

PREVENTING 30-DAY REHOSPITALIZATION AMONG ELDERLY PATIENTS
THROUGH A COLLABORATIVE TRANSITION OF CARE PROGRAM BETWEEN
ACUTE AND PRIMARY CARE

by

Katie S. Wingate

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Approved by:

Stephanie J. Woods, PhD, RN
Chair
School of Nursing

Charlene Whitaker-Brown, DNP, MSN FNP-C
School of Nursing

William S. Kelly, MD, FAAFP, CAQ-G
Kernersville Primary Care

Suzanne Lamorey, PhD
Department of Special Education and Child Development

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ABSTRACT

KATIE S. WINGATE. Preventing 30-day rehospitalization among elderly patients through a collaborative transition of care program between acute and primary care.
(Under the direction of DR. STEPHANIE J. WOODS)

There is a disconnect between acute and primary care when transitioning elderly patients from the hospital to the community, often leading to insufficient primary care follow-up and increased rehospitalization. The purpose of this pilot study was to examine the effect of a multi-component transition of care intervention coordinated by the primary care setting on 30-day rehospitalization and primary-care follow-up rates, as well as to examine the implementation of the intervention into practice. Thirty-day outcomes were measured by telephone interview and electronic record review of 10 elderly participants who were discharged from a local hospital and received the multi-component transition of care intervention led by an adult-gerontological primary care nurse practitioner. Of the 10 participants who completed all phases of the intervention and lived to 30-days post-discharge, none had a 30-day rehospitalization. The intervention may be effective in preventing 30-day rehospitalization. Completing post-hospital follow-up appointments was more efficient than those completed prior to implementation because the nurse practitioner had already met with participants during their hospital stay to gather information on the hospitalization and begin discharge planning. The intervention required a proactive approach from the primary care office to obtain hospitalization information, and was found to be time intensive, yet effective, among this group of participants. Further research is needed with a larger sample size and a longer duration of follow-up.

DEDICATION

I dedicate this paper to my husband, Adam. None of this would have been possible without your unending support, encouragement, and prayers or without God's grace. Thank you Adam for being my number one cheerleader. We made it!

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CHAPTER 1: NATURE OF THE PROJECT

1.1 Introduction and Background

The days following discharge from the hospital are challenging for patients, especially for elderly patients who may lack the financial and social support needed to combat the increasing demands of poor physical and mental health. The risk for returning to the emergency department or being readmitted to the hospital is ever present; if rehospitalization occurs, the challenges these patients face continue to grow. Not only are negative consequences of rehospitalization experienced by patients, but also by the inpatient and outpatient facilities. Acute care hospitals face penalties for excessive rehospitalizations, and rehospitalizations illuminate the presence of poorly coordinated care and follow-up by the primary care team (White, Carney, Flynn, Marisno, & Fields, 2014). Multiple transition of care interventions aimed at reducing rehospitalizations have been created, and some have had significant results. Elements of the effective interventions were combined to create a multi-component transition of care intervention which was examined in this pilot study. The purpose of this paper is to: (a) define the importance and significance of rehospitalization prevention; (b) provide a summary of the evidence surrounding transition of care interventions; and (c) describe the doctoral scholarly project which examined the multi-component transition of care intervention through the completion of a pilot study.

1.2 Problem Statement

In 2011, Medicare spent \$24 billion on all-cause 30-day readmissions (Hines, Barret, Jiang, & Steiner, 2014). Since October 1, 2012, the Centers for Medicare and Medicaid Hospital Readmissions Reduction program has been penalizing hospitals for excessive 30-day rehospitalizations for heart failure, acute myocardial infarction, and community-acquired pneumonia (White et al., 2014; DeLia, Tong, Gaboda, & Casalino, 2014). In 2015, payment reduction for 30-day rehospitalization increased from 2% to 3% and added chronic obstructive pulmonary disease and hip or knee arthroplasty to the list of diagnoses for which hospitals can be penalized (Centers for Medicare and Medicaid Services, 2014a). The pneumonia readmission criteria were expanded in 2016 to include diagnoses of aspiration pneumonia and diagnoses of sepsis with pneumonia present on admission. In 2017, admission for coronary artery bypass graft surgery will be monitored for readmission rates and penalties (Centers for Medicare and Medicaid Services, 2016).

Medicare insures a highly vulnerable population at risk for rehospitalization, which makes rehospitalization prevention challenging. Jencks, Williams, and Coleman (2009) identified the top five medical diagnoses associated with the highest rates of rehospitalizations among Medicare patients: (a) heart failure, (b) pneumonia, (c) chronic obstructive pulmonary disease, (d) psychoses, and (e) gastrointestinal illness. Having multiple prior hospitalizations and a longer length of hospital stay were also associated with increased risk for rehospitalization (Jencks, Williams, & Coleman, 2009). Risk factors among low-income elderly patients include living alone, dissatisfaction with primary care provider, not being insured by Medicaid, and requiring a new assistive

device and/or nursing home placement in the past six months (Iloabuchi, Deming, Tu, & Counsell, 2014).

Failure to follow-up with a primary care provider post-discharge is a major, and perhaps the most modifiable risk factor, for rehospitalization. Half of the Medicare patients rehospitalized within 30-days of discharge between 2003 and 2004 did not have a visit with an outpatient physician prior to readmission (Jencks, Williams, & Coleman, 2009). The lack of primary care follow-up is often due to poor communication between acute and primary care. Kripalani et al. (2007) found that the availability of a discharge summary by the time of primary care follow-up visit occurred between 12 and 34% of the time. Discharge summaries also lack important information concerning the patient's hospitalization, discharge medications, diagnostic test results, and follow-up plans (Kripalani et al., 2007).

Hospital readmissions of elderly patients create serious financial and health burdens. Understandably, patients and healthcare systems may perhaps all benefit from a coordinated transition of care program designed to reduce hospital readmissions for vulnerable elderly patients. However, collaboration and communication between acute and primary care has been insufficient and ineffective in transitioning elderly patients from the hospital to the community in order to prevent rehospitalizations.

1.3 Purpose of the Project

The purpose of this project was to implement a multi-component transition of care intervention between acute and primary care settings to help transition elderly patients from the hospital to the home more effectively, thereby reducing 30-day rehospitalizations. The investigator initiated the intervention prior to hospital discharge

and carried it forward into the primary care setting, hoping to discover if the transition of care intervention decreased the risk for rehospitalization among chronically ill elderly patients within 30-days of hospital discharge. The intervention was created using components identified in the literature to be effective in reducing rehospitalizations and included: (a) in-hospital discharge planning, (b) post-discharge telephone contact, (c) post-discharge follow-up visit with primary care, (d) communication between the acute and primary care settings, (e) creation of a patient-centered care plan, and (f) coordination of transition of care by an advanced practice nurse. The components were adapted to fit the needs and routines of the primary care office. This project was a pilot study to test the new multi-component intervention and examine how well it was implemented at the primary care office. Ultimately, the study investigator hoped to gain understanding of the intervention effectiveness in preventing 30-day rehospitalizations and how best to incorporate the intervention into the current routine of the primary care practice.

1.4 Significance of the Project

1.4.1 Healthcare System Impact

Rehospitalization rates, and efforts to lower them, have received much attention since the creation of the Centers for Medicare and Medicaid Hospital Readmission Reduction Program in 2012. Hospitals are working to lower rehospitalization rates under the pressure of Medicare payment reductions if rehospitalization rates are exceeded. At the same time, primary care offices are seeing potential increased payments by Medicare if transitional care management and hospital follow-up visits are completed. Current Procedural Terminology code 99495 can be billed for completion of a telephone follow-

up call within two days of discharge and a face-to-face encounter of moderate medical-decision making complexity within 14 days of discharge at a reimbursement rate of approximately \$163 dollars. A face-to-face high-complexity encounter within seven days of discharge coupled with telephone follow up within two days of discharge is allowed a reimbursement rate of \$231 dollars with the 99496 code; both rates are higher than the previously used 99214 follow-up code that is reimbursable at \$103 to \$130 dollars (Bendix, 2013).

1.4.2 Population Impact

The median hospital-wide, risk-standardized readmission rate, including all-cause unplanned 30-day readmission, has been slowly declining since July 2010 across the United States. From 2010 to 2011 the median national readmission rate was 16.3% among Medicare beneficiaries. The following year, the median readmission rate declined to 16.0% and was 15.5% from July 2012 to 2013 (Centers for Medicare and Medicaid Services, 2014b, Table I.C.1). The latest (July 2013 to June 2014) available current national average rate of unplanned all-cause 30-day readmissions among Medicare beneficiaries is 15.2% (“Hospital Profile,” n.d.).

This project was implemented in the piedmont region of North Carolina at a small community hospital that had only been open a little over four years by the time of implementation. A few areas of North Carolina fall into the better than national average category for all-cause 30-day readmissions; however, the majority of North Carolina is in the average performing category (Centers for Medicare and Medicaid Services, 2014b, Figure I.C.4). The average hospital-wide readmission rate for North Carolina from July 2013 to June 2014 was 15% (“CMS Readmit Hospital-Wide,” n.d). The sister hospital to

the site of project implementation, which is a large tertiary hospital in the neighboring city, had a hospital-wide all-cause readmission rate of 14.8% during this same time period (“CMS Readmit Hospital-Wide,” n.d.). Specific data for the hospital site of implementation is not available from CMS, likely due to the relative youth of the hospital. However, data analysis conducted by the hospital revealed an overall readmission rate among patients 65 years of age and older of 13.23% from June 2014 to October 2014 (D. Kring, personal communication, December 9, 2015). The current project was implemented one year later during this same five-month time period.

