FACTORS RELATED TO READMISSIONS IN A RURAL GEORGIA
HOSPITAL: A FEASIBILITY AND ACCEPTABILITY STUDY

by

KELLI AMANDA DUNAGAN

(Under the Direction of Elisabeth Lilian Pia Sattler)

ABSTRACT

Unplanned hospital readmissions contribute to financial and human cost, prompting hospitals to seek tailored interventions to improve patient health outcomes. The Archway Partnership Project implemented a prospective cohort study to examine modifiable factors associated with readmissions to a rural hospital in South Georgia. This present qualitative study aimed to determine the feasibility and acceptability of (1) methods and approach and of (2) dietary assessment methods used in the Archway Partnership Project. Email surveys were utilized to obtain data on the perspective of research team members. Thematic analysis was used to identify two themes: *factors that impacted the Archway Partnership Project* and *actions that may overcome these factors*. Subthemes identified included complications to recruitment, data collection, and staffing. Analysis revealed potential solutions. Findings from this study established limiting aspects and suggested solutions of the Archway Partnership Project, which, once addressed, may lead to improved feasibility and acceptability.

INDEX WORDS: hospital readmissions; rural; Georgia; feasibility; acceptability

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CHAPTER ONE

Introduction

Hospital (re)admissions present a persistent burden on patient well-being and healthcare cost. The annual cost of Medicare payments for unplanned hospital (re)admissions in 2011 was $9.4 billion, with many (re)admissions estimated to be preventable (1). Hospital readmissions have been used as quality of care indicator, because a large proportion of readmissions are considered to be preventable by improvements in coordination of care and discharge planning (2). Readmissions are associated with quality of care, as they pertain to the timeliness, effectiveness, and efficiency of the health care provided during a hospital stay (3). Low quality of care has been traditionally viewed as a main factor in post-discharge complications, which in turn may lead to unplanned hospital readmissions (4).

In order to improve hospital quality of care and contain associated healthcare cost, the Medicare Hospital Readmission Reduction Program (HRRP) was implemented under the Patient Protection and Affordable Care Act (ACA) in October 2012 (5, 6). This program reduces payments to hospitals with excess all-cause 30-day readmissions for Medicare beneficiaries initially admitted with diagnoses of acute myocardial infarction (AMI), heart failure (HF), pneumonia, chronic obstructive pulmonary disease (COPD), elective total hip arthroplasty, total knee arthroplasty, and coronary artery bypass graft surgery (7). The original all-cause readmission rate of almost 20% was significantly reduced to 17.8% between 2009 and 2015 (8, 9).

While readmission rates have been decreasing across the U.S, there are remaining barriers to overcome. The Center for Medicare Advocacy has identified 4 factors as "most strongly related to preventable readmissions:" premature discharge, lack of partnership between inpatient and outpatient services, failure to communicate care goals to patients, and lack of emergency department decision-making skills to admit patients who may not require an inpatient stay (10, 11). In addition, readmission rates may be influenced by social factors, including demographic characteristics, the cultural competency and communication clarity of medical professionals, access to care, disease self-management, and medical factors, such as disease severity and comorbidities (12-14). Social factors such as older age, race, lower SES, undesirable health behaviors, and living situation, have been shown to result in increased readmission risk (12, 15, 16). Moreover, individuals experiencing self-management issues, such as lack of discharge information understanding, lack of ability to care for themselves, or low medication or diet adherence are more likely to be readmitted (17). Patients in rural areas tend to be older, in poorer health, to have a lower socioeconomic status (SES), and have reduced access to medical care compared to urban patients (18, 19). Although research has shown associations between readmission and patient-specific factors, previous studies have not investigated the problems and challenges faced by rural, low-SES populations that may result in readmissions to the hospital. There is a need for research to fill the current gap of knowledge pertaining to unique factors associated with readmissions of patients to rural hospitals serving predominantly low SES populations.

Through a collaboration with the Archway Partnership, which connects Georgia communities with University of Georgia (UGA) researchers and resources to address

locally identified issues, researchers at the UGA College of Pharmacy, Department of

Clinical and Administrative Pharmacy, conducted a prospective observational study in

order to identify factors influencing readmissions to Taylor Regional Hospital (TRH), a

hospital in Hawkinsville, a rural area in Georgia. Guided by the Vanderbilt Inpatient

Cohort Study (VICS) conceptual framework, the following factors were assessed: health

literacy, aspects of self-management, patient-system factors, and individual patient

characteristics (13). This study was unique in its approach in that it was stakeholder

informed through community based participatory research (CBPR). While currently still

ongoing, this research has the potential to identify future interventions that may lessen

human and financial costs to patients, hospitals, and their communities.

Knowledge of feasibility and acceptability of projects, such as the Archway

Partnership Project, is needed to devise and implement the most effective intervention

programs (20). Individual interviews, including online surveys, are a common and

effective method utilized to evaluate these criteria (21, 22). Online surveys have been

shown to be effective in eliciting timely, insightful, and quality responses from

participants (23). Previous studies have used interviews to gather insights about barriers,

facilitators, and further project needs from researchers involved in the implementation of

the larger projects and serve as a basis for this formative project (24, 25).

The objective of this study was to evaluate the feasibility and acceptability of a

prospective cohort study examining factors related to hospital readmissions of

hospitalized patients with original admission diagnoses of HF, COPD and pneumonia at

TRH. During this study, we also focused on evaluating the feasibility and acceptability of

the dietary assessment methods used to examine patient dietary characteristics in relation

to hospital readmissions. The expected outcome of this study was to inform researchers of appropriate methods to assess factors that may impact hospital readmissions for patients originally admitted with diagnoses of HF, COPD, or pneumonia in a rural setting.

CHAPTER TWO

Literature Review

Hospital Readmissions in the United States

The Centers for Medicaid and Medicare Services (CMS) define a hospital readmission as "an admission to a hospital within 30 days of a discharge from the same or another hospital." By definition, hospital readmissions may be the result of any condition, regardless of relation to the diagnosis at the original admission, as all readmissions are considered to be disruptive to patients, caregivers, and the healthcare system (26). In 2011, 16% of hospital admissions of Medicare/ Medicaid beneficiaries resulted in 1 or more readmissions within 30 days of discharge (1). In 2011, $41.3 billion were spent as a result of hospital readmissions, $9.4 billion of which were Medicare/ Medicaid covered costs (1). For Medicare patients, the 4 conditions with the highest readmission rates were congestive heart failure, septicemia, pneumonia, and COPD, with respective readmission rates of 24.5%, 21.3%, 17.9%, and 21.5% in 2011 (1). The Medicare Payment Advisory Commission estimated that in 2009, 12% of readmissions were potentially avoidable (5, 27). With this in mind, Goldfield et al. defined potentially avoidable readmissions as those with " reasonable expectation that it could have been prevented by the following: (1) the provision of quality of care during the initial hospitalization, (2) adequate discharge planning, (3) adequate post-discharge follow-up, or (4) improved coordination between inpatient and outpatient health care teams" (28). In addition to these provisions, there are other variables that may act as factors predicting or

influencing early hospital readmissions. The 30-day period post hospital discharge is a vulnerable time for patients, as they must manage new diagnoses, medications, and discharge instructions, and are often required to adopt new knowledge and skills associated with disease self-management (29). It is crucial to understand how socioeconomic status, demographics, rural location, health status, discharge planning, and disease self-management affect hospital readmissions. A better understanding of these factors may help lower high readmission rates and subsequent human and financial costs in the U.S.

Factors Associated with Hospital Readmissions

Socioeconomic and demographic factors

Patient characteristics associated with a higher risk of 30-day readmissions include race, older age, and SES (30). In 2016, 14.5% of the U.S. population was over the age of 65 years (31, 32). Those aged older than 75 years were found to be more likely to experience a 30-day readmission than their younger counterparts, in part explained by increased morbidity, more severe disease states at admission, and higher likelihood of lower SES (14). The U.S. Census Bureau reported that more than 1/3 of older adults are living at or below 200% of the Federal Poverty Level (FLP) in 37 states (31, 32). Further, a review found that older adults of low SES have an increased risk of readmissions after an initial hospital admission for HF or community-acquired pneumonia within 30 days of discharge (12). Additionally, those insured with Medicare and/or Medicaid, especially African-Americans, are also more likely to experience early readmissions (12, 33). Equally important, regions where lower educational status is most prevalent, have

reported higher readmission rates for HF and pneumonia patients (34). Those with less

than a college education were 3.1-fold more likely to be readmitted to the hospital within

30 days than their more educated counterparts (17). In summary, SES of the area's

population, regardless of proximity to the hospital, has shown to have an effect on

readmission rates of those with HF and pneumonia (34).

Rural Location

Rural hospitals and hospitals with greater shares of low-income beneficiaries were

penalized more often and had higher average penalties due to the HRRP (8). This may be

explained by rural populations having a higher risk of hospital readmissions due to a

higher percentage of elderly people and people at lower SES than in urban areas (35-38).

It was also reported that individuals who live in areas with fewer general practitioners per

capita may be readmitted more frequently (34). Researchers speculated that the

combination of older, low-SES populations and fewer general practitioners, who serve

the population, may result in lower rates of follow-up care noted in these areas (38). For

those living in rural communities, the largest barriers to follow-up care with a primary

care physician (PCP) after discharge appear to be financial costs, transportation, and PCP

convenience, such as short wait times, availability, or potential for house calls (39).

Health Status

The level of physical, mental, and cognitive functioning, the presence of

comorbidities, and disease severity are determinants of health status (13). Sattler et al

conducted a study on the effects of various factors on hospital readmissions in low-

income older Medicare beneficiaries in need of nutrition assistance in GA and found that

those admitted more than once had a higher prevalence of chronic comorbidities than

those who were not readmitted (40). In addition, increasing disease severity and poor functional status have also been associated with higher levels of readmissions (30). In a similar study that controlled for comorbidities, poor functioning measures, such as physical limitations, were independently associated with higher incidences of readmissions (41). Disease severity, determined by patient age, the initial diagnoses, and presence of comorbidities, has been associated with higher levels of hospital readmissions, more emergency department and urgent care visits, and higher hospital resource needs (42).

For Medicare beneficiaries in 2011, the 4 conditions with the largest number of 30-day readmissions were congestive heart failure, septicemia, pneumonia, and COPD (1). Consequently, heart failure, pneumonia, and COPD were initially included in Medicare's HRRP policy to reduce readmission rates. The Centers for Disease Control and Prevention (CDC) and the American Heart Association (AHA) estimated that 5.7 million Americans were affected by HF in 2012 (43). Heart failure is the most common diagnosis in hospital patients 65 years and older (44). Low SES and older age are predictors of HF exacerbations (37, 45). Additionally, a higher rate of HF readmissions was noted for African-American participants, potentially due to genetic differences and differences in sodium metabolism (46, 47). Potential complications of heart failure include kidney and liver failure, which further increase risk for readmissions (48, 49).

An estimated 15 million Americans have been diagnosed with COPD and the prevalence of COPD is higher in those 65 years of age or older (50). As of 2011, the prevalence was highest in the Southeastern region of the U.S., with 6.9% of Georgian respondents in a national survey reporting a diagnosis of COPD, only slightly higher than

the national average of 6.5% (50, 51). Additionally, this survey reported that COPD

prevalence increased with decreasing annual household income. For those residing in

low-income areas, the chance of being readmitted to the hospital for COPD was 22%

above their higher income counterparts (52). This condition is associated with declines in

respiratory function, which in turn leads to increased mortality risk, decreased quality of

life, and greater risk of disability (53). Due to difficulty eating during acute exacerbations

of COPD, nutritional deficiencies and a negative nutrient intake can occur, which may be

sustained and result in poor prognosis and increased risk of readmission (54).

  Recurrent pneumonia is a common reason for PCP visits and hospitalizations

(55). Annual hospitalization rates for pneumonia typically increase with age and

recurrence is very common in pneumonia survivors, especially in the elderly (55). Low

SES and education status have also been associated with increased risk of pneumonia

exacerbations (12). In light of these factors, relative risk of pneumonia is higher in rural

areas compared to urban centers (56). A wide range of medical complications, including

oropharyngeal dysphagia, malnutrition, and a compromised immune system, may cause

readmissions of these patients (57).

Health Literacy

 Health literacy is defined as the ability to read, understand, and act upon health

information, including reading and comprehending prescription labels, appointment

reminders, completing health insurance forms, and following instructions for self-

management (58). Low health literacy may result from inadequate patient-physician

communication and lead to poor health status, reduced health benefits, greater use of

emergency care, missed physician visits, inappropriate use of medication and nutrition

prescriptions, and increased hospitalizations (58-60). In a study conducted to identify the

relationship of health literacy and non-adherence in HF patients, researchers found that

those with lower health literacy were 4 times more likely to be non-adherent to medical

instructions (61). Authors speculated that this non-adherence likely resulted in an

increased risk for HF readmissions (61). Baker et al administered the Test of Functional

Health Literacy in Adults questionnaire to Medicare enrollees to determine the

relationship between health literacy and healthcare utilization. Patients with inadequate

health literacy were more likely to be hospitalized compared to those with adequate

health literacy, even after adjusting for health status and SES (59). This carries

importance, because 1/3 of Medicare enrollees aged 65+ years were found to have

inadequate health literacy (62). Many of these patients were taking 3 or more medications

per day and had at least 1 chronic condition, increasing their need to have adequate health

literacy to actively participate in their own care (62).

Quality of Care

Readmissions occurring within 30 days of discharge may reflect poor quality of

care, whereas readmissions at later times may be more likely due to the underlying

severity of a patient's disease (63, 64). When compared to urban medical centers, rural

hospitals did not perform as well on quality of care indicators for cardiovascular disease

and pneumonia (65). A study by Balla and colleagues found that 1/3 of early

readmissions were linked to quality of care issues and could have been prevented if the

problem had been addressed during the initial stay (66).

