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Monitoring Congestive Heart Failure Across the Healthcare Continuum

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MONITORING CONGESTIVE HEART FAILURE ACROSS THE HEALTHCARE

CONTINUUM

by

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Abstract

Congestive heart failure is a chronic condition where the heart no longer pumps adequate blood and oxygen to bodily organs. CHF is a chronic condition that affects millions of people on a yearly basis. Common diseases that cause CHF are coronary artery disease, high blood pressure, and diabetes. CHF patients face many compilations that affect their daily activities. Along with morbidity CHF has major financial implications because much of the cost associated with CHF healthcare is avoidable. The purpose of this study is to evaluate the effects of monitoring congestive heart failure across the healthcare continuum with application to the Corbin and Strauss trajectory model of chronic illness. The research hypothesis is that monitoring CHF across the healthcare continuum effects CHF readmission rates.

This study was conducted at a large medical university hospital. The sample size includes a random selection of 100 consecutive CHF admission occurrences. Retrospective data was reviewed using a chart audit tool. Data included in the review were admission dates, discharge dates, readmission dates if applicable, disposition and, financial class. Data analysis for the study was done by using a chi-squared test. The dependent variables in the study were readmission in 30 days or less compared to no readmission in 30 days or less. The null hypothesis for the chi-squared test is there is no relationship between readmissions and care across the continuum. The study failed to reject H_0 at 5% of level of significance.

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Introduction

Statement of Problem

Congestive heart failure (CHF) is a chronic, debilitating condition that affects millions of people annually. CHF occurs when the heart can no longer pump an adequate supply of blood and oxygen to support other bodily organs. Coronary artery disease, high blood pressure, and diabetes are common causes of CHF. Individuals with CHF face many complications such as difficulty breathing, interference with daily activities, and weight gain related to swelling (American Heart Association AHA, 2011).

CHF has become an increasing epidemic because individuals with cardiac conditions are living longer due to improvements in therapeutic innovations (AHA, 2011). There are about 5.8 million people in the United Sates who have CHF. On average 670,000 people are being diagnosed with the condition every year. Although individuals with CHF are living longer; about one and every five people with CHF die within one year from the diagnosis of the condition. CHF contributed to 282,754 deaths in the year 2010 (Colucci, 2011).

Current research suggests that CHF patients are facing a shorter length of stay with higher readmission rates. According to Colucci (2011), the CHF patient has the highest risk of death one month after being discharged from the hospital. About one quarter of those hospitalized with CHF are readmitted with thirty days (Colucci, 2011).

In addition to the mortality of CHF there are financial implications of the disease. Colucci (2011) states the cost of CHF adds up to over 39 billion dollars in health care, pharmaceuticals, and loss of productivity. Much of the cost associated with CHF

healthcare is avoidable. Medicare beneficiaries make up the bulk of those treated with CHF. According to Medicare reports approximately 18% of Medicare beneficences are readmitted within 30 days of discharge resulting in over $12 million dollars of avoidable healthcare cost (Brock, 2008).

The Centers for Disease Control and Prevention (CDC) reports that there is no current cure for CHF, research suggest that managing and monitoring the disease across the health care continuum will decrease mortality, morbidity, and hospital readmissions (CDC, 2010). Individuals with CHF need careful monitor of symptoms and conditions in both the outpatient and inpatient setting.

Purpose

The purpose of this study is to evaluate the effects of monitoring congestive heart failure across the healthcare continuum on readmission rates of 30 days or less utilizing the Corbin and Strauss trajectory model of chronic illness.

Background

Disease process.

Heart Failure (HF) occurs when the pumping action of the heart malfunctions. According to AHA (2011), HF is the result of diseases of the heart value or muscles, infection of the heart of muscle, congenital heart defects, hypertension, blocked arteries, and/or previously damaged heart muscles.

There are different classes, stages and, types of heart failure dependent upon the symptoms and complications of the effected individual. Systolic HF occurs when the lower chambers of the heart are unable to supply enough blood to supply the body's needs. Diastolic heart failure is the result of the heart not being able to take its necessary

rest between beats resulting in blood refluxing in the upper champers and vessels of the heart (Torpy, 2009).

The result of both diastolic and systolic HF is fluid build up or edema in the lungs, legs, and other parts of the body. The excess fluid causes the heart to compensate by becoming hypertrophic, thickening of muscle walls, or through dilation of the chambers. Complications resulting from the heart's remodeling are weakness, fatigue, palpations, shortness of breath, neck vein distention, and swelling in the abdomen and lower extremities (Torpy, 2009).

The American Heart Association's New York Heart Association Functional (NYHA) Classification is the most commonly used model for classifying heart failure. The NYHA has two categories for classification: functional assessment and objective assessment (see Table 1).

Table 1

American Heart Association's New York Heart Association Functional (NYHA)

Classification

Class	Functional Capacity: How the cardiac disease patient feels w/ physical activity
I	Individual has cardiac disease but no limits in physical activity.
II	Individual has cardiac disease with slight limits on physical activity. Individual comfortable when at rest.
III	Individual has cardiac disease with noticeable limits on physical activity. Individual comfortable when at rest. Activity that is less than ordinary causes fatigue, shortness of breath, chest pain, or palpitations.
IV	Individuals with cardiac disease are unable to carry out physical activity without discomfort. Chest pain and other symptoms may be present at rest. Discomfort increases with physical activity.

Class	Objective Assessment
A	No objective signs of cardiovascular diseases noted. Individual has no symptoms and no limitation on physical activity.
B	Minimal objective evidence of disease. Individual has mild symptoms with slight limits on ordinary activity. Comfortable at rest.
C	Moderately severe evidence of cardiovascular disease noted. Obvious limits of activity. Individual comfortable at rest.
D	Severe objective evidence of cardiovascular disease. Individual has severe limitation with presence of symptoms at rest.

Note. Adapted from the American Heart Association. 2011

Complications from HF have major effects on an individual's quality of life. The
end stage of HF results when the healthcare team has exhausted all resources in managing
the disease or the individual refuses to comply or accept treatment. The result of not
being able to treat HF is death. The two main causes of death in heart failure patients are
sudden cardiac death and progressive pump failure (Colucci, 2011).

Treatment.

The National Guideline Clearinghouse (NGC) is an initiative of United States
Department of Health and Human Services' (DHHS) Agency for Healthcare Research
and Quality. The objectives of NGC are to define practices to meet the needs of the
majority of patient populations and to aid healthcare providers in decision making by
detailing a list of acceptable treatment options for prevention, diagnosis, and management
of diseases such as HF.

As with every health process diagnosis begins with assessment. When diagnosing
the HF patient it is imperative for providers to obtain a health history, height, weight,
body mass index, use of drugs/alcohol and, orthostatic blood pressures. Subjective matter

to include in the assessment is information regarding the individual's ability to perform activities of daily living including any limitations. (NGC, 2009).

Other necessary clinical indicators for HF will be shown on a 12-lead electrocardiography which shows the heart's rhythm by analyzing its electrical signals. X-rays are commonly used to show the front and the side chest. Another radiography test is the echocardiogram (ECHO). When an ECHO is coupled with doppler flow studies the test will provide a moving visual of the heart's beat and blood flow while providing images of the heart's structure and valves. In certain populations it may be necessary to conduct sleep studies to determine if the patient is experiencing sleep disturbed breathing. (NGC, 2009).

More comprehensive studies to diagnosis HF include a stress test and/or cardiac catherization. For a stress test individuals experience the effect of stress on the heart by either exercising on a treadmill or through medicine induced stress. A stress test allows providers to see if the heart is getting enough blood and oxygen during exercise or stressed activities. Coronary arteriography is an invasive type of x-ray that shows blockages and plaque build up in the coronary arteries. If indicated other test will include Holter monitoring which records an individual's cardiac rhythm for 24 hours on a portable monitor, biopsy of cardiac tissue and / or, rheumatologic disease workup. (NGC, 2009).

Analyzing lab work is a crucial component of the HF diagnosis process. A complete blood count is usually the initial lab draw. The NGC (2009) recommends another key lab which is a B-type natriuretic peptide, brain natriuretic peptide, or simply BNP. BNP is a hormone secreted by the brain that typically rises when a patient has HF.

BNP levels are linked with HF severity, often concluding a poorer prognosis in those with higher levels of BNP (Association for Clinical Chemistry, 2011).

Although HF has no cure individuals with HF have options to manage their condition. One of the most critical things the healthcare team can do is to educate patients on HF and therapeutic compliance. The NGC (2009) recommends that individuals receive counseling on abstaining from smoking, drinking, and drugs. The NGC (2009) also recommends exercise in HF patients to promote quality of life. AHA's Get with the Guidelines -Heart Failure is a collaborative quality improvement measure that's has demonstrated an increased adherence to evidence based care in patients hospitalized with HF (AHA, 2011). Get with the Guidelines measures supported by this research study include discharged calls, follow-up scheduled appointment, and disease management referral (AHA, 2011).

When treating HF the NGC (2009) recommends ten different methods of pharmacological managements. Due to the increased body fluid diuretics commonly called "water pills" are the most widely used drug classification for treating HF. Diuretics work by helping the body excrete excess water and sodium. Vasodilators are medications that work by relaxing blood vessel to lower blood pressure. Because HF effects the pumping action of the heart, drugs such as digoxin are commonly used to help the heart beat more efficiently (AHA, 2011).

Other types of medications treat HF by blocking hormones in the body. Angiotensin converting enzyme (ACE) inhibitors blocks hormones so that the heart works less with the intent of preventing disease progression. Beta-adrenergic blockers lower blood pressure and slow heart rate creating less stress on the heart. Angiotensin

receptor blockers ARBs are prescribed to lower blood pressure which is less stress on the pumping action of the heart. Aldosterone antagonists works by lowering volume through excreting salt and water from the body. The combination of hydralazine and nitrates is a medical regimen that relaxes blood vessels to decrease work load. Inotropes are another class of medication and are given intravenously or directly into the blood stream to help the heart beat more purposefully. Infusion of positive inotropic drugs is recommended in the end stages of HF to improve heart functions by allow the heart to beat more purposefully. (Torpy, 2009).

Other treatment options for HF incorporate surgical interventions. When necessary the NGC (2009) recommends coronary revascularization by placing stents in blocked arteries, implantable defibrillators or resynchronization pacemakers, open heart surgery, or heart transplant if necessary. According to the American Heart Association (2011), surgery is not frequently used to treat HF unless the patient has an identifiable problem that can be corrected with intervention.

Management.

Managing HF is a complex process that requires strict conformity and compliance to medical regimes. It is recommended by the AHA (2011) and the America College of Cardiology to have multidisciplinary disease management programs in high risk HF patients. Observational research studies have shown healthcare provider directed disease management programs increase the long term prognosis of HF patients.

Patients with all types of chronic illnesses should be enrolled in a disease maintenance program. The Heart Failure Society of America, HFSA (Lindenfeld et al., 2010) recommends multidisciplinary HF disease management programs in high risk

patients. The HFSA (Lindenfeld et al., 2010) defines high risk patients as those with diabetes, low urine output, renal insufficiency, chronic obstructive pulmonary disease, persistent NYHA class III or IV symptoms, frequent hospitalizations, multiple comorbidities, depression or cognitive impairment, inadequate social support, poor health literacy, and/or persistent noncompliance with medical regimes.

Patients with HF are to assume a self management role while in the recovery phase of the disease process. In regards to self management individuals face many questions. While in the hospital patients may clearly understand discharge education. Discharge instructions may soon be forgotten when an individual gets home. As concluded by Horwitz and Krumholz (2011) patients may not understand instruction, signs of worsening, or even who to call with questions. Horwitz and Krumholz (2011) further emphasizes that the lack of coordination between patients and providers lead to poor outcomes, additional costly expenditures, and need for more health care services.

