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Steps to Reducing Heart Failure Hospital Readmissions Through Improvement in Outpatient Care

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This is to certify that the doctoral study by

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2015

Abstract

Steps to Reducing Heart Failure Hospital Readmissions

Through Improvement in Outpatient Care

by

Patricia Dunn

MSN, ARNP, University of Central Florida, 1999

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The outpatient care of the heart failure (HF) patient is fragmented due to lack of evidence-based practice guidelines use. The primary goal of this project was to improve the care of the HF patient in the outpatient arena through use of clinical pathways using the logic model as the project framework. The intervention was carried out over a 4-week period on a convenience, random sample of patients (n = 80) attending a cardiology practice. The patients were recruited from 2 physicians' patient populations and selected based on an adult diagnosis of HF, reduced ejection fraction of <40% at some point in time, and a New York Heart Association (NYHA) functional class II-V. Comparisons were made in the documentation of care between patients on or off the pathway. The intervention included documentation of patient education, care follow-up, medications, NYHA class, and symptom exacerbation, documented in the electronic medical record. The quality of care data were evaluated based on 3 of the Joint Commission core measures for outpatient care of the HF patient. Additional data were collected regarding use of the clinical pathway based on provider and week of implementation. Data were analyzed via a Chi-square test of independence comparing pathway use by provider and use of pathway as study progressed. The comparative results show statistically significant differences in use of the pathway by provider and a statistically significant increase in use during the project. The quality of care results varied in statistical significance. The pathway utilization increased over time and provided a method for standardizing documentation of care for the HF patient in this outpatient clinic, a benefit for HF patients and providers in this cardiology practice and beyond.

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Chapter 1: Overview of Heart Failure

Heart disease is the leading cause of death in the United States and a potential precipitating factor for heart failure (HF). HF is the term given for the heart's inability to sufficiently pump the blood through the body. Left-sided HF is a symptom of failure or decreased function of the left ventricle and is primarily caused by coronary artery disease (CAD) or uncontrolled hypertension (HTN); however, cardiomyopathy, which is an enlarged or thickened left ventricle, can also cause left HF (Markaity, 2012). Right-sided HF is caused by increased lung pressure, which is typically secondary to pulmonary hypertension, chronic obstructive pulmonary disease, pulmonary valve stenosis, or frequent pulmonary blood clots (Markaity, 2012). HF is a frequent cause of hospital admissions in the United States, with the risk for repeat hospitalizations being high.

Explanation of the Problem

The Center for Medicare and Medicaid Services (CMS) places a priority on reducing the number of hospital readmissions within 30 days for high-risk diagnoses such as HF, ultimately financially penalizing hospitals with unacceptable rates (Center for Medicare and Medicaid Services, 2011). Readmissions of patients with HF cause an increased financial burden to the system and can be a predictor of adverse patient outcomes. Hospitals may face financial penalties on Medicare reimbursement and value-based purchasing incentives if 30-day readmissions of HF patients are above recognized standards.

Improvement in in-patient hospital care, use of evidence-based practice (EBP) guidelines, guideline-directed medical therapy (GDMT), readiness assessment for discharge, and transition of care to outpatient status are encouraged to optimize outcomes

and reduce the frequency of hospital admissions or readmissions for HF. (U.S. Department of Health & Human Services, 2013). This process, however, is not always seamless.

Problem Statement

A problem exists with the continued care of the HF patient after stabilization and hospital discharge. Data have shown that care of the HF patient is frequently fragmented and hospital readmissions may be prevented with more structured follow up care (Kay et al., 2006). While much literature is available regarding in-patient HF care and outcome monitoring, and there has been an increase in literature available guiding the structure and development of formal outpatient HF clinics, little literature is found to guide the independent practice in the effort to provide and monitor adequate care to the HF patient in a structured manner.

Significance of Heart Failure

Prevalence

In 2009 approximately 5.7 million Americans had a diagnosis of HF. It was a contributing factor in 280,000 mortalities in 2008 alone and the incidence is increasing, with 650,000 new cases diagnosed each year (Center for Disease Control and Prevention, 2013). It is estimated that half of the people diagnosed with HF will die within 5 years of diagnosis, with a cost to the healthcare system of approximately 34 million dollars annually, including the cost of treatment and disability losses (Center for Disease Control and Prevention, 2013). HF is the cause of 12-15 million office visits and 6.5 million hospital days annually, with the prevalence rising as the elderly population increases with

the aging of 78 million baby boomers. One in five Americans are expected to be over the age of 65 by 2050 (Butler, 2012).

The county in Florida in which this study was conducted, had a population of 545,750 in 2011, with 2,522 annual hospitalizations for coronary heart disease (CHD)and 541 hospitalizations for congestive heart failure (CHF), representing an age-adjusted rate of 309.1 and 72.2 per 100,000 respectively, according to the county chronic disease profile (Florida Department of Health, 2013). The annual death count in this county from CHD in 2011 was 992; it was 74 for HF. The age-adjusted death rate from HF in Florida and this county has been on the increase, with higher rates of HF occurring among men specifically Black men (Florida Department of Health, 2013).

HF can affect adults of all ages but it is a significant problem and a major cause of hospitalizations in patients greater than 65 years old and carries a high mortality rate among elderly (Mant, Al-Mohammad, Swan, & Laramee, 2011). The incidence of HF is increasing and is more prevalent in those over 65; therefore, as the population ages so does the risk for developing HF (Pinkerman et al., 2013), however, of the 541 HF hospital admissions in 2011, in the county in which this study was conducted, 415 of them occurred in those under age 65 and were categorized as preventable (Florida Department of Health, 2013).