Discharge Planning and Social Support

Poor discharge instruction comprehension, including medications and diet prescribed, and poor knowledge about disease management may lead to higher readmission rates (17). In a study that examined patients' perception of the discharge process, Horwitz et al. found that only 26.3% of patients 65+ years of age were knowledgeable about their post-discharge care (67). Factors examined in this study included whether follow-up appointments had been made and if patient diagnosis and instructions were explained in language they could understand, emphasizing a great need to provide patient-friendly discharge instructions and verify patient understanding at hospital discharge (67). In addition to older age, lower educational status and cognitive impairment were also identified as leading to poor understanding of discharge instructions (29, 68). Although low comprehension of discharge instructions was associated with higher readmission rates, this study showed that patients perceive their understanding of discharge instructions higher than objectively measured (67). For example, 89% of patients with potentially preventable readmissions reported high perceptions of the ability to conduct post-discharge care whereas actual ability was much lower (11). In order to minimize readmissions, the Project Re-Engineered Discharge (RED) randomized intervention utilized individualized patient education, appointment reminders, and phone calls from medical professionals to reinforce discharge plans (69). A discharge advocate, who was trained to identify best discharge practices, created these individualized plans. The coordination of care in this study resulted in a reduction of 30-day readmission rates for the urban patients who received the intervention (69).

Improving communication between physicians and their patients and their patient's caretakers may improve information exchange and discharge planning (70). A review by Phillips et al showed that interventions that included comprehensive discharge planning plus post-discharge support reduced hospital readmissions in HF patients (71). Lack of understanding of discharge instructions has been shown to stem from the increased stress of hospitalization in intensive care unit patients, which may be decreased by adequate social support from family and friends during the transition from hospital to home (72). This support can consist of informational, emotional, or instrumental assistance (73). Research has shown that social support affects adherence to discharge plans; however, research is inconclusive on how social support influences hospital readmissions (12, 74). It is plausible that patients who rely on family and friends to care for them after discharge are protected from hospital readmissions. A study conducted in 1000 patients admitted to 12 academic medical centers between 2012 and 2013 reported that 15% of readmitted patients noted insufficient support from family, caregivers, or friends (11). Living alone and being unmarried, as well as more frequent address changes, were also associated with higher levels of readmissions (12). Without social support, disease management may be inadequate and hospital utilization may increase (11).

Disease Self-Management

Disease self-management is greatly influenced by a combination of the factors, including rural location, SES, health literacy, social support, and discharge planning (75). Adequate self-management knowledge, including ability to identify symptoms that indicate worsening of disease and appropriate care, has been shown to have a positive impact on quality of life and hospitalizations (76). Unplanned readmissions may result

due to gaps in self-management knowledge (30, 77, 78). Self-management behaviors include medication and diet adherence, smoking, and substance abuse, which are factors significantly associated with hospital readmissions (12). The World Health Organization (WHO) determined that only 50% of chronic disease patients take their medications as recommended (79). Common recommendations include appropriate and regular use of medications, a low sodium diet for HF patients, increased physical activity, preventative care methods, such as medication therapy for hypertension, and self-monitoring of signs and symptoms of patient disease states (61, 80). Lack of adherence to medications has shown to result in decreased physical functioning, increased disease exacerbations, and higher risk for hospitalization (81). Lack of adherence to diet has shown to result in malnourished patients who have a higher risk of readmissions and other adverse health outcomes than their well-nourished counterparts (82). It has also been determined that lack of knowledge about and inability to comply with low-sodium diets are associated with increased risk for HF readmission within 90 days (61). Adherence may be a component of other aspects of self-management, such as self-efficacy, or the perceived adequacy of one's ability to self-manage, as well as motivation (83). A study by Linn and colleagues distributed self-administered self-management assessments to HF patients and found that those with the lowest self-management scores had the highest rates of readmissions, indicating a need to educate patients on how to self-manage (75). In addition, interventions that focus on teaching appropriate self-management skills have shown a decrease in readmission rates (84, 85). This holds importance as self-management skills may help improve not only 30-day readmissions, but also long-term health outcomes (76).

Policy Action to Reduce Hospital Readmission Rates

To address high readmission rates in Medicare patients, improve quality of care, and save healthcare cost, the HRRP was established under the 2010 Affordable Care and Patient Protection Act, and 1st implemented in October 2012. The policy requires the Centers for Medicare and Medicaid Services (CMS) to reduce payments to Medicare-participating hospitals with excess readmissions for Medicare beneficiaries initially admitted with AMI, HF, pneumonia, COPD, elective total hip arthroplasty (THA), total knee arthroplasty (TKA), and coronary artery bypass graft surgery (CABG) (7). These conditions were identified and endorsed by the National Quality Forum as the most relevant to the HRRP based on evidence from administrative claims data (86). The program penalizes hospitals by reducing payments across all Medicare admissions if they report higher-than-expected readmission rates for these conditions (8). A penalty is given to any hospital with a Medicare risk-adjusted readmission rate greater than the annual national average, which was 17.8% in 2015, and is based on the difference between the estimated rate officials believed was appropriate and the actual rate (27, 86). The penalty is assessed against diagnosis-related-groups (DRG) payment rates for all conditions at a hospital and is applied to all admissions. DRGs function as the basic unit of payment and set payment rates for treatments of related diagnoses (87). For example, if a patient was admitted to a penalized hospital, the typical Medicare DRG payment would be reduced according to the percent penalty. The original 2012 ruling of HRRP adopted readmission measures for AMI, HF, and pneumonia, and established methods to calculate the excess readmission ratio of individual hospitals that included adjustments for factors such as demographics, comorbidities, and patient frailty (7). In 2014, CMS adopted an algorithm

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to account for planned versus unplanned readmissions, so that hospitals would not be over-penalized (7). Chronic obstructive pulmonary disease, elective THA, and TKA were added to the list of applicable conditions in 2015, and CABG will be included in the payment calculations in 2017 (7). In 2012, 2/3 of Medicare-participating hospitals were found to have higher readmission rates than the CMS models predicted, resulting in a penalty for each of these hospitals (63). In 2013, the penalty rate was 1% of each hospital's Medicare based DRG payment but has since increased to 3% in 2017 with an average payment adjustment of a 0.58% reduction among all hospitals (8). CMS estimates that 2017 penalties across all hospitals will total $528 million, $108 million more than 2016 (8). This increase in total penalties is due to the larger number of conditions included in the calculations for the 2017 readmission penalty, as a similar increase was seen in 2015 when COPD and knee and hip replacement were added (8).

CMS has publicized hospital readmission rates on its "Hospital Compare" website since 2009 (27). Since the implementation of HRRP in 2012, readmission rates have begun to fall and the 2016 all-cause readmission rate was 15.6% (9, 86). Specifically, the readmission rate of HRRP targeted conditions declined from 21.5% in 2007 to 17.8% in 2015 (88). The vast majority of hospitals have improved their readmission rates, suggesting that new interventions put into place to avoid fines were successful (8)

While there has been success in lowering national readmission rates, HRRP has raised some concerns. The Medicare Payment Advisory Commission has suggested that factors beyond hospitals' control should be considered in penalty allocation to excess readmission rates (27). Changes to the measure discussed were risk-adjusted measures and setting hospital performance targets. Currently, Medicare readmission measures

adjust for patient demographic characteristics, including age, but they do not take into consideration socioeconomic or community-level social factors (27). Therefore, legislation has been introduced to Congress in hopes that HRRP penalty calculations can be adjusted for socioeconomic factors. Another concern is that, as of 2017, HRRP does not utilize targets for readmission rates, such as a rate of less than 15%, and hospital performance is instead compared to national averages (8). This means that if national readmission rates decline, hospitals that have been successful in improving their readmission rates but still have rates above the national average may still be penalized. Additionally, hospitals are bearing the penalties of readmissions alone, while other provider and patient factors likely playing a role in patient disease management, are not considered. Focusing on outpatient care and self-management may be a way to improve readmission rates outside of hospitals (8). While policymakers develop solutions to these issues, hospitals are interested in examining factors associated with readmission and develop potential strategies to reduce readmissions subject to penalties (86).

Archway Partnership Project Approach and Methodology

In order to help communities solve locally identified problems through UGA researchers and resources, the Archway Partnership was founded in 2005. Taylor Regional Hospital approached the Archway Partnership and researchers at the UGA College of Pharmacy, Department of Clinical and Administrative Pharmacy, in an attempt to find ways to reduce readmissions of HF, COPD, and pneumonia patients. While currently ongoing, the Archway Partnership Project serves as a stepping-stone to filling in the gaps of knowledge about causes of readmissions in a rural population in

Georgia through a sample of patients originally admitted to TRH for HF, COPD, or pneumonia. The Archway Partnership Project was informed by community stakeholders. This study approach has shown to be successful in determining and prioritizing issues in disease management and public health, and promoting quality of life (89). In addition, community based participatory research (CBPR) has shown to have beneficial effects on socioeconomically-disadvantaged communities (90).

Hospital Readmissions in Pulaski County

The Archway Partnership study took place at TRH in Hawkinsville, Pulaski County, GA, a county at high risk for hospital readmissions. Taylor Regional Hospital, an acute care facility which serves Pulaski County, is 1 of only 61 rural general hospitals in the state, and had predicted readmission rates of 17.7%, 20.6%, and 15% for COPD, HF, and pneumonia in 2015, respectively (91). Hawkinsville, GA, is defined as "rural" with a population of less than 50,000 people or less, and categorized as "not urban" by the U.S. Department of Health and Human Services Health Resources and Service Administration (HRSA) (92). In 2015, the U.S. Census Bureau reported that 31.8% of the population in Pulaski County were African-American (32). In addition, 19.5% of the total population in Pulaski County were aged 65+ years (31, 32). Further, 80.9% of residents reported having at least a high school diploma between the years of 2011 and 2015, and only 12.1% reported having a minimum of a Bachelor's degree (32). Adding to the increased risk of potential readmissions, the average household income in Pulaski County, GA, in 2015 was $17,600, just below 150% FPL (31, 32). Due to the increased readmission rate risks, TRH has been seeking to improve their transitional care between hospital and community through collaboration with the Archway Partnership in order to control

readmission rates of their HF, COPD, and pneumonia patients. The hospital has an invested interest in addressing the issue as the 49-bed hospital has experienced a loss in financial assets since the implementation of the HRRP (93).

Archway Project Goal, Approach, and Methodology

The currently ongoing, exploratory Archway Project uses a prospective cohort study design, whereas many studies focused on readmission rates were retrospective (94). The long-term goal of this research project is to reduce 30-day hospital readmissions rates for patients originally admitted with diagnoses of HF, COPD, or pneumonia. The objective of the project is to identify self-management characteristics associated with readmissions of patients originally admitted with HF, COPD, or pneumonia. Gaining such knowledge could lead to the development of programs aimed at reducing the human and financial costs of excess hospital readmissions. A convenience sample of patients 18+ years who were admitted to TRH with diagnoses of HF, pneumonia, and COPD beginning in January 2016 were included in the project. Patients not meeting these criteria, those who did not wish to participate, and those who were being discharged to a long-term care facility or a rehabilitation center were excluded. Patients were identified by ICD-9 diagnosis codes from their medical record and were subsequently recruited by trained nurses using a standardized script on the 2nd or 3rd day of their hospital stay. The 6-item Cognitive Screening tool was used to assess patient's cognition level in order to determine eligibility for study inclusion (95). The 3-object recall, which was included in this tool, has high sensitivity for identification of subjects with cognitive impairment (96). After this screening, each participant received a unique research identification number. Recruitment continues, as the project is still ongoing.

Information was collected via patient interviews and from hospital records by a nurse researcher or a hospital case manager. Multiple factors were assessed in person at discharge and via telephone for all remaining collection times. Participants were interviewed 4 times and were expected to participate in the study for 1 month. The estimated interview times were as follows: 1) Baseline survey at discharge was 30-40 minutes, 2) the 1st of 3 follow-up telephone interviews (3 days post-discharge) was 15-20 minutes, 3) the 2nd follow-up telephone interview (20 days post-discharge) was 20-30 minutes, and 3) the last follow-up telephone interview (30 days post-discharge) was 15-20 minutes. Total duration of patient participation was 2-2.5 hours.

Timeline of Archway Partnership Project
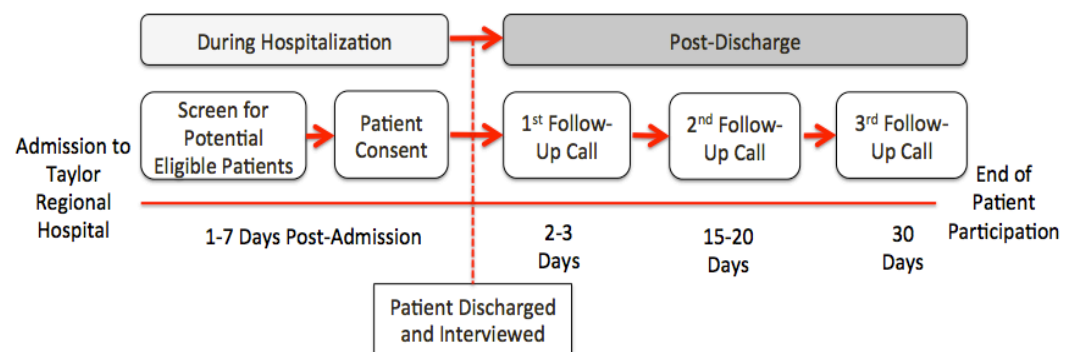
Information about the timeline of the Archway Partnership Project are illustrated in Figure 1. At baseline, demographic data, presence of discharge instructions, health literacy, medication adherence, presence of depression, diet, dietary sodium prescription, physical activity level, and smoking status were assessed. At the 1st telephone follow-up, dietary sodium prescription was measured again along with post-discharge medication

and medical access, understanding of discharge instructions, and stress levels. The 2nd

follow-up assessed medication adherence and stress level once more, in addition to

patient self-efficacy. The final follow-up included measurements of physical activity,

smoking status, health-related quality of life, and social support. Throughout patient

enrollment in the project, healthcare utilization, including readmissions, emergency room

visits, and PCP visits, were monitored. All potentially identifiable information were

protected by usage of research identification numbers and filed in a locked cabinet in a

locked room. Only nurse researchers and team members at TRH have access to these

medical records.

Factors Measured in Archway Project

All questionnaires are available for review in Appendix A.