With disease management programs individuals have support across the continuum to aid in the maintenance and recovery of a chronic condition. In regards to disease management, Horwitz and Krumholz (2011) states such programs allow for an integrated multidisciplinary approach for caring for chronic illnesses. Their research by also supports the use of disease management programs, stating care plans provide education, support, and coordination among care and treatment of chronically ill individuals.

Social Significance

There are significant social implications regarding HF due to the vast number of Americans at risk for developing the disease. Results from the 2010 Census Bureau (Howden & Meyer, 2011) indicate that the number of older individuals grew at a greater

rate than younger ages. Howden and Meyer (2011) further state that there are 40.3

million persons over the age of 65 living in the United States. The CDC (2010) states HF

is the leading cause of hospitalization among individuals over the age of 65.

With over 47 million Medicare beneficiaries it is essential that HF patients get

adequate care across the continuum. According to a report released in April 2009, the

Medicare Payment Advisory Commission, stated Medicare was in charge of paying for

all admissions based on the diagnosis regardless of whether it is an initial or readmission

related to the initial diagnosis (Hackbarth, 2009).

Brock (2008) considers HF to be one of the most costly conditions of hospital

readmissions. According to Brock (2008) 18% of Medicare patients are readmitted within

30 days of discharge with 13% of those readmissions being avoidable. The financial

consequences of these avoidable Medicare readmissions are $12 billion. Brock (2008)

makes further added that readmissions are an intersection of quality, cost and, patient

safety.

Due to the congress mandated prospective payment system hospitals are

reimbursed on a perspective payment system. The system provides a flat rate per ace for

inpatient services. This payment system rewards efficient hospitals while providing lower

performing hospitals an incentive to become more efficient (Gottlober, 2001). Starting in

October of 2012 the current system will use an adjustment factor to reduce

reimbursement on preventable readmission (Federal Register, 2011).

In addition to the financial implications of readmission it is important to consider

the inadequate care HF patients are receiving. According to Brock (2008), patients

readmitted within 30 days of discharge are a probable marker for poor quality of care and wasteful spending.

Conceptual Framework

The purposed research study was applied to the Corbin and Strauss trajectory model for chronic illness. The Trajectory framework is derived from grounded theory. Grounded theory is designed to discover occurrences and their characteristics. The theory further discovers and uncovers conditions that effect occurrences. Grounded theory draws out a range of possible outcomes that may occur when actions occur or fail to occur. The goal of this study is to determine if monitoring HF with outpatient services will affect the occurrence of patients being readmitted to the hospital in thirty days or less. Validity of the Corbin and Strauss model is evident in the fact that research was conducted in a variety of conditions, illnesses, and settings (Woog, 1992).

Concepts of the trajectory model denote the course of an illness with the combined efforts of the patient, family and, healthcare team. The model further shapes the disease process to determine outcomes, managing symptoms, and handling disability (see Table 2). Lastly the model states diseases have a course of action that cannot always be predicted (Woog, 1992).

Table 2

Corbin and Strauss Chronic Illness Trajectory Framework

Major concepts	
Trajectory	Collaborative efforts of patient, family, healthcare team to shape disease course
Trajectory phasing	Changes/ phases in the course of a chronic illness
Trajectory projection	Individualized vision of illness course
Trajectory scheme	Plan to shape, control, and hand disability of an illness

Note. Adapted from *The Chronic Illness Trajectory Framework: the Corbin and Strauss Nursing Model,* by P. Woog, p. 16. Copyright 1992 by Springer Publishing Company.

The model further concludes chronic illnesses have a course that can be shaped through disease management. Most of the disease management occurs outside the hospital. Healthcare providers must be able to adapt treatments to an individual's lifestyle. Providing patients with care in their own home environment allows providers to see limitation faced by the patient (Woog, 1992).

Theoretical Assumptions

The purpose study shares the same theoretical assumptions of the Corbin and Strauss model. The trajectory model concluded there were eight phases in the process of the chronic illness. The proposed study supports the trajectory model but considers cycling and repeating of phases outlined in the Corbin and Strauss model. Table 3 applies HF to the phases in the trajectory model. Figure 1 was formulated to show the conceptual framework behind the HF disease process.
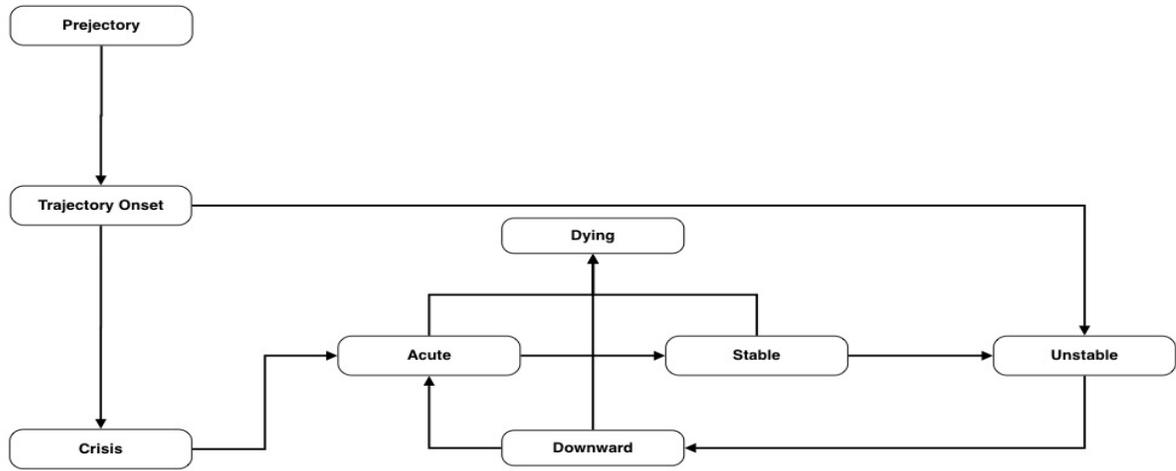
Table 3

Trajectory Model Applied to Heart Failure

Phases	Definition	Application to study
Pretrajectory	Asymptomatic phase prior to course of illness onset. Progression and preventive phase	Disease begins to progress in Individuals with HF risk failures such as CAD, DM, valve disease, HTN, and other morbidities
Trajectory onset	Diagnostic phase where signs and symptoms began to appear	Individuals present to clinic or providers with unexplained weight gain, SOB, and activity intolerance
Crisis	Life threatening	Symptoms requiring emergency treatment from ER or CHF observation unit
Acute	Active illness requiring need for hospitalization	Conditions not controlled in ER requiring
Stable	Current medical regime is controlling disease process	Stabilized HF individual can be discharged on current regime
Unstable	Period where disease requires invention but not hospitalization	Interventions provided from discharge calls, home health nurse, provider at CHF clinic
Downward	Continued deterioration and disease progression	Patient requiring hospital readmission
Dying	Immediate time preceding death	Referral to hospice. Possible mortality.

Note. Adapted from *The Chronic Illness Trajectory Framework: the Corbin and Strauss Nursing Model,* by P. Woog, p. 17. Copyright 1992 by Springer Publishing Company.

Figure1

Conceptual Framework of Heart Failure Disease Process

Research Hypothesis

Ancheta (2006) states that most studies on HF use a retrospective analysis or predictive model. Issues with retrospective models are different demographics, compliance levels and, utilization of new therapies. Patients who present with HF have acute onset of complications that need to be addressed immediately. When an intervention is unsuccessful providers can look back to see what course of action should be utilized next. Looking back on the success of interventions can be done on an individual or hospital wide basis. This retrospective research can be used to aid improvements in managing across the continuum in future HF populations. The research hypothesis is that monitoring CHF across the healthcare continuum effects CHF readmission rates.

Chapter 2

Literature Review

Two electronic databases where utilized to search the literature including PubMED and CINAHL. The following key words were utilized to search the literature: congestive heart failure, CHF, heart failure, retrospective, and trajectory. A total of 15 research studies applicable to the subject of this study were chosen for the literature review; these included studies related to tele-monitoring, outpatient studies, end of life care studies, psychosocial implications, and chart audit studies.

Tele-monitoring Research

In regards to monitoring HF across the healthcare continuum tele-monitoring is one of the most crucial and important areas to research. Tele-monitoring allows healthcare providers to gain diagnostic information without the patient ever leaving their home. When a patient is at risk for hospitalization or has worsening symptoms the provider can intervene in an adequate amount of time.

Research by Gambetta et al. (2007) indicates that tele-monitoing is an important part of managing HF. The purpose of the study was to present an investigation to determine the impact of telemarketing on HF management process. The study was a quantitative design that compared baseline characteristics between patients that utilized telemarketing alone as opposed to tele-monitoring and the support of a HF clinic. The sample was 282 patients who had NYHA class III or IV HF. Inclusion criteria were patients hospitalized twice within the past year with a diagnosis of HF. Data collection was done through assessment. Assessments were completed by cardiologist, an advanced practice nurse and, the HF nurse team. Study participants were assessed every 1-2 weeks.

Participants in the tele-monitoring group were given a welcome packet with telephone numbers and instructions. Subjects also received a scale with a digital display. Information was stored and analyzed using automatic decision support tools. Alerts were set for absolute values and would report signs or symptoms. Abnormal scores were identified by HF nurses who were able to provide intervention to that patient. Participants were assessed for symptom management, compliance, and successfulness of medication. The study found that using tele-monitoring and self-directed tele-management has a high value when treating the HF patient. Researchers in the study concluded that tele-monitoring is successful in HF management but feels further works needs to be done in shaping HF management in general. (Gambetta et al., 2007).

Research by Wade et al. (2011) assessed the impact of providing internet-based tele-monitoring to supplement nursing care. The study was a randomized clinical trial that compared the effects of case management. The study invited Medicare advantaged members with HF living in New York, New Jersey, or Pennsylvania. The groups in the study were tele-monitoring with case management versus tele-monitoring alone. Individuals in the study had a remote management unit placed in their home via secure internet through broadband connection. A wired blood pressure cuff, and wireless weight scale transmitted data to the case management team. Data was collected using the Quality Control Inc. SF 12 Health Survey. The study concluded despite effective implementation there was no discernible impact on overall morbidity or mortality. The study did conclude that there was a reduction in hospitalizations for trial participants. Although mortality or morbidity did not change, decreasing admissions provides substantial cost savings for

healthcare. Researchers believe had the study been longer are conducted on a larger population results may have been different. (Wade et al., 2011).

Research by Copeland et al. (2010) found the benefits of using telephone interventions in managing HF. The purpose of the study was to assess if telephone intervention improved quality of life and outcomes in patients with CHF. Participants came from the Veteran's Administration (VA). The study used 458 participants in a quantitative randomized trial. The study had one year of pre-intervention, one year of intervention, and a follow-up period. Data was collected using patient self-reports, instructor interviews, patient electronic records, and data extraction from the VA Resource Allocation Center for cost estimates. Patients in the study had access to a round-the-clock nurse advice line, medication reminders, action plans, literature, and motivational interviewing sessions. The study concluded no actual survivor benefit but it did provide behavioral improvements for those diagnosed HF. The study lacked information regarding the impact of telephone monitoring has on readmissions (Copeland et al., 2010)

The previous studies show little improvement in mortality and morbidity with HF. The studies do conclude better quality of life, decreased hospitalization and disease management when utilizing tele-monitoring. Possibly providing more aggressive interventions and tele-monitoring early in the HF disease process would improve outcomes. Researchers in the study concluded short time frames and small population samples are possible reasons for little to no improvements on mortality.