Context and Magnitude

In Florida alone, the age-adjusted death rate from HF has increased from 1,605 in 2003 to 2,418 in 2011; which is a rate increase from 6.9 to 8.9 per 100,00 (Florida Department of Health, 2013). According to the Florida-US Health State comparison ranking in 2009 (Florida Department of Health, 2013), the age-adjusted diagnosis of HF

in Florida was 244.1 per 100,000, compared with the U.S. statistic of 158.9 per 100,000, although deaths from HF are lower at 7.7 compared to 16.9 respectively.HF is a condition composed of signs and symptoms and often difficult to classify as a specific cause of death; therefore, limitations calculating the exact mortality rates exist because of potential misclassification of, or failure to list as, a cause of death (National Institutes of Health, 2012).

The calculated 30-day national risk-standardized readmission rate (RSRR) for HF in 2007-2009 was 24.7% (Center for Medicare and Medicaid Services, 2011). Recent statistics from a local for-profit hospital in Central Florida showed a 30-day readmission rate for HF patients of 28%, which placed this hospital at risk for Medicare reimbursement penalties. While this hospital has been successful in reducing the readmission of HF patients over 9 months from 28% to 11% through hospital process changes, there is uncertainty if these improvements will be maintained without a formal outpatient follow-up care guidance plan. The patients from this hospital are discharged to individual cardiologists, internists, and primary care providers for follow-up care with the expectation that standardized EBP guidelines will be utilized in follow-up care.

Reduction in HF readmissions starts with in-patient care through development and implementation of multidisciplinary pathways, which include proper use of medications, life-style and risk factor modification, and patient education based on EBP guidelines, optimally followed by appropriate outpatient care (Herrick, 2001). Outpatient HF clinics, which specialize in the care of HF patients, have shown improvement in patient quality of life and management of patient symptoms, in part through use of evidence-based

guidelines for care management, but also through patient and family education and close patient follow up (Kutzleb & Reiner, 2006).

The for-profit hospital system serves community healthcare needs; however, the focus also is placed on positive financial returns that can be distributed among shareholders. Often for-profit hospitals achieve financial gains by limiting unprofitable services and offering those that generate revenue or are profitable (Horwitz, 2005). Even though HF disease management clinics have shown a positive return on investment (ROI) in some cases, projecting profits and expenses and developing a business plan could be difficult. The question remains if they are financially feasible and cost effective in a for-profit healthcare system whose emphasis is on the financial bottom line and ROI (Goetzel, Ozminkowski, Villagra, & Duffy, 2005).

Needs Assessment

Guidelines and recommendations for the care of the HF patient are well established and documented in the literature and include recommendations for medical therapy, lifestyle changes, hospital follow up and ongoing monitoring, and palliative care (American College of Cardiology Foundation/American Heart Association, 2013; Lainscak, 2004; Mant, Al-Mohammad, Swan, & Laramee, 2011; National Clinical Guideline Cemtre, 2010; Whitlock, 2010). Despite these guidelines and recommendations that are widely available to providers, HF hospitalizations remain high; therefore, in order to prevent symptom exacerbation, hospitalizations, and re-hospitalizations, a clear recognition of care deficiency areas and patient care needs should be established. Involving the direct care provider as a primary stakeholder in the needs assessment can help reveal deficiencies.

The normative need of the HF patient for this project was established using secondary sources for data collection, including Florida Department of Health, Division of Public Health Statistics & Performance Management, CDC, and Florida Charts county and state profile reports to assess the prevalence, morbidity, and mortality of HF in the chosen community compaired to state and federal statistics. Perceived need was established by relying on key informant interviews from members of the healthcare team caring for HF patients and through primary and secondary data sources, including members of nursing services, medical providers, case-mangement, and home-care providers. These individuals are considered primary stakeholders in this project and helped to elucidate areas of deficiency in local HF care answering questions such as perception of care deficits, number of patients hospitalized monthly with HF, frequency of homecare follow up, and number of patients receiving standard evidence-based therapies through review of discharge and admission data. Expressed need was established by review of the literature, data collection on inpatient care and outpatient follow up care, and utilizing services such as homecare, telemedicine data, cardiac rehabilitation services, expert opinion, patient data, and secondary sources such as chart reviews and available service statistics.

The common threads of needs to improve HF care and prevent readmissions were identified as stakeholder involvement, consistency of care, appropriate use of evidence-based therapies, timely follow up post hospital discharge, patient adherence to prescribed medications and diet promoted through patient and caregiver education, and patient understanding of symptoms of disease progression with timely reporting. After these needs were reviewed, the research question was developed.

Research Questions and Hypothesis

Research Question

Efforts to improve the care of the HF patient should continue beyond hospitalization. These efforts should include optimizing the care provided at the outpatient clinic. In the heart failure patient, can the outpatient care process be improved at a for-profit health system?

Hypothesis

To answer this question several processes of care for the HF patients in an outpatient cardiology clinic were analyzed. These processes were related to utilization of recommended GDMT and development and utilization of a HF clinical care pathway, which led to the first null hypothesis that there was no difference in care for patients utilizing the heart failure pathway.

Providers may react differently to the utilizing clinical pathways and clinical guidelines. This difference has been demonstrated by documented fragmentation and inconsistency of care despite the existence of well-established guidelines (Fonarow et al., 2008). Questions related to the potential difference in pathway utilization by providers led to the second null hypothesis that there would be no statistical difference between provider and pathway utilization.