The national median 30-day readmission rates for disease-specific causes has also been slowly declining in recent years (see Table 1). The majority of North Carolina (NC) fell into the average performing category from July 2010 to June 2013 (Centers for Medicare and Medicaid Services, 2014b, Figure I.A.6); a few central and eastern areas of the state were categorized in the moderately worse performing category. Overall, the North Carolina average for 30-day readmissions for acute myocardial infarction, heart failure, pneumonia, COPD, and stroke from July 2011 to June 2014 were similar to the median national rates from July 2012 to June 2013 (see Table 1). For the hospital site of study implementation, the 30-day disease-specific readmission rates from June 2014 to October 2014 are slightly lower than national and North Carolina rates (see Table 1).

Table 1: 30-day disease-specific readmission rates (%) nationally and regionally

| Disease | National Median Rate 7/10-6/11 | National Median Rate 7/11-6/12 | National Median Rate 7/12-6/13 | NC Rate 7/11-6/14 | Hospital Site of Implementation Rate 6/14-10/14 |
|------------------|---|---|---|-------------------------|---|
| Acute MI | 18.6 | 17.8 | 17.0 | 16.7 | 0 |
| Heart failure | 23.4 | 22.6 | 21.9 | 21.6 | 14.29 |
| Pneumonia | 17.8 | 17.4 | 16.6 | 17.0 | 13.16 |
| COPD | 21.1 | 20.9 | 20.0 | 19.9 | 11.76 |
| Stroke | 13.7 | 13.3 | 12.7 | 12.8 | 10 |

Note. MI = myocardial infarction. National median rates refer to 30-day, risk-standardized readmission rates. This data was retrieved from “Medicare Hospital Quality Chartbook: Performance Report on Outcome Measures,” from the Centers for Medicare and Medicaid Services, 2014b, Table I.A.2. North Carolina data adapted from “CMS Readmit by Condition,” n.d., Retrieved from <http://www.nchospitalquality.org/tabledate.lasso>. Hospital data retrieved from D. Kring, personal communication, September 29, 2015.

1.5 Clinical Question

In order to address the problems surrounding Medicare rehospitalizations, the project investigated the clinical question – does a multi-component transition of care program between acute and primary care decrease rehospitalization rates among chronically ill community dwelling older adults within 30-days of discharge? The overall objective of the pilot study was to examine the effects of the transition of care intervention. Effect on 30-day rehospitalization rates, patient compliance with follow-up, and primary care office routine were examined.

1.6 Project Objectives

There were three process and three outcome objectives for this pilot study. Process objectives were (a) to establish an agreement between the primary care office and the hospital system to allow for transition of care collaboration by June 1, 2015; (b) to

develop a transition of care program for elderly patients to be implemented at the primary care office starting on June 1, 2015; and (c) to develop a method for implementing the transition intervention into the normal office work-flow by June 1, 2015. Short-term outcome objectives were to, within five months, have: (a) 90% of hospital discharge summaries for project participants transmitted to and reviewed by clinicians at the primary care office before hospital follow-up appointment; (b) 90% compliance with hospital follow-up appointments at the primary care office within 14 days of hospital discharge; and (c) a lower rate of rehospitalization among project participants than the hospital average. The long-term objective was to develop a plan for continued implementation of the transition of care intervention within six months of project completion.

CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Literature Review

A systematic review of the literature was conducted to examine the various transition of care interventions that have been developed and tested to reduce rehospitalizations among elderly patients. CINAHL and PubMed databases were searched. Key terms searched included: *readmission, rehospitalization, transitions, intervention, reduction, primary care, acute care, and elderly*. Articles reviewed were published between 1994 and 2014, and special attention was given to those articles that emphasized rehospitalization reduction as the primary outcome, focused on the elderly population, and/or included participation of the primary care setting in the transition of care intervention. The majority of the research on readmission reduction interventions among the elderly population has been completed by a multidisciplinary team at the University of Pennsylvania, which has examined Naylor's Transitional Care Model (TCM). A search for literature by Naylor was completed, as well as a search for articles obtained from references lists of other literature pertaining to rehospitalization reduction interventions.

The review identified two major themes in the literature: (a) effective transition of care interventions involve multiple components and (b) Naylor's work on the Transitional Care Model is an influencing force for other tested interventions. The review also identified frequently used and effective intervention components among the

transition of care interventions. These components are all part of the TCM and were utilized in various ways by other transition of care intervention bundles and include: (a) nursing discharge planning coordinators, (b) patient-centered care plans, (c) telephonic health services, (d) post-discharge home visits, and (e) coordination with primary care.

Multifactorial Interventions

A variety of interventions were found to effectively reduce rehospitalizations. An analysis of four systematic reviews found that the majority of transition of care interventions involved multiple components (Batty, 2010; Hansen et al., 2011; Naylor, Aikin, Kurtzman, Olds, & Hirschman, 2011; Verhaegh et al., 2014). Two systematic reviews identified the inclusion of patient-centered discharge instructions and a post-discharge telephone call as two consistently effective interventions that significantly reduced rehospitalizations (Hansen et al., 2011; Naylor et al., 2011). Additionally, Naylor and colleagues (2011), in a systematic review of randomized control trials (RCTs; n = 21), reported that the most effective and long-lasting interventions after discharge were those with nine or more weeks of intervention, that focused on patient self-management, and that connected acute and primary care providers to improve care transition across settings. Nurses served as leaders and care managers in all identified effective interventions and the majority of these interventions included a home visit. Batty (2010) examined 13 international studies on interventions targeting hospital admissions and also found that a multicomponent system of interventions was key in reducing rehospitalizations. Interventions which incorporated a home-based system utilizing comprehensive geriatric assessment, care planning, promotion of health, and management of disease were the most effective models. Providing continuity of care across settings

prior to discharge and utilization of experienced multi-disciplinary teams also displayed promise in reducing rehospitalizations (Batty, 2010).

Verhaegh et al. (2014) conducted a systematic review of RCTs ($n = 26$) testing transition of care interventions to determine effectiveness in terms of short term (≤ 30 days), intermediate-term (31-180 days), and long-term (181-365 days) readmissions. Similar to other systematic review findings, effective interventions involved multiple components. However, only high-intensity interventions were associated with decreased short-term readmissions. Interventions were given an intensity level based on actions occurring during the in-patient and post-discharge time periods, the presence of provider continuity, the inclusion and number of home visits or telephone follow-up calls, and the total duration of the intervention. Meta-regression by Verhaegh et al. (2014) of the individual interventions revealed that care coordination by a nurse, communication between the hospital and primary care provider, and a home visit within three days of discharge were all statistically significant ($p = 0.04$; $p = 0.003$; $p < 0.001$, respectively) in reducing rates of short-term readmissions. Finding the majority of effective transition of care interventions to involve multiple steps and components, the systematic reviews illuminate the complexity of rehospitalization prevention and call for the implementation of a multicomponent intervention approach.

Naylor's Work on the Transitional Care Model

The Transitional Care Model (TCM) is an example of a multicomponent intervention that has shown to reduce rehospitalizations among elderly patients (Naylor et al., 1994; Naylor et al., 1999; Naylor et al., 2004; Naylor et al., 2013). The model is specifically designed for chronically ill older patients who are at high risk for

readmission and who are transitioning from the hospital to the home setting.

Interventions of the TCM can be led by an advance practice nurse (APN) trained in the management of geriatric patients with chronic illnesses. The APN provides inpatient hospital assessment and planning, home visits, availability for telephone communication, coordination of primary care follow up, and evidenced-based plans of care. The model is carried out in a comprehensive format focusing on patient and caregiver needs, involves collaboration with a multifaceted healthcare team, and provides coordination between healthcare providers from the time of index admission through an average of two months following hospital discharge (Naylor et al., 2013).

Naylor and colleagues conducted a series of RCT studies to examine the efficacy of interventions within the TCM. In a RCT of 276 hospitalized patients age 70 years and older, Naylor et al. (1994) found that a comprehensive, individualized discharge planning process led by geriatric APNs significantly reduced rehospitalizations within two-weeks and six-weeks of discharge among medical patients ($p = 0.02$ and $p = 0.04$, respectively), but did not significantly reduce rehospitalizations among surgical patients. Naylor et al. (1999) modified the design of her original study (Naylor et al., 1994) to include patients with any of the top 10 reasons for hospitalization among Medicare beneficiaries in 1992. The intervention was implemented over a four week time period; this was twice the length of time for intervention in the 1994 study. Patients who received the lengthier intervention had significantly fewer rehospitalizations at 24-weeks post-discharge ($p < 0.001$), and fewer of these rehospitalizations were related to the original admission reason compared to control subjects ($p = 0.005$). Of note, control subjects were more likely to

have a longer length of hospital stay and an earlier time to first rehospitalization (Naylor et al., 1999).