Independent Variables

Demographic Data

Race, ethnicity, language, and socioeconomic status were abstracted from hospital

electronic health records (EHR) and an in-person interview. The questionnaire used

during the in-person interview to record this information included questions about age,

patient perception of overall health, ethnicity, highest level of education completed, and

language spoken. Education and income were used to assess SES. As the project has been

conducted at a community level, research team members approached the project with a

general idea of the SES of the community. This method has been utilized often and is

effective and confidential (97). Research using medical records has been conducted

according to city, state, and federal laws and regulations, including the Health Insurance

Portability and Accountability Act of 1996 (HIPAA).

Depressive Symptoms and Stress

The 8-question Patient Health Questionnaire (PHQ-8) detected the presence and

severity of depressive symptoms and stress. Chronic conditions, such as COPD, and

health outcomes may be negatively affected by comorbid depressive symptoms (98). This

tool is a valid diagnostic and severity measure for depressive disorders in population-

based studies (99).

Health Literacy

A trained nurse measured the patient's ability to process and understand basic

health information via The Newest Vital Sign (NVS) survey (100). This survey was

designed to quickly and accurately evaluate a patient's ability to read, understand, and act

upon given health information and takes about 3 minutes completion time (101). This

survey is comprised of 6 literacy and numeracy questions, which consist of 1 health

scenario and a nutrition facts label (101). The questions lend information about a variety

of components beyond reading and writing skills. For instance, numeracy involves the

manipulation of numbers, which is a skill patients rely on to calculate blood sugar levels,

to assess blood pressure readings, to measure medications, and to determine insurance

deductibles. Numeracy is assessed on the NVS survey by asking patients to calculate total

caloric amounts and percentages of daily intake off of the nutrition facts label. Asking

patients to read and interpret potential allergens on this label assesses literacy.

Information gathered from the NVS survey results can be used to tailor education

programs to specific populations (102). The NVS survey has been validated for

assessments of Caucasian, African-American, Hispanic and several other ethnicities and of adults throughout the lifespan (102).

Understanding of Discharge Process and Instructions

Understanding of discharge instructions was measured using a modified version of the Understanding Discharge Instructions survey established by Horwitz and colleagues (67). This survey was created in response to a 2010 evaluation of transitional care of patients 65+ years with acute coronary syndrome, HF, or pneumonia. The modified survey includes a variety of questions pertaining to language used, recognition of PCP recommendations and prescriptions, and follow-up plans (67). Patient understanding of transitional care and the experience associated with the discharge process were evaluated with the Care Transitions Measure (CTM-15) measurement tool. This validated survey generates information that can be utilized by health care systems to improve coordination of care out of the hospital (103). Use of the CTM series in minority groups and in rural America has shown that African-Americans and rural residents tend to report worse transition experiences than their counterparts, which carries importance for the Archway Partnership Project (104).

Patient Self-Efficacy

Patient self-efficacy was measured using the Patient Activation Measure (PAM-13^{TM}) assessment tool via phone call (105). Self-efficacy is defined as the personal belief that one possesses the skills and knowledge to self-manage (83). This 13-question survey measures patient knowledge, skill, and confidence for self-management, and has been shown to be valid and reliable across age ranges and racial categories (105).

Sodium Intake

A self-reported Dietary Sodium Restriction Questionnaire (DSRQ) was administered to measure patients' knowledge of their nutrition prescription and their adherence to the restriction, if prescribed (106). Low-sodium diet recommendations are the most common non-pharmacologic intervention used in care of HF patients and nonadherence is very high (106-108). In a study by Neily and colleagues, 86% of HF patients in a rural hospital were unaware that they were prescribed a low-sodium diet and 56% were able to determine whether foods were low or high sodium content (107). It has been validated for use in HF patients in both rural and urban settings (106).

Dietary Intake Assessment

Dietary intake was assessed via phone call with the Block Brief 2000 Food Frequency Questionnaire (FFQ), which uses a list of about 70 possible food items (about 2/3 of the usual questionnaire) and includes portion amount. It was used to assess quality of reported intake (109). Completed FFQs were sent away to NutritionQuest for analysis of dietary quality and composition (110). Composition analyses of dietary intake yielded macro- and micronutrient intakes and a Healthy Eating Index (HEI) 2010 score for each respondent (111). The HEI is a measure of diet quality measuring conformance of dietary intake to the 2010 Dietary Guidelines for Americans with 10 nutrient components (112). Each component of the index has a maximum score of 10 and a minimum score of 0. The maximum overall HEI score is 100 (112). High component scores indicate intakes close to the recommended ranges or amounts; low component scores indicate fewer adherences with the recommended ranges or amounts. Adequacy and moderation are the 2 major perspectives of this index. Additionally, HEI 2010 can be used to identify gaps between

actual intake and recommended intake and identify healthy eating patterns in patients (112).

The Archway Partnership Project selected FFQs instead of other dietary assessment methods, such as food diaries and recalls, for the study protocol due to concern of patient burden and administrative concerns of implementation. Information from FFQs may be used to determine usual dietary intake, as they estimate intake over long periods of time (113). This method may also be used for assessing the dietary differences between two groups, in this case, participants readmitted and not readmitted, but estimates are likely to be biased (114). These biases may be the results of participants reporting more healthful intakes than actually consumed to appeal to researchers. This can be done in a single interview session, rather than multiple times over the course of the study, such as required for 24-hour dietary recalls, but frequency does prevent some level of bias (114, 115). Additionally, FFQs can be used to comprehensively assess nutrient intake in order to allow researchers to identify specific dietary factors that lead to adverse health outcomes of patients with chronic diseases (115). The full version of the Block FFQ can take 30 to 35 minutes to complete, whereas the predicted time for the 2000 edition is 15 to 20 minutes (116). Block Brief FFQs are validated for use across the lifespan, in a diverse population of ethnicities, and via interview or self-administration has been compared with the typical diet records and recalls (109, 116). The use of telephone-administrated FFQs has been shown to have correlations with validated means of data collection (113, 117).

Medication Adherence

Medication adherence and barriers related to adherence were analyzed using the Morisky Medication Adherence Scale (MMAS-8) survey and patient interview. Medication refills were monitored to assess if patients had access to pharmacies for their post-discharge medication fills. The 8-question MMAS-8 survey ranked the degree of adherence and focused on medication-taking behaviors and possible barriers. The MMAS-8 has been validated for use in clinic settings, for low-income patients, and for patients with chronic diseases (118).

Physical Activity

Physical Activity (PA) was measured using the Health Risk Assessment (HRA) conducted at annual PCP visits. The HRA is a self-reported assessment, circulated by the CDC for the ACA, in which exercise frequency and intensity are measured and health-promoting feedback can be given by the PCP (119). Results from this tool informed researchers on patients' frequency, duration, and intensity of physical exercise. Questions in this assessment were written at a 5th or 6th grade literacy level, in plain language that is culturally appropriate and actionable, meaning that programs to help patients improve behaviors are available (119).

Smoking Status

Current smoking status was evaluated using the Behavioral Risk Factor Surveillance System (BRFSS) survey. Questions asked on this survey informed researchers on the tobacco history of participants, the frequency, and type of tobacco use. The information gathered by this survey can be used at a state or community level to assess needs and plan public health priorities. Assessments of the survey, including

questions about smoking status, have been conducted and concluded that the BRFSS is a valid and reliable source on health related information (120). While differences in self-reports and physical measures have been reported, the self-report methods in the BRFSS for smoking have been deemed reliable (120).

Dependent Variables

Health-related Quality of Life

A European Quality of Life 5-Dimensions 5-Level (EQ-5D-5L) survey was used to assess mobility, self-care, usual activities, pain, and anxiety/ depression. These were measured via telephone call. The measurement tool included 5 questions and a visual scale to decrease patient burden and improve response rate. Participants were asked to indicate if they had no problems, some problems, or complete inability/extreme issue with each health state (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression). While depressive symptoms had already been assessed in more detail, this tool provides a follow-up assessment to determine if symptoms have subsided. The EQ-5D-5L survey has been validated for use in patients with chronic conditions, such as cardiovascular and respiratory diseases (121).

Healthcare Utilization

Hospital readmissions, emergency room visits, and physician visits were measured from baseline to 30 days post-discharge using the RED toolkit interview form via telephone call and hospital record abstraction (69). The toolkit, which includes activities and materials for improving the discharge process, was developed by Boston University in 2003 and has since been adopted by many hospitals. The toolkit includes an

outline of the steps needed to implement RED at a hospital and a script and form for recording telephone interviews (122). This form includes space to record dates and reasons for readmission, emergency room visits, and physician visits (122). It provides hospitals with a standardized strategy for measuring discharge planning and healthcare utilization (123).

Feasibility/ Acceptability of Project Implementation

Gaining insights into the project implementation experiences of researchers is vital to identify problems hindering the success of the project (124). Feasibility studies are typically conducted alongside pilot studies to identify parameters needed to be redesigned if the study was repeated at a larger scale. These parameters can include barriers to recruitment, follow-up rates, number of eligible patients, and the characteristics of outcome measures (125). Research on the methodology, specifically feasibility and acceptability of larger studies, is crucial, regardless of outcome, as it may inform future studies of appropriate and effective protocols (125).

Whether a study approach and methodology is feasible and acceptable is often measured through the perspective of research team members. The perspective of the research team member can be gained through interviews, which may be online surveys, face-to-face, or telephone interactions (22). In a qualitative study of 72 researchers, who were involved in recruiting participants to a randomized control trial, organizational difficulties, barriers to recruitment, and researcher discomfort were identified through researcher report of experiences in interviews (25). For example, recruiters were uncomfortable and anxious in circumstances of identifying and approaching potential

participants. These results indicated that further training and support were needed for researchers to recruit effectively. Further, interview methods can be used to determine the acceptability of various research tools. A study on nurse experiences in using a palliative care tool resulted in knowledge of the usefulness and feasibility of the tool (24).

An email questionnaire was chosen to conduct research due to convenience, geographical distance between researchers, and freedom for open expression of views without influence from the interviewer. Open-ended questions were included to allow respondents to voice concerns about the research to ensure that project developers could fully understand the issues encountered by research team members and that no important issues were missing (126). Web-based data collection has been shown to have the advantages of low-cost and short response time (127). Research has shown that email respondents are more likely to respond and provide more in-depth responses than those who receive questionnaires in the mail or via telephone, due to convenience and participants having more time to think deeply about responses (23). Additionally, email questionnaires with open-ended questions were shown to elicit similar numbers of ideas and be of similar quality as an interview conducted via telephone (23).

Study Objective, Specific Aims, Hypotheses

The overall goal of this qualitative research study was to test the acceptability and feasibility of the Archway Partnership Project study approach and methodology. The 1st specific aim of this study was to evaluate the perspectives of research team members of a prospective project examining factors related to hospital readmissions of rural hospitalized patients with original admission diagnoses of HF, COPD, and pneumonia on

how well the methods and approach used in this specific setting worked. The 2nd specific

aim was to evaluate the feasibility and acceptability of the dietary assessment method

used to examine patient dietary characteristics. Direct quotations from research team

members were analyzed to evaluate feasibility and acceptability. We hypothesized that

(1) research team members found the various tools and methods used to be feasible to

collect data that may be used to identify factors of readmission that can be targeted for

readmission, and that (2) the FFQ used for dietary assessment was feasible to collect data

that can be used to identify dietary components that may be associated with readmissions.

CHAPTER THREE

Methods

Study Design

For the purposes of understanding feasibility and acceptability of the Archway

Partnership Project, a 5-question survey was sent, via email, to key research team

members involved in the implementation of this study. The survey was sent to individual

research team members and returned between January and March 2017. The questions

ranged from broad aspects of the project as a whole, to more narrow questions about the

implementation of the FFQ. This questionnaire was used to gather responses to 5

questions of experience as follows:

1. What are the facilitators of implementing this project?

2. What barriers, if any, were encountered while implementing this project?

3. What would you change, if anything, about the implementation of this project?

4. What were your experiences with implementing the food frequency questionnaire
   (Block Brief 2000 FFQ)?

5. Are there any suggestions you can make about how to better implement this
   project?

All questions allowed for open-ended responses. These methods enabled a deeper

understanding of the experiences with the Archway Partnership Project research process

needed to identify the stages of research in need of improvement. Those who did not

respond to the initial questionnaire response request were sent a follow-up email within 2

weeks of sending the initial questionnaire. If after 3 email attempts potential participants did not respond, no further contact was attempted.

Institutional Review Board Approval

The UGA Institutional Review Board (IRB) on Human Subjects approved this study (IRB ID#STUDY00002481).

Data Management

All questionnaires were completely confidential and kept either on a computer with lock codes and passwords required to access them or in a locked filing cabinet in a locked room. Personal identifying information was removed from transcripts. Only research team members have access to the data files.