Changing practices and behaviors may take time. Changes to the status quo and challenges to perceived authority or knowledge are not always well received, with cultural barriers frequently being the most formidable roadblock to change (Best & Neuhauser, 2006). Recognizing these change barriers led to questions related to

acceptance of the pathway over time and the third null hypothesis that there would be no difference in pathway utilization based on the week of the study.

Purpose and Objective

The purpose of this project was to improve the care of the HF patient in the outpatient cardiology clinic associated with a for-profit health system by utilizing an evidence-based guided HF clinical pathway for care coordination, with an objective to improve the care process. This project was done with the objective of laying the foundation for a nurse-led HF clinic, promoting multidisciplinary team collaboration, and instituting practice change to promote standardized, continuity of care, and consistency of care including timely follow up, utilization of EBP guidelines and guideline-directed medical therapy, and education to increase patient self-care through patient adherence to diet, lifestyle, and follow-up recommendations, as well as to increase the patient's understanding of signs and symptoms of disease progression, thereby improving patient outcomes and quality of life.

Framework

Changes to the status quo and challenges to perceived authority, knowledge, or established patterns and habits are not always well received, with cultural barriers frequently being the most formidable roadblock to change (Best & Neuhauser, 2006). The challenge to support the patients and providers while encouraging guideline implementation and practice change is an obstacle that can be approached with change theory. The framework for this project was chosen to support the process rather than specifically to apply to a disease management program. The theory of reasoned action (TRA)/ theory of planned behavior (TBA) links people's behaviors to beliefs, attitudes,

and intentions and has been used extensively in health research to predict health behaviors (Evans, Ndetan, & Williams, 2009). This theory was used as a framework to support the planned process change to improve practice and care for this patient group. Literature supports use of TRA/TBA for understanding and motivating behavior change in providers and patients (Bilic, 2005; Courneya, K. S.; Rodgers, W. M.; Fraser, S. N.; Murray, T. C.; Dub, B.; Black, B., 2003; Evans, Ndetan, &Williams, 2009).

Treatment and Adherence

The interventions for treatment of HF include, but are not limited to, the prescribed use of multiple medications based on evidence-based practice guidelines, the dietary restriction of sodium intake, life style changes, ongoing monitoring, and documentation of patient status and functional class. Additionally, fluid intake restrictions may also be recommended for some patients (Duffy, Hoskins, & Chen, 2004; Mant, Al-Mohammad, Swan, & Laramee, 2011; Whitlock, 2010). Evidence shows that first line therapy treatment with beta-blockers (b-blockers) and angiotensin converting enzyme inhibitor (ACE-I) improve quality of life and reduce morbidity (Mant, Al-Mohammad, Swan, & Laramee, 2011). Additionally, diuretics are commonly used to manage fluid balance, treat dyspnea, and minimize edema (Butler, 2010; Tansey, 2010). Medications are used in conjunction with recommendations for life-style modifications such as following a low-sodium diet. Despite the established evidence based care recommendations, there continues to be inadequate treatment and variations in care delivery across physician practices. IMPROVE HF was a prospective cohort study examining the therapy use data on patients (N= 15,381) diagnosed with chronic HF and reduced ejection fraction (EF) $\leq$35% to examine the patterns of care for HF patients in

the outpatient setting. Seven care metrics were examined, including; use of ACE-I, use of b-blocker, aldosterone inhibitor, anticoagulation in patients with atrial fibrillation, implantable cardioverter-defibrillator (ICD), cardiac resynchronization therapy, and documentation of HF education. The results indicated there is a wide variation in care consistency across physician practices with no practice providing optimal care to more than 62% of the patients (Fonarow et al., 2008).

Regardless of the etiology, once HF has developed, a major risk associated with symptom exacerbation, worsening HF, and mortality is lack of adherence to treatment (White, 2005). Lack of adherence to dietary sodium restriction and fluid intake guidelines, medication regimes, and follow up recommendations can lead to increased HF symptoms (Evangelista et al., 2003; George & Shalansky, 2006). Treatment non-adherence in HF patients is associated with increased morbidity and mortality and poor compliance is associated with decreased quality of life, increased healthcare costs, and hospital readmission. Increased fluid volume and repeat hospitalizations secondary to exacerbation of HF is considered a predictor of poor prognosis (Albert, Buchsbaum, & Li, 2007). Adherence to medication regime and life-style changes, including low sodium diet, is an integral part of HF treatment guidelines and requires patient participation.

Assumptions

Multiple issues affect the development of HF occurrence and HF patient hospitalizations, among which are increasing prevalence of predisposing factors, unhealthy habits and lifestyle, inconsistent or inadequate care, and treatment non-adherence. The increased incidence of HF symptom exacerbation leads in turn to decreased quality of life, increased family and financial burden, and increased stress on

the healthcare system. Managing predisposing factors through risk factor modification, standardizing care based on evidence-based guidelines, and treatment adherence can help to decrease the prevalence of HF and HF exacerbation leading to hospitalization. Evidence-based guidelines help to standardize and direct care; therefore, utilizing guidelines for providers, nurses, and multi-disciplinary care providers in order to direct and optimize care should lead to consistency in care standards and prevent symptom exacerbation, improving quality of life and decreasing healthcare costs for HF patients and society.