Outpatient Clinic Research

Outpatient clinics are one of the main outlets for providing HF monitoring across the healthcare continuum. The use of outpatient services is vital after a patient has been hospitalized with HF. Outpatient clinics provide patient with the care they need to avoid unnecessary hospitalizations.

Research by Proctor et al. (2000) suggests that discharge planning decreases cost by increasing quality of care and prevention of early readmission. The study specifically looks at home care and its relationship with readmission rates among Medicare patients at an unidentified hospital. The study used a prospective design to track Medicare patients with HF after their discharge. The sample included 253 Medicare patients that were ages 65 and older. The study had a quantitative design that gathered data from a structured telephone interviews. The interviews were conducted at 6 weeks, 10 weeks, and 14 weeks post discharge. The study found that CHF patients most likely to be readmitted were sicker, noncompliant and, received less than adequate home care. The study suggests more research needs to be done in the home setting rather then while the patient is still institutionalized. This study was beneficial and it can used to identify and target individuals who are most likely to be readmitted in the weeks post discharge (Proctor et al. 2000).

A study by Muss et al. (2010) looked at Veteran Affairs (VA) in a rural area to determine what impact outpatient visits have on hospital readmissions. The purpose of the study was to identify and compare potentially preventable readmissions with usage of 30 day post discharge services. The study used logistic regression to examine post acute service use and its impact on readmission rates. Data from the VA from 2005 until 2007

was analyzed to examine patient characteristics and hospital admission rates among veterans. Data from the sample was collected, categorize, and group using the 3M Potentially Preventable Readmissions (PPR) software. The PPR software identifies readmission are that result from deficiencies in care or treatment as opposed to unrelated events. Any related admissions that occurred within 30 days subsequent to an admission were identified as a PPR. The quantitative study concluded that post follow-up care is an important factor to promote recovery and good health among hospitalized individuals with heart failure. (Muss et al., 2010).

Research by Freimark et al. (2009) looked at data over five years at a CHF daycare clinic. Data was reviewed retrospectively on all patients admitted to that Medical Center CHF daycare between September 2000 and September 2005. The sample included 190 advanced CHF patients. Information for the study was gathered by reviewing the computerized medical records of patients participating in the CHF daycare. Data included in the study was mortality, disease exacerbation, hospitalizations, and/or significant changes in patient condition. The study concluded that it is beneficial to provide CHF patients with outpatient services. Outpatient services provided in the study include multidrug intravenous treatment, electrolyte monitoring, cardiac rhythm monitoring, patient education, psychological support, and monitoring of cardiac rhythm. This study showed a reduction in morbidity and mortality and hospitalization were deceased during the time of the study. (Freimark et al., 2009)

The previous mentioned studies concluded that outpatient care plays a key role in decreasing readmissions rates. It is also beneficial to identify those who are at high risk for hospital readmission. Those at the highest rated for readmissions need to be targeted

and monitored closely across the health care continuum. All patients need to be monitored by a multidisciplinary team; those who are at high risk for admissions need to be given priority and more aggressive care in the outpatient setting.

End of Life Care Research

Research conducted by Haydar et al. (2004) incorporated interdisciplinary weekly meetings to assure care coordination in end of life CHF and dementia patients. The study was a retrospective case controlled study that took placed in a geriatrician led interdisciplinary house call program. Patients were homebound and died under the care of the house call program from October 1996 to April 2001. The study sample was 142 patients with a diagnosis of CHF or dementia. Medical records where reviewed to obtain patient demographic, measure of function status, hospitalizations, and death place. The study determined that patients with CHF were more likely to have care plans directed at disease modification and treatments. According to research, patients with CHF who die in the hospital create twice the expense as those who die elsewhere. (Haydar et al., 2004).

A research study by Seamark et al. (2002) explored the prevalence of symptomatic HF in order to adopt a palliative care approach. The study was city based in a market town with a rural catchment area. Participants where selected through hand searching which yielded 548 patients with symptomatic HF. The study was able to demonstrate a pragmatic method to estimate the prevalence of HF through utilization of diagnostic testing such as BNP levels. Although the death rate in the cohort was lower than expected the study was able to develop a palliative care approach in participants who

die not experience sudden death. The study suggests further studies to identify HF patients with dying trajectory. (Seamark et al., 2002).

Research by Gott et al. (2007) explored dying trajectories in HF. The study used a quantitative longitudinal design. The sample had a total of 27 participated who were diagnosed with HF, 60 years or older who had completed questionnaires for a minimum of five specific time points prior to death. The study used the Kansas City Cardiomyopathy Questionnaire Physical Limitation Score. From the data collected researchers in this study where unable to identify a typical dying trajectory. The researcher suggests their findings challenge efforts to plan a deliver palliative care based on a theoretical HF death trajectory. (Gott et al., 2007)

Boyd et al., (2009) evaluated services available for people with advanced HF and end of life care in the United Kingdom. The studied used longitudinal analysis of interview triads in addition with cross-sectional analysis of interviews at specific stages. Researchers were able to gain access to patient and family experiences as treatments and services were discussed. Recruitment for the study wad done through a purposeful sampling of individuals with NYHA Class III or IV HF. Data was collected through serial qualities interviews with participants and their families. The study led to the development of a HF care framework with varying stages. The study concluded that patients with long-term conditions needing palliative care should be identified and managed proactively using pragmatic criteria. (Boyd et al., 2009)

Research by Gott et al. (2007) supports that of Seamark et al. (2002) in that dying trajectories are not always predictable.   The research suggests proactive approaches to managing dying trajectories.

Psychosocial Implications

The Worcester Heart Failure Study conducted by Saczynski et al., (2009) used a life table analysis to examine the difference in long term survival in relation to age. The study examined age specific differences in clinical presentation, receipt of therapy, recommended lifestyle modification and survival in hospitalized patients with acute heart failure. The study was a qualitative population based study conducted in a large Central New England metropolitan hospital. The study had 4534 patients and conducted observational research between 1995 and 2000. Medical records were reviewed for demographic, clinical and treatment data. Research participants were divided in four age groups; below age 65, ages 65-74, ages 74-84 and above 85. The study concluded that patients age 75 and older were mostly likely female, with multiple comorbidities, lower body mass index and higher ejection fractions. The study also concluded that older patients were more likely to receive symptom modifying medication as apposed to disease modifying treatments. The study contributes great knowledge to research in that older patient respect a distinct clinical presentation. (Saczynski et al., 2009).

A research study by Dejong et al. (2005) supports the importance of assessing and treating patients with psychosocial parameters. The purpose of the study was to consider the impact of sociodemographic, clinical, health perception and, emotional variables in predicting health status. The study tested a multivariable model of health status and was a sub study of a prospective, randomized clinical trail designed to determine the optimal disease management regimen to improve outcomes in HF patients. The study used 87 participants to conceptualize health related quality of life, physical activity level and burden of symptoms. The study was conducted in three urban and suburban community

hospitals located in the Midwest. Participants for the study were recruited at the end of a HF hospitalization. The study used the Minnesota Living with Heart Failure Questionnaire in order to conceptualized symptoms. Questionnaires where administered within one week of discharge by a nurse research assistant. Findings of the study concludes that clinicians who want to deliver patient center care must address sociodemographic and clinical measures to improve outcomes. In addition to assessing these variables providers need to offer intervention to correct issues. (Dejong et al., 2005)

In order to provide adequate patient care providers need to consider every factor in the treatment and diagnosis process. Both age and social demographic play roles in how the HF patient is able to adapt to treatment. Patient centered care is necessary across the healthcare continuum in order to improve outcomes.

Conducting Chart Audits

Maddocks et al. (2010) conducted a study to determine the feasibility of using electronic medical record (EMR) data from the Deliver Primary Healthcare Information (DELPHI) database. Data was extracted in order to measure quality of care in patients with HF in ten primary healthcare practices in southwestern Ontario. Researchers extracted data from the medical records of 488 patients who have CHF marked in the medical record over a period of three years. The study showed low frequencies of documented care items for CHF. In order to avoid errors made in the Maddocks et al.,(2010) study researchers should be mindful of obstacles such as incomplete patient records, inaccessibility of data and, reliability of EMR versus manual chart audits.

Assiri (2011) conducted a qualitative retrospective cohort to investigate the clinical and therapeutic profiles of HF patients admitted to a Saudi Arabia Hospital. The

study sample included 300 consecutive patients admitted to Aseer Central Hospital with a diagnosis of HF from June 2007 until May 2009. Patient related data was analyzed utilizing frequencies, percentages, and measures of central tendencies. Results form the study support the concept of demonstrating trends in medical data. The study concluded making such data widely available will aid in the improvement of HF management and encourage providers to use evidence base guidelines in daily practice.

Sanborn et al. (2005) used data from a chart audit to determine if CHF was the second leading cause of hospitalization in a small rural hospital. The study found that the majority of the patient population were older and noncompliant to prescribed medical regime. The study used a chart abstraction tool to examine the care of all CHF patients admitted to the facility between 2000 and 2001. The tool provided researchers with other information including sociodemographic status and outpatient appointment schedule. The study concluded CHF management in the rural area needed improvement. The study prompted attention to address the lack in continuity of care, outpatient services and access to diagnostic testing.

The studies in this section all conclude that chart audits are valuable tools in obtaining data about a specific population. When conducting chart audits researcher must be careful and make sure they get the whole picture so that the data is not misinterpreted.

Chapter Three

Methodology

The purpose of this study is to evaluate the effects of monitoring congestive heart failure across the healthcare continuum with application to the Corbin and Strauss trajectory model of chronic illness. This chapter describes the methodology used in the study including research design, sample, data collection, and data analysis.

Procedures

Initial approval for the study to evaluate the effects of monitoring congestive heart failure across the healthcare continuum on patient readmission with 30 days or less was obtained from the CHF Coordinator at the site where the research was conducted. The following people at the site were notified of the study: The Director of Nursing for Cardiovascular Services, The Director of Nursing Research and the Nursing Research Council. The study is a retrospective chart review that used electronic medical record data queries to identify a sample of 100 admission cases.

Ethical Considerations

Prior to data collection the research study to evaluate the effects of monitoring congestive heart failure across the healthcare continuum on patient readmission with 30 days or less was approved by the Institutional Research Board at Gardner-Webb University and by the Research Board at the study hospital. The study hospital follows the guidelines for patient confidentiality mandated by the Health Insurance Portability and Accountability Act of 1996 (HIPAA). Confidentiality was maintained at all times and anonymity was insured. All account numbers, medical record numbers, and subject

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names were omitted from the data queries. The individual records were labeled as a1 through a100.

Sample

This study was conducted at a large medical university hospital. The CHF Coordinator of the research site has data on subjects with readmissions from the years 2006 till present. Research subjects were admitted to an adult inpatient unit at the research site with an ICD-9 diagnosis relating to HF. The sample size includes a random selection of 100 consecutive CHF admission occurrences from the available data.

Instruments

A medical record audit for was used to collect data for the study. Validity of the audit form is evident by integrating concepts from Duke University Medical Center's Department of Community and Family Medicine in its development (2005). Variables addressed in the audits include, financial glass group, thirty day readmission occurrences, and discharge dispositions (Appendix C).

Data Collection and Analysis

Data queries where conducted on patients with heart failure ICD-9 codes. Retrospective data was reviewed from the dates of November 2009 until and May 2010. Data included in the review were admission dates, discharge dates, readmission dates if applicable, disposition and, financial class.