Participants

Research team members involved with the Archway Partnership Project, including research team members at TRH (Lamar Leslie, M.S., Pharm.D), research team members at UGA who developed study design and methodology (Henry Young, Ph.D , Shada Kanchanasuwan, Pharm.D) and team members at the Archway Partnership administrative level (Michelle Elliot, MPA) were included in the study. The participants were identified by the project Primary Investigator, Dr. Young, which is common in research that interviews key informants (128). Five questions were sent to researchers by email. There was an 80% return rate (N=4). The research team members' responses gave a wide range of perspectives on experiences with the Archway Partnership Project

implementation. The small sample size in this study is typical of qualitative research, as qualitative sampling is conducted purposefully to "illuminate the questions under study and to increase the scope or range of data exposed (129)."
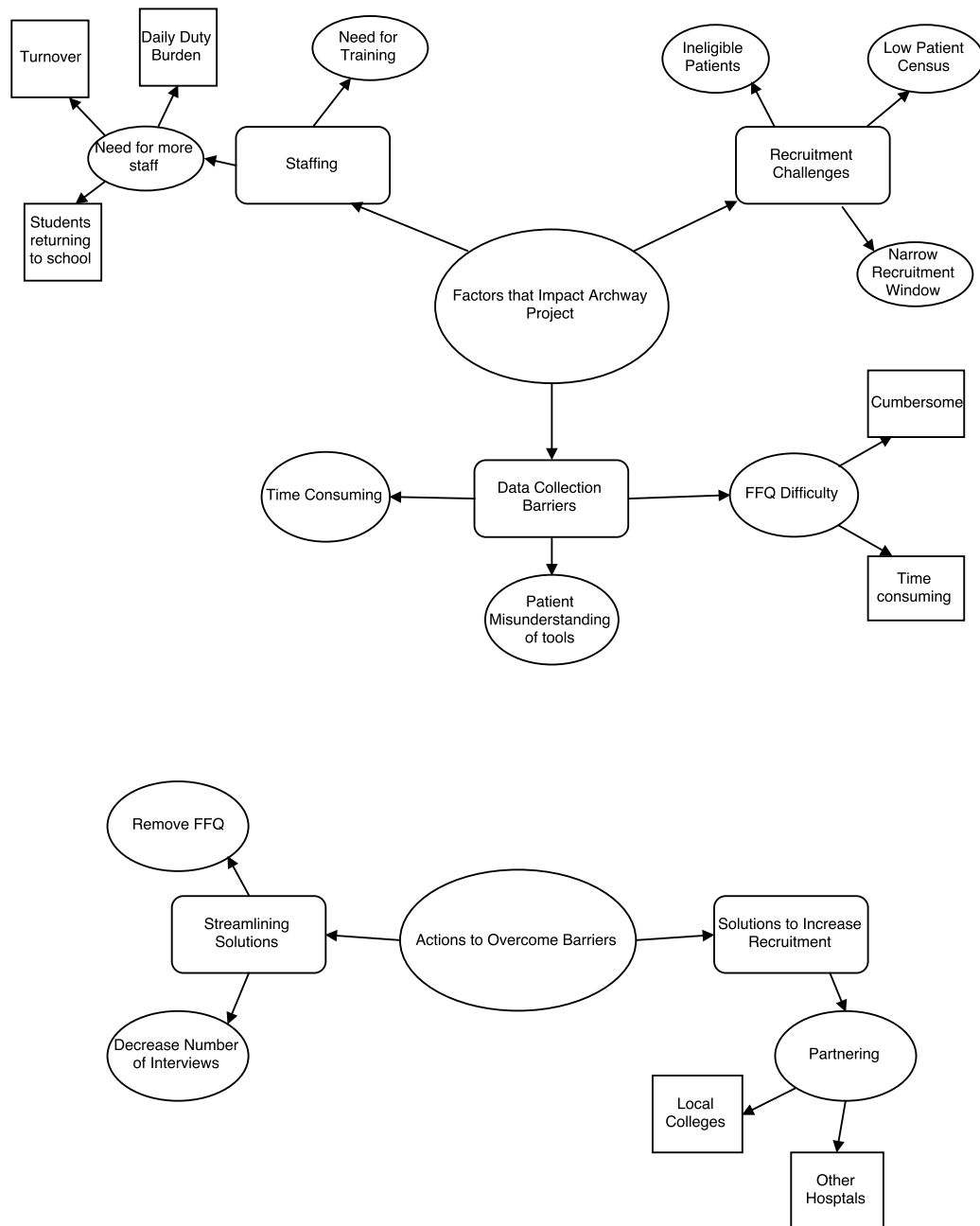
Thematic Analysis

Analysis was conducted using thematic analysis methods, based on the techniques of constant comparison from grounded theory (130, 131). Thematic analysis was conducted to examine trends and patterns in the survey responses. In order to identify common themes across the data, analysis was conducted across questions, rather than for each open-ended question individually. One independent reviewer conducted analysis of all questionnaire transcripts. The coding method was both inductive and semantic; reviewer abstracted codes and themes directly from the surface meaning of data with no preconceived notions by repeated rounds of reading and categorizing. This process included 6 steps: 1) becoming familiar with data; 2) generating initial codes; 3) searching for themes; 4) reviewing the themes; 5) defining and naming themes; and 6) producing the report (130). During the 1st step, the reviewer read through all survey transcripts to gather basic analytic information and allow orientation to the data (131). This initial step was crucial in that it provided the opportunity for the reviewer to break up data into component parts, compare data with other data, and identify gaps (131). Next, while generating initial codes, the reviewer coded using line-by-line coding and the constant comparison method keeping in mind the research question of the feasibility and acceptability of the Archway Partnership Project

(131). This included further comparing data with other data to find differences and similarities. All 19 codes were abstracted from the survey transcripts, some of which were derived *in vivo*, or directly from the data using participant's words, to preserve participants' meanings (131). During the 3rd stage of analysis, these codes were sorted, synthesized and organized into larger groups of data, hereby denoted as "themes." Potential themes were created and cross-referenced with each other to identify relationships and overlap. Patterns of codes were then reviewed to verify that themes were coherent. A thematic map was created to determine if themes accurately reflected the whole data set and to show relationships between themes.

Thematic Map

Turnover

Daily Duty Burden

Need for Training

Ineligible Patients

Low Patient Census

Need for more staff

Staffing

Recruitment Challenges

Students returning to school

Factors that Impact Archway Project

Narrow Recruitment Window

Cumbersome

Time Consuming

Data Collection Barriers

FFQ Difficulty

Patient Misunderstanding of tools

Time consuming

Remove FFQ

Streamlining Solutions

Actions to Overcome Barriers

Solutions to Increase Recruitment

Decrease Number of Interviews

Partnering

Local Colleges

Other Hosptals

The final thematic map is presented in Figure 2. Subthemes were identified

through the creation of this map and overall themes were constructed. These

themes underwent repeated investigation for refinement and direct quotes from

surveys were grouped under each to provide clear illustration. A "member check",

in which survey participants had the opportunity to approve or deny analysis, was

conducted to further prevent subjective coding (132). Two research team

members responded to these member check emails to affirm thematic analysis,

while the lack of response from the other team members was also considered

affirmative. Memos were created throughout analysis to define each code and

gather all relevant quotes and information from survey and to maintain a level of

organization. The overall themes that resulted from this analysis of perspectives

were organized into a framework comprised of: 1) Factors that impacted the

Archway Partnership Project; and 2) Actions that may overcome these factors.

These are presented, respectively, in the results section below. This framework

offers insight into the acceptability of the project by the terms of the Archway

Partnership Project researchers. These analyses revealed that aspects of the

project were limiting but can be adapted to streamline implementation.

CHAPTER FOUR

Results

Two main themes were identified from the thematic analysis: *(1) factors that impacted the Archway Partnership Project,* and *(2) actions to overcome barriers*. Within *factors that impacted the Archway Partnership Project*, the sub-themes included staffing, recruitment challenges, and data collection barriers, each of which were comprised of further codes pulled from data. In our presentation of *actions to overcome barriers,* the 2 sub-themes identified were streamlining solutions and solutions to increase recruitment. The codes that comprised these sub-themes were paired with quotations and evidence from participant responses.

Factors that Impacted the Archway Partnership Project

This section of the results addressed the factors that affected the feasibility and acceptability of the larger project. Participants identified barriers in the Archway Partnership Project as related to: 1) staffing; 2) recruitment; and 3) data collection as themes. The presentation of each sub-theme displayed the intricate problems research team members encountered during each stage of the research process.

Staffing

Major points that were identified by research team members as complications with staffing included not having enough staff participation, not having a "consistent" staff pool, and a need for more staff training for the project to continue. Research team

members at TRH noted "it was difficult getting enough participations from staff."

Although nurses and doctors at the facility were approached to assist in the

implementation of the study, various constraints prevented increased participation. This

resulted in a small researcher team available to implement the project while "not having

staff fully responsible for the project" on site. One research team member reported,

"staffing issues to implement the project in the hospital [include] turnover, burden with

daily duties, [and] students returning to school." The research team members on staff at

TRH were busy with the daily patient care activities; therefore, student researchers were

recruited during the summer of 2016. These student researchers were seen as project

facilitators, as during this period, project implementation went at a steady pace.

Unfortunately, this pace quickly declined once student researchers had to return to the

university for the fall semester. This issue of consistency of researcher team members

posed a further problem, as constant turnover led to increased need for training. "The

learning curve for this project was steep," mentioned 1 research team member when

asked about project barriers. The protocols for this project included multiple in-depth

questionnaires predicted to take 20-40 minutes each to conduct with patients and had a

timeline of 1 month per patient that may have been inadequate for those interviewing

patients. "It took some time to learn this," reported 1 research team member about the

study protocol. Overall, 100% of research team members identified a need for a higher

number of research team members and many also reported a need to "train them."

Without an appropriate amount of well-trained team members, the Archway Partnership

Project would not be capable of moving forward, according to the interviewees. One

research team member stated, "The role of the research assistant, in my opinion, is critical."

It is important to note that despite small numbers for staffing, research team members did praise those who did participate. "The hospital staff is committed to the value of the information collected and to helping their patients' outcomes improve," noted one research team member after expressing need for more trained staff.

Recruitment Challenges

When questioned about barriers encountered during the Archway Partnership Project implementation, 75% of research team members mentioned recruitment issues, including a low patient census, narrow window of time for recruitment, and issues to identifying eligible patients. Inadequate staffing was also noted at this point, as implementation of this project was "facilitated primarily by the identification of eligible patients," and there were not enough staff present to identify these patients. Despite the fact that exclusion criteria were not expansive, they were seen as a barrier to recruitment:

> "Barriers to this project include patients that reside in nursing homes or who have caregivers. Many of these patients rely on others for the administration of their medications and management of their health. These patients are usually not eligible."

The difficulty with recruiting project participants was intensified by low patient census at TRH. One research team member reported the census to be lower than "anticipated" and felt that it had "lengthened the time of the study to an unacceptable degree." Without a steady flow of patients into the hospital, the research team was unable to identify and recruit participants to the project, which seems to have resulted in a level of study fatigue,

as the motivation among research team members due to the novelty of the project wore off. Even when eligible patients were identified, issues persisted. "There seems to be a very narrow window between admission where the patient is well enough to take part in a lengthy interview and release," a research team member wrote. Due to time constraints from daily duties and low TRH staff participation, available research team members may easily miss this time window and consequently, patients may be discharged without being interviewed. In addition, over 40% of patients asked between January and July 2016 to participate refused project participation.

Data Collection Barriers

Overall, research team members found the research process "time-consuming." The "burden with daily duties" identified as a staffing barrier likely also affected data collection of the Archway Partnership Project. With 1 in-person interview and 3 follow-up telephone call interviews included in the study protocol, research team member time invested was 2-2.5 hours, not including time for data entry, which was also seen as a barrier by 1 research team member.

Issues often arose pertaining to patient understanding of questions asked in implemented surveys. In fact, 75% of responding research team members indicated that patients experienced difficulty with responding to survey questions. "The education level of patients has been a huge challenge to collecting information," noted 1 research team member. Criticisms from 75% of research team members were directed at the use of the Block Brief FFQ. "I also found that many of the questions that required patients to use mathematical calculations for nutritional facts were very difficult for patients," wrote 1 research team member. Similarly, another explained, "Participants didn't really seem to

understand the questions and references to the portion size of the meals (although pictures were provided)." Some found it too "time-consuming" on its own, while others found it "cumbersome to implement." Despite having no other dietary questionnaires involved in the project, one research team member even felt that the FFQ was "redundant."

In summary, the 3 subthemes mentioned outline the major barriers to the project as seen by the research team members. At each stage of the project, from staffing to recruiting to collecting data, barriers were identified and discussed.

Actions to Overcome Barriers

This section of the results addresses how the aforementioned factors can be overcome to result in a more easily accepted project. Every research team member respondent lent at least 1 suggestion for how to improve implementation. The 2 groups of solutions that were emphasized by the data were (1) to streamline the project and (2) to increase recruitment.

To streamline the project, suggestions were made to remove the FFQ or decrease the number of follow-up telephone calls. The "cumbersome" FFQ brought much criticism from research team members, due to causing confusion among participants. "I [would] not include the FFQ into the interview because it is too long for the interview process," suggested one research team member. Another research team member had a similar idea and reported, "I understand diet and lifestyle have major effects on health. It might be more beneficial if the food questionnaire was done separately as an independent study." Another streamlining suggestion aimed at decreasing interview times. When asked what

changes should be made, a research team member responded, "I would probably only have 2 follow up phone calls after the initial interview instead of 3." Another research team member took this suggestion a step further by stating, "I would cut down the interview into just 2 interviews (before and after)." Indeed, following this suggestion could decrease research team member time investment by 20 minutes to an hour. Such a strategy would, however, require protocol evaluation to determine parts of the survey that could be excluded or edited.

Increasing the recruitment of both research team members and participants was a critical need identified by this qualitative research. Facilitating this process could substantially impact the project as a whole. A need to identify research team members was especially apparent in data, as having a "committed and motivated staff" was seen as a way to better implement the project. One research team member suggested identifying "community resources that might provide a consistent research assistant pool." This could include temporary work agencies, volunteer organizations, or students from local universities. "Partnering with Middle Georgia State University's Nursing program could have been beneficial for research assistant recruitment," 1 research team member implored. Partnering with outside organizations, such as schools and other rural hospitals, was suggested by 50% of research team members. Research team members also suggested that the Archway Partnership Project "include more rural hospitals to increase qualified participants in the study" and "expedite data collection." This is a suggestion that has been previously acknowledged and pursued by lead research team members.

CHAPTER FIVE

Discussion

The purpose of this qualitative study was to determine feasibility of the methods and approach of the Archway Partnership Project. This study was also designed to determine if the FFQ utilized in the project was feasible and acceptable to the research team members and setting. In summary, this study found that the Archway Partnership Project research team members identified barriers and potential solutions to the implementation of the project. Research team members readily identified difficulties with staffing and training, recruitment issues stemming from lack of eligible patients, and confusion surrounding multiple measurement tools as key barriers to project implementation. A key finding was the importance of research assistants to the project, as inadequacies with staff recruitment had demobilized other stages of the research process. The FFQ utilized in the Archway Partnership Project was a challenge as participants struggled to understand dietary intake questions. Research team members also found this tool difficult to implement for this project protocol. These findings can be utilized to develop a more widely accepted project protocol to evaluate modifiable factors of readmission.

Staffing

The research team members involved in the Archway Partnership Project evaluated their peers as committed to the project, yet, from their perspective, the project

required more research team members for appropriate implementation. The time burden

of the study was identified as a staffing issue, as research team members at TRH

perceived a lack of time to finish both, clinical care duties and research obligations. A

large time investment and research team members working a significant distance from

each other have been noted as barriers by researchers in other qualitative research, just as

they were identified in this study (133). Evidence from another qualitative study of

researchers indicated that research roles were of "lower status" than clinical roles, and

therefore not prioritized (25). Due to this prioritization, researchers employed by the

study, such as the UGA student research team members involved with this study, have

been shown to be easier to train and utilize during recruitment and data collection (25).