Limitations

Potential limitations exist in accurate identification and scheduling of heart failure patients by the clerical staff. Attempts to educate the scheduling personnel were made prior to initiation of the project. Additionally, failure to capture a sufficient amount of patients during the limited study period may have contributed to an inability to truly assess the effectiveness of the process improvement compared to the usual process. Ongoing assessment of the process can be accomplished based on the long-term goal assessment of decreased exacerbation and hospital admission rates. Additionally, potential bias of patient outcomes may exist related to the clinic specialty and many patients having bi-ventricular cardiac resynchronizations devices; however, the focus of the project was more on the care process than care outcomes. Care outcomes with evidence-based care utilization have been well established as described in the literature review.

Definitions of Term

Care pathway, clinical pathway, clinical guidelines: evidence-based, multidisciplinary care plans that create a guide containing essential steps, recommended in the care of patients with a specific diagnosis.

Heart failure (HF): A term given for the heart's inability to sufficiently pump the blood throughout the body to meet the body's metabolic needs.

End stage heart failure: Marked symptoms at rest despite optimal medical therapy.

Ejection fraction (EF): A measurement of the percentage of blood, ejected by the heart, during a diastolic cycle.

New York Heart Association functional class (NYHA): Method used to grade heart failure severity based on patient symptoms classified into 4 levels as follows: no shortness of breath with routine activities of daily living which are (NYHA class I), shortness of breath with long walks or climbing several flights of stairs (NYHA class II), shortness of breath with short walks (NYHA class III), or shortness of breath at rest (NYHA class IV).

Palliative care: care that focuses on relieving and preventing suffering, utilizing a multidisciplinary approach, which is appropriate for patients in all disease stages, including those undergoing treatment for curable illnesses, living with chronic diseases, or nearing the end of life.

Return on Investment (ROI): Performance measure used to evaluate the efficiency of an investment, calculated by the benefit (return) of an investment divided by the cost of the investment; expressed as a percentage or a ratio.

Summary

HF continues to be a major public health concern affecting 5.8 million people in the United States and accounting for one of the most frequent causes of hospitalization and hospital readmissions annually (Center for Disease Control and Prevention, 2013). Efforts to reduce hospital admissions and readmissions may favorably impact the patient's quality of life, the family dynamic and the burden on the health care system. While efforts at reducing HF readmissions should start while the patient is in the hospital, admission and readmission preventive efforts should take place in the outpatient clinic through the use of EBP guided therapy. These efforts include proper preventive measures and lifestyle modification, patient and family education, the use of early diagnosis and treatment utilizing EBP guidelines, GDMT, proper documentation of patient status, and ongoing monitoring with modified treatments and ultimately palliative care as dictated by the patients status (Hauptman, et al., 2008). Outpatient HF clinics have been proven effective as an adjunct to symptom management but exact ROI is difficult to calculate and potentially unappealing to for-profit health systems unless tangible and intangible benefits out -weigh the expense.

The magnitude of the problem with HF care has been discussed and the importance of finding solutions to care, for all HF patients and the community involved in this study, has been highlighted. A review of the literature was done to guide the development of the project and contribute to the adequate understanding of the necessary components needed to complete the project and is reviewed in chapter 2. This review included the components considered important to comprehensive HF management. Chapter 3 includes a description of the approach, design, participant recruitment,

protection of subjects, data collection procedures, goals, and methodology for compiling and analyzing data. Chapter 4 includes results and implications of the study. This chapter interprets the findings related to limitations, and implications for social change, while analyzing the researcher from the domains of; scholar, practitioner growth, project developer, and future professional development. Chapter 5 is a final project evaluation report that summarizes the project goals, outcomes, areas of future study, and plans for dissemination.

Chapter 2: Review of the Scholarly Evidence

Introduction

HF is a well-documented and studied clinical syndrome that affects millions of Americans at an estimated annual cost of $37 billion dollars (U.S. Department of Health & Human Services, 2013) and has established care guidelines, quality measures, and treatment strategies (Lainscak, 2004; Mant, Al-Mohammad, Swan, & Laramee, 2011; U.S. Department of Health & Human Services, 2013). Prompt recognition of HF diagnosis upon hospitalization can facilitate appropriate interventions and improved care. This care should be extended beyond the hospital period and include outpatient care, education, and palliative care. The following is a brief review of literature surrounding the components of recommended care for the HF patient. All of the aspects should be considered when customizing and individualizing the care of patients with this complex syndrome.

The search for relevant studies was conducted using the CINAHL Plus with Full Text, Cochrane Database of Systematic Reviews, Dissertations & Thesis at Walden University, and MEDLINE with Full Text. Google Scholar was also utilized. The key words adherence, care models, care, clinic, clinical pathway, disease management, healthcare cost, heart failure, guidelines, inpatient, outpatient, palliative care, theory of reasoned action, outcomes, and quality, quality of life were used for the search criteria. For the purposes of this review, only peer-reviewed articles published in scholarly journals since 2000 were considered. Industry recognized medical and government websites for statistical

data including the American College of Cardiology, the American Heart Association, the Center for Disease Control, the Florida Department of Health, the Joint Commission of Hospitals, and the Society of Hospital Medicine were also utilized.