Each of one of the 100 admission cases was applied to the chart audit form. Data from the chart audits where compiled into corresponding groups. Occurrences and trends were identified. A chi-square test was used to show the likelihood of readmission occurring without the intervention of monitoring across the healthcare continuum.
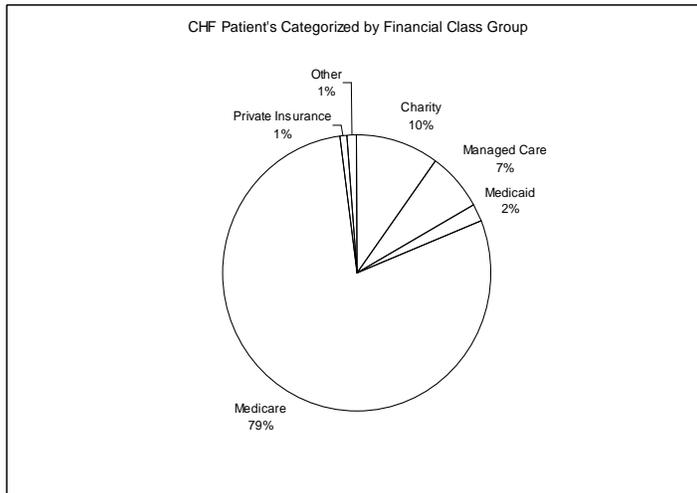
Chapter 4

Results

This chapter presents the results of the study to evaluate the effects of monitoring CHF across the healthcare continuum. The sample demographics are presented, followed by the results for the research questions. One hundred consecutive CHF admissions were randomly selected for the research study. A chi-square analysis of the research data was conducted on the patient data related to the 100 different admission occurrences.

Demographical data collected in the study shows the financial classification regarding pay for services for the sample population. The majority of subjects (79%) of the sample were Medicare Beneficiaries, with 10% charity cases, 7% managed care and only 1% private insurance. The financial classifications regarding pay for services for the sample is illustrated in Figure 2. With such a large Medicare patient population it is essential that care is managed correctly. According to the Unites States Department of Health and Human Service, Medicare will pay for inpatient acute care services based on care quality and not the quantity (USDA, 2011). Research suggests patients that continue to get readmitted have received inadequate care somewhere in their disease management process.

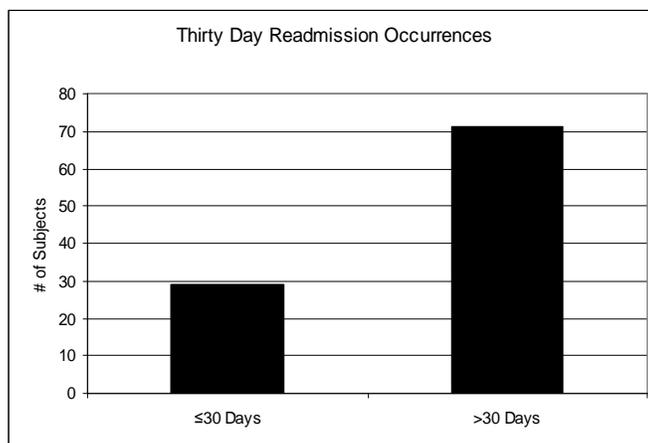Figure 2

Financial Class Percentages

Research has shown that readmissions are where quality, cost, and patient safety intersect (Brock, 2008). Descriptive statistical analysis of the data found that a large portion (*n* =29) of the sample was readmitted in 30 days or less following discharge. Figure 3 illustrates the readmission rates for the sample.
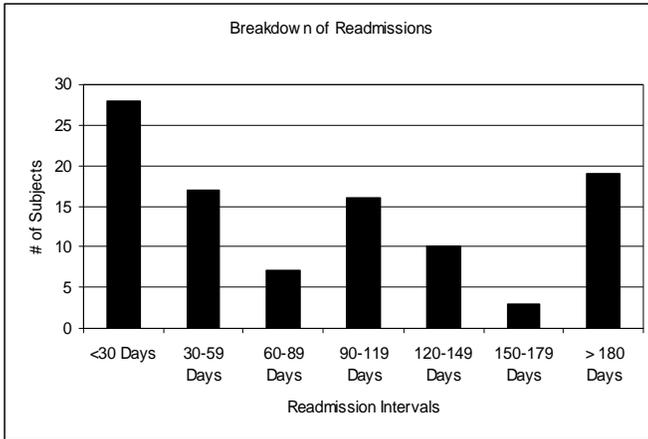
Figure 3

Thirty Day Readmission Rates

Further breakdown of the data found over half ($n = 52$) of the sample population

was readmitted within 90 days following discharge. Less than 20 CHF patients remained

out of the hospitalized for a minimum of 180 days.

Figure 4

Readmission Rates Breakdown

Statistical analysis utilizing the chi-squared test was conducted to test the

hypothesis that monitoring CHF across the healthcare continuum effects CHF

readmission rates. The dependent variables in the study were readmission in 30 days or

less and no readmission in 30 days or less. The chi-squared test is used to determine how

well observed data fits anticipated outcomes. In this study a chi-squared test was used to

determine the difference between the observed outcome of readmission in 30 days or less

and the outcome that the readmission in 30 days or less was likely to occur by chance.

The study compares what would have occurred in the absence of any true association

between healthcare given across the continuum and ≤30 day readmission rates.

If there is no relationship between care across the continuum and readmission in

30 days or less it would be expected that a patient would be readmitted solely by chance.

The null hypothesis for this study was there is no relationship between care across the

continuum and readmission in 30 days or less for patients with CHF. The statistical level

of significance was set at .05. Results of the chi-squared test ($p=0.7276$) indicated the

results were not significant and the null hypothesis could not be rejected. The data used in

the study was unable to establish that health care across the continuum has an effect on

CHF patients being readmitted to the hospital in 30 days or less. Table 4 shows the result

of the Chi-Squared Test for Heart Failure Readmission.

Table 4.

Chi-Squared Test: Heart Failure Readmissions

Chi-Squared Test: Monitoring Healthcare Across the Continuum			
Observed Outcomes			
	Readmitted ≤30 Days	Not Readmitted in ≤30 Days	Row Totals
Continuum Services Utilized	14	37	51
Continuum Services Not Utilized	15	34	49
Column Totals	29	71	100
Expected Outcomes			
	Readmitted ≤30 Days	Not Readmitted in ≤30 Days	Row Totals
Continuum Services Utilized	14.79	36.21	51
Continuum Services Not Utilized	14.21	34.79	49
Column Totals	29	71	100
p=value:	0.727637589		

Chapter Five

Discussion

Significance of the Findings

The chi-squared analysis of the data did not support the hypothesis that health care across the continuum has an effect on CHF patients being readmitted to the hospital in 30 days or less. The null hypothesis could not be rejected at the 0.05 level of significance. The research study does provide insight on healthcare and readmission rates for the CHF population. The Corbin and Strauss trajectory model for chronic illness was suitable in the study due to the large portion of readmission occurrences for patients with CHF. The patients with CHF who were subjects in this study cycled and repeated phases in the model. Although results from the study are that readmissions occurred by chance and not as a result of healthcare across the continuum, it was evident that a large portion of the sample was readmitted in 90 days or less.

Significance to Nursing

There are many nursing implications to consider when dealing with the CHF patient. According to Brock (2008) a quarter of all patients hospitalized with CHF are readmitted within 30 days. Proper patient education, compliance promotion, and transition care are beneficial to patient outcomes and readmission rates.

According to Brock (2008) 20% of Medicare beneficiaries are readmitted within 30 days. Brock (2008) further states the high level of readmission indicates inappropriate transition care, lower patient satisfaction, and increased health care cost. The high number of Medicare patients in this sample and the high number of readmissions calls for specific interventions aimed at this population of healthcare recipients.

There are many implications for nurses when dealing with the HF patients. Equipping patient with medication, scales, and blood pressure cuffs is not enough. A patient that monitors and medicates themselves inappropriately is an insignificant act that provides no benefit to the patient. According to Brock (2008) patients need to have scales big enough to stand on and have numbers that are visible to the patient. Missing any key component in the medical regime is s sign of inadequate care coordination, mismanaged self-care and, can lead to an unnecessary hospitalization. (Brock, 2008). The high number of readmissions revealed in the data analysis calls for stronger medical regime and management of CHF patients over the continuum of healthcare.

In addition to patient accountably there must be accountability among providers. The Medicare Payment Advisory Commission states that readmissions are not a result of mistakes that occur in the hospital by inadequate transition preparation (Hackbarth, 2009). According to Brock (2008) one in five patients discharged from a hospital experience an adverse event within three weeks of being discharged. Injuries resulting from these adverse events are medicine related and often can be mitigated or avoided.

Implications for Nursing Practice

The study uncovered a large number of readmissions that occurred 30 days or less from discharge. For nursing this is a travesty that demonstrates inadequate healthcare over the continuum. Nurses can be a proponent of these patients through more effective discharge planning, community follow up and referrals for CHF patients. Adequate intervention could have deferred and possibly avoided these readmissions.

The number of readmissions also has an effect on reimbursement of services. The number of charity patients in the study sample calls for decreasing readmissions. The

smallest percentage of decrease in hospital readmissions has the potential to decrease healthcare costs for all.

Recommendations for future research

The sample selection only included a small portion of CHF admission occurrences. Future research should include a larger sample size from multiple healthcare facilities. Conducting a more comprehensive analysis of discharge disposition could provide more insight on what continuum services are most effective. Identification of the relationship of financial classification regarding pay for services on readmission rates should be included in future research. In order to improve outcomes and reimbursement, the healthcare team should analyzes which needs of the CHF patients are continuing to be left unmet.

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Gardner-Webb University IRB

THE INSTITUTIONAL REVIEW BOARD
of
GARDNER-WEBB UNIVERSITY

This is to certify that the research project titled:

The Effect of Monitoring Congestive Heart Failure Across the Healthcare Continuum with application to the Corbin and Strauss Trajectory Model of Chronic Illness.

being conducted by _____ Katrina Walker _____

has received approval by the Gardner-Webb University IRB.

Date_ 11/9/11 _____

Exempt Research

Signed _____
   Department/School/Program IRB Representative
   _____
   Department/School/Program IRB Member

Expiration date _____ 11-9-12 _____

   IRB Approval:

   __X___ Exempt _____ Expedited _____ Non-Exempt (Full Review)

Revised 09-09

Medical Record Audit Instrument Developed for Study

Date:

Auditor:

Admission dates included in study:

Total Medical Records Reviewed:

Subjects included in the audit:

Financial Class Group	Yes or No (Binary, only one applicable)
Charity	
Managed Care	
Medicaid	
Medicare	
Private Insurance	
Other	

Discharge Status	Yes or No (Binary, only one applicable)
AMA	
Home w/o continuum services	
Home w/ CHF Clinic Visit	
Home Health	
Hospice	
SNF	
Rehab	

Thirty Day Readmission Occurrences	Yes or No (Binary, only one applicable)
≤30 Days	
>30 Days	

Readmission Occurrence Breakdown	Yes or No (Binary, only one applicable)
<30 Days	
30-59 Days	
60-89 Days	
90-119 Days	
120-149 Days	
150-179 Days	

MONITORING CONGESTIVE HEART FAILURE ACROSS THE HEALTHCARE

CONTINUUM

by

Katrina E. Walker

A thesis submitted to the faculty of
Gardner-Webb University School of Nursing
in partial fulfillment of the requirements for the
Degree of Master of Science in Nursing

Boiling Springs

2011

Submitted by: Approved by:

_____   _____
Katrina E. Walker   Dr. Rebecca Beck-Little

_____   _____
Date   Date

Abstract

   Congestive heart failure is a chronic condition where the heart no longer pumps adequate blood and oxygen to bodily organs. CHF is a chronic condition that affects millions of people on a yearly basis. Common diseases that cause CHF are coronary artery disease, high blood pressure, and diabetes. CHF patients face many compilations that affect their daily activities. Along with morbidity CHF has major financial implications because much of the cost associated with CHF healthcare is avoidable. The purpose of this study is to evaluate the effects of monitoring congestive heart failure across the healthcare continuum with application to the Corbin and Strauss trajectory model of chronic illness. The research hypothesis is that monitoring CHF across the healthcare continuum effects CHF readmission rates.