To further evaluate the APN-guided comprehensive discharge planning process, Naylor et al. (2004) conducted a RCT with 239 patients age 65 and older who were hospitalized specifically with a diagnosis of heart failure. Intervention methodologies were similar to the previous 1994 and 1999 studies; however, the intervention period was longer at three months post-discharge. At 52 week post-discharge, both rehospitalization and death rates among intervention participants (47.5%) were significantly lower ($p = 0.01$, adjusted) compared to control participants (61.2%) who received traditional hospital discharge processes. Intervention participants also had a longer time to rehospitalization or death ($p = 0.026$) and fewer rehospitalizations at 52 weeks post-discharge than controls (104 and 162, respectively; $p = 0.047$).

Naylor and colleagues reported inconsistent findings related to functional outcomes and quality of life with their intervention studies. In the 1994 study, Naylor et al. found a significant decline ($p < 0.001$) in functional status among all study participants during the first two weeks of discharge and a return to baseline among all participants by 12 weeks of discharge. In the 1999 study, Naylor et al. found that mean functional status scores in control and intervention groups improved at 24 weeks post-discharge, but there were no significant differences between the groups. Participants who received the intervention in the 2004 study, however, had higher overall reported quality of life at 12 weeks post-discharge ($p < 0.05$). The decreased dependency scores and improvements in functional status were not significantly different than controls (Naylor et al., 2004).

Additionally, the intervention was found to be cost-effective despite the multifactorial nature of the intervention and use of APNs. Naylor and colleagues found in the 1994, 1999, and 2004 RCTs significant reductions in total costs of health care services among intervention participants ($p = 0.02$ at six weeks, $p < 0.001$ at 24 weeks; $p = 0.002$ at 52 weeks, respectively). The intervention, therefore, not only reduces rehospitalizations but also reduces total healthcare costs.

TCM interventions were implemented with 172 high-risk Aetna Medicare Advantage hospitalized patients under a prospective, quasi-experimental design as part of the health insurance program's already established geriatric telephone case management system (Naylor et al., 2013). Each intervention participant was matched to a control insurance beneficiary with similar health and demographic characteristics. At three months post-discharge, rates of rehospitalization were significantly less among intervention participants compared to matched controls ($p < 0.041$), and at one year, a significant per member cost savings was observed ($p < 0.037$). Significant improvements ($p < 0.001$) in quality of life, functional status, and health status were also found among study participants (Naylor et al., 2013).

Naylor and colleagues' three RCTs support the TCM as an effective model for rehospitalization prevention. The TCM has also served as an influencing force for other transitions of care interventions that have been developed and tested. Many of the themes of the TCM are mirrored in other effective interventions, such as: (a) nursing discharge planning coordinators, (b) patient-centered care plan, (c) telephonic health services, (d) post-discharge home visits, and (e) coordination with primary care. These themes are discussed in the following section.

Nursing Discharge Planning Coordinators

APNs served as the discharge planning coordinators in the TCM (Naylor et al., 2013). Nursing expertise has also been used in other transition of care intervention research (Coleman, Parry, Chalmers, & Min, 2006; Daly et al., 2005; Jack et al., 2009; Rich et al., 1995; White et al., 2014). Such expertise has been found to decrease rehospitalization. Rich and colleagues (1995), in a prospective, randomized trial of 282 high-risk hospitalized congestive heart failure patients age 70 years and older, found that an intensive patient education multidisciplinary discharge program led by an experienced cardiovascular research nurse significantly decreased the rehospitalization rates for congestive heart failure among intervention participants compared to controls ($p = 0.04$; Rich et al., 1995). Similarly, a disease management intervention led by an APN with access to and collaboration with a pulmonologist and geriatrician that targeted the chronically critically ill – those hospitalized patients requiring three or more days of mechanical ventilation and who survived to hospital discharge – found that intervention participants had fewer rehospitalization rates compared to controls ($p = 0.03$; Daly et al., 2005). Other transition of care interventions have utilized various levels of nursing expertise, such as: APN transition coaches (Coleman et al., 2006), nurse discharge advocates (Jack et al., 2009), and primary care nurse coordinators (White et al., 2014), and found significant reduction in rehospitalization.

Patient-Centered Care Plans

Essential to the TCM are the focus on patient's individualized needs, engagement of patients and caregivers, and attention to early identification of, and reaction to, symptoms that increase risk for rehospitalization – all of which create a patient-centered

care plan (Naylor et al., 2013). Other transition of care interventions have also included patient-centered care plans. Coleman et al. (2006) examined the Care Transitions Intervention (CTI) in a RCT of 712 hospitalized patients aged 65 years and older. The CTI included individualized education on alarming symptoms that indicate worsening of condition with instructions on appropriate management. The model also included the development of a patient-centered health record which was intended to create care plan continuity across treatment settings. Coleman et al. (2006) found that patients who received the CTI were significantly less likely to have 30- and 90-day rehospitalizations ($p = 0.048$ and $p = 0.04$, respectively). Rehospitalization rates for the same reason as the initial admission were also significantly less at 90 days ($p = 0.04$) and 180-days ($p = 0.046$) for CTI recipients. Additionally, hospital costs were significantly less ($p = 0.049$) at 180-days for intervention patients.

The study by Coleman et al. (2006) was conducted in a Medicare Advantage setting; however, the majority of older adults in the United States are insured by a Medicare fee-for-service plan, which are generally fragmented with fewer incentives for cost control and less availability of case management for care coordination (Parry et al., 2009). In an effort to see if the CTI was effective among Medicare-fee-for-service patients, Parry et al. (2009) conducted a RCT of 98 hospitalized patients in a Medicare fee-for-service setting. Intervention participants had significantly lower overall 90- and 180-day rehospitalization rates ($p = 0.01$ and $p = 0.08$, respectively) and lower 90- and 180-day rehospitalization rates for the same reason as an index admission ($p = 0.03$ and $p = 0.008$, respectively). Decreased rates of 30-day, all-cause rehospitalizations and rehospitalizations for same reason as index hospitalization were not significant ($p = 0.15$

and $p = 0.20$, respectively). The CTI was shown to have applicability and usefulness in a more representative population and setting (Parry et al., 2009).

The Reengineered Hospital Discharge (RED) intervention also included similar patient-centered components and has shown significant results. As part of the in-hospital component of the RED intervention, nurse discharge advocates educate patients on alarming symptom identification and management, as well as create an individualized discharge summary as components of a patient-centered care plan. Jack and colleagues (2009) examined the RED intervention in a RCT of 749 hospitalized adults. Intervention patients had a significantly lower rate of hospital utilization than control subjects ($p = 0.009$), better understanding of discharge diagnosis ($p = 0.017$), and higher rates of primary care follow-up ($p < 0.001$). Unlike other transition of care intervention research reviewed, this study did not focus on elderly patients; mean age of participants was 49.9 years (Jack et al., 2009).

Telephonic Health Services

Within the TCM, an APN is available by telephone seven days per week for two months post-discharge on average (Naylor et al., 2013). The CTI model also utilizes telephone communication; transition coaches reach out to patients by telephone three times during the 28 days following discharge (Coleman et al., 2006). The RED intervention incorporates a telephone call by a pharmacist within two to four days of discharge to reinforce the discharge plan (Jack et al., 2009). However, systematic review by Crocker, Crocker, & Greenwald (2012) examining the effects of post-discharge telephone follow-up in the primary care setting on hospital readmissions and post-discharge emergency department visits failed to find significant reduction in either

outcome, but post-discharge primary care contact was increased in all three studies reviewed; two of the three studies reviewed by Crocker, Crocker, & Greenwald (2012) found significant increases in primary care contact. This finding has clinical significance since the absence of primary care follow-up has been shown to increase risk for rehospitalization (Misky, Wald, & Coleman, 2010).

Post-Discharge Home Visits

Like the TCM, many of the studies describing transition of care interventions have utilized a model that incorporates post-discharge home visits (Coleman et al., 2006; Daly et al., 2005; and Rich et al., 1995). A descriptive, non-experimental study examining the effects of a social worker mediated transitional care model which included a home visit within the first 72 hours of discharge, and additional home visits as needed, found a 61% reduction in hospital readmission among a high-risk for readmission population of elderly patients (Watkins, Hall, & Kring, 2012). Purposes of home visits among various intervention studies include: (a) physical and environmental assessment (Daly et al., 2005; Naylor et al., 1999; Watkins, Hall, & Kring, 2012); (b) performance of case management services and patient education (Naylor et al., 1999; Rich et al., 1995; Watkins, Hall, & Kring., 2012); and (c) reconciliation of medication regimens (Coleman et al., 2006).