Inpatient Care

Manning, Wendler, and Bauer (2010) described the development and implementation of an advanced practice nurse-led HF clinic approach to manage the acute care of HF patients and demonstrated consistent improvement in core monitoring indicators sustained over time. After development of a mechanism to identify all HF patients admitted to the hospital, regardless of admitting diagnosis, using criteria such as: secondary diagnosis, laboratory monitoring results, and case management identification of patients, the heart failure support team (HFST) led by a nurse practitioner was able to monitor the care of the HF patient. Upon verifying the diagnosis based on history and/or EF, the HF patient was then tagged as such in the EMR creating a relationship with the diagnosis for future encounters. A standardized tool was utilized to be included in the chart to provide for documentation of HF patient care based on the Joint Commission (TJC) recommended care measures including documentation of EF and use of ACE-I or angiotensin receptor blocker (ARB) in those with EF <40%. The outcome of this study showed that a comprehensive advanced practice nurse led HF management program improved adherence to TJC core measures regarding HF care (Manning, 2010).

Similarly, Kay et al. (2006) performed a review of the Carolina Healthcare System HF care, for the purpose of improving HF care compliance with TJC core

measures, and controlling cost and showed care to be fragmented. The assumption was made that hospital readmissions could be prevented through closer follow up care and more aggressive therapy. The establishment of an interdisciplinary committee to evaluate programs and recommend changes spearheaded the development of an improved care delivery system that focused on intensive staff education regarding disease management, medication interventions, smoking cessation, and nutritional counseling. The outcome reflected a reduction in 30-day HF readmission rates from 7.3% to 1.7% and mortality declined by 25%. These improvements were brought about in part by improved cardiac discharge instructions and homecare services that included patient needs assessment prior to discharge, home clinical pathway, behavior modification, and cardiac monitoring consisting of daily BP, heart rate, and weight(Kay et al., 2006).

Another approach to inpatient HF management was developed and reported by Discher, Klein, Pierce, Levine, A. B., and Levine, B. (2003) which included a nurse case-managed HF program (Discher, Klein, Pierce, Levine, & Levine, 2003). The purpose of the study was not to develop a specialized HF unit but rather a nurse case management HF program, implementing practice guidelines that were extended to diverse providers encountering the challenges of large variation of practice among providers and reluctance to adhere to guidelines. The researchers in this retrospective study examined the outcome effects of this disease management program implemented in a hospital setting. The program included the development of a HF algorithm and clinical pathway, the development of educational programs for physicians and nursing staff competency in HF care, and the development of patient educational materials. All materials were based on Agency for Healthcare Policy and Research (AHCRP) clinical

criteria for HF. The program goal was to improve care while lowering cost, decrease the length of stay, increase usage of AHCRP care criteria for HF patients, and maintain staff satisfaction. The outcome showed that patients in the managed group (*n=396*) had significantly increased documentation of left ventricular dysfunction and ACE-I use, lower length of stay (3.9±2.2 vs 6.1±2.8 days, $p<.001$)) and a significant reduction in cost ($4404±$1989 vs $6828± $3347, $p<.0001$) compared to the unmanaged group (n=197). These improvements were sustained at one year with the success of the program attributed to clinical pathway algorithm, staff education, and inpatient follow-up by nursing case managers (Discher, Klein, Pierce, Levine, & Levine, 2003).

Outpatient Care

Formal HF disease management clinics have become a recognized way to deliver coordinated care to the HF patient. Lainscak (2004) studied the effect of treatment strategies provided at HF clinics in a prospective cohort study of all patients referred to the HF clinic. Those with signs and symptoms of HF, LVEF <45%, and at least 3 visits to the HF clinic were included, with patients acting as his or her own control in before and after intervention data collection. Extensive medical history, physical exam, and echocardiogram were done at the initial visit. Patients and their care providers received a 45- minute initial consultation with the physician that included instruction on disease process, recognition of signs and symptoms of worsening condition, importance of adherence to prescribed medications and non-pharmacological measures such as fluid and sodium restriction, physical activity, and risk factor modification. Prior to the study, there were 52 hospitalizations (.81 per patient) for HF amongst the cohort. After intervention, 14 hospitalizations (.57 per patient) reflected a reduction of 73%. Knowledge regarding

HF was assessed at baseline with questionnaire prior to first contact with the physician; follow up questionnaire results after the third visit showed significant improvement. Pharmacological management analysis showed an improvement in the use and dosages of guideline-recommended medications. The study results showed that coordination of outpatient care, patient education, and follow up helped to improve, patient knowledge, adherence to EBP guidelines, outcomes, and perceived quality of life (Lainscak, 2004).

Similarly a descriptive, qualitative study done by Crowder (2006) using ethnographic interviewing of participants (*N*=15) at an outpatient HF clinic showed participants had self-reported improved quality of life and symptom management. Twelve (80%) of the participants were referred by providers due to repeat HF hospitalizations and the remaining participants were self or family referred. All participants had NYHA class III-IV HF symptoms and reported an improvement in quality of life attributed to being enrolled in the HF clinic (Crowder, 2006).

Sochalski et al. (2009) found similar results in outcomes for HF patients. The study analyzed data from 10 randomized clinical trials of HF care management programs, including those trials run by certified HF nurses or advanced practice nurses (*n*= 6). The reveiw found that multi-disciplinary managed care program patients had fewer hospital readmissions than patients receiving routine care (Sochalski, et al., 2009).