   This study was conducted at a large medical university hospital. The sample size includes a random selection of 100 consecutive CHF admission occurrences. Retrospective data was reviewed using a chart audit tool. Data included in the review were admission dates, discharge dates, readmission dates if applicable, disposition and, financial class.   Data analysis for the study was done by using a chi-squared test. The dependent variables in the study were readmission in 30 days or less compared to no readmission in 30 days or less. The null hypothesis for the chi-squared test is there is no relationship between readmissions and care across the continuum. The study failed to reject H_0 at 5% of level of significance.

Copyright Page

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Chapter One

Introduction

Statement of Problem

Congestive heart failure (CHF) is a chronic, debilitating condition that affects millions of people annually. CHF occurs when the heart can no longer pump an adequate supply of blood and oxygen to support other bodily organs. Coronary artery disease, high blood pressure, and diabetes are common causes of CHF. Individuals with CHF face many complications such as difficulty breathing, interference with daily activities, and weight gain related to swelling (American Heart Association AHA, 2011).

CHF has become an increasing epidemic because individuals with cardiac conditions are living longer due to improvements in therapeutic innovations (AHA, 2011). There are about 5.8 million people in the United Sates who have CHF. On average 670,000 people are being diagnosed with the condition every year. Although individuals with CHF are living longer; about one and every five people with CHF die within one year from the diagnosis of the condition. CHF contributed to 282,754 deaths in the year 2010 (Colucci, 2011).

Current research suggests that CHF patients are facing a shorter length of stay with higher readmission rates. According to Colucci (2011), the CHF patient has the highest risk of death one month after being discharged from the hospital. About one quarter of those hospitalized with CHF are readmitted with thirty days (Colucci, 2011).

In addition to the mortality of CHF there are financial implications of the disease. Colucci (2011) states the cost of CHF adds up to over 39 billion dollars in health care, pharmaceuticals, and loss of productivity. Much of the cost associated with CHF

healthcare is avoidable. Medicare beneficiaries make up the bulk of those treated with CHF. According to Medicare reports approximately 18% of Medicare beneficences are readmitted within 30 days of discharge resulting in over $12 million dollars of avoidable healthcare cost (Brock, 2008).

The Centers for Disease Control and Prevention (CDC) reports that there is no current cure for CHF, research suggest that managing and monitoring the disease across the health care continuum will decrease mortality, morbidity, and hospital readmissions (CDC, 2010). Individuals with CHF need careful monitor of symptoms and conditions in both the outpatient and inpatient setting.

Purpose

The purpose of this study is to evaluate the effects of monitoring congestive heart failure across the healthcare continuum on readmission rates of 30 days or less utilizing the Corbin and Strauss trajectory model of chronic illness.

Background

Disease process.

Heart Failure (HF) occurs when the pumping action of the heart malfunctions. According to AHA (2011), HF is the result of diseases of the heart value or muscles, infection of the heart of muscle, congenital heart defects, hypertension, blocked arteries, and/or previously damaged heart muscles.

There are different classes, stages and, types of heart failure dependent upon the symptoms and complications of the effected individual. Systolic HF occurs when the lower chambers of the heart are unable to supply enough blood to supply the body's needs. Diastolic heart failure is the result of the heart not being able to take its necessary

rest between beats resulting in blood refluxing in the upper champers and vessels of the heart (Torpy, 2009).

The result of both diastolic and systolic HF is fluid build up or edema in the lungs, legs, and other parts of the body. The excess fluid causes the heart to compensate by becoming hypertrophic, thickening of muscle walls, or through dilation of the chambers. Complications resulting from the heart's remodeling are weakness, fatigue, palpations, shortness of breath, neck vein distention, and swelling in the abdomen and lower extremities (Torpy, 2009).

The American Heart Association's New York Heart Association Functional (NYHA) Classification is the most commonly used model for classifying heart failure. The NYHA has two categories for classification: functional assessment and objective assessment (see Table 1).

Table 1

American Heart Association's New York Heart Association Functional (NYHA)

Classification

Class	Functional Capacity: How the cardiac disease patient feels w/ physical activity
I	Individual has cardiac disease but no limits in physical activity.
II	Individual has cardiac disease with slight limits on physical activity. Individual comfortable when at rest.
III	Individual has cardiac disease with noticeable limits on physical activity. Individual comfortable when at rest. Activity that is less than ordinary causes fatigue, shortness of breath, chest pain, or palpitations.
IV	Individuals with cardiac disease are unable to carry out physical activity without discomfort. Chest pain and other symptoms may be present at rest. Discomfort increases with physical activity.

Class	Objective Assessment
A	No objective signs of cardiovascular diseases noted. Individual has no symptoms and no limitation on physical activity.
B	Minimal objective evidence of disease. Individual has mild symptoms with slight limits on ordinary activity. Comfortable at rest.
C	Moderately severe evidence of cardiovascular disease noted. Obvious limits of activity. Individual comfortable at rest.
D	Severe objective evidence of cardiovascular disease. Individual has severe limitation with presence of symptoms at rest.

Note. Adapted from the American Heart Association. 2011

Complications from HF have major effects on an individual's quality of life. The end stage of HF results when the healthcare team has exhausted all resources in managing the disease or the individual refuses to comply or accept treatment. The result of not being able to treat HF is death. The two main causes of death in heart failure patients are sudden cardiac death and progressive pump failure (Colucci, 2011).

Treatment.

The National Guideline Clearinghouse (NGC) is an initiative of United States Department of Health and Human Services' (DHHS) Agency for Healthcare Research and Quality. The objectives of NGC are to define practices to meet the needs of the majority of patient populations and to aid healthcare providers in decision making by detailing a list of acceptable treatment options for prevention, diagnosis, and management of diseases such as HF.

As with every health process diagnosis begins with assessment. When diagnosing the HF patient it is imperative for providers to obtain a health history, height, weight, body mass index, use of drugs/alcohol and, orthostatic blood pressures. Subjective matter

to include in the assessment is information regarding the individual's ability to perform activities of daily living including any limitations. (NGC, 2009).

Other necessary clinical indicators for HF will be shown on a 12-lead electrocardiography which shows the heart's rhythm by analyzing its electrical signals. X-rays are commonly used to show the front and the side chest. Another radiography test is the echocardiogram (ECHO). When an ECHO is coupled with doppler flow studies the test will provide a moving visual of the heart's beat and blood flow while providing images of the heart's structure and valves. In certain populations it may be necessary to conduct sleep studies to determine if the patient is experiencing sleep disturbed breathing. (NGC, 2009).

More comprehensive studies to diagnosis HF include a stress test and/or cardiac catherization. For a stress test individuals experience the effect of stress on the heart by either exercising on a treadmill or through medicine induced stress. A stress test allows providers to see if the heart is getting enough blood and oxygen during exercise or stressed activities. Coronary arteriography is an invasive type of x-ray that shows blockages and plaque build up in the coronary arteries. If indicated other test will include Holter monitoring which records an individual's cardiac rhythm for 24 hours on a portable monitor, biopsy of cardiac tissue and / or, rheumatologic disease workup. (NGC, 2009).

Analyzing lab work is a crucial component of the HF diagnosis process. A complete blood count is usually the initial lab draw. The NGC (2009) recommends another key lab which is a B-type natriuretic peptide, brain natriuretic peptide, or simply BNP. BNP is a hormone secreted by the brain that typically rises when a patient has HF.

BNP levels are linked with HF severity, often concluding a poorer prognosis in those with higher levels of BNP (Association for Clinical Chemistry, 2011).

Although HF has no cure individuals with HF have options to manage their condition. One of the most critical things the healthcare team can do is to educate patients on HF and therapeutic compliance. The NGC (2009) recommends that individuals receive counseling on abstaining from smoking, drinking, and drugs. The NGC (2009) also recommends exercise in HF patients to promote quality of life. AHA's Get with the Guidelines -Heart Failure is a collaborative quality improvement measure that's has demonstrated an increased adherence to evidence based care in patients hospitalized with HF (AHA, 2011). Get with the Guidelines measures supported by this research study include discharged calls, follow-up scheduled appointment, and disease management referral (AHA, 2011).

When treating HF the NGC (2009) recommends ten different methods of pharmacological managements. Due to the increased body fluid diuretics commonly called "water pills" are the most widely used drug classification for treating HF. Diuretics work by helping the body excrete excess water and sodium. Vasodilators are medications that work by relaxing blood vessel to lower blood pressure. Because HF effects the pumping action of the heart, drugs such as digoxin are commonly used to help the heart beat more efficiently (AHA, 2011).

Other types of medications treat HF by blocking hormones in the body. Angiotensin converting enzyme (ACE) inhibitors blocks hormones so that the heart works less with the intent of preventing disease progression. Beta-adrenergic blockers lower blood pressure and slow heart rate creating less stress on the heart. Angiotensin

receptor blockers ARBs are prescribed to lower blood pressure which is less stress on the pumping action of the heart. Aldosterone antagonists works by lowering volume through excreting salt and water from the body. The combination of hydralazine and nitrates is a medical regimen that relaxes blood vessels to decrease work load. Inotropes are another class of medication and are given intravenously or directly into the blood stream to help the heart beat more purposefully. Infusion of positive inotropic drugs is recommended in the end stages of HF to improve heart functions by allow the heart to beat more purposefully. (Torpy, 2009).

Other treatment options for HF incorporate surgical interventions. When necessary the NGC (2009) recommends coronary revascularization by placing stents in blocked arteries, implantable defibrillators or resynchronization pacemakers, open heart surgery, or heart transplant if necessary. According to the American Heart Association (2011), surgery is not frequently used to treat HF unless the patient has an identifiable problem that can be corrected with intervention.

Management.

Managing HF is a complex process that requires strict conformity and compliance to medical regimes. It is recommended by the AHA (2011) and the America College of Cardiology to have multidisciplinary disease management programs in high risk HF patients. Observational research studies have shown healthcare provider directed disease management programs increase the long term prognosis of HF patients.

Patients with all types of chronic illnesses should be enrolled in a disease maintenance program. The Heart Failure Society of America, HFSA (Lindenfeld et al., 2010) recommends multidisciplinary HF disease management programs in high risk

patients. The HFSA (Lindenfeld et al., 2010) defines high risk patients as those with diabetes, low urine output, renal insufficiency, chronic obstructive pulmonary disease, persistent NYHA class III or IV symptoms, frequent hospitalizations, multiple comorbidities, depression or cognitive impairment, inadequate social support, poor health literacy, and/or persistent noncompliance with medical regimes.

Patients with HF are to assume a self management role while in the recovery phase of the disease process. In regards to self management individuals face many questions. While in the hospital patients may clearly understand discharge education. Discharge instructions may soon be forgotten when an individual gets home. As concluded by Horwitz and Krumholz (2011) patients may not understand instruction, signs of worsening, or even who to call with questions. Horwitz and Krumholz (2011) further emphasizes that the lack of coordination between patients and providers lead to poor outcomes, additional costly expenditures, and need for more health care services.