Coordination with Primary Care

The timing of, and adherence to, primary care follow-up visits significantly impacts rehospitalization rates. In a prospective cohort study of 65 patients, Misky, Wald, and Coleman (2010) found that those patients without timely primary care follow-up – defined as within the four weeks post-discharge – were 10 times more likely to have a

readmission ($p = 0.04$). Lin, Barnato, and Degenholtz (2011) completed a retrospective analysis of the Medicare Current Beneficiary Survey 2001 to 2003 data, which revealed a negative association between physician follow-up and 90-day readmission rates (OR = 0.23, 95% CI 0.13-0.43) with 22% of patients with a follow-up visit being readmitted and 52% of those without follow-up being readmitted ($p < 0.001$). The timing of follow-up visits in this study of 326 Medicare beneficiaries did not affect readmission rates, as all-time increments after discharge (< 7 days, 8-14 days, 15-21 days, and > 21 days) had a significant negative association with 90-day readmission (Lin, Barnato, & Degenholtz, 2011). The way in which the Transitional Care Model (TCM) incorporates coordination with the primary care setting is through the accompaniment of patients by the advanced practice nurse to hospital follow-up visits (Naylor et al., 2013). As with other components of the TCM, coordination with primary care is reflected in many of the transitional care interventions.

Follow-up with primary or specialty serves is one of the foundations of the Care Transitions Intervention (CTI) and is achieved through patient self-scheduling, recommendations and encouragement to seek primary care follow-up, preparatory education for the visit, and assistance in scheduling if needed (Coleman et al., 2006). While no statistically significant reductions were seen in readmission rates or emergency room visits through the implementation of CTI in a study of low-income elderly hospitalized patients, the intervention did exhibit significant increases in primary care follow-up among intervention participants ($p < 0.001$ for 30-, 90-, and 180-days post-discharge; Ohuabunwa, Jordan, Shah, Fost, & Flacker, 2013). The Reengineered Hospital Discharge (RED) intervention takes a more proactive approach in coordination of care in

that the nurse discharge advocate schedules and coordinates all post-discharge follow-up appointments prior to discharge and transmits patient-specific discharge summaries to the follow-up physician. Patients receiving the RED intervention had significantly higher ($p < 0.001$) primary care follow-up rates (62%) compared to controls (44%; Jack et al., 2009).

Another intervention which has shown promise is described by White et al., (2014) – creating a culture of continuity. The intervention involves notification of the primary care provider (PCP) of hospital admission and discharge so that the PCP can be involved during hospitalization and discharge planning. Hospital providers are responsible for sending a comprehensive discharge summary to the PCP. Follow-up appointments with the PCP are scheduled within one week of discharge. A registered nurse serves as a care manager within the primary care practice to develop post-discharge assessment questions, schedule post-hospital follow-up, and communicate with the hospital care team. This process has shown to significantly reduce readmissions ($p = 0.02$) among patients who receive the intervention compared to those who receive traditional care, thus implying that a coordinated effort between acute and primary care can reduce rehospitalization risk (White et al., 2014).

Similarly, a quality improvement process implemented in a large, urban primary care setting found that a proactive discharge planning approach and practice transformation reduced rehospitalization rates (Cavanaugh et al., 2014). The process utilizes a primary care case-manager who stratifies hospitalized patients according to readmission risk, schedules follow-up visits within five days of discharge for medium- to high-risk patients, and coordinates transportation. Telephone reminders of follow-up

appointments are also made. The 60-min follow-up visit was conducted by a Clinical Pharmacist Practitioner and included a 20-min visit by the patient's primary physician. Intervention patients had a significantly lower number of 30- and 90-day readmissions ($p = 0.023$ and $p = 0.004$, respectively) than usual care patients. Differences in 30- and 90-day ER visits, however, were not significant. Intervention patients also had significantly more hospital follow-up visits within 30 days ($p = 0.003$) than usual care patients (Cavanaugh et al., 2014).

Another primary care practice transformation is the adoption of a patient-centered medical home (PCMH) that establishes the primary care setting as the center for coordination of care. One type of PCMH model is the ProvenHealth Navigator (PHN) which incorporates the standards of the PCMH with the inclusion of five additional components – one of which includes transition of care management involving a case manager who is responsible for coordinating hospital follow-up. Patients are contacted within 48 hours of discharge to conduct medication reconciliation, coordinate needed home and social support resources, and insure timely primary care follow-up (Gilfillan et al., 2010). An observational study of Medicare claims data over four years and among 11 intervention settings and 75 control settings found that the PHN was associated with a significant 18% reduction in inpatient admission and 36% reduction in readmissions ($p < 0.01$ and $p = 0.02$, respectively; Gilfillan et al., 2010). While the PHN has multiple components, not all of which are specifically targeting rehospitalization reduction, the model and its rehospitalization reduction interventions is a primary care intervention that has been shown to reduce rehospitalizations.

Review Summary

Much of the literature concerning transition of care interventions to reduce rehospitalizations among elderly patients examines those interventions that utilize a multicomponent approach, and no solitary intervention has consistently shown to be effective. Certain components of the interventions appear to show more promise in the reduction of rehospitalizations than others and include: (a) patient-centered discharge plans, (b) post-discharge telephonic follow-up, (c) patient self-management focus, (d) home visits post-discharge, (e) nursing discharge planning coordinators, and (f) acute and primary care collaboration. Collaboration between acute and primary care is a needed focus of further study as the inclusion of a primary care hospital follow-up visit appears effective in reducing rehospitalizations (Lin, Barnato, & Degenholtz, 2011; Misky, Wald, & Coleman, 2010; Naylor et al., 2013). However, there is less research on the inclusion of the primary care team in the discharge planning process before the patient is discharged. Many transition of care interventions either focus on acute care or primary care practice transformation but not on how the two settings can work together to reduce rehospitalizations.

2.2 Theoretical Framework

The transitions theory describes the vulnerability of transitions that patients face during various life changes and the ways in which nurses are influential in supporting patients through transitions (Im, 2011) and guides this project. Centered around the theme that changes in life, health, relationships, and environments result in, and are a result of, transitions, the transitions theory has been adopted by a wide variety of nursing research studies examining the nature of nursing phenomena dealing with transitions (Im, 2011;

Meleis, Sawyer, Im, Messias, & Schumacher, 2000). There are four major concepts in the theory: the nature of transitions, transition conditions, patterns of response, and nursing therapeutics (Im, 2011).

The nature of transitions involves both type (developmental, health/illness, situational, or organizational) and patterns (single, multiple, sequential, simultaneous, related, or unrelated) of transitions. Also included in the nature of transitions are the properties of awareness, engagement, change and difference, time span, and critical events. Awareness is defined by the level at which the transition is perceived and recognized, while engagement is the level of involvement in the transition process. Change and difference are the result of, and result in, the transition to be confronted. Additionally, transitions occur over time, and some begin, or are marked, by a critical life point or event (Meleis et al., 2000). The transition of interest in this project was the health/illness transition from the hospital to the home. This also involved the transition from hospitalist care management back to primary care management. The participant was transitioning to a new state of health, whether improved or decreased, after hospital discharge. Therefore, there were multiple, simultaneous, and related patterns occurring. This project actively engaged participants and made them aware of the transitions through interventions that occurred in the acute care and primary care settings. The transitions were marked by a critical point – hospital discharge – and were specifically examined in this project through a 30-day time span.

The second concept of the theory is the condition of transitions, involving the person, community, and society (Im, 2011). These conditions will either facilitate or inhibit the transition. Personal conditions are assigned to the transition as the person gives

meaning to the event and transition process; this meaning influences whether the transition will occur in a healthy and positive manner. The person typically ascribes cultural beliefs and attitudes to the transition, while socioeconomic status, preparation, and knowledge also influence the success of the transition. Availability of community resources and the opinions or stigma beliefs of society also serve as influencing conditions surrounding transitions (Meleis et al., 2000). This project specifically addressed participants' preparation and knowledge as an influence on the transition. Participant education was provided during and after hospitalization to help prepare participants to manage their health condition(s). Participant knowledge of discharge instructions, diagnoses, medications, and actions to take in an emergency were assessed during the post-discharge telephone call.

Patterns of response are the third concept of the theory and describe the ways the person responds to transitions. Positive, healthy transitions need process and outcome indicators. The process indicators move the patient through the transition positively or negatively. These indicators can be assessed and intervened upon by nursing. Patients should feel connected to the transition and be actively involved with the process for healthy transitions to occur. Location of the transition and developing confidence and coping mechanisms are also patterns of response. Outcome indicators of healthy responses include new skills necessary to manage the transition and developing a fluid and integrative identity as a result of the transition (Meleis et al., 2000). This project helped participants be actively involved in the transition through interaction with the same advance practice nurse during and after hospitalization to complete intervention

components. The goal was to successfully transition participants home with the skills needed to manage their health, which was provided through participant education.

The final concept of the theory involves the nursing therapeutics which serve to influence the ways in which people move through transitions (Meleis et al., 2000). Nursing therapeutics for this study were comprised of discharge planning and post-discharge follow-up care between the participant and the advanced practice nurse. The hospital to home transition was described as a health/illness transition that involved multiple, simultaneous, and related transitions: (a) hospital to home, (b) hospital provider to community provider, and (c) change in health status. The multi-component intervention was expected to influence the nature and condition of the transition, as well as the participants' patterns of response. Appendix A displays the adaptation of the transition theory to the project intervention.

CHAPTER 3: PROJECT DESIGN

3.1 Methodology

The purpose of the pilot study was to implement a multi-component transition of care intervention into a primary care office routine. The project was implemented over a five month time period from June 1 to October 31, 2015. Rehospitalization rates were compared between the participants and the hospital readmission rate during June to October of 2014 among patients 65 years of age and older. Because this was a pilot study, a goal of 20 participants was sought.