The importance of outpatient follow up of HF patients was demonstrated in a systematic review of non-pharmacological strategies for improving HF outcomes by Duffy, Hoskins, and Chen (2004). The reviewers examined 15 research studies which met inclusion criteria of randomized controlled trial and minimally acceptable HF study assessment score (HFSAS) of 13. The HFSAS is an evaluation tool designed to analyze

HF studies and includes items such as sample size, timeline, and NYHA functional class. All of the studies included an intervention and a control group, with randomly assigned participants, having an average age 71.5 years, with predominantly NYHA functional class III symptoms, and a predominantly male cohort. The care was delivered by a multi-disciplinary team 73% of the time and nurse-led care 26% of the time. Care delivered included education, close monitoring, family and emotional support, team collaboration, and telephone contact. The results reported in the studies were decreased hospital readmissions and the same or improved quality of life with cost of care staying the same or reduced in all studies but one (Duffy, Hoskins, & Chen, 2004). This review demonstrated the importance of non-pharmacological measures and comprehensive care to treat HF, improve outcomes, improve quality of life, and decrease cost.

Palliative Care

HF affects 1-2% of the developed world, with greater than 10% of the elderly population eventually developing this syndrome (Gadoud, Jenkins, & Hogg, 2013). The lifetime prevalence of HF is 15-20% in all adults with the risk for developing this syndrome increasing with age. HF patients can suffer with severe symptoms which include pain, anxiety, disability, and eventually death, with a 30-50% mortality rate within 5 years after the first HF hospitalization. The caregivers of these patients also experience a high degree of burden and stress (Howlett, 2011).

Palliative care, which involves the promotion of physical and psychological health, has been a recognized part of end of life care for patients with malignancy but has not been associated with care of the HF patient until recently. Howlett (2011) discussed the reasoning why palliative care is not a consistent part of the HF patients care plan.

These reasons include the inability to precisely predict life expectancy in HF patients, episodes of sudden death in otherwise stable, compensated HF patients, therapies used for the treatment and symptom control of HF often prolong life, misunderstanding by patients, caregivers and some providers regarding the role of palliative care, and unwillingness by some providers to discuss end-of-life issues.

Recommendations for palliative care plan coincide with the stages of HF which include Stage 1, the chronic disease management phase; Stage 2, supportive and palliative care phase; and Stage 3, terminal care phase. During Stage1 symptoms are generally NYHA functional class III and the goals of palliative care include; active monitoring, prolonging survival, symptom control, patient and caregiver education, and self- management. Stage 2 coincides with NYHA functional class III-IV and most likely increased hospitalization events. This phase has goals more consistent with symptom management, multidisciplinary needs assessment, discussion of the prognosis and likely course of the disease, and advance directive planning. Stage 3 is end-stage disease with symptom control, increased practical care and emotional support, and a formalized plan for resuscitation status addressed. This phase may continue to bereavement support for the caregivers and family (Howlett, 2011).

Howlett (2011) reviewed a general guideline for the inclusion of palliative care services in the HF patient care pathway, with recommendations for each stage of HF, including emphasis on reevaluating goals of therapy as the disease progresses. The recommendation is to approach the patient early in the disease process regarding prognosis, advanced directives, and resuscitation status, identification of a healthcare

surrogate, support with psychosocial issues including respite care, and evaluation of coping and caregiver burden (Howlett, 2011).

National and international guidelines recommend palliative care as an integral part of HF management (National Clinical Guideline Cemtre, 2010). Gadoud, Jenkins, and Hogg (2013) discussed the gaps in care related to the HF patient in regards to palliative care. Factors related to inequities and barriers in providing palliative care to HF patients include; difficulty by clinicians in discussing the poor prognosis associated with HF, fear of causing alarm in patients and families, fear of destroying patient's hope, limited time for conversations because of busy clinics, and the medical model focus on prevention of death (Gadoud, Jenkins, & Hogg, 2013). Goals of palliative care presented by Gadoud (2013) include symptom control, holistic assessment and support for all domains including; physical, spiritual, open communication, and medical and device therapy. The importance of accurate prognosis and specific symptom management including the management of dyspnea, edema, fatigue, and pain is a desired goal as well as the utilization of an integrated team approach.

Evidence supports that providers and doctors agree with palliative care for HF patients. Hanratty et al. (2002) investigated doctors' perception of palliative care in a explorative, qualitative study conducted in Northwest England involved a variety of providers (N=29) including general practitioners, consultants in cardiology, geriatricians, and palliative care providers. This study used focus groups to facilitate identification of topics of interest to each provider. The results revealed that there was a lack of coordination of care for the HF patient secondary to repeated hospital admissions under the care of different providers and lack of community support. The group agreed that

difficulty with prognostics and the unstable trajectory of the progression of HF leads to difficulty with palliative care services. A common belief that palliative care doctors have difficulty treating HF was held by the group (Hanratty et al., 2002). There was a consensus of the participants regarding the need for the inclusion of palliative care with HF and a clarification of the roles of providers. Barriers identified arose from coordination of care, prognosis and course of HF, and views of colleagues' roles. Additionally, recommendations for specialist nurses and general practitioners that could act as care coordinators were deemed a central component of palliative care services (Hanratty et al., 2002)..

Treatment Guidelines

The science related to the treatment of HF continues to evolve and includes inpatient and outpatient care. The American College of Cardiology Foundation and the American Heart Association (ACCF/AHA) task force have been producing EBP guidelines since 1980 (American College of Cardiology Foundation/American Heart Association, 2013). These guidelines include the definition of HF based on the NYHA functional class, staging guidelines based on disease processes and progression, pharmacological strategies for the treatment of HF, explanation of stages of HF with recommended treatments for each stage, indications for cardiac resynchronization device placement guidelines, and recommendations for care on hospital discharge including prompt follow-up care recommendations, with multidisciplinary disease management which includes palliative care. These guidelines are scrutinized annually and updated as needed with the most recent update completed in 2013.