Training was seen as an area to improve by research team members, which is a common

complaint among health care researchers interviewed for qualitative research (134).

Additionally, study fatigue may have played a role in the level of participation noted by

some research team members, as issues with study protocol have been shown to lead to a

lack of motivation in researchers (135). In order to gain insight on how to engage

research team members more effectively, the researcher that did not respond to the survey

email should be pursued.

Recruitment

Research team members struggled with recruitment due to a low patient census,

timing of identification, and various patient characteristics that made them ineligible to

participate. Training and work-related support of research team members involved in

recruitment has been suggested to help with completing recruitment (25). Additionally,

the issues with identifying eligible patients due to low census or research team member insecurity are not uncommon. In fact, Donovan et al conducted a qualitative study with recruiters which reported that research team member discomfort with study protocol led to anxiety associated with approaching patients (25). The Archway Partnership Project study population included mostly socially disadvantaged individuals, which may be more difficult to recruit. A review by Bonevski et al found that research team members often struggle with recruiting subjects from this population due to mistrust in research or researchers, fear of authority, and perceptions of no personal benefit from participation in research (136). A qualitative study to determine patient perspective of research team members might lend useful information for this project's future. Researcher and healthcare provider bias was also identified as a barrier to recruitment by the Bonevski review, as healthcare professionals failed to encourage research participation due to beliefs that lower SES populations lacked time, interest, or ability to participate. It is uncertain if this bias existed among the Archway Partnership Project research team members. Time burden was a barrier encountered during recruitment, as research team members had a "narrow window" to identify and recruit patients before discharge. This may have been the perception of the "lower-status role" of research, placing the study as a low priority, or insecurities in recruiting skills, which have been indicated as barriers to nurse researchers (135). Additionally, Spilsbury et al reported that fluctuations in recruitment rates may affect the personal motivation of research team members, as they may not be capable of meeting expectations of lead research team members. This time burden was further implicated through decreased staffing, which may have put stress on research team members involved in recruiting patients.

Data Collection

Patients who were recruited had misunderstandings of measurement tools, especially the FFQ, which research team members identified as being time-consuming and cumbersome. One research team member reported, "The education level of patients has been a huge challenge to collecting information." Bonevski's review also identified language, lack of education, and low literacy as major barriers to data collection and measurement as these issues may prohibit the collection of self-administered survey data. (136). Low educational attainment and older age have also been associated with difficulties in remembering activities accurately, even without the presence of cognitive impairment, which may have led to the patient confusion about various measurement tools, including the FFQ (137). Similar to data reported in this study, other qualitative research has reported that patients struggle with reporting on portion sizes, despite the inclusion of pictures for comparison (138). These difficulties with measurement tools may have caused interview times to extend past the allotted amount, which would explain research team members' complaints that the tools were "time-consuming".

Suggested Solutions

The overall theme of overcoming barriers outlines possible solutions for future research studies, as identified by study team members at the Archway Partnership Project. These research team members realized that although the Archway Partnership Project has experienced barriers to implementation, "the project itself is a brilliant idea with great potential." Qualitative methods have been utilized to evaluate local issues to be considered when introducing new ideas and determining potential solutions (139). One

suggested method to improve recruitment of both patients and research team members was to partner with local organizations, colleges, and other rural hospitals. Greysen and colleagues also identified partnering with community organizations as important, as partnering may provide a way to fill the "missing piece" in patient's healthcare that hospitals cannot fill (140). This would align well with the methods of CBPR, as more local community members would be involved with the research process. Researchers reported that hiring community members for CBPR studies was effective for improving data collection due to increased participant trust (141).

Another recommended solution was to decrease the number of interviews conducted and to remove the FFQ from the study protocol. Limiting time spent in interviews would cut down on research team member time commitment and possibly study fatigue, but would require intense evaluation on inclusion and exclusion of surveys. Half of researchers suggested that removing the FFQ would be sufficient to shorten the research process, due to the time-consuming and "cumbersome" nature of the tool that the researchers reported. The Rapid Eating and Activity Assessment for Patients (REAP) is a possible alternative dietary assessment that could be utilized. This validated questionnaire provides assessment in one to nine minutes and can be transformed into a Healthy Eating Index (HEI) score (142). As a healthy diet has been shown to have an important effect on clinical outcomes, excluding a dietary assessment may have significant impacts on study findings and long-term planning in the prevention of hospital readmissions (143).

Strengths

Qualitative studies can offer valuable insights into the perspectives of research team members, generating research questions for quantitative studies (144). Thematic analysis provides flexible methods for conducting in-depth analyses while still allowing data to be presented in a way that is readily accessible to those outside of the academic community (144). Interviews are ideal for in-depth personal narratives and exploring a single respondent's reactions without the bias of other participants. Further, interviews can be conducted without the constraints of moderators, assistants, meeting spaces, and a collaboration of time (21). In comparative studies, interviews were shown to be 32-37% more cost-effective and to generate more high-quality ideas per person than other qualitative methods, such as focus groups (21, 145). The methods used in this study are ideal for formative evaluation, as they are relatively quick while still providing insights into project implementation, identifying areas to improve, and suggesting solutions to barriers (139).

Limitations

The flexibility of thematic analysis can be both an advantage and disadvantage, as there are few specific guidelines for analysis and insights given can be very broad (130). Additionally, thematic analysis is still not a well-understood method, as it is relatively new in the realm of qualitative research with guidelines 1st laid out in 1998 (146). In this particular study, the results cannot be generalized to other studies investigating factors involved in hospital readmissions. It is likely that only research team members, that were most willing, responded to the emailed questionnaire, while non-responding research

team members may have had different perspectives. Finally, only one questionnaire was sent to research team members, with only one follow-up member check. In order to gain more in-depth information, more interactions may have been necessary.

Implications

This study serves as a formative evaluation for the Archway Partnership Project approach and methodology. Research team member perspectives are important sources of information on strengthening and limiting aspects of an observational research project. Thematic analysis provides a relatively fast method to evaluate themes of a project evaluation. Additionally, the results of this method can be presented in a way that is understandable to those outside of academia, which may be helpful when adapting ongoing projects.

CHAPTER SIX

Conclusion

In conclusion, research team members provided their perspectives on the feasibility and acceptability of the Archway Partnership Project, which strived to identify modifiable factors of hospital readmissions. Using thematic analysis, barriers to this project including staffing inadequacies, recruitment challenges, and problems with data collection were identified. Research team members indicated that there was a "learning curve" to the study protocol that impacted all levels of the research process. They also indicated that participants struggled to understand measurement tools, especially the FFQ, due to literacy and education shortcomings. While the methods currently in place have not been fully accepted by research team members at TRH, solutions to improve their feasibility and acceptability were proposed. Solutions given by research team members included partnering with other local organizations to improve research team member and participant recruitment, removing the FFQ from the study protocol, and reducing the number of interviews of participants. Implementing 1 or more of these strategies may generate full feasibility and acceptability of the Archway Partnership Project in the opinion of all research team members involved as methods will no longer be deemed "cumbersome" or "time-consuming". Follow-up interviews with research team members after the implementation of 1 or more of these strategies could provide further information about project needs. Additionally, a larger sample of the research team member pool would provide more insight into the successes and barriers of the

Archway Partnership Project. This may provide a methodology for evaluating modifiable factors of readmissions that is specifically tailored to hospitals serving rural, low-income populations. It is necessary to develop study methodologies that are feasible and acceptable to specific populations; utilizing qualitative research methods is an ideal way to assess feasibility and acceptability of such projects.

References:

1.   Hines A, Barrett M, Jiang H, Steiner C. Conditions with the largest number of adult hospital readmissions by payer, 2011. HCUP Statistical Brief# 172. Rockville, MD: Agency for Healthcare Research and Quality; 2014. 2014.

2.   Jencks SMM, Williams MM, Coleman EMM. Rehospitalizations among Patients in the Medicare Fee-for-Service Program. *The New England Journal of Medicine* 2009;360.

3.   Organization WH. Quality of Care: A process for making strategic choices in health systems: World Health Organization, 2006.

4.   Benbassat J, Taragin M. Hospital readmissions as a measure of quality of health care: Advantages and limitations. *Archives of Internal Medicine* 2000;160(8):1074-81.

5.   Commission MPA. CMS Promoting Greater Efficiency in Medicare. 2007.

6.   Foundation THJKF. Internet: http://kff.org/health-reform/fact-sheet/summary-of-the-affordable-care-act/ 2017.

7.   Services CfMM. April 18, 2016. Internet: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html

8.   Boccuti CC, Giselle September 30, 2016. Internet: http://kff.org/medicare/issue-brief/aiming-for-fewer-hospital-u-turns-the-medicare-hospital-readmission-reduction-program/.

9.   (CMS) CfMMS. Internet: https://data.medicare.gov/Hospital-Compare/Readmissions-and-Deaths-National/qqw3-t4ie .

10. Edelman T. April 18, 2016. Internet: http://www.medicareadvocacy.org/reducing-hospital-readmissions-by-addressing-the-causes/

11. Auerbach AD, Kripalani S, Vasilevskis EE, Sehgal N, Lindenauer PK, Metlay JP, Fletcher G, Ruhnke GW, Flanders SA, Kim C. Preventability and causes of readmissions in a national cohort of general medicine patients. *JAMA Internal Medicine* 2016;176(4):484-93.

12. Calvillo-King L, Arnold D, Eubank KJ, Lo M, Yunyongying P, Stieglitz H, Halm EA. Impact of social factors on risk of readmission or mortality in pneumonia and heart failure: systematic review. *Journal of General Internal Medicine* 2013;28(2):269-82.

13. Meyers AG, Salanitro A, Wallston KA, Cawthon C, Vasilevskis EE, Goggins KM, Davis CM, Rothman RL, Castel LD, Donato KM, et al. Determinants of health after hospital discharge: rationale and design of the Vanderbilt Inpatient Cohort Study (VICS). *BMC Health Services Research* 2014;14:10.

14. Silverstein MD, Qin H, Mercer SQ, Fong J, Haydar Z. Risk factors for 30-day hospital readmission in patients ≥65 years of age. Proceedings (Baylor University Medical Center) 2008;21(4):363-72.

15. Iloabuchi TC, Mi D, Tu W, Counsell SR. Risk Factors for Early Hospital Readmission in Low-Income Elderly Adults. *Journal of the American Geriatrics Society* 2014;62(3):489-94.

16. Gorina Y, Pratt LA, Kramarow EA, Elgaddal N. Hospitalization, Readmission, and Death Experience of Noninstitutionalized Medicare Fee-for-service

Beneficiaries Aged 65 and Over. National Health Statistics Reports 2015(84):1-24.

17.   Regalbuto R, Maurer MS, Chapel D, Mendez J, Shaffer JA. Joint Commission Requirements for Discharge Instructions in Patients With Heart Failure: Is Understanding Important for Preventing Readmissions? *Journal of Cardiac Failure* 2014;20(9):641-9.

18.   Gamble J-M, Eurich DT, Ezekowitz JA, Kaul P, Quan H, McAlister FA. Patterns of Care and Outcomes Differ for Urban vs. Rural Patients with Newly Diagnosed Heart Failure, Even in a Universal Health Care System. *Circulation*: Heart Failure 2011.

19.   Jin Young C. A PORTRAIT OF RURAL HEALTH IN AMERICA. *Journal of Rural Social Sciences* 2012;27(3):1.

20.   Feeley N, Cossette S, Côté J, Héon M, Stremler R, Martorella G, Purden M. The importance of piloting an RCT intervention. *CJNR* 2009;41(2):84-99.

21.   Namey E, Guest G, McKenna K, Chen M. Evaluating Bang for the Buck: A Cost-Effectiveness Comparison Between Individual Interviews and Focus Groups Based on Thematic Saturation Levels. *American Journal of Evaluation* 2016;37(3):425-40.

22.   Brinkmann S. Interview. Edtion ed. In: Teo T, ed. Encyclopedia of Critical Psychology. New York, NY: Springer New York, 2014:1008-10.

23.   Coderre F, Mathieu A, St-Laurent N. Comparison of the quality of qualitative data obtained through telephone, postal and email surveys. *International Journal of Marketing Research* 2004;46:347-58.

24. Hermans K, Spruytte N, Cohen J, Van Audenhove C, Declercq A. Usefulness, feasibility and face validity of the interRAI Palliative Care instrument according to care professionals in nursing homes: A qualitative study. *International Journal of Nursing Studies* 2016;62:90-9.

25. Donovan JL, Paramasivan S, de Salis I, Toerien M. Clear obstacles and hidden challenges: understanding recruiter perspectives in six pragmatic randomised controlled trials. *Trials* 2014;15(1):5.

26. Horwitz L, Partovian C, Lin Z, Herrin J, Grady J, Conover M, Montague J, Dillaway C, Bartczak K, Ross J. Hospital-wide (all-condition) 30-day risk-standardized readmission measure. Yale New Haven Health Services Corporation/Center for Outcomes Research & Evaluation Retrieved September 2011;10:2012.

27. Commission MPA. Report to the Congress: Medicare and the health care delivery system [Internet]. Washington (DC): MedPAC; 2012 Jun.

28. Goldfield NI, McCullough EC, Hughes JS, Tang AM, Eastman B, Rawlins LK, Averill RF. Identifying Potentially Preventable Readmissions. *Health Care Financing Review* 2008;30(1):75-91.

29. Chugh A, Williams MV, Grigsby J, Coleman EA. Better Transitions: Improving Comprehension of Discharge Instructions. *Frontiers of Health Services Management* 2009;25(3):11-32.

30. Vest JR, Gamm LD, Oxford BA, Gonzalez MI, Slawson KM. Determinants of preventable readmissions in the United States: a systematic review. *Implementation Science* 2010;5(1):88.

31.   Coming of Age. State Legislatures 2016;42(7):11.

32.   Bureau USC. Quickfacts- Pulaski County, Georgia. http://www.census.gov, 2015.

33.   Joynt KE, Orav E, Jha AK. Thirty-day readmission rates for medicare
        beneficiaries by race and site of care. *JAMA* 2011;305(7):675-81.