3.2.1 Subjects

An inclusion and exclusion algorithm was developed to guide the researcher in determining which patients were eligible to participate in the study (see Appendix B). Inclusion criteria included being an established patient of the primary care office, age 65 years or older, English-speaking, a resident of the community and not long-term care, cognitively intact, and admitted for, or have a diagnosis of, one of the following: (a) chronic obstructive pulmonary disease, (b) pneumonia, (c) acute myocardial infarction, (d) heart failure, (e) hypertension, or (f) diabetes mellitus. The first four diagnoses, along with hip or knee arthroplasty, were included in the Medicare 2015 payment reductions for excess readmissions (CMS, 2014a). Hip or knee arthroplasty was not included since these patients would have followed-up with surgical services. Hypertension and diabetes were

also eligible diagnoses as these are two of the more common chronic illnesses managed by the primary care office. Patients were excluded if they were only seen in the emergency department, were younger than 65 years, had significant cognitive impairment, resided in or discharged to a long-term care setting, or did not have one of the eligible diagnoses. Participants signed informed consent and Health Insurance Portability and Accountability Act (HIPPA) documents approved by the hospital system and university institutional review boards before being included in the study.

3.2.2 Setting

There were two settings for the implementation of this project: a primary care office and an acute care hospital. The primary care office is an independently owned practice in a suburban town in North Carolina and has been recognized as a Level III Patient-Centered Medical Home. The office employs three prescribing practitioners – a family practice/geriatric physician, a physician assistant, and an adult-gerontological nurse practitioner – who collectively manage the primary care needs of patients of all ages. Prior to implementation of the project, these providers did not conduct hospital visits while patients were hospitalized. Additional staff consists of a registered dietician, three certified medical assistants, an office manager, an administrative assistant, and a billings manager. The acute-care hospital is a 50-bed community hospital with an emergency department. The hospital is located approximately eight minutes from the primary care office and utilizes a hospitalist-based treatment system.

3.2.3 Measures

Three data collection forms were created to document intervention data. The *data collection tool* was created to collect demographic information on participants, monitor

the progression of the intervention, and document outcomes (see Appendix C). The *chart review* tool was created to document pertinent information about the participant's hospitalization gathered during the hospital visit (see Appendix D). The *telephone follow-up documentation form* (see Appendix E) was adapted from the publically available Re-Engineered Discharge (RED) toolkit created by the Agency for Healthcare Research and Quality (AHRQ) and the RED researchers (AHRQ, 2013). This form was used to document the telephone call that occurred within two-days of discharge.

Thirty-day rehospitalization was the major outcome of the study. The occurrence of rehospitalizations was measured by two methods: during a 30-day follow-up phone call with the participant or caregiver and through review of the participant's chart looking for readmissions or visits to the emergency department within 30-days of discharge. By reviewing the participant's chart, the investigator confirmed the subjective answer given by the participant during the 30-day follow-up call. The admitting diagnoses for readmissions or emergency room visits were also gathered to determine if the participant was rehospitalized for the same diagnosis as the initial admission. Rates of primary care follow-up were also monitored in a similar fashion. Whether participants completed a post-discharge primary care follow-up visit was monitored through the primary care office electronic health record. Participant satisfaction with the intervention was assessed with a simple 5-point Likert scale ranking satisfaction level.

3.2.4 Intervention

The intervention was led by the adult/gerontological nurse practitioner employed by the primary care office. The nurse practitioner served as study investigator and completed all components of the intervention and data collection. Prior to initiation of the

project, the primary care office providers did not make hospital visits, and hospitalists managed the care of the hospital patients per the hospital system's protocol. There was also no proactive approach to schedule hospital follow-up visits post-discharge by the primary care office.

The intervention involved components identified in the literature to be effective in reducing rehospitalizations and included: (a) in-hospital discharge planning, (b) post-discharge telephone contact, (c) post-discharge follow-up visit with primary care, (d) communication between the acute and primary care settings, (e) creation of a patient-centered care plan, and (f) coordination of transition of care by an advanced practice nurse. There were three implementation phases involving the above intervention components. Phase one was a hospital visit during admission. Phase two was a post-discharge telephone follow-up call. Phase three was a post-discharge follow-up visit in the primary care office (see Figure 1).

Phase one, the hospital visit, was conducted to gather admission information, begin the discharge planning process, and communicate with hospitalists. This allowed the investigator direct access with the participants' charts and communication with hospitalists to determine participant needs post-discharge. The investigator discussed the reason for admission with the participant, as well as how the primary care office would be involved with the participant's care post-discharge. The patient-centered care plan, which was formatted as a booklet, was introduced to the participant and then completed in the primary care office. Participant consent was collected during phase one.

Phase two, a post-discharge telephone follow-up call, was made within two days of discharge. During this phase, the investigator contacted the participant by phone to

gather information on how the participant was adapting to the home environment. Questions were asked concerning the participants' understanding of their health status, post-hospitalization needs such as further diagnostic imaging or lab work and medications. Participants were also asked if they knew what to do in case of an emergency. Any misunderstandings or needs for further clarification were addressed through participant education by the investigator.

Phase three involved a follow-up primary care office visit completed within 14-days of discharge. The discharge summary was reviewed prior to the visit. The purpose of the office visit was to reconcile medications, perform a physical exam, coordinate needed diagnostic imaging, lab work, or referrals; and create a patient-centered care plan. The care plan was formatted as a booklet and included areas for participants to write questions for healthcare providers and an updated medication list. Information on alarming symptoms signaling deterioration in health status, and what to do if these symptoms arise, was included in the care plan. Participants took the care plans with them at the conclusion of the visit.

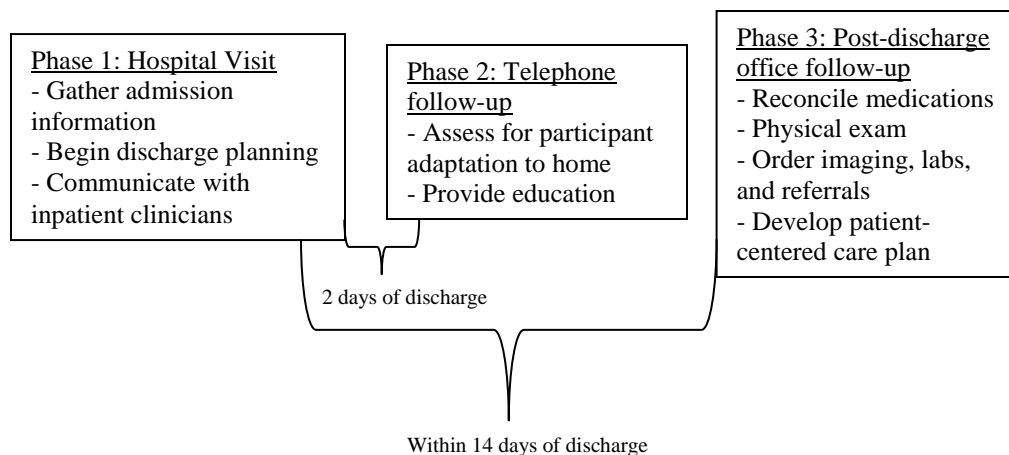


Figure 1 : Phases of intervention implementation

3.2.5 Data Collection

The primary care office was alerted of hospital admissions by daily log-in to the remote access of the hospital's electronic health record system to review the inpatient list. This list displays only patients of the primary care office who were admitted to the hospital. When a patient is admitted, the patient is asked to name his primary care provider, which places the patient's name in the primary care office's inpatient list on the remote access system. Once a potential participant was identified on the list, the investigator used the hospital electronic health system and primary care office electronic health record to determine patient eligibility. During the hospital visit, informed consent was obtained before any component of the intervention took place. Participants also signed a HIPPA form giving the investigator permission to review the in-hospital patient record. Once informed consent and HIPPA forms were obtained, a chart review was completed at the hospital visit (see Appendix D). Participant demographics and intervention data pertaining to the hospital visit were documented on the data collection

tool. The primary care office was made aware of the date of discharge through review of the hospital electronic health record remote access in office. At this point, the discharge summary was requested. The telephone encounter was documented on the telephone follow-up documentation form (see Appendix E). The occurrence and length of encounter were documented on the data collection tool. Data on completion of intervention components in phase three was documented on the data collection tool as well.

Data on study outcomes was collected 30-days after discharge. The investigator called the participant to determine rehospitalization status and satisfaction with the intervention. Hospital records were also reviewed for rehospitalization information. This information, along with the number of missed intervention components, was recorded on the data collection tool.

3.2 Project Analysis

Data analysis occurred primarily through descriptive statistics. Participant demographic data was recorded in an Excel spreadsheet. Age was described through mean and standard deviation. Additionally, percentages were obtained for gender, race, home environment, inclusion diagnoses, and hospitalization and primary care follow-up history. Descriptive statistics were also used to describe intervention component data. Whether the intervention component was completed within the appropriate time frame and the length of time spent on each component was described. Rates of 30-day rehospitalization and mean participant satisfaction were described. Thirty-day rehospitalization rates were compared between study participants and the hospital's overall rehospitalization rate during the same five-month time period the year prior to intervention implementation. Fisher's exact test was used to look for statistical

significance of the differences between study participants and the hospital
rehospitalization rate.