The ACCF/AHA guidelines stress the importance of risk factor modification, early detection, and the prevention or reduction of morbidity and mortality (Yancy, Krunholz, & Ryan, 2013).The guidelines are written by a committee of selected experts and utilize evidence-based recommendations with the class of the recommendation being an estimate of the size of the treatment effect designated by classification I, IIA, IIB, and III, with I being benefit outweighing risk and III being no benefit or potentially harmful. The level of evidence representing the level of certainty or precision of effect designated by A through C, with A being utilized in multiple population and C being utilized in limited populations (American College of Cardiology Foundation/American Heart Association, 2013).

The National Institute for Health and Clinical Excellence (NICE) has similar guidelines for HF care which strive to promote patient centered care by considering individual needs and preferences, through communication and education, to allow patients to reach decisions regarding their care based on evidence-based information. These guidelines were developed in London and are utilized in Europe and are consistent with the ACCF/AHA guidelines with recommendations regarding diagnosis, functional class, staging, treatment modalities including medications, life-style modification, monitoring, rehabilitation, discharge planning, discussions regarding prognosis, and palliative care (National Clinical Guideline Cemtre, 2010).

The Institute for Clinical Systems Improvement (ICSI) also provides guidelines for the care of the HF patient with a system in place for frequent updates as new evidence emerges and guidelines change (Pinkerman, et al., 2013). These resources are comprehensive, researched based guides that are complete and succinct, covering many

areas including classification of disease, inpatient and outpatient care guidelines, and tools for adherence.

The Heart failure Society of America (HFSA) has published a consensus statement regarding HF care. This statement acknowledges that the treatment of HF should occur on a continuum from acute care episodic treatment requiring hospitalization through chronic care management in the outpatient office setting. Recommendations for the outpatient setting include; prompt follow up within 7 days or less of hospitalization, early identification of symptom progression, evidenced- based medical therapy, quality of life evaluation, and patient and family education to improve adherence to medical regimens and treatment plans. This is especially important when recognizing that outpatient care accounts for a significant portion of HF expenditures with HF being the leading cause of for outpatient visits in the Medicare population (Hauptman, et al., 2008). HFSA also recommends patients and their family members or caregivers receive additional education and counseling delivered by a multidisciplinary team. The guidelines recommend educational instructions include definitions of disease processes, symptom recognition, medication indication and usage, the importance of risk factor and life style modification, activity recommendations, and the importance of treatment and follow up adherence (Rich, et al., 2008).

American Heart Association (AHA) has a goal to improve care for patients with heart disease and stroke through utilization of their get with the guidelines (GWTG) program. This program includes modules for patient management tools in patients with HF, stroke, and coronary artery disease (CAD) that contain patient specific recommendations that allow for real time data collection and a method for tracking

adherence internally and against national benchmarks. These guidelines are focused mainly for the inpatient care of the HF patient and have shown improvement in documentation of process of care in a study comparing 215 hospitals enrolled in the GWTG-HF program to other hospitals not enrolled (*N*=4,245) from 2006-2007. The GWTG hospitals had significantly higher documentation of left ventricular EF, use of ACE-I or ARB, and discharge instructions. The GWTG hospitals showed a 30-day readmission rate that was lower than non-GWTG hospitals (-.33%; 95% CI, -.53% to -.12%; p=.002), however there was no significant difference in 30-day mortality rate (Heidenreich, et al., 2012).

Currently care recommendations and interventions for treatment of HF are consistent across guidelines and include, but are not limited to, the prescribed use of multiple medications, based on EBP guidelines, the dietary restrictions of sodium intake, life style changes, ongoing monitoring **,** and prompt outpatient follow up post hospitalization ideally within 3-7 days. Additionally, fluid intake restrictions may also be recommended for some patients (Duffy, Hoskins, & Chen, 2004; Mant, Al-Mohammad, Swan, & Laramee, 2011; Whitlock, 2010). Despite the improved outcomes found in clinical trials through management of HF with medications and life-style modification, because of patient characteristics and inconsistent outpatient care, these benefits may not be realized in clinical practice. It is estimated that 64% of hospital readmissions are caused by patient non-adherence to medical regimes and of these 54% could be prevented (Grange, 2005).

Outpatient HF clinics have been shown to improve outcomes, improve quality of life, and decrease hospitalizations through an organized, consistent approach to care, and

providing prompt follow up (Hauptman et al., 2008; Herrick, 2001). However, in the absence of an available HF clinic, EBP guideline recommended care should be used. One method of coordinating care is utilizing clinical pathways to guide the outpatient treatment plan and should include the recommendations of current EBP research and guidelines.

Clinical Pathways

Utilizing clinical practice guidelines and pathways to guide care can guide decisions, promote the utilization of evidence- based research, provide patient-centered care, form a basis for inter-professional team cooperation, and facilitate quality improvement efforts (Clutter, 2009). Clinical pathways have become a recognized way of providing a roadmap for multidisciplinary care for patients, using evidenced based care, by translating clinical guidelines into protocols tailored to local hospitals and providers. Multiple terms have been used to describe clinical pathways including; care plans, care maps, clinical practice protocols, and integrated clinical pathway among a few. The criteria for defining and development of clinical pathways were studied by Kinsman et al.(2010), for a Cochrane review, to establish standard characteristics of a clinical pathway. Their research revealed that there are up to 84 different terms that may mean clinical pathway. A four stage process was used to develop criteria to define clinical pathway with results revealing several common criteria including; guiding care for a well defined group of patients over a specified period of time, goals and key elements of care are stated based on evidence-based guidelines, a specific sequence of actions utilizing a multi-disciplinary care team, help communication with patients by providing clearly written care summary, and provisions for documentation, monitoring, and evaluation of

outcomes and variances (Kinsman, Rotter, James, Snow, & Willis, 2010). Utilizing these criteria, consistency can be achieved in defining and developing clinical pathways.

