.

Your participation is completely optional. There are no negative effects to your care if you do not participate. You can decide to opt out now or at any time. Should you choose to participate, your health information will be kept confidential in HIPAA compliant encrypted files and given back to Old Pueblo Cardiology at the conclusion of the project. Old Pueblo Cardiology encourages your participation.

Please select your preference to participate in this transitional care telephone follow up program:

No---Do not call me. I do not want to participate.

Yes---Call me the week after I discharge home! I want to participate.

Name: _____

Phone Number: _____

Best time to call (Optional): _____

Signature of Consent: _____

Thank you for your time and consideration,
 Lee Goldberg, MD and Joseph DeBoe, DNP, Old Pueblo Cardiology
 Lydia Moor, BSN, RN, DNP student, University of Arizona College of Nursing

APPENDIX C:

OLD PUEBLO CARDIOLOGY (OPC) LETTER OF SUPPORT FOR DNP PROJECT



October 1, 2019

University of Arizona
Institutional Review Board
1618 Helen Street
Tucson, Arizona 85721

RE: IRB Letter of Support for DNP Project

Dear University of Arizona Institutional Review Board Chair and Members:

I am writing this letter of support for Doctor of Nursing Practice student Lydia Moor. It is our intention to support her Doctor of Nursing Practice Research Project titled: Feasibility of Using Target: HF Telephone Follow-Up in A Private Practice-Based Heart Failure Transitional Care Program.

Research Overview:

1. Project Summary:

This single center quality improvement Doctor of Nursing project is based on a prospective design to examine the feasibility of using the AHA Target: HF telephone follow-up tool to survey adults with heart failure.

2. Project Objectives:

The project consists of three Aim's

- **Aim 1:** Describe patient willingness to participate in telephone follow-up by reporting consent rates, contact rates, and follow-up tool completion rates.
- **Aim 2:** Calculate the Target: HF tool/telephone follow-up time with descriptive statistics.
- **Aim 3:** Describe patient self-care management needs related to patient education and medications for HF management using the Target: HF telephone follow-up tool using descriptive statistics.

3. Background & Rationale for the Project:

The purpose of this project is to evaluate the feasibility of using the American Heart Association Target: HF telephone follow-up tool with heart failure patients recently discharged from acute care into the care of our providers at my cardiology practice (Old Pueblo Cardiology, P.C.) in Tucson,

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www.leegoldbergmcardiology.com



Arizona. The project is part of greater effort to build toward an Advanced Practice Registered Nurse (APRN)-led heart failure transitional care program based within a private cardiology practice where care is provided both in acute care and community settings.

It is a common problem for barriers or breakdowns in healthcare to occur that prevents effective transitioning post-discharge into effective self-care management. Common breakdowns in transitioning care for heart failure patients occur with patient assessment, patient and caregiver education, handoff communications, and following hospital discharge. This project is designed to evaluate a tool that has been put forth for patient education in heart failure that can aid in minimizing the barriers and breakdowns that can lead to hospital readmission.

Please do not hesitate to contact with any questions.

Sincerely,

DocuSigned by:


Joseph DeBoe, DNP, ACNPC-AG, CCRN
Old Pueblo Cardiology, P.C.

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APPENDIX D:

AIM 1 AND AIM 2 DATA COLLECTION EXCEL SPREADSHEETS

Aims 1 Data Collection Excel Spreadsheet

	A	B	C	D	E	F	G	H
1	Eligible Patient Total (x)	Consented (Y/N)	Name	Telephone Number	Best Time To Call	Number of Call Attempts (x, xx, xxx)	Successfully contacted patient (Y/N)	Completed care tool (Y/N)
2								
3								
4								
5								
6								
7								
8								
9								
10								

Aims 2 Data Collection Excel Spreadsheet

	A	B	C	D
1	Name	Call Start Time	Call End Time	Call Duration in Minutes
2				
3				
4				
5				
6				
7				
8				
9				
10				

APPENDIX E:
THE UNIVERSITY OF ARIZONA INSTITUTIONAL REVIEW BOARD APPROVAL
LETTER



THE UNIVERSITY OF ARIZONA

**Research, Discovery
& Innovation**

 Human Subjects
Protection Program

 1618 E. Helen St.
P.O. Box 245137
Tucson, AZ 85724-5137
Tel: (520) 626-6721
<http://rgw.arizona.edu/compliance/home>
Date: October 28, 2019

Principal Investigator: Lydia Marie Moor

Protocol Number: 1910100339

Protocol Title: Feasibility of Using the Target:HF Telephone Follow-up Tool in a Private Practice-Based Heart Failure Transitional Care Program

Determination: Human Subjects Review not Required

Documents Reviewed Concurrently:

HSPP Forms/Correspondence: *Determination of Human Research_Moor_Final Unsigned with edits 10.22.2019_RTP edits(1).pdf*

Regulatory Determinations/Comments:

- Not Human Subjects Research as defined by 45 CFR 46.102(e): as presented, the activities described above do not meet the definition of research involving human subjects as cited in the regulations issued by the U.S. Department of Health and Human Services which state that "Human subject means a living individual about whom an investigator (whether professional or student) conducting research: (i) Obtains information or biospecimens through intervention or interaction with the individual, and uses, studies, or analyzes the information or biospecimens; or (ii) Obtains, uses, studies, analyzes, or generates identifiable private information or identifiable biospecimens. "

The project listed above does not require oversight by the University of Arizona.

If the nature of the project changes, submit a new determination form to the Human Subjects Protection Program (HSPP) for reassessment. Changes include addition of research with children, specimen collection, participant observation, prospective collection of data when the study was previously retrospective in nature, and broadening the scope or nature of the study activity. Please contact the HSPP to consult on whether the proposed changes need further review.

The University of Arizona maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00004218).

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