CHAPTER 4: PROJECT RESULTS

4.1 Sample Demographics

During June 1 to October 31, 2015, a total of 36 patients of the primary care office were admitted to the community hospital. Twenty participants were excluded from the study. The majority of these patients ($n = 7$; 35%) were excluded because they were admitted and discharged within one-day, usually over the weekend. The investigator could not schedule a hospital visit before discharge for these patients, as the primary care office is not open on the weekends to review the remote access health record system for new admissions. Cognitive impairment ($n = 6$; 30%) was the second most common reason for study exclusion. Five patients (25%) refused to participate. One patient did not have an inclusion diagnoses, and one patient was discharged to inpatient rehabilitation.

Sixteen patients ($n = 16$) consented to participate in the study. The average age of participants was 83.9 years ($SD = 8.11$). The majority of participants were female ($n = 11$; 68.75%). There were five male participants (31.25%). All participants were Caucasian. Three participants lived alone (18.75%), eight lived with a spouse (50%), and five (31.25%) lived with a caregiver. Hypertension was the most common inclusion diagnosis ($n = 6$; 37.5%). Five participants (31.25%) had a diagnosis of heart failure, three participants (18.75%) had a diagnosis of diabetes, one participant (6.25%) had a diagnosis of COPD, and one participant (6.25%) had a diagnosis of myocardial infarction. The majority of participants ($n = 12$; 75%) had been hospitalized, either

admitted or seen in the emergency room, within the past year. Most of the participants who had been hospitalized within the past year failed to complete a post-discharge follow-up visit with the primary care office ($n = 7$; 58.33%). Table 2 describes the sample population demographics.

Table 2: Sample population demographics

| | <i>M (SD)</i> | Frequency | Percentage |
|--|---------------|----------------|------------|
| Age | 83.88 (8.11) | | |
| Gender | | | |
| Male | | 5 | 31.25 |
| Female | | 11 | 68.75 |
| Race | | | |
| Caucasian | | 16 | 100 |
| Other | | 0 | 0 |
| Living Arrangement | | | |
| Alone | | 3 | 18.75 |
| With Spouse | | 8 | 50 |
| With Caregiver | | 5 | 31.25 |
| Inclusion Diagnosis | | | |
| Heart Failure | | 5 | 31.25 |
| Hypertension | | 6 | 37.5 |
| Diabetes Mellitus | | 3 | 18.75 |
| COPD | | 1 | 6.25 |
| Myocardial Infarction | | 1 | 6.25 |
| Hospitalized Last Year | | | |
| Yes | | 12 | 75 |
| No | | 4 | 25 |
| Followed-up with Primary Care After Hospitalization ^a | | | |
| Yes | | 5 ^b | 41.67 |
| No | | 7 | 58.33 |

Note. COPD = chronic obstructive pulmonary disease.

^a This information relates to the number of patients who followed up with primary care following a hospitalization that occurred within the past year.

^b Of the 5 participants who followed up with primary care after a hospitalization within the past year, one participant only followed-up 4 out of 5 hospitalizations.

4.2 Intervention Data

Of the 16 participants, 10 (62.5%) completed all three phases of the intervention implementation and lived to 30-days post-discharge. There were 16 hospital visits completed by the advanced practice nurse. Fifteen telephone follow-up calls were completed. One participant was discharged to palliative care and removed from the study; therefore telephone follow-up was not completed. A total of 11 primary care follow-up office visits were completed within 14 days of discharge. Three participants refused to complete office follow-up within 14 days, and one participant passed away before office follow-up could be completed. One participant completed all three phases of intervention but passed away before 30-days of discharge; therefore, 10 participants completed all three phases and lived to 30-days post-discharge.

The average amount of time spent on hospital visits was 25.31 minutes (range = 15 – 45 minutes). Time spent on telephone calls averaged 6.81 minutes (range = 3 – 20 minutes). The average amount of time spent on the primary care office follow-up visits was 23.43 minutes (range 15 – 50 minutes).

4.3 Project Outcomes

Short-term objectives were to be reached by the end of the five-month project implementation period. Two of the three short-term project outcome objectives were met. The first short-term objective was to have 90% of hospital discharge summaries among study participants received and reviewed by the time of office follow-up visit. This outcome was achieved as 100% of hospital discharge summaries for study participants were received and reviewed by the time of office follow-up visit. The second short-term objective was to have 90% compliance with post-hospital office follow-up appointments

within 14 days of hospital discharge. This outcome was not achieved, as only 78.57% of participants who lived to the time of office follow-up visit completed the office visit. The third short-term objective was to have a lower rate of rehospitalization among project participants than the hospital average. This objective was met as the rehospitalization rate among participants was less than the overall hospital readmission rate for the same five-month time period the year prior to project implementation. The long-term objective was to have a plan for continued implementation of the transition of care intervention within six months of project implementation. The primary care office plans to continue the intervention once the advanced practice nurse obtains hospital privileges.

Of the 10 participants who completed all three phases of the intervention and lived to 30-days post-discharge, none were readmitted or seen in the emergency room within 30-days of hospital discharge. The one participant who passed away before 30-days of discharge was readmitted, primarily for palliative care measures. The rehospitalization rate among all study participants (6.25%) was lower than the readmission rate for the hospital site of implementation. The overall hospital readmission rate for patients 65 years of age and older from June to October, 2014 was 13.23% (D. Kring, personal communication, December 9, 2015). This percentage includes any patient 65 years of age or older readmitted to the hospital within 30-days of discharge and is not specific to the patients of the primary care office in this study. Table 3 displays the results from the Fisher's exact test comparing the rates of rehospitalizations among study participants and the overall hospital readmission rate. The differences in the rehospitalization rates were not significant.

Table 3: Comparisons of readmissions between participants, excluded patients, and current hospital rates

| | Not Readmitted | Readmitted | Fisher's Exact Test |
|---|-------------------|------------|------------------------|
| Study participants ($n=16$) | 15 | 1 | |
| Hospital patients ($n=529$) | 459 | 70 | 0.360 |
| Participants of all interventions & living to 30-days ($n=10$) | 10 | 0 | |
| Hospital patients ($n=529$) | 459 | 70 | 0.246 |

Note. Hospital readmission data includes all patients age 65 years of age and older admitted to the hospital site during June to October 2014 (D. Kring, personal communication, December 9, 2015).

4.4 Discussion

The results of this pilot study illuminate some of the many challenges faced by primary care practices trying to coordinate care transitions for hospitalized patients. One of the major challenges is the lack of communication between the acute and primary care settings. The project investigator found that identifying hospitalized patients required a proactive approach. The hospital system sends a faxed alert to the primary care office to notify that one of the primary care practice's patients has been under the care of any facility within the hospital system. This could include any of the surrounding acute or outpatient facilities; therefore, the alert does not provide sufficient information that a patient has actually been admitted and could not be relied upon to identify admitted patients. Instead, the in-patient hospital list had to be reviewed daily through remote hospital electronic record access at the primary care office.

Additionally, hospital discharge summaries that were sent by fax to the primary care office were brief and lacked key pieces of information about the hospitalizations.

The primary care office accessed the hospital electronic record remote access system to obtain the complete discharge summary written by the discharging practitioner. Once retrieved, these summaries were found adequate in providing a summary of the hospitalization, important diagnostic findings, medication changes, and instructions for discharge.

Findings from this pilot study also highlight the difficulties faced when trying to coordinate post-discharge care with patients. Of the hospitalized patients approached about the study, 25% refused to participate. None of these refusals cited participation in a research study as the reason. Reasons given for not participating included not wanting to follow-up with primary care after discharge, preferring to follow-up with a specialist, or being “too busy” to complete a follow-up visit. Of the 16 original consenting participants, 18.75% ($n = 3$) refused to come in for primary care follow-up, either at all or within the two-week post-discharge interval. Explanations for not following-up included the family not wanting to put their family member through the trouble of coming to the office, a short-term rehab facility’s rules against primary care provider follow-up, and one participant not feeling well enough to come to the office.

The multi-component intervention was also time intensive. The intervention required extra time to search the hospital record for admitted patients, complete the hospital visit and telephone call, and retrieve and review discharge summaries. Despite the time intensity of the intervention, the primary care office follow-up visits were more efficient and less time consuming than the hospital follow-up visits that were completed prior to initiation of the study. The increased efficiency of post-discharge office visits was observed because the investigator had met with the participant while hospitalized,

began the discharge planning process prior to follow-up, and received the complete hospital discharge summary by the time of office follow-up. Additionally, a review of reimbursement data conducted by primary care administration found that the higher reimbursement rates received offset the time intensity of the intervention. Transitional Care Management (TCM) codes were billed for office follow-up visits completed within 14-days of discharge accompanied by a telephone follow-up call completed within 2-days of discharge. The average reimbursement received for the office visits for the 10 participants who completed all three phases of intervention implementation and lived to 30-days post-discharge was \$92 more than the average rate received for a 99214 evaluation and management code usually billed for hospital follow-up visits (personal communication, J. Kelly, February 10, 2016).