With disease management programs individuals have support across the continuum to aid in the maintenance and recovery of a chronic condition. In regards to disease management, Horwitz and Krumholz (2011) states such programs allow for an integrated multidisciplinary approach for caring for chronic illnesses. Their research by also supports the use of disease management programs, stating care plans provide education, support, and coordination among care and treatment of chronically ill individuals.

Social Significance

There are significant social implications regarding HF due to the vast number of Americans at risk for developing the disease. Results from the 2010 Census Bureau (Howden & Meyer, 2011) indicate that the number of older individuals grew at a greater

rate than younger ages. Howden and Meyer (2011) further state that there are 40.3 million persons over the age of 65 living in the United States. The CDC (2010) states HF is the leading cause of hospitalization among individuals over the age of 65.

With over 47 million Medicare beneficiaries it is essential that HF patients get adequate care across the continuum. According to a report released in April 2009, the Medicare Payment Advisory Commission, stated Medicare was in charge of paying for all admissions based on the diagnosis regardless of whether it is an initial or readmission related to the initial diagnosis (Hackbarth, 2009).

Brock (2008) considers HF to be one of the most costly conditions of hospital readmissions. According to Brock (2008) 18% of Medicare patients are readmitted within 30 days of discharge with 13% of those readmissions being avoidable. The financial consequences of these avoidable Medicare readmissions are $12 billion. Brock (2008) makes further added that readmissions are an intersection of quality, cost and, patient safety.

Due to the congress mandated prospective payment system hospitals are reimbursed on a perspective payment system. The system provides a flat rate per ace for inpatient services. This payment system rewards efficient hospitals while providing lower performing hospitals an incentive to become more efficient (Gottlober, 2001). Starting in October of 2012 the current system will use an adjustment factor to reduce reimbursement on preventable readmission (Federal Register, 2011).

In addition to the financial implications of readmission it is important to consider the inadequate care HF patients are receiving. According to Brock (2008), patients

readmitted within 30 days of discharge are a probable marker for poor quality of care and wasteful spending.

Conceptual Framework

The purposed research study was applied to the Corbin and Strauss trajectory model for chronic illness. The Trajectory framework is derived from grounded theory. Grounded theory is designed to discover occurrences and their characteristics. The theory further discovers and uncovers conditions that effect occurrences. Grounded theory draws out a range of possible outcomes that may occur when actions occur or fail to occur. The goal of this study is to determine if monitoring HF with outpatient services will affect the occurrence of patients being readmitted to the hospital in thirty days or less. Validity of the Corbin and Strauss model is evident in the fact that research was conducted in a variety of conditions, illnesses, and settings (Woog, 1992).

Concepts of the trajectory model denote the course of an illness with the combined efforts of the patient, family and, healthcare team. The model further shapes the disease process to determine outcomes, managing symptoms, and handling disability (see Table 2). Lastly the model states diseases have a course of action that cannot always be predicted (Woog, 1992).

Table 2

Corbin and Strauss Chronic Illness Trajectory Framework

Major concepts	
Trajectory	Collaborative efforts of patient, family, healthcare team to shape disease course
Trajectory phasing	Changes/ phases in the course of a chronic illness
Trajectory projection	Individualized vision of illness course
Trajectory scheme	Plan to shape, control, and hand disability of an illness

Note. Adapted from *The Chronic Illness Trajectory Framework: the Corbin and Strauss Nursing Model,* by P. Woog, p. 16. Copyright 1992 by Springer Publishing Company.

The model further concludes chronic illnesses have a course that can be shaped through disease management. Most of the disease management occurs outside the hospital. Healthcare providers must be able to adapt treatments to an individual's lifestyle. Providing patients with care in their own home environment allows providers to see limitation faced by the patient (Woog, 1992).

Theoretical Assumptions

The purpose study shares the same theoretical assumptions of the Corbin and Strauss model. The trajectory model concluded there were eight phases in the process of the chronic illness. The proposed study supports the trajectory model but considers cycling and repeating of phases outlined in the Corbin and Strauss model. Table 3 applies HF to the phases in the trajectory model. Figure 1 was formulated to show the conceptual framework behind the HF disease process.
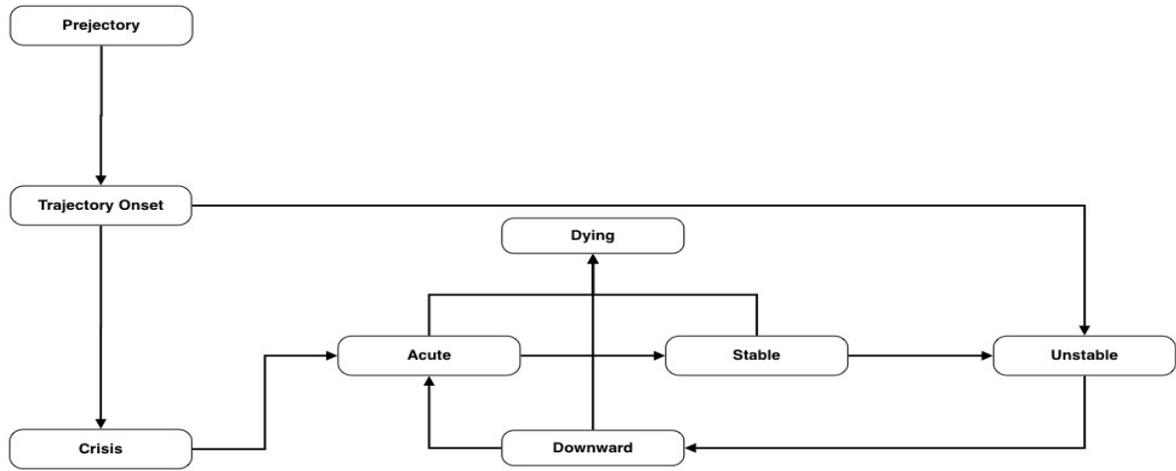
Table 3

Trajectory Model Applied to Heart Failure

Phases	Definition	Application to study
Pretrajectory	Asymptomatic phase prior to course of illness onset. Progression and preventive phase	Disease begins to progress in Individuals with HF risk failures such as CAD, DM, valve disease, HTN, and other morbidities
Trajectory onset	Diagnostic phase where signs and symptoms began to appear	Individuals present to clinic or providers with unexplained weight gain, SOB, and activity intolerance
Crisis	Life threatening	Symptoms requiring emergency treatment from ER or CHF observation unit
Acute	Active illness requiring need for hospitalization	Conditions not controlled in ER requiring
Stable	Current medical regime is controlling disease process	Stabilized HF individual can be discharged on current regime
Unstable	Period where disease requires invention but not hospitalization	Interventions provided from discharge calls, home health nurse, provider at CHF clinic
Downward	Continued deterioration and disease progression	Patient requiring hospital readmission
Dying	Immediate time preceding death	Referral to hospice. Possible mortality.

Note. Adapted from *The Chronic Illness Trajectory Framework: the Corbin and Strauss Nursing Model,* by P. Woog, p. 17. Copyright 1992 by Springer Publishing Company.

Figure1

Conceptual Framework of Heart Failure Disease Process

Research Hypothesis

Ancheta (2006) states that most studies on HF use a retrospective analysis or

predictive model. Issues with retrospective models are different demographics,

compliance levels and, utilization of new therapies. Patients who present with HF have

acute onset of complications that need to be addressed immediately. When an

intervention is unsuccessful providers can look back to see what course of action should

be utilized next. Looking back on the success of interventions can be done on an

individual or hospital wide basis. This retrospective research can be used to aid

improvements in managing across the continuum in future HF populations. The research

hypothesis is that monitoring CHF across the healthcare continuum effects CHF

readmission rates.

Chapter 2

Literature Review

Two electronic databases where utilized to search the literature including PubMED and CINAHL. The following key words were utilized to search the literature: congestive heart failure, CHF, heart failure, retrospective, and trajectory. A total of 15 research studies applicable to the subject of this study were chosen for the literature review; these included studies related to tele-monitoring, outpatient studies, end of life care studies, psychosocial implications, and chart audit studies.

Tele-monitoring Research

In regards to monitoring HF across the healthcare continuum tele-monitoring is one of the most crucial and important areas to research. Tele-monitoring allows healthcare providers to gain diagnostic information without the patient ever leaving their home. When a patient is at risk for hospitalization or has worsening symptoms the provider can intervene in an adequate amount of time.

Research by Gambetta et al. (2007) indicates that tele-monitoing is an important part of managing HF. The purpose of the study was to present an investigation to determine the impact of telemarketing on HF management process. The study was a quantitative design that compared baseline characteristics between patients that utilized telemarketing alone as opposed to tele-monitoring and the support of a HF clinic. The sample was 282 patients who had NYHA class III or IV HF. Inclusion criteria were patients hospitalized twice within the past year with a diagnosis of HF. Data collection was done through assessment. Assessments were completed by cardiologist, an advanced practice nurse and, the HF nurse team. Study participants were assessed every 1-2 weeks.

Participants in the tele-monitoring group were given a welcome packet with telephone numbers and instructions. Subjects also received a scale with a digital display. Information was stored and analyzed using automatic decision support tools. Alerts were set for absolute values and would report signs or symptoms. Abnormal scores were identified by HF nurses who were able to provide intervention to that patient. Participants were assessed for symptom management, compliance, and successfulness of medication. The study found that using tele-monitoring and self-directed tele-management has a high value when treating the HF patient. Researchers in the study concluded that tele-monitoring is successful in HF management but feels further works needs to be done in shaping HF management in general. (Gambetta et al., 2007).

Research by Wade et al. (2011) assessed the impact of providing internet-based tele-monitoring to supplement nursing care. The study was a randomized clinical trial that compared the effects of case management. The study invited Medicare advantaged members with HF living in New York, New Jersey, or Pennsylvania. The groups in the study were tele-monitoring with case management versus tele-monitoring alone. Individuals in the study had a remote management unit placed in their home via secure internet through broadband connection. A wired blood pressure cuff, and wireless weight scale transmitted data to the case management team. Data was collected using the Quality Control Inc. SF 12 Health Survey. The study concluded despite effective implementation there was no discernible impact on overall morbidity or mortality. The study did conclude that there was a reduction in hospitalizations for trial participants. Although mortality or morbidity did not change, decreasing admissions provides substantial cost savings for

healthcare. Researchers believe had the study been longer are conducted on a larger population results may have been different. (Wade et al., 2011).

Research by Copeland et al. (2010) found the benefits of using telephone interventions in managing HF. The purpose of the study was to assess if telephone intervention improved quality of life and outcomes in patients with CHF. Participants came from the Veteran's Administration (VA). The study used 458 participants in a quantitative randomized trial. The study had one year of pre-intervention, one year of intervention, and a follow-up period. Data was collected using patient self-reports, instructor interviews, patient electronic records, and data extraction from the VA Resource Allocation Center for cost estimates. Patients in the study had access to a round-the-clock nurse advice line, medication reminders, action plans, literature, and motivational interviewing sessions. The study concluded no actual survivor benefit but it did provide behavioral improvements for those diagnosed HF. The study lacked information regarding the impact of telephone monitoring has on readmissions (Copeland et al., 2010)

The previous studies show little improvement in mortality and morbidity with HF. The studies do conclude better quality of life, decreased hospitalization and disease management when utilizing tele-monitoring. Possibly providing more aggressive interventions and tele-monitoring early in the HF disease process would improve outcomes. Researchers in the study concluded short time frames and small population samples are possible reasons for little to no improvements on mortality.