34.   Herrin J, St. Andre J, Kenward K, Joshi MS, Audet A-MJ, Hines SC. Community
        Factors and Hospital Readmission Rates. *Health Services Research*
        2015;50(1):20-39.

35.   Quality through collaboration : the future of rural health: Washington, D.C. :
        National Academies Press, c2005., 2005.

36.   Weeks WB, Lee RE, Wallace AE, West AN, Bagian JP. Do Older Rural and
        Urban Veterans Experience Different Rates of Unplanned Readmission to Va and
        Non‐Va Hospitals? *The Journal of Rural Health* 2009;25(1):62-9.

37.   Philbin EF, Dec GW, Jenkins PL, DiSalvo TG. Socioeconomic status as an
        independent risk factor for hospital readmission for heart failure. *The American
        Journal of Cardiology* 2001;87:1367-71.

38.   Toth M, Holmes M, Van Houtven C, Toles M, Weinberger M, Silberman P. Rural
        medicare beneficiaries have fewer follow-up visits and greater emergency
        department use postdischarge. *Medical Care* 2015;53(9):800-8.

39.   Hardman B, Newcomb P. Barriers to primary care hospital follow-up among
        older adults in rural or semi-rural communities. *Applied Nursing Research*
        2016;29:222-8.

40. Sattler ELP, Lee JS, Young HN. Factors associated with inpatient hospital (re)admissions in Medicare beneficiaries in need of food assistance. *Journal of Nutrition in Gerontology and Geriatrics* 2015;34(2):228-44.

41. Soley-Bori M, Soria-Saucedo R, Ryan CM, Schneider JC, Haynes AB, Gerrard P, Cabral HJ, Lillemoe KD, Kazis LE. Functional Status and Hospital Readmissions Using the Medical Expenditure Panel Survey. *Journal Of General Internal Medicine* 2015;30(7):965-72.

42. Hao W, Johnson C, Robinson RD, Nejtek VA, Schrader CD, Leuck J, Umejiego J, Trop A, Delaney KA, Zenarosa NR. Roles of disease severity and post-discharge outpatient visits as predictors of hospital readmissions. *BMC Health Services Research* 2016;16:1-10.

43. Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, Das SR, de Ferranti S, Després J-P, Fullerton HJ. Heart disease and stroke statistics—2016 update. *Circulation* 2016;133(4):e38-e360.

44. Healthcare E. Internet: https://www.emoryhealthcare.org/heart-vascular/wellness/heart-failure-statistics.html.

45. Rosamond W, Flegal K, Friday G, Furie K, Go A, Greenlund K, Haase N, Ho M, Howard V, Kissela B, et al. Heart disease and stroke statistics--2007 update: a report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation* 2007;115(5):e69-e171.

46. Fuchs FD. Why Do Black Americans Have Higher Prevalence of Hypertension? An Enigma Still Unsolved 2011;57(3):379-80.

47. Benjamin EJ, Blaha MJ, Chiuve SE, Cushman M, Das SR, Deo R, de Ferranti SD, Floyd J, Fornage M, Gillespie C, et al. Heart Disease and Stroke Statistics—2017 Update: A Report From the American Heart Association. *Circulation* 2017.

48. Freda BJ, Knee AB, Braden GL, Visintainer PF, Thakar CV. Heart Failure: Effect of Transient and Sustained Acute Kidney Injury on Readmissions in Acute Decompensated Heart Failure. *The American Journal of Cardiology* 2017.

49. Eastwood CA, Howlett JG, King-Shier KM, McAlister FA, Ezekowitz JA, Quan H. Determinants of early readmission after hospitalization for heart failure. *The Canadian Journal Of Cardiology* 2014;30(6):612-8.

50. Chronic obstructive pulmonary disease among adults--United States, 2011. *MMWR Morbidity And Mortality Weekly Report* 2012;61(46):938-43.

51. Ford ES, Croft JB, Mannino DM, Wheaton AG, Zhang X, Giles WH. COPD surveillance—United States, 1999-2011. *CHEST Journal* 2013;144(1):284-305.

52. Elixhauser A AD, Podulka J. Readmissions for Chronic Obstructive Pulmonary Disease, 2008: Statistical Brief #121. Healthcare Cost and Utilization Project (HCUP) Statistical Briefs 2011.

53. Croft JB. The association of chronic obstructive pulmonary disease, disability, engagement in social activities, and mortality among US adults aged 70 years or older, 1994–2006. *International Journal of COPD* 2014;9:75-83.

54. Snider JT, Jena AB, Linthicum MT, Hegazi RA, Partridge JS, LaVallee C, Lakdawalla DN, Wischmeyer PE. Original Research: COPD: Effect of Hospital Use of Oral Nutritional Supplementation on Length of Stay, Hospital Cost, and

30-Day Readmissions Among Medicare Patients With COPD. *Chest* 2015;147:1477-84.

55.   Dang T, Majumdar S, Marrie T, Eurich D. Recurrent Pneumonia: A Review with Focus on Clinical Epidemiology and Modifiable Risk Factors in Elderly Patients. *Drugs & Aging* 2015;32(1):13.

56.   Singh GK, Siahpush M. Widening Rural–Urban Disparities in All-Cause Mortality and Mortality from Major Causes of Death in the USA, 1969–2009. *Journal of Urban Health* : Bulletin of the New York Academy of Medicine 2014;91(2):272-92.

57.   Cabré M, Serra-Prat M, Force L, Almirall J, Palomera E, Clavé P. Oropharyngeal Dysphagia is a Risk Factor for Readmission for Pneumonia in the Very Elderly Persons: Observational Prospective Study. *Journals of Gerontology: Series A: Biological Sciences and Medical Sciences* 2014;69(3):330-7.

58.   Andrus MR, Roth MT. Health literacy: a review. Pharmacotherapy: *The Journal of Human Pharmacology and Drug Therapy* 2002;22(3):282-302.

59.   Baker DW, Gazmararian JA, Williams MV, Scott T, Parker RM, Green D, Ren J, Peel J. Functional health literacy and the risk of hospital admission among Medicare managed care enrollees. *American Journal of Public Health* 2002;92(8):1278-83.

60.   Kripalani S, Jacobson TA, Mugalla IC, Cawthon CR, Niesner KJ, Vaccarino V. Health literacy and the quality of physician-patient communication during hospitalization. *Journal of Hospital Medicine* 2010;5(5):269-75.

61. Kollipara UK, Jaffer O, Amin A, Toto KH, Nelson LL, Schneider R, Markham D, Drazner MH. Relation of Lack of Knowledge About Dietary Sodium to Hospital Readmission in Patients With Heart Failure. *The American Journal of Cardiology* 2008;102(9):1212-5.

62. Gazmararian JA, Baker DW, Williams MV, et al. Health literacy among medicare enrollees in a managed care organization. *JAMA* 1999;281(6):545-51.

63. Joynt KE, Jha AK. A path forward on Medicare readmissions. New England Journal of Medicine 2013;368(13):1175-7 3p. doi: 10.1056/NEJMp1300122.

64. Fischer C, Lingsma HF, Marang-van de Mheen PJ, Kringos DS, Klazinga NS, Steyerberg EW. Is the readmission rate a valid quality indicator? A review of the evidence. *PloS* one 2014;9(11):e112282.

65. Lutfiyya MN, Bhat DK, Gandhi SR, Nguyen C, Weidenbacher-Hoper VL, Lipsky MS. A comparison of quality of care indicators in urban acute care hospitals and rural critical access hospitals in the United States. *International Journal for Quality in Health Care* 2007;19(3):141-9.

66. Balla U, Malnick S, Schattner A. Early Readmissions to the Department of Medicine as a Screening Tool for Monitoring Quality of Care Problems. *Medicine* 2008;87(5):294-300.

67. Horwitz LI, Moriarty JP, Chen C, et al. Quality of discharge practices and patient understanding at an academic medical center. *JAMA Internal Medicine* 2013;173(18):1715-22.

68. Artinian NT, Magnan M, Christian W, Lange MP. What do patients know about their heart failure? *Applied Nursing Research* 2002;15(4):200-8.

69. Adams CJ, Stephens K, Whiteman K, Kersteen H, Katruska J. Implementation of the Re-Engineered Discharge (RED) Toolkit to Decrease All-Cause Readmission Rates at a Rural Community Hospital. *Quality Management in Health Care* 2014;23(3):169-77 9p.

70. DeCoster V, Ehlman K, Conners C. Factors Contributing to Readmission of Seniors into Acute Care Hospitals. *Educational Gerontology* 2013;39(12):878-87.

71. Phillips CO, Wright SM, Kern DE, Singa RM, Shepperd S, Rubin HR, Phillips CO, Wright SM, Kern DE, Singa RM, et al. Comprehensive discharge planning with postdischarge support for older patients with congestive heart failure: a meta-analysis. *JAMA* 2004;291(11):1358-67.

72. Tilburgs B, Nijkamp MD, Bakker EC, van der Hoeven H. The influence of social support on patients' quality of life after an intensive care unit discharge: A cross-sectional survey. *Intensive and Critical Care Nursing* 2015;31(6):336-42.

73. Thoits PA. Social support as coping assistance. J*ournal of Consulting and Clinical Psychology* 1986;54(4):416-23.

74. DiMatteo MR. Social Support and Patient Adherence to Medical Treatment: A Meta-Analysis. *Health Psychology* 2004;23(2):207-18.

75. Chlalup Linn A, Azollin K, Nogueira de Souza E. Association between self-care and hospital readmissions of patients with heart failure. *Revista Brasileira de Enfermagem* 2016;69(3):469-74.

76. Ory MG, Ahn S, Jiang L, Lorig K, Ritter P, Laurent DD, Whitelaw N, Smith ML. National Study of Chronic Disease Self-Management: Six-Month Outcome Findings. *Journal of Aging and Health* 2013;25(7):1258-74.

77.	Harris S. Reducing 30-Day Readmissions for Chronic Obstructive Pulmonary Disease. *MEDSURG Nursing* 2016;25(6):403-22.

78.	Fitzgerald AA, Powers JD, Ho PM, Maddox TM, Peterson PN, Allen LA, Masoudi FA, Magid DJ, Havranek EP. Impact of Medication Nonadherence on Hospitalizations and Mortality in Heart Failure. *Journal of Cardiac Failure* 2011;17(8):664-9.

79.	Organization WH. Adherence to long-term therapies: evidence for action. Geneva: WHO; 2003. 2014.

80.	Lainscak M, Blue L, Clark AL, Dahlström U, Dickstein K, Ekman I, McDonagh T, McMurray JJ, Ryder M, Stewart S, et al. Self-care management of heart failure: practical recommendations from the Patient Care Committee of the Heart Failure Association of the European Society of Cardiology. *European Journal of Heart Failure* 2011;13(2):115-26.

81.	Ruppar TM, Cooper PS, Mehr DR, Delgado JM, Dunbar-Jacob JM. Medication Adherence Interventions Improve Heart Failure Mortality and Readmission Rates: Systematic Review and Meta-Analysis of Controlled Trials. *Journal Of The American Heart Association* 2016;5(6).

82.	Tappenden KA, Quatrara B, Parkhurst ML, Malone AM, Fanjiang G, Ziegler TR. Critical role of nutrition in improving quality of care: an interdisciplinary call to action to address adult hospital malnutrition. *JPEN* 2013;37(4):482-97.

83.	Benzo RP, Abascal-Bolado B, Dulohery MM. Self-management and quality of life in chronic obstructive pulmonary disease (COPD): The mediating effects of positive affect. *Patient Education and Counseling* 2016;99(4):617-23.

84. Colín Ramírez E, Castillo Martínez L, Orea Tejeda A, Rebollar González V, Narváez David R, Asensio Lafuente E. Effects of a nutritional intervention on body composition, clinical status, and quality of life in patients with heart failure. *Nutrition* 2004;20(10):890-5.

85. Casimir YE, Williams MM, Liang MY, Pitakmongkolkul S, Slyer JT. The effectiveness of patient-centered self-care education for adults with heart failure on knowledge, self-care behaviors, quality of life, and readmissions: a systematic review. JBI Database of Systematic Reviews & Implementation Reports 2014;12(2):188-262 75p. doi: 10.11124/jbisrir-2014-1438.

86. McIlvennan CK, Eapen ZJ, Allen LA. Hospital Readmissions Reduction Program. *Circulation* 2015;131(20):1796-803.

87. Hoffman J. September 8, 2015. Internet: http://www.besler.com/2016-readmissions-penalties/ 2017).

88. Zuckerman RB, Sheingold SH, Orav EJ, Ruhter J, Epstein AM. Readmissions, Observation, and the Hospital Readmissions Reduction Program. *New England Journal of Medicine* 2016;374(16):1543-51 9p.

89. Salemi JL, Salinas-Miranda AA, Wilson RE, Salihu HM. Transformative Use of an Improved All-Payer Hospital Discharge Data Infrastructure for Community-Based Participatory Research: A Sustainability Pathway. *Health Services Research* 2015;50 Suppl 1:1322-38.

90. Wallerstein N, Duran B. Community-based participatory research contributions to intervention research: the intersection of science and practice to improve health equity. *American Journal Of Public Health* 2010;100 Suppl 1:S40-S6.

91.   Services CfM. June 30,2015. Internet:

https://www.medicare.gov/hospitalcompare/readmission-reduction-program.html

(accessed February 7, 2017 2017).

92.   Administration HRaS. Version January 2017. Internet:

https://www.hrsa.gov/ruralhealth/aboutus/definition.html.

93.   Services CfMaM. Internet:

https://www.medicare.gov/hospitalcompare/profile.html -

profTab=2&ID=110135&loc=HAWKINSVILLE%2C%20GA&lat=32.2837731

&lng=-

83.4721177&name=TAYLOR%20REGIONAL%20HOSPITAL&Distn=1.7

(accessed April 10, 2017 2017).

94.   Snider JT, Jena AB, Linthicum MT, Hegazi RA, Partridge JS, LaVallee C,

Lakdawalla DN, Wischmeyer PE. Effect of Hospital Use of Oral Nutritional

Supplementation on Length of Stay, Hospital Cost, and 30-Day Readmissions

Among Medicare Patients With COPD. *CHEST* 2015;147(6):1477-84 8p.

95.   Abdel-Aziz K, Larner AJ. Six-item cognitive impairment test (6CIT): pragmatic

diagnostic accuracy study for dementia and MCI. *International Psychogeriatrics*

2015;27(6):991-7.