Ranjan et al. (2003) performed an 18 month, pre and post- test evaluation of HF patients stratified to clinical pathway care (*n*=174) or no clinical pathway (*n*=197), to determine if clinical pathway use contributed to decreased length of stay, decreased cost, and improved care based on the criteria of increased ACE-I usage. Results showed there was significant reduction in hospital length of stay, lower median hospital charges and increased ACE-I usage in the clinical pathway group (81% vs 48%). This indicated that the clinical pathway use in patients with HF was associated with a reduction in hospital length of stay and improvement in quality of care (Ranjan, Tarigopula, Srivastava, Obasanjo, & Obah, 2003).

The utility of clinical pathways was demonstrated by Allen, Gillon, and Rixson (2009) through a systematic review of 9 papers, representing 7 randomized control trial studies was performed to evaluate the effectiveness of integrated care pathways (ICP) used on adult and pediatric patients, in secondary and tertiary care centers. The goals of the ICPs were varied but included promoting practice change, improving outcomes, adherence to best practice guidelines, reducing treatment variations, and improving quality of care. The pathways covered medical conditions including neck fractures, pediatric asthma emergency room care, endoscopic surgery care, community acquired pneumonia, and HF. The review found ICPs are effective for supporting proactive care and ensuring timely clinical assessment and intervention, promoting adherence to recommended guidelines reducing variation in care, improving documentation, improving provider agreement regarding treatment options, providing decision support,

providing role direction and directing professional practice. The ICPs were not found to be helpful when extreme flexibility of care is needed, for diagnosis with unpredictable courses, and when used in cases where best evidence and a successful multidisciplinary approach have been well established. The use of ICPs was found to be most beneficial in the case where there is identified service or quality deficiencies. (Allen, Gillen, & Rixson, 2009).

Conceptual Model

The logic model (Appendix A) was used for the HF care improvement project. This model has been used across many professions including academics, nursing and public health, management fields, business and sociology to name a few and will help to facilitate practice change by examining the inputs, processes and outcomes of the intervention. The CDC uses the logic model for their Heart Disease and Stroke prevention program and evaluation (Department of Health and Human Services, 2006). It was appropriate for this project as the goals of the project were to standardize care and change the current practice of HF care at an outpatient clinic. Care standardization was done through the utilization of a clinical pathway to guide a nurse-led HF clinic, utilizing inputs such as stakeholder assistance in the development process and tools for process change, implementing the process change, and monitoring of outputs and outcomes

The logic model as the framework for the intervention helped to guide and to organize the process. It allowed for communication of the program purpose, description of actions intended to lead to desired results, improve program staff knowledge, involvement of stakeholders including patients and providers, and identification of obstacles to program success (Kettner, Moroney, & Martin, 2008; Knowlton & Phillips,

2013). The model is generally made up of three or four core elements including inputs, process, outputs, and outcomes. For the purposes of this project, inputs, process, outputs, short-term and intermediate outcomes were utilized. Long-term outcomes will be evaluated later.

Inputs in this case are the stakeholders which include nursing staff, physician and nurse practitioner providers, multi-disciplinary care team involved in the HF quality improvement process, the HF patient and resources. The input from the providers and team were utilized as appropriate for this project as the goals of the project were to change the current practice of HF care at an outpatient clinic through the development of a nurse-led HF clinic. The stakeholder assistance in the development process and tools for process change, implementation of the process change, and monitoring of outputs and outcomes helped to shape the program during development, implementation and evaluation. The patients input were utilized during the teaching process by examining their specific needs and tailoring interventions to coincide with them as much as possible. The resources were the tools utilized for teaching and data collection. The teaching tools included basic instruction on disease process, medication adherence, life-style modification, signs and symptoms, and follow up care.

The process included the activities necessary to establish the HF clinic. This consisted of utilization of EBP treatments, outpatient follow up care, and resources. The EBP treatments were based on recommended guidelines established by the ACCF/AHA, HFSA, and NICE (American College of Cardiology Foundation/American Heart Association, 2013; Hauptman, et al., 2008; National Institutes of Health, 2012).The

outputs were the activities included in the program effecting the clients or stakeholders that these activities served which included; total number of patients that become enrolled in the HF program, number of patients being treated utilizing the appropriate clinical pathway GDMT, appropriate documentation of NYHA functional class and advanced directives, number of patients completing education component regarding prescribed medication and lifestyle recommendations and number of patients with appropriate therapies or reasons why not documented. Also the number of contacts per individual patient, including phone contact, was monitored.

The outcomes were defined in terms of short, intermediate and long-term goals related to the program impact and can be used to evaluate the success of the program. The short-term goals were the development and institution of the clinical pathway and education program. The intermediate goals were implementation of a Nurse-led HF clinic pilot program, improved quality of care based on the utilization of evidenced-based guidelines including; patient education, timely follow-up, and treatments based on stages of disease progression. The long-term goals were decreased symptom exacerbation events, decreased frequency of hospital readmissions, improved quality of life and decreased financial burden having a positive impact on the health care system which will be evaluated later.

The components of HF care are well described in guidelines that are frequently updated and include inpatient care, outpatient