Outpatient Clinic Research

Outpatient clinics are one of the main outlets for providing HF monitoring across the healthcare continuum. The use of outpatient services is vital after a patient has been hospitalized with HF. Outpatient clinics provide patient with the care they need to avoid unnecessary hospitalizations.

Research by Proctor et al. (2000) suggests that discharge planning decreases cost by increasing quality of care and prevention of early readmission. The study specifically looks at home care and its relationship with readmission rates among Medicare patients at an unidentified hospital. The study used a prospective design to track Medicare patients with HF after their discharge. The sample included 253 Medicare patients that were ages 65 and older. The study had a quantitative design that gathered data from a structured telephone interviews. The interviews were conducted at 6 weeks, 10 weeks, and 14 weeks post discharge. The study found that CHF patients most likely to be readmitted were sicker, noncompliant and, received less than adequate home care. The study suggests more research needs to be done in the home setting rather then while the patient is still institutionalized. This study was beneficial and it can used to identify and target individuals who are most likely to be readmitted in the weeks post discharge (Proctor et al. 2000).

A study by Muss et al. (2010) looked at Veteran Affairs (VA) in a rural area to determine what impact outpatient visits have on hospital readmissions. The purpose of the study was to identify and compare potentially preventable readmissions with usage of 30 day post discharge services. The study used logistic regression to examine post acute service use and its impact on readmission rates. Data from the VA from 2005 until 2007

was analyzed to examine patient characteristics and hospital admission rates among veterans. Data from the sample was collected, categorize, and group using the 3M Potentially Preventable Readmissions (PPR) software. The PPR software identifies readmission are that result from deficiencies in care or treatment as opposed to unrelated events. Any related admissions that occurred within 30 days subsequent to an admission were identified as a PPR. The quantitative study concluded that post follow-up care is an important factor to promote recovery and good health among hospitalized individuals with heart failure. (Muss et al., 2010).

Research by Freimark et al. (2009) looked at data over five years at a CHF daycare clinic. Data was reviewed retrospectively on all patients admitted to that Medical Center CHF daycare between September 2000 and September 2005. The sample included 190 advanced CHF patients. Information for the study was gathered by reviewing the computerized medical records of patients participating in the CHF daycare. Data included in the study was mortality, disease exacerbation, hospitalizations, and/or significant changes in patient condition. The study concluded that it is beneficial to provide CHF patients with outpatient services. Outpatient services provided in the study include multidrug intravenous treatment, electrolyte monitoring, cardiac rhythm monitoring, patient education, psychological support, and monitoring of cardiac rhythm. This study showed a reduction in morbidity and mortality and hospitalization were deceased during the time of the study. (Freimark et al., 2009)

The previous mentioned studies concluded that outpatient care plays a key role in decreasing readmissions rates. It is also beneficial to identify those who are at high risk for hospital readmission. Those at the highest rated for readmissions need to be targeted

and monitored closely across the health care continuum. All patients need to be monitored by a multidisciplinary team; those who are at high risk for admissions need to be given priority and more aggressive care in the outpatient setting.

End of Life Care Research

Research conducted by Haydar et al. (2004) incorporated interdisciplinary weekly meetings to assure care coordination in end of life CHF and dementia patients. The study was a retrospective case controlled study that took placed in a geriatrician led interdisciplinary house call program. Patients were homebound and died under the care of the house call program from October 1996 to April 2001. The study sample was 142 patients with a diagnosis of CHF or dementia. Medical records where reviewed to obtain patient demographic, measure of function status, hospitalizations, and death place. The study determined that patients with CHF were more likely to have care plans directed at disease modification and treatments. According to research, patients with CHF who die in the hospital create twice the expense as those who die elsewhere. (Haydar et al., 2004).

A research study by Seamark et al. (2002) explored the prevalence of symptomatic HF in order to adopt a palliative care approach. The study was city based in a market town with a rural catchment area. Participants where selected through hand searching which yielded 548 patients with symptomatic HF. The study was able to demonstrate a pragmatic method to estimate the prevalence of HF through utilization of diagnostic testing such as BNP levels. Although the death rate in the cohort was lower than expected the study was able to develop a palliative care approach in participants who

die not experience sudden death. The study suggests further studies to identify HF

patients with dying trajectory. (Seamark et al., 2002).

Research by Gott et al. (2007) explored dying trajectories in HF. The study used

a quantitative longitudinal design. The sample had a total of 27 participated who were

diagnosed with HF, 60 years or older who had completed questionnaires for a minimum

of five specific time points prior to death. The study used the Kansas City

Cardiomyopathy Questionnaire Physical Limitation Score. From the data collected

researchers in this study where unable to identify a typical dying trajectory. The

researcher suggests their findings challenge efforts to plan a deliver palliative care based

on a theoretical HF death trajectory. (Gott et al., 2007)

Boyd et al., (2009) evaluated services available for people with advanced HF and

end of life care in the United Kingdom. The studied used longitudinal analysis of

interview triads in addition with cross-sectional analysis of interviews at specific stages.

Researchers were able to gain access to patient and family experiences as treatments and

services were discussed. Recruitment for the study wad done through a purposeful

sampling of individuals with NYHA Class III or IV HF. Data was collected through

serial qualities interviews with participants and their families. The study led to the

development of a HF care framework with varying stages. The study concluded that

patients with long-term conditions needing palliative care should be identified and

managed proactively using pragmatic criteria. (Boyd et al., 2009)

Research by Gott et al. (2007) supports that of Seamark et al. (2002) in that dying

trajectories are not always predictable.   The research suggests proactive approaches to

managing dying trajectories.

Psychosocial Implications

The Worcester Heart Failure Study conducted by Saczynski et al., (2009) used a life table analysis to examine the difference in long term survival in relation to age. The study examined age specific differences in clinical presentation, receipt of therapy, recommended lifestyle modification and survival in hospitalized patients with acute heart failure. The study was a qualitative population based study conducted in a large Central New England metropolitan hospital. The study had 4534 patients and conducted observational research between 1995 and 2000. Medical records were reviewed for demographic, clinical and treatment data. Research participants were divided in four age groups; below age 65, ages 65-74, ages 74-84 and above 85. The study concluded that patients age 75 and older were mostly likely female, with multiple comorbidities, lower body mass index and higher ejection fractions. The study also concluded that older patients were more likely to receive symptom modifying medication as apposed to disease modifying treatments. The study contributes great knowledge to research in that older patient respect a distinct clinical presentation. (Saczynski et al., 2009).

A research study by Dejong et al. (2005) supports the importance of assessing and treating patients with psychosocial parameters. The purpose of the study was to consider the impact of sociodemographic, clinical, health perception and, emotional variables in predicting health status. The study tested a multivariable model of health status and was a sub study of a prospective, randomized clinical trail designed to determine the optimal disease management regimen to improve outcomes in HF patients. The study used 87 participants to conceptualize health related quality of life, physical activity level and burden of symptoms. The study was conducted in three urban and suburban community

hospitals located in the Midwest. Participants for the study were recruited at the end of a HF hospitalization. The study used the Minnesota Living with Heart Failure Questionnaire in order to conceptualized symptoms. Questionnaires where administered within one week of discharge by a nurse research assistant. Findings of the study concludes that clinicians who want to deliver patient center care must address sociodemographic and clinical measures to improve outcomes. In addition to assessing these variables providers need to offer intervention to correct issues. (Dejong et al., 2005)

In order to provide adequate patient care providers need to consider every factor in the treatment and diagnosis process. Both age and social demographic play roles in how the HF patient is able to adapt to treatment. Patient centered care is necessary across the healthcare continuum in order to improve outcomes.

Conducting Chart Audits

Maddocks et al. (2010) conducted a study to determine the feasibility of using electronic medical record (EMR) data from the Deliver Primary Healthcare Information (DELPHI) database. Data was extracted in order to measure quality of care in patients with HF in ten primary healthcare practices in southwestern Ontario. Researchers extracted data from the medical records of 488 patients who have CHF marked in the medical record over a period of three years. The study showed low frequencies of documented care items for CHF. In order to avoid errors made in the Maddocks et al.,(2010) study researchers should be mindful of obstacles such as incomplete patient records, inaccessibility of data and, reliability of EMR versus manual chart audits.

Assiri (2011) conducted a qualitative retrospective cohort to investigate the clinical and therapeutic profiles of HF patients admitted to a Saudi Arabia Hospital. The

study sample included 300 consecutive patients admitted to Aseer Central Hospital with a diagnosis of HF from June 2007 until May 2009. Patient related data was analyzed utilizing frequencies, percentages, and measures of central tendencies. Results form the study support the concept of demonstrating trends in medical data. The study concluded making such data widely available will aid in the improvement of HF management and encourage providers to use evidence base guidelines in daily practice.

Sanborn et al. (2005) used data from a chart audit to determine if CHF was the second leading cause of hospitalization in a small rural hospital. The study found that the majority of the patient population were older and noncompliant to prescribed medical regime. The study used a chart abstraction tool to examine the care of all CHF patients admitted to the facility between 2000 and 2001. The tool provided researchers with other information including sociodemographic status and outpatient appointment schedule. The study concluded CHF management in the rural area needed improvement. The study prompted attention to address the lack in continuity of care, outpatient services and access to diagnostic testing.

The studies in this section all conclude that chart audits are valuable tools in obtaining data about a specific population. When conducting chart audits researcher must be careful and make sure they get the whole picture so that the data is not misinterpreted.

<center>**Chapter Three**</center>

<center>**Methodology**</center>

The purpose of this study is to evaluate the effects of monitoring congestive heart failure across the healthcare continuum with application to the Corbin and Strauss trajectory model of chronic illness. This chapter describes the methodology used in the study including research design, sample, data collection, and data analysis.

Procedures

Initial approval for the study to evaluate the effects of monitoring congestive heart failure across the healthcare continuum on patient readmission with 30 days or less was obtained from the CHF Coordinator at the site where the research was conducted. The following people at the site were notified of the study: The Director of Nursing for Cardiovascular Services, The Director of Nursing Research and the Nursing Research Council. The study is a retrospective chart review that used electronic medical record data queries to identify a sample of 100 admission cases.

Ethical Considerations

Prior to data collection the research study to evaluate the effects of monitoring congestive heart failure across the healthcare continuum on patient readmission with 30 days or less was approved by the Institutional Research Board at Gardner-Webb University and by the Research Board at the study hospital. The study hospital follows the guidelines for patient confidentiality mandated by the Health Insurance Portability and Accountability Act of 1996 (HIPAA). Confidentiality was maintained at all times and anonymity was insured. All account numbers, medical record numbers, and subject

<center>24</center>

names were omitted from the data queries. The individual records were labeled as a1 through a100.

Sample

This study was conducted at a large medical university hospital. The CHF Coordinator of the research site has data on subjects with readmissions from the years 2006 till present. Research subjects were admitted to an adult inpatient unit at the research site with an ICD-9 diagnosis relating to HF. The sample size includes a random selection of 100 consecutive CHF admission occurrences from the available data.

Instruments

A medical record audit for was used to collect data for the study. Validity of the audit form is evident by integrating concepts from Duke University Medical Center's Department of Community and Family Medicine in its development (2005). Variables addressed in the audits include, financial glass group, thirty day readmission occurrences, and discharge dispositions (Appendix C).

Data Collection and Analysis

Data queries where conducted on patients with heart failure ICD-9 codes. Retrospective data was reviewed from the dates of November 2009 until and May 2010. Data included in the review were admission dates, discharge dates, readmission dates if applicable, disposition and, financial class.