Despite the challenges of care transitions and the time intensity of the intervention, the findings from this pilot study indicate that the intervention may be effective in preventing rehospitalizations. The 30-day rehospitalization rate – including readmissions and ER visits – was 0% among participants who completed all phases of the intervention and survived to 30-days post-discharge. The overall readmission rate among all patients 65 years of age and older readmitted to the same hospital during the same time period the year prior to project implementation was 13.23% (D. Kring, personal communication, December 9, 2015). Although the differences in rehospitalization rates between project participants and the overall hospital rate were not statistically significant, the findings are clinically significant and suggest that the intervention may be effective in reducing readmission risk. However, a limitation of this study is the small sample size,

which makes drawing statistical conclusions difficult. Yet, the findings are positive and imply that further evaluation of the multi-component intervention should be investigated.

Participants also viewed the intervention as worthwhile as participant satisfaction scores were high. Among the 10 participants who completed all phases of implementation and lived to 30-days, the average satisfaction score was 4.9 on a 5-point Likert scale. Participants and their caregivers reported appreciation of the hospital visit and the extra care received. One participant reported that he had wanted an *advocate* while hospitalized, and this intervention provided one for him. Another participant avoided a medication discrepancy upon discharge through communication between his family member, the study investigator, and the hospitalist. The intervention also allowed the investigator to develop rapport and trust with the participants. Several participants contacted the office post-discharge with questions and concerns for the investigator, even after the intervention was complete.

CHAPTER 5: IMPLICATIONS

5.1 Implications for Practice

Inadequate communication between the acute and primary care setting has been found in other transition of care research. In a retrospective chart review of 121 hospitalized patients of a primary care office without admitting privileges, researchers found that 21% of patients were discharged before the primary care office was even made aware of admission (McMillan, Trompeter, Havrda, & Fox, 2013). Discharge summaries have also been found to be inadequate in providing necessary information for post-hospitalization care (Kripalani et al., 2007).

A proactive approach in obtaining information was successful in addressing these challenges for the primary care office participating in this pilot study. Actively searching for hospitalized patients and obtaining their discharge summaries was more efficient than relying on the faxed reports sent by the hospital. However, this requires remote access into the hospital electronic health record from the primary care office. This may not always be available for all primary care offices looking to provide post-hospitalization care. Additionally, patients must identify their primary care provider upon hospital admission in order for the primary care office to view the patient's chart through the remote access system. Actively identifying the patient's primary care provider and allowing the provider access into the hospital electronic health record are two ways in which hospital systems can improve communication between the two settings.

The amount of time necessary to provide this transition of care intervention must also be taken into consideration by other primary care practices. The latter two components of the intervention – the telephone call and in-office appointment – are reimbursable under the Medicare Transitional Care Management (TCM) codes. Current reimbursement rates range from \$163 - \$231, which is an increase compared to previous reimbursement rates for the office visit alone (Bendix, 2013); therefore, these components of the intervention not only improved patient outcomes, but the practitioner's time was also compensated financially.

However, it is the hospital visit which sets this intervention apart from other transition of care interventions implemented by primary care. Direct communication between the primary care provider and the patient during the hospitalization provides a familiar face and advocate to the patient, begins the process of planning for post-discharge care, and maintains rapport between the provider and patient. Unfortunately, without hospital privileges, the primary care provider cannot be reimbursed for the hospital visit, as was the case in this pilot study. Primary care practices must take this into consideration when determining whether to implement this particular component of the intervention. The time saved on post-discharge follow-up visits, due to the information gleaned and rapport built during the in-hospital visit, and higher reimbursement rates for the TCM codes made the hospital visit financially viable for the primary care office participating in this study.

It is important to note that the multi-component intervention was adapted around the needs of the patient. Patient education was based on the patient, and individualized care plans were developed. Further development of the intervention and adaptation by

other primary care offices should focus on the patient-centered approach. Creating a patient-centered intervention may help resolve issues surrounding patients not following up post-discharge as well as encourage engagement in the transition process.

5.2 Implications for Future Research

The findings from the pilot study are limited by the small number of participants. The intervention was also only completed at one primary care and hospital location. A larger sample size and multiple sites of implementation should be pursued in future research. Future research should also include patients with cognitive impairment to examine the effectiveness of this intervention among this patient population and their caregivers. Thirty percent of the admitted patients who did not participate in the study were excluded due to cognitive impairment, suggesting that primary care manages a large population of cognitively impaired patients.

The effectiveness of this intervention should be examined over a longer time period, such as 60-days or 90-days post-discharge. The more effective transition of care interventions in reducing rehospitalizations are those with nine or more weeks of intervention implementation (Naylor et al., 2011). Additional components may need to be built into the intervention to sustain its effectiveness over a longer time frame. More frequent contact with participants via telephone or office visits over a longer time period may increase feelings of being connected, a prominent theme in the transitions theory, and may sustain the effectiveness of the intervention over a longer post-discharge time frame.

Nursing therapeutics need to be further refined to reflect the complexities of the post-hospitalization experience, particularly with vulnerable elderly patients. It would be

important to know more information about patient perspectives of the intervention in order to understand which parts of the intervention may need modifying. Understanding what patients view as most helpful and what should be changed could help to strengthen the intervention. Research examining levels of confidence and mastery of skills and new knowledge in the elderly as they transition from the hospital to home is needed.

5.3 Summary

The pilot study found that the multi-component intervention may be effective in preventing 30-day rehospitalization and identified areas of concern in transition of care management. The study is limited by its small sample size and short time-frame for implementation, both of which were satisfactory for a pilot study but inadequate to generalize the findings to a larger patient population. Findings from the pilot study suggest that the intervention should be further researched to gain better understanding of its effectiveness. The findings also suggest that the intervention is worthwhile and feasible to be implemented into current office routine for this primary care office.

5.4 Recommendations

An agreement between the hospital system and the independently-owned primary care practice would be needed to sustain the practice changes required by this multi-component transition of care intervention. Hospital visits by the study investigator were allowed for the purposes of conducting research; however, to continue to allow these visits as part of the intervention, the hospital system will need to allow the outside primary care provider access to patients while hospitalized. Continued remote access and a proactive approach to reviewing the hospital record are required for continued implementation and would need to be added to the daily primary care office routine.