96.   Callahan CM, Unverzagt FW, Hui SL, Perkins AJ, Hendrie HC. Six-item screener

to identify cognitive impairment among potential subjects for clinical research.

Medical Care 2002;40(9):771-81.

97.   Casey JA, Schwartz BS, Stewart WF, Adler NE. Using electronic health records for population health research: a review of methods and applications. *Annual Review of Public Health* 2016;37:61-81.

98.   Ng T, Niti M, Tan W, Cao Z, Ong K, Eng P. Depressive symptoms and chronic obstructive pulmonary disease: Effect on mortality, hospital readmission, symptom burden, functional status, and quality of life. *Archives of Internal Medicine* 2007;167(1):60-7.

99.   Kroenke K, Strine TW, Spitzer RL, Williams JBW, Berry JT, Mokdad AH. The PHQ-8 as a measure of current depression in the general population. *Journal of Affective Disorders*;114(1):163-73.

100.   Weiss BD, Mays MZ, Martz W, Castro KM, DeWalt DA, Pignone MP, Mockbee J, Hale FA, Shah LC, West P, et al. Newest Vital Sign. Health literacy instrument in family medicine: The Newest Vital Sign ease of use and correlates 2010;23:195-203.

101.   Weiss BD, Mays MZ, Martz W, Castro KM, DeWalt DA, Pignone MP, Mockbee J, Hale FA. Quick assessment of literacy in primary care: the newest vital sign. *The Annals of Family Medicine* 2005;3(6):514-22.

102.   Shealy KM, Threatt TB. Utilization of the Newest Vital Sign (NVS) in Practice in the United States. *Health Communication* 2016;31(6):679-87 9p.

103.   Coleman EA, Mahoney E, Parry C. Assessing the Quality of Preparation for Posthospital Care from the Patient's Perspective: The Care Transitions Measure. 2005:246.

104.   Parry C, Mahoney E, Chalmers SA, Coleman EA. Assessing the Quality of
        Transitional Care: Further Applications of the Care Transitions Measure.
        2008:317.

105.   Hibbard JH, Mahoney ER, Stockard J, Tusler M. Development and Testing of a
        Short Form of the Patient Activation Measure. *Health Services Research*
        2005;40(6 Pt 1):1918-30.

106.   Bentley B, Lennie TA, Biddle M, Chung ML, Moser DK. Demonstration of
        psychometric soundness of the Dietary Sodium Restriction Questionnaire in
        patients with heart failure. Heart & Lung: *The Journal of Acute and Critical Care*
        2009;38(2):121-8.

107.   Neily JB, Toto KH, Gardner EB, Rame JE, Yancy CW, Sheffield MA, Dries DL,
        Drazner MH. Potential contributing factors to noncompliance with dietary sodium
        restriction in patients with heart failure. *American Heart Journal* 2002;143(1):29-
        33.

108.   Gupta D, Georgiopoulou VV, Kalogeropoulos AP, Dunbar SB, Reilly CM, Sands
        JM, Fonarow GC, Jessup M, Gheorghiade M, Yancy C, et al. Dietary Sodium
        Intake in Heart Failure. *Circulation* 2012;126(4):479-85.

109.   Block G, Gillespie C, Rosenbaum EH, Jenson C. A rapid food screener to assess
        fat and fruit and vegetable intake. *American Journal of Preventive Medicine*
        2000;18(4):284-8.

110.   . Internet: http://nutritionquest.com/company/ .

111.   Drewnowski A, Aggarwal A, Cook A, Stewart O, Moudon AV. Geographic
        disparities in Healthy Eating Index scores (HEI-2005 and 2010) by residential

property values: Findings from Seattle Obesity Study (SOS). *Preventive Medicine* 2016;83:46-55 10p.

112.   Guenther PM, Casavale KO, Reedy J, Kirkpatrick SI, Hiza HAB, Kuczynski KJ, Kahle LL, Krebs-Smith SM. Update of the Healthy Eating Index: HEI-2010. *Journal of the Academy of Nutrition and Dietetics* 2013;113(4):569-80.

113.   Subar AF, Thompson FE, Kipnis V, Midthune D, Hurwitz P, McNutt S, McIntosh A, Rosenfeld S. Comparative validation of the Block, Willett, and National Cancer Institute food frequency questionnaires - The eating at America's table study.

114.   Institute NC. Internet: https://dietassessmentprimer.cancer.gov/approach/table.html.

115.   Shim J-S, Oh K, Kim HC. Dietary assessment methods in epidemiologic studies. Epidemiology and Health 2014;36:e2014009.

116.   Block G, Hartman AM, Naughton D. A Reduced Dietary Questionnaire: Development and Validation. 1990:58.

117.   Coates RJ, Serdula MK, Byers T, Mokdad A, Jewell S, Leonard SB, Ritenbaugh C, Newcomb P, Maresperlman J, Chavez N, et al. A Brief, Telephone-Administered Food Frequency Questionnaire Can Be Useful for Surveillance of Dietary-Fat Intakes.

118.   Lam WY, Fresco P. Medication Adherence Measures: An Overview. *BioMed Research International* 2015;2015:217047.

119.   Paula Staley M, Stange P, Richards C. Interim Guidance for Health Risk Assessments and their Modes of Provision for Medicare Beneficiaries.

120. Pierannunzi C, Hu SS, Balluz L. A systematic review of publications assessing reliability and validity of the Behavioral Risk Factor Surveillance System (BRFSS), 2004–2011. *BMC Medical Research Methodology* 2013;13(1):49.

121. . Internet: http://www.euroqol.org/faqs/eq-5d-5l.html.

122. Jack B, Paasche-Orlow M, Mitchell S, Forsythe S, Martin J, Brach C. An overview of the Re-Engineered Discharge (RED) toolkit. Prepared by Boston University under Contract No HHSA290200600012i) Rockville, MD: Agency for Healthcare Research and Quality 2013.

123. Greenwald JL, Denham CR, Jack BW. The hospital discharge: a review of a high risk care transition with highlights of a reengineered discharge process. *Journal of Patient Safety* 2007;3(2):97-106.

124. Yardley L, Morrison L, Bradbury K, Muller I. The person-based approach to intervention development: application to digital health-related behavior change interventions. *Journal Of Medical Internet Research* 2015;17(1):e30-e.

125. Arain M, Campbell MJ, Cooper CL, Lancaster GA. What is a pilot or feasibility study? A review of current practice and editorial policy. *BMC Medical Research Methodology* 2010;10(1):67.

126. O'Cathain A, Thomas KJ. "Any other comments?" Open questions on questionnaires – a bane or a bonus to research? *BMC Medical Research Methodology* 2004;4:25-.

127. Weible R, Wallace J. Cyber research: The impact of the Internet on data collection. *Marketing Research* 1998;10(3):18-31.

128. Gilchrist VJ. Key informant interviews. Edtion ed. In: Crabtree BF, Miller WL, Crabtree BF, Miller WL, eds. Doing qualitative research. Thousand Oaks, CA, US: Sage Publications, Inc, 1992:70-89.

129. Kuzel AJ. Sampling in qualitative inquiry. Edtion ed. In: Crabtree BF, Miller WL, Crabtree BF, Miller WL, eds. Doing qualitative research. Thousand Oaks, CA, US: Sage Publications, Inc, 1992:31-44.

130. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative research in psychology 2006;3(2):77-101.

131. Charmaz K. Constructing grounded theory: Sage, 2014.

132. Koelsch LE. Reconceptualizing the Member Check Interview. International *Journal of Qualitative Methods* 2013;12(1):168.

133. Nair KM, Dolovich L, Brazil K, Raina P. It's all about relationships: A qualitative study of health researchers' perspectives of conducting interdisciplinary health research. *BMC Health Services Research* 2008;8(1):110.

134. Davis MM, Devoe M, Kansagara D, Nicolaidis C, Englander H. "Did I do as best as the system would let me?" Healthcare professional views on hospital to home care transitions. *Journal of General Internal Medicine* 2012;27(12):1649-56.

135. Spilsbury K, Petherick E, Cullum N, Nelson A, Nixon J, Mason S. The role and potential contribution of clinical research nurses to clinical trials. *Journal of Clinical Nursing* 2008;17(4):549-57.

136. Bonevski B, Randell M, Paul C, Chapman K, Twyman L, Bryant J, Brozek I, Hughes C. Reaching the hard-to-reach: a systematic review of strategies for

improving health and medical research with socially disadvantaged groups. *BMC Medical Research Methodology* 2014;14(1):42.

137. Tooze JA, Vitolins MZ, Smith SL, Arcury TA, Davis CC, Bell RA, DeVellis RF, Quandt SA. High levels of low energy reporting on 24-hour recalls and three questionnaires in an elderly low-socioeconomic status population. *The Journal of Nutrition* 2007;137(5):1286-93.

138. Vuckovic N, Ritenbaugh C, Taren DL, Tobar M. A Qualitative Study of Participants' Experiences with Dietary Assessment. *Journal of the American Dietetic Association* 2000;100:1023-8.

139. Pope C, van Royen P, Baker R. Qualitative methods in research on healthcare quality. *Quality and Safety in Health Care* 2002;11(2):148-52.

140. Greysen SR, Hoi-Cheung D, Garcia V, Kessell E, Sarkar U, Goldman L, Schneidermann M, Critchfield J, Pierluissi E, Kushel M. 'Missing Pieces'- Functional, Social, and Environmental Barriers to Recovery for Vulnerable Older Adults Transitioning from Hospital to Home. *Journal of the American Geriatrics Society* 2014;62(8):1556-61.

141. Castleden H, Morgan VS, Lamb C. "I spent the first year drinking tea": Exploring Canadian university researchers' perspectives on community-based participatory research involving Indigenous peoples.

142. Gans KM, Ross E, Barner CW, Wylie-Rosett J, McMurray J, Eaton C. REAP and WAVE: new tools to rapidly assess/discuss nutrition with patients. *The Journal of Nutrition* 2003;133(2):556S-62S.

143. Lim SL, Ong KCB, Chan YH, Loke WC, Ferguson M, Daniels L. Malnutrition and its impact on cost of hospitalization, length of stay, readmission and 3-year mortality.

144. Braun V, Clarke V. What can ''thematic analysis''offer health and wellbeing researchers? *International Journal of Qualitative Studies on Health and Well-Being* 2014;9.

145. Fern EF. The Use of Focus Groups for Idea Generation: The Effects of Group Size, Acquaintanceship, and Moderator on Response Quantity and Quality. *Journal of Marketing Research* 1982;19(1):1-13.

146. Boyatzis RE. Transforming qualitative information: Thematic analysis and code development. Thousand Oaks, CA, US: Sage Publications, Inc, 1998.

Archway Partnership Project Questionnaires

Demographic data

1. What is your age?

    [1] ☐ 18-30 years

    [2] ☐ 31-50 years

    [3] ☐ 51-70 years

    [4] ☐ 71-above years

2. In general, how would you rate your overall health?

    [1] ☐ Excellent

    [2] ☐ Very good

    [3] ☐ Good

    [4] ☐ Fair

    [5] ☐ Poor

3. What is the highest grade or level of school that you have completed?

    [1] ☐ Some elementary or high school but did not graduate

    [2] ☐ High school graduate or GED

    [3] ☐ Some college or 2-year degree

    [4] ☐ 4-year college graduate

4. Are you of Spanish, Hispanic, or Latino origin or descent?

    [1] ☐ No, not Spanish/Hispanic/Latino

    [2] ☐ Yes

5. How would you describe your race? Please choose one or more.

    [1] ☐ White

[2]☐ Black or African American

[3]☐ Asian

[4]☐ Native Hawaiian or Other Pacific Islander

[5]☐ American Indian or Alaska Native

6. What language do you mainly speak at home?
   [1]☐ English

   [2]☐ Spanish

   [3]☐ Some other language (please print): _____

Admission Abstraction Form

	Yes	No	Not known	N/A
Did the patient have acute coronary syndrome on admission				
Did the patient have CHF on admission				
Did the patient have community acquired pneumonia				
Did the patient have COPD				
Did the patient have asthma				
Pamphlet or additional patient information provided?				
Do the d/c instructions include recommendations for activity?				
Do the d/c instructions include clear recommendations for diet? (mark **no** if reads only "cardiac diet," "ADA diet," "renal diet" without explanation)				
Is there a medication list in the discharge instructions?				
General comment, "Please stop taking any other medications not listed here."				
Do the discharge instructions include smoking cessation guidance or medications?				
Do the d/c instructions include specific "call your doctor for" signs/symptoms? (check "no" if statement is generic, i.e. "Call your doctor if				

symptoms get worse")				
Is there a specific doctor and/or phone number to call with problems listed anywhere in the d/c instructions? (include f/u appointments)				
CHF only				
• Do these warning signs include weight gain?				
• Do these warning signs include orthopnea/PND/DOE/pedal edema?				
• Do these warning signs include chest pain, palpitations?				
CAP only				
• Do these warning signs include fever/chills/sweats?				
• Do these warning signs include dyspnea, productive cough?				
Name and contact information of discharging physician included?				
Who authored the discharge instructions?				
• Registered Nurse				
• Physician Assistant/APRN				
• Physician				
• Case Manager / Social Worker / Discharge Planner				
Who discussed the discharge instructions?				
• Registered Nurse				
• Physician Assistant/APRN				
• Physician				
• Case Manager / Social Worker / Discharge Planner				

Discharge Practices and patient understanding / Post-discharge medication and medical access

Comprehension of discharge instruction assessment questionnaires

Discharge instruction domains	D/C instruction			Response		Comprehension
	Yes	No	N/A	Yes	No	
Medication						
1. Were you prescribed any new medications at discharge?						
2. Were you told to continue taking medications they had been taking prior to hospitalization?						
3. Have you filled your prescription?	N/A	N/A				
Follow-up appointment						
4. Were you told to schedule a follow-up appointment post-hospital discharge?						
5. Did the hospital schedule a follow-up appointment for you?						
6. Have you made any medical follow-up appointment?	N/A	N/A				
Diet						
7. Were you told to follow a specific diet at hospital discharge? (examples of recommended diets are diabetic, heart healthy, low salt, or low fat diet)						
Exercise/ activity						
8. Were you told to engage in any physical activity at hospital discharge? (examples of recommended diets are physical therapy and walking)						
Smoking						
9. Were you told to quit smoking?						