Each of one of the 100 admission cases was applied to the chart audit form. Data from the chart audits where compiled into corresponding groups. Occurrences and trends were identified. A chi-square test was used to show the likelihood of readmission occurring without the intervention of monitoring across the healthcare continuum.
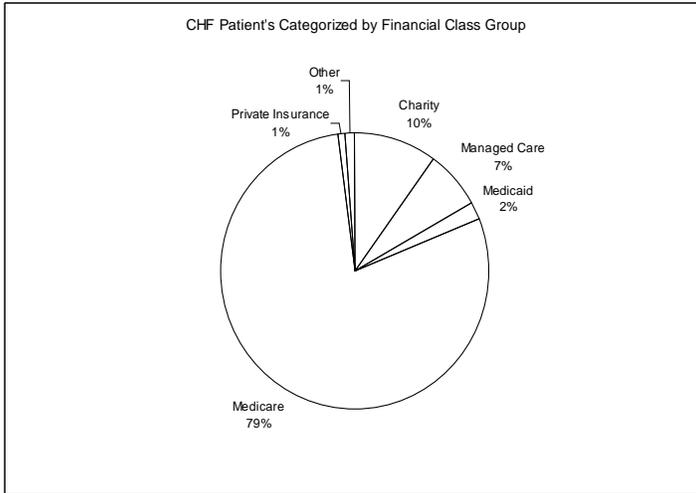
Chapter 4

Results

This chapter presents the results of the study to evaluate the effects of monitoring CHF across the healthcare continuum. The sample demographics are presented, followed by the results for the research questions. One hundred consecutive CHF admissions were randomly selected for the research study. A chi-square analysis of the research data was conducted on the patient data related to the 100 different admission occurrences.

Demographical data collected in the study shows the financial classification regarding pay for services for the sample population. The majority of subjects (79%) of the sample were Medicare Beneficiaries, with 10% charity cases, 7% managed care and only 1% private insurance. The financial classifications regarding pay for services for the sample is illustrated in Figure 2. With such a large Medicare patient population it is essential that care is managed correctly. According to the Unites States Department of Health and Human Service, Medicare will pay for inpatient acute care services based on care quality and not the quantity (USDA, 2011). Research suggests patients that continue to get readmitted have received inadequate care somewhere in their disease management process.

Figure 2

Financial Class Percentages

CHF Patient's Categorized by Financial Class Group

Other
1%

Private Insurance
1%

Charity
10%

Managed Care
7%

Medicaid
2%

Medicare
79%

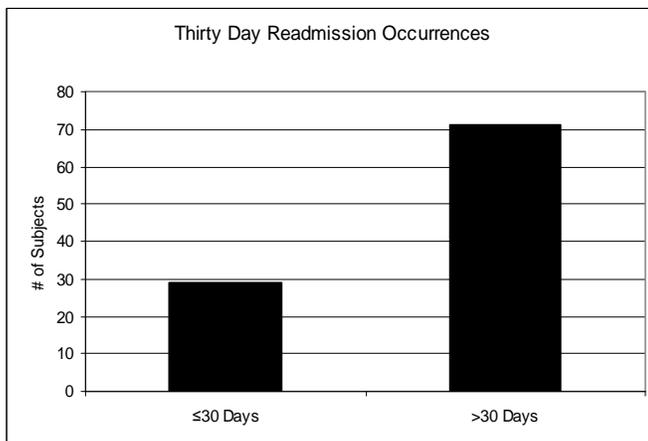Research has shown that readmissions are where quality, cost, and patient safety intersect (Brock, 2008). Descriptive statistical analysis of the data found that a large portion (*n* =29) of the sample was readmitted in 30 days or less following discharge. Figure 3 illustrates the readmission rates for the sample.
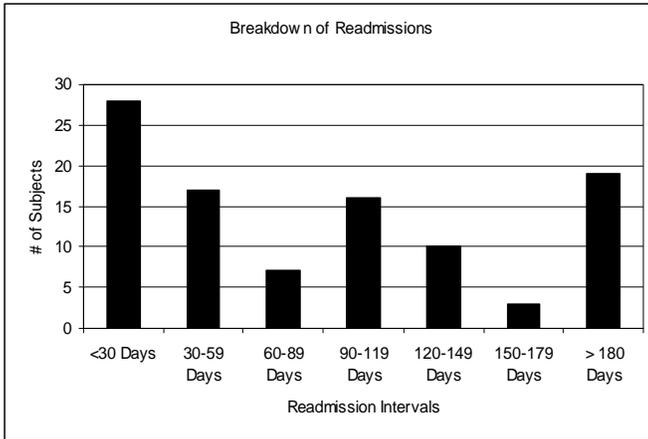
Figure 3

Thirty Day Readmission Rates

Thirty Day Readmission Occurrences

# of Subjects

≤30 Days   >30 Days

Further breakdown of the data found over half ($n = 52$) of the sample population

was readmitted within 90 days following discharge. Less than 20 CHF patients remained

out of the hospitalized for a minimum of 180 days.

Figure 4

Readmission Rates Breakdown

Statistical analysis utilizing the chi-squared test was conducted to test the

hypothesis that monitoring CHF across the healthcare continuum effects CHF

readmission rates. The dependent variables in the study were readmission in 30 days or

less and no readmission in 30 days or less. The chi-squared test is used to determine how

well observed data fits anticipated outcomes. In this study a chi-squared test was used to

determine the difference between the observed outcome of readmission in 30 days or less

and the outcome that the readmission in 30 days or less was likely to occur by chance.

The study compares what would have occurred in the absence of any true association

between healthcare given across the continuum and ≤30 day readmission rates.

If there is no relationship between care across the continuum and readmission in

30 days or less it would be expected that a patient would be readmitted solely by chance.

The null hypothesis for this study was there is no relationship between care across the

continuum and readmission in 30 days or less for patients with CHF. The statistical level

of significance was set at .05. Results of the chi-squared test ($p=0.7276$) indicated the

results were not significant and the null hypothesis could not be rejected. The data used in

the study was unable to establish that health care across the continuum has an effect on

CHF patients being readmitted to the hospital in 30 days or less. Table 4 shows the result

of the Chi-Squared Test for Heart Failure Readmission.

Table 4.

Chi-Squared Test: Heart Failure Readmissions

Chi-Squared Test: Monitoring Healthcare Across the Continuum			
Observed Outcomes			
	Readmitted ≤30 Days	Not Readmitted in ≤30 Days	Row Totals
Continuum Services Utilized	14	37	51
Continuum Services Not Utilized	15	34	49
Column Totals	29	71	100
Expected Outcomes			
	Readmitted ≤30 Days	Not Readmitted in ≤30 Days	Row Totals
Continuum Services Utilized	14.79	36.21	51
Continuum Services Not Utilized	14.21	34.79	49
Column Totals	29	71	100
p=value:	0.727637589		

Chapter Five

Discussion

Significance of the Findings

The chi-squared analysis of the data did not support the hypothesis that health care across the continuum has an effect on CHF patients being readmitted to the hospital in 30 days or less. The null hypothesis could not be rejected at the 0.05 level of significance. The research study does provide insight on healthcare and readmission rates for the CHF population. The Corbin and Strauss trajectory model for chronic illness was suitable in the study due to the large portion of readmission occurrences for patients with CHF. The patients with CHF who were subjects in this study cycled and repeated phases in the model. Although results from the study are that readmissions occurred by chance and not as a result of healthcare across the continuum, it was evident that a large portion of the sample was readmitted in 90 days or less.

Significance to Nursing

There are many nursing implications to consider when dealing with the CHF patient. According to Brock (2008) a quarter of all patients hospitalized with CHF are readmitted within 30 days. Proper patient education, compliance promotion, and transition care are beneficial to patient outcomes and readmission rates.

According to Brock (2008) 20% of Medicare beneficiaries are readmitted within 30 days. Brock (2008) further states the high level of readmission indicates inappropriate transition care, lower patient satisfaction, and increased health care cost. The high number of Medicare patients in this sample and the high number of readmissions calls for specific interventions aimed at this population of healthcare recipients.

There are many implications for nurses when dealing with the HF patients. Equipping patient with medication, scales, and blood pressure cuffs is not enough. A patient that monitors and medicates themselves inappropriately is an insignificant act that provides no benefit to the patient. According to Brock (2008) patients need to have scales big enough to stand on and have numbers that are visible to the patient. Missing any key component in the medical regime is s sign of inadequate care coordination, mismanaged self-care and, can lead to an unnecessary hospitalization. (Brock, 2008). The high number of readmissions revealed in the data analysis calls for stronger medical regime and management of CHF patients over the continuum of healthcare.

In addition to patient accountably there must be accountability among providers. The Medicare Payment Advisory Commission states that readmissions are not a result of mistakes that occur in the hospital by inadequate transition preparation (Hackbarth, 2009). According to Brock (2008) one in five patients discharged from a hospital experience an adverse event within three weeks of being discharged. Injuries resulting from these adverse events are medicine related and often can be mitigated or avoided.

Implications for Nursing Practice

The study uncovered a large number of readmissions that occurred 30 days or less from discharge. For nursing this is a travesty that demonstrates inadequate healthcare over the continuum. Nurses can be a proponent of these patients through more effective discharge planning, community follow up and referrals for CHF patients. Adequate intervention could have deferred and possibly avoided these readmissions.

The number of readmissions also has an effect on reimbursement of services. The number of charity patients in the study sample calls for decreasing readmissions. The

smallest percentage of decrease in hospital readmissions has the potential to decrease

healthcare costs for all.

Recommendations for future research

The sample selection only included a small portion of CHF admission

occurrences. Future research should include a larger sample size from multiple

healthcare facilities. Conducting a more comprehensive analysis of discharge disposition

could provide more insight on what continuum services are most effective. Identification

of the relationship of financial classification regarding pay for services on readmission

rates should be included in future research. In order to improve outcomes and

reimbursement, the healthcare team should analyzes which needs of the CHF patients are

continuing to be left unmet.

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Gardner-Webb University IRB

THE INSTITUTIONAL REVIEW BOARD
of
GARDNER-WEBB UNIVERSITY

This is to certify that the research project titled:

The Effect of Monitoring Congestive Heart Failure Across the Healthcare Continuum with application to the Corbin and Strauss Trajectory Model of Chronic Illness.

being conducted by _____Katrina Walker_____

has received approval by the Gardner-Webb University IRB.

Date___11/9/11_____

Exempt Research

Signed _____
        Department/School/Program IRB Representative
        _____
        Department/School/Program IRB Member

Expiration date _____11-9-12_____

        IRB Approval:

        __X__ Exempt _____Expedited _____Non-Exempt (Full Review)

Revised 09-09

Appendix B

Medical Record Audit Instrument Developed for Study

Date:

Auditor:

Admission dates included in study:

Total Medical Records Reviewed:

Subjects included in the audit:

Financial Class Group	Yes or No (Binary, only one applicable)
Charity	
Managed Care	
Medicaid	
Medicare	
Private Insurance	
Other	

Discharge Status	Yes or No (Binary, only one applicable)
AMA	
Home w/o continuum services	
Home w/ CHF Clinic Visit	
Home Health	
Hospice	
SNF	
Rehab	

Thirty Day Readmission Occurrences	Yes or No (Binary, only one applicable)
≤30 Days	
>30 Days	

Readmission Occurrence Breakdown	Yes or No (Binary, only one applicable)
<30 Days	
30-59 Days	
60-89 Days	
90-119 Days	
120-149 Days	
150-179 Days	