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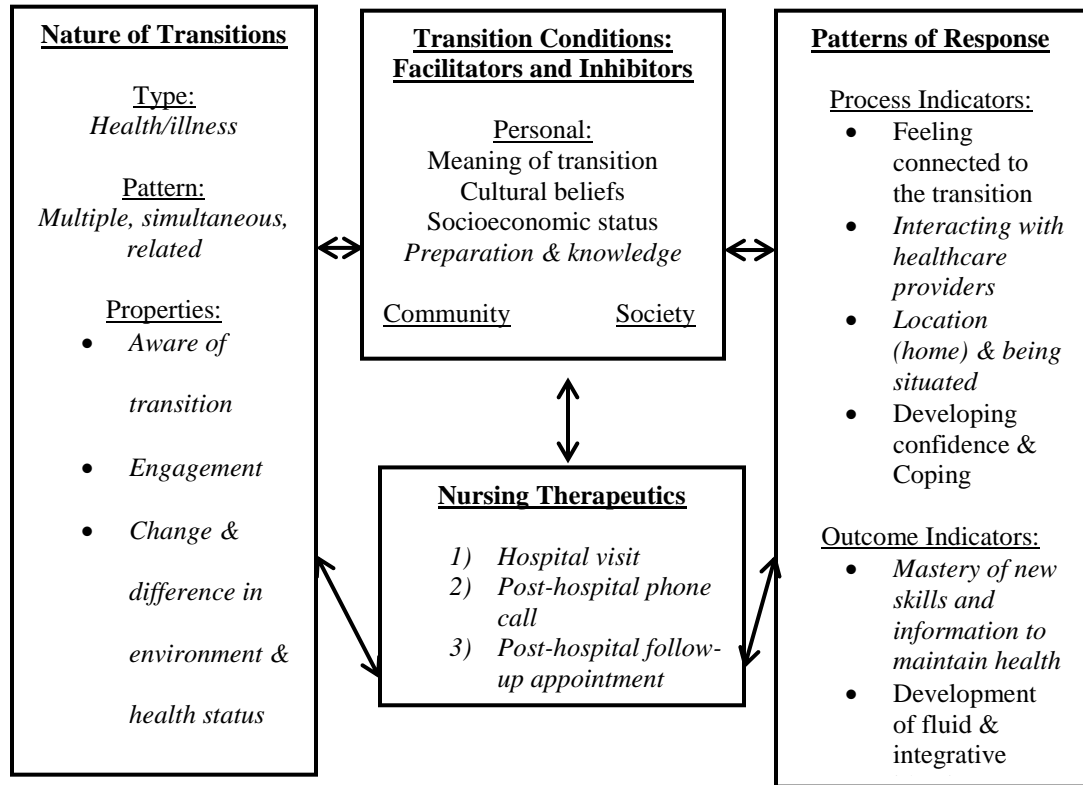
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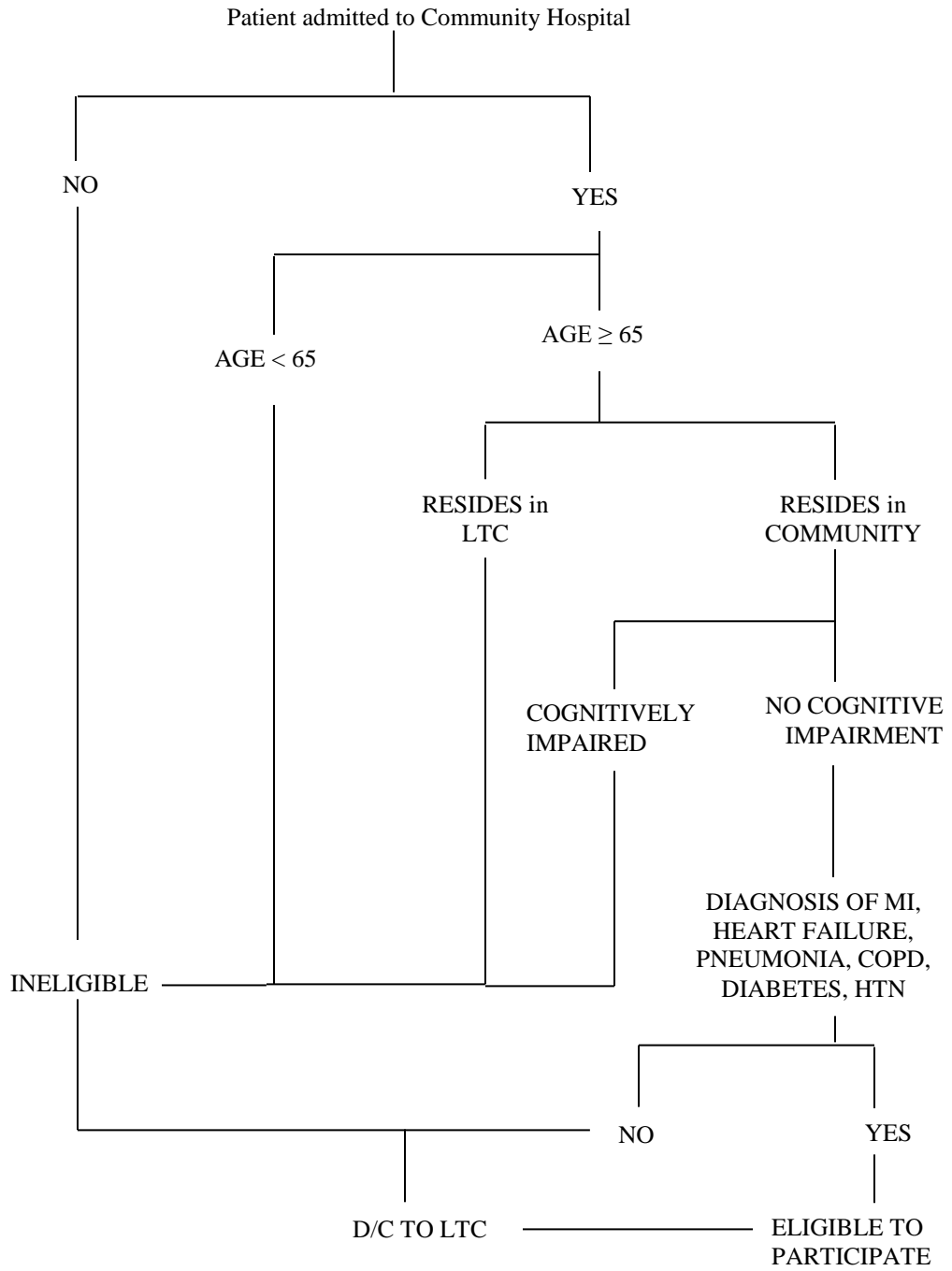
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APPENDIX A: TRANSITIONS THEORY ADAPTED TO HOSPITAL DISCHARGE



Note. The transitions theory adapted to the project intervention. Components written in italic font represent areas of the transitions theory that were addressed in the project. Adapted from “Experiencing Transitions: An Emerging Middle-Range Theory,” by A. I. Meleis, L. M. Sawyer, E. Im., D. K. H. Messias, and K. Schumacher, 2000, *Advances in Nursing Science*, 23(1), p. 17. Copyright 2000 by Aspen Publishers, Inc.

APPENDIX B: PARTICIPANT INCLUSION/EXCLUSION ALGORITHM



APPENDIX C: DATA COLLECTION TOOL

Patient Demographics

Patient ID: _____ Age: _____
 Gender: M / F Race/ethnicity: White / African-American / Asian / Hispanic / Native American / Other
 Primary admission diagnosis: _____
 Secondary admission diagnosis: _____
 Home environment: Lives alone / with spouse/significant other / lives with caregiver: _____
 Hospitalized/ER in the past year: Y / N # of times: _____ Followed-up with PCP: Y / N

Intervention Components

| Hospital | Telephone | Primary Care |
|--------------------------------|----------------------------------|-------------------------------|
| Admission date: _____ | Discharge date: _____ | PCP f/u: 7 days / 14 days |
| Date of PCP alert: _____ | D/c summary requested: Y / N | Length of PCP f/u: _____ |
| Hospital visit: _____ | Telephone f/u w/in 2 days: Y / N | |
| Length of visit: _____ | Length of telephone f/u: _____ | D/c summary received: Y/N |
| PHR started: Y / N | Telephone f/u documented: Y / N | Time since d/c: _____ |
| Chart review: Y / N | | D/c summary reviewed: Y/ N |
| Discharge planning with: _____ | | Completed PHR: Y / N |
| | | Med reconciliation: Y/N |
| | | Med discrepancies: Y/N |
| | | Labs/DI ordered: Y/N |

30-day Outcomes**Date of 30-day follow up:** _____

| | |
|---|-------------------------------------|
| Was the patient readmitted to the hospital? Y/N | If so, admitting diagnosis: _____ |
| Was the patient seen in the ER? Y/N | If so, admitting diagnosis: _____ |
| Source of information: Patient/caregiver/ EHR/Both | |
| Did patient complete 30-day telephone f/u? Y/N | Did patient complete PCP f/u? Y / N |
| Patient satisfaction score with intervention: 1/2/3/4/5 | Number of missed components: ____ |

Patient satisfaction scale: 1 (extremely dissatisfied), 2 (dissatisfied), 3 (neutral),
 4 (satisfied), 5 (extremely satisfied)

APPENDIX D: CHART REVIEW

Patient ID: _____

Primary admission diagnosis: _____

Secondary admission diagnosis: _____

Major hospital events:

Abnormal labs: _____ Diagnostics: _____

Consulting providers: _____

Plans for discharge:

Discharging home? Y / N

Home health services ordered? Y / N

Type: _____

Outstanding labs/DI: _____

Medication changes: _____

Other appropriate follow-up needed: _____

Additional notes: _____

APPENDIX E: TELEPHONE FOLLOW-UP DOCUMENTATION FORM

Patient name: _____ Date of call: _____
 Date of discharge: _____ Spoke with: Patient / Caregiver:
 Primary d/c diagnosis: _____ Secondary d/c diagnosis: _____

Diagnosis and Health Status

Med changes: Y / N Med list update: Y / N Ask patient about his/her diagnosis and
 Needs DI or lab: Y / N If so, _____ comorbidities
 Needs referral: Y / N If so, _____ Patient confirmed understanding
 PCP f/u apt: Y / N Date: _____ Further instruction was needed

Primary Condition

If primary condition has worsened:

What, if any, actions had the patient taken?

- Returned to see PCP
 Called/contacted PCP
 Gone to the ER/urgent care
 Gone to another MD
 Spoken with home health nurse
 Other:

New Problem

If new problem since discharge:

What, if any, actions had the patient taken?

- Returned to see PCP
 Called/contacted PCP
 Gone to the ER/urgent care
 Gone to another MD
 Spoken with home health nurse
 Other:

Medications

Are there meds patient is taking that are not on d/c summary : Y / N If so, _____

Are there problems with the medications on the d/c summary: Y / N

| | | |
|--|--|--|
| Med # 1: _____ | Med # 2: _____ | Med # 3: _____ |
| Problem: _____ | Problem: _____ | Problem: _____ |
| <input type="checkbox"/> Intentional non-adherence | <input type="checkbox"/> Intentional non-adherence | <input type="checkbox"/> Intentional non-adherence |
| <input type="checkbox"/> Inadvertent non-adherence | <input type="checkbox"/> Inadvertent non-adherence | <input type="checkbox"/> Inadvertent non-adherence |
| <input type="checkbox"/> System/provider error | <input type="checkbox"/> System/provider error | <input type="checkbox"/> System/provider error |
| Recommendations made | Recommendations made | Recommendations made |
| __No change needed | __No change needed | __No change needed |
| __Educated patient/caregiver | __Educated patient/caregiver | __Educated patient/caregiver |
| __Advised to go to the ED | __Advised to go to the ED | __Advised to go to the ED |
| __Advised to call specialist | __Advised to call specialist | __Advised to call specialist |
| __Other: | __Other: | __Other: |

Barriers to PCP f/u: Y / N

Solutions: _____

Know what to do in emergency: Y / N

Education provided: _____

Time spent on phone call: _____ minutes

Note. Adapted from "Postdischarge Followup Phone Call Documentation Form: Re-engineered

Discharge (RED) Toolkit," by AHRQ, 2013, Retrieved from