FOR HEART FAILURE PATIENTS ONLY

Understanding discharge instructions in patient with heart failure survey

1. Circle the one sentence that you think is true about exercise and your heart.
   a) Exercise may be harmful for my heart and I should wait before starting.
   b) Exercising 30 minutes five times per week is beneficial or good for my heart.
   c) I should exercise as much as I can tolerate.
   d) Exercise will have no effect on my heart.
   e) I do not know how exercise will affect my heart.

2. Circle the one sentence that you think is the most important advice to follow about your diet.

a) I should eat plenty of fruits and vegetables.
a) I should limit how much fat I eat.
b) I should limit how much salt I eat and water I drink.
c) I should drink more water.
d) I do not know the most important advice to follow about my diet.

3. When should you check your weight? Circle one answer.
   a) Every day at home
   b) Every week at home
   c) Every month at home
   d) Whenever I go to the doctor
   e) Never
   f) I do not know how often my weight should be checked.

4. What should you do if your symptoms return or get worse? Circle one answer.
   a) Wait a few days and see if I feel better
   b) Stop taking my medications
   c) Call my doctor or 911
   d) I do not know what to do if my symptoms return or get worse.

5. Understanding of discharge medications
   Please list all of the medicines you will take after leaving the hospital

	Name of medicine	Dosage (mg)	How many times per day?
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

6. *When and where are your follow up appointments?*
   List all of your schedule appointments.

Name of doctor or clinic	Date	Time	Location

Scoring the Understanding discharge instructions in patient with heart failure survey

1. For the exercise question patients received a point if they correctly identified that exercising for 30 minutes five times per week is beneficial for their heart or if they identified that they should wait before exercising (for patients who had recently had a myocardial infarction or a major procedure performed, such as catheterization with stenting or coronary artery bypass graft). Patients also received a point for the exercise question if they matched alternate instructions given on their discharge papers, such as that they should exercise as much as tolerated.

2. For the diet question, patients received a point if they identified that they should follow a low-salt diet or they were able to match alternate dietary advice (e.g., eating fruits and vegetables) provided on the discharge summary.

3. For the question about weight, patients received a point if they chose that they should check their weight daily.

4. For the question regarding responses to worsening symptoms, patients received a point for responding that they would call their doctor or 911 in the case of worsening symptoms.

5. For the question about follow-up appointments, patients scored a point if they were able to correctly list all of the names of the doctors or clinics at which they had follow-up visits scheduled.

6. For the medications question, patients scored a point if they were able to correctly list all of the medicines they would be taking after they left the hospital.

7. For all of these questions, patients' actual discharge summaries and discharge medication lists were accessed and used to score each item. All decisions about how the instrument would be scored were made before the investigators began the study.

Cognitive screening (Six-Item screener)

1. **CALLER**: I would like to ask you some questions that use your memory. I am going to name three objects. Please wait until I say all three words, and then repeat them. Remember what the three objects are because I am going to ask you to name them again in a few minutes. Please repeat these words for me: APPLE – TABLE - PENNY. (Interviewer may repeat names 3 times if necessary but repetition not scored.)

Did patient correctly repeat all three words?   □ **Yes**   □ **No**

	Correct	Incorrect
What year is this?	1	0
What month is this?	1	0
What is the day of the week?	1	0

CALLER: How often does someone have to help you when you read instruction, pamphlets, or others written material from your doctor or pharmacy? I will read your choices.

    □ 1-Never   □ 2-Rarely   □ 3-Sometimes   □ 4-Often   □ 5-Always

What were the three objects I ask you to remember?	Correct	Incorrect
1) Apple	*1*	*0*
2) Table	*1*	*0*
3) Penny	*1*	*0*
SCORE:		

If scores 4 or more correct responses to the Six-item screeners, continue with the script.

<center>□ PASS   □ FAIL</center>

If the <u>patient</u> scores less than 4 correct answers on the survey, thank them for their time and ask if you may speak with the patient's caregiver. When speaking with the patient's caregiver, inquire as to whether the patient has known issues with cognition that are being followed by their doctor. If not, suggest that they bring this issue to their doctor's attention at their next visit. If the patient does not have a physician that they follow with, suggest clinics in their immediate area where they may receive medical care.

If the **<u>caregiver</u> scores less than 4 correct answers on the survey**, thank them for their time. Inquire as to whether the caregiver has known issues with cognition that are being followed by their doctor. If not, suggest that they bring this issue to their doctor's attention at their next visit. If the patient does not have a physician that they

follow with, suggest clinics in their immediate area where they may receive medical care.

Health literacy (The Newest Vital Sign)

We are asking our patients to help us learn how well patients can understand the medical information that doctors give them. Would you willing to help us by looking at some health information and then answering a few questions about that information? Your answers will help our doctors learn how to provide medical information in ways that patients will understand. It will only take about 3 minutes.

READ TO SUBJECT: This information is on the back of a container of a pint of ice cream.

	ANSWER CORRECT?	
	Yes	**No**
1. If you eat the entire container, how many calories will you eat? **Answer:** 1,000 is the only correct answer		
2. If you are allowed to eat 60 grams of carbohydrates as a snack, how much icecream could you have? ***Answer:*** *Any of the following is correct: 1 cup (or any amount up to 1 cup),half the container. Note: If patient answers "two servings," ask "How much icecream would that be if you were to measure it into a bowl?"*		
3. Your doctor advises you to reduce the amount of saturated fat in your diet.You usually have 42 g of saturated fat each day, which includes one serving ofice cream. If you stop eating ice cream, how many grams of saturated fat wouldyou be consuming each day? ***Answer:*** *33 is the only correct answer*		
4. If you usually eat 2,500 calories in a day, what percentage of your daily valueof calories will you be eating if you eat		

one serving? *Answer: 10% is the only correct answer*		
READ TO SUBJECT: Pretend that you are allergic to the following substances: penicillin, peanuts, latex gloves, and bee stings.		
5. Is it safe for you to eat this ice cream? *Answer: No*		
6. (Ask only if the patient responds "no" to question 5): Why not? *Answer: Because it has peanut oil.*		
Numbers of correct answers		

Instructions:

Start Asking the 6 questions, one by one, giving the patient as much time as needed to refer to the nutrition label to answer the questions.

There is no maximum time allowed to answer the questions. The average time needed to complete all 6 questions is about 3 minutes. However, if a patient is still struggling with the first or second question after 2 or 3 minutes, the likelihood is that the patient has limited literacy and you can stop the assessment.

Ask the questions in sequence. Continue even if the patient gets the first few questions wrong. However, **if question 5 is answered incorrectly, do not ask question 6.**

You can stop asking questions if a patient gets the first four correct. With four correct responses, the patient almost certainly has adequate literacy.

Do not prompt patients who are unable to answer a question. Prompting may jeopardize the accuracy of the test. Just say, "Well, then let's go on to the next question."

Do not show the score sheet to patients. If they ask to see it, tell them that "I can't show it to you because it contains the answers, and showing you the answers spoils the whole point of asking you the questions."

Do not tell patients if they have answered correctly or incorrectly. If patients ask, say something like: "I can't show you the answers till you are finished, but for now you are doing fine. Now let's go on to the next question."

Interpretation
Score of 0-1 suggests high likelihood (50% or more) of limited literacy.
Score of 2-3 indicates the possibility of limited literacy.
Score of 4-6 almost always indicates adequate literacy.

Nutrition Facts

Serving Size   ½ cup

Servings per container   4

Amount per serving

Calories	250	Fat Cal	120

	%DV
Total Fat 13g	20%
Sat Fat 9g	40%
Cholesterol 28mg	12%
Sodium 55mg	2%
Total Carbohydrate 30g	12%
Dietary Fiber 2g	
Sugars 23g	
Protein 4g	8%

*Percentage Daily Values (DV) are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Ingredients: Cream, Skim Milk, Liquid Sugar, Water, Egg Yolks, Brown Sugar, Milkfat, Peanut Oil, Sugar, Butter, Salt, Carrageenan, Vanilla Extract.

Patient Activation

The Patient Activation Measure, 13-item

Below are some statements that people sometimes make when they talk about their health. Please indicate how much you agree or disagree with each statement as it applies to you personally by circling your answer. Your answers should be what are true for you and not just what you think the doctor wants you to say.

	Strongly disagree	disagree	agree	Strongly agree	N/A
1. When all is said and done, I am the person who is responsible for taking care of mu health.					
2. Taking an active role in my own health care is the most important thing that affects my health.					
3. I am confident I can help prevent or reduce problems associated with my health.					
4. I know what each of my prescribed medications do.					
5. I am confident that I can tell whether I need to go to the doctor or whether I can take care of a health problem myself.					
6. I am confident that I can tell a doctor concerns I have even when he or she does not ask.					
7. I am confident that I can follow through on medical treatments I may need to do at home.					
8. I understand my health problems and what causes them.					
9. I know what treatments are available for my health problems.					
10. I have been able to maintain (keep up with) lifestyle changes, like eating right or exercising.					
11. I know how to prevent problems with my health.					
12. I am confident I can figure out solutions when new problems arise with my health.					
13. I am confident that I can maintain lifestyle changes, like eating right and exercising, even during times of stress.					

EQ-5D-3L^{TM}

By placing a check in one box in each group below, please indicate which statements best

describe your own health state today

1. Mobility

    ¹☐   I have no problems in walking about

    ²☐   I have some problems in walking about

    ³☐   I am confined to bed

2. Self-Care

    ¹☐   I have no problems with self-care

    ²☐   I have some problems washing or dressing myself

    ³☐   I am unable to wash or dress myself

3. Usual Activities (e.g. work, study, housework, family or leisure activities)

    ¹☐   I have no problems with performing my usual activities

    ²☐   I have some problems with performing my usual activities

    ³☐   I am unable to perform my usual activities

4. Pain/Discomfort

    ¹☐   I have no pain or discomfort

    ²☐   I have moderate pain or discomfort

    ³☐   I have extreme pain or discomfort

5. Anxiety/Depression

    ¹☐   I am not anxious or depressed

    ²☐   I am moderately anxious or depressed

$^3\square$ I am extremely anxious or depressed

6. To help people say how good or bad a health state is we have drawn a scale (rather like a thermometer) on which the best state you can imagine is marked 100 and the worst state you can imagine is marked 0.

   We would like to indicate on this scale how good or bad your own health is today, in your opinion. Please do this by drawing a line from the circle at the bottom of thermometer below to whichever point on the thermometer indicates how good or bad your own health is today.
   Score (0-100): _____   0 --

------------------------100

Health Care Utilization

Survey is administered to patients beginning 30 days after the date of index hospital discharge.
All questions and all answer categories must be read exactly as they are worded.
No changes are permitted to the order of the answer categories.
All transitional statements must be read.

Index admission date: ___ ___ /___ ___ /___ ___ ___ ___

Index discharge date: ___ ___ /___ ___ /___ ___ ___ ___

Date initial call attempt: ___ ___ /___ ___ /___ ___ ___ ___

Caller records the call attempts and time talking with patient:

#1: Date(mo/day/yr): ____ /____ /____ Time of day ___:___ action taken/time with subject: _____

_____

#2: Date(mo/day/yr): ____ /____ /____ Time of day ___:___ action taken/time with subject: _____

_____

#3: Date(mo/day/yr): ____ /____ /____ Time of day ___:___ action taken/time with subject: _____

_____

#4: Date(mo/day/yr): ____ /____ /____ Time of day ___:___ action taken/time with subject: _____

_____

#5: Date(mo/day/yr): ____ /____ /____ Time of day ___:___ action taken/time with subject: _____

_____

#6: Date(mo/day/yr): ____ /____ /____ Time of day ___:___ action taken/time with subject: _____

_____

#7: Date(mo/day/yr): ____ /____ /____ Time of day ___:___ action taken/time with subject: _____

_____

#8: Date(mo/day/yr): ____ /____ /____ Time of day ___:___ action taken/time with subject: _____

_____

HOSPITAL USE

1. Have you stayed in a hospital overnight since you left the hospital on (discharge date)? This means being admitted to a hospital floor (not just the emergency room).

    [1]☐ Yes [2]☐ No

If YES, please fill out the table below for each hospital visit. Ask for the hospital, date of

arrival, and reason for each hospitalization.

Hospital	Date You Arrived	Reason
1.		
2.		
3.		
4.		
5.		

2. Have you been to the emergency room since you left the hospital on (discharge date)? These would be emergency room visits that did not cause you to be admitted to the hospital (so you stayed in the emergency room the entire time and went home from the emergency room).

    [1]☐ Yes [2]☐ No

If YES, please fill out the table below for each emergency room visit. Ask for the

hospital, date of arrival, and reason for each visit.

Hospital	Date You Arrived	Reason
1.		
2.		

84

3.		
4.		
5.		

APPOINTMENTS

These next questions are about any appointments you had after you left the hospital on

(discharge date).

3. Do you have a particular doctor's office, clinic, health center, or other place that you usually go if you are sick or need advice about your health?

   ¹☐ Yes ²☐ No

4. Since you left the hospital on (discharge date), have you seen your medical provider, sometimes called a primary care provider (or someone in their office)?

   ¹☐ Yes ²☐ No

   If YES, What date did you see this person? _____

Social Support

How often is each of the following types of support available to you if you need it?

	None of the time	A little of the time	Some of the time	Most of the time	All of the time
	1	2	3	4	5
1. Someone to help with daily chores if you were sick					
2. Someone to turn to for suggestions about how to deal with a personal problem					
3. Someone to do something enjoyable with					
4. Someone to love and make you feel wanted					

Dietary Sodium Restriction Questionnaire

1. Were you prescribed a low-salt diet by your health care provider?
   _____Yes; if yes, continue with question 2
   _____No; if no,
2. How closely do you follow your prescribed low-salt diet?

   [1]☐ Never

   [2]☐ Sometimes

   [3]☐ Most times

   [4]☐ Always

3. How easy is it to follow your prescribed law-salt diet?

   [1]☐ Very hard

   [2]☐ Hard

   [3]☐ Easy

   [4]☐ Very easy

4. Has following this diet helped you manage your health condition?

   [1]☐ Not at all

   [2]☐ Slightly

   [3]☐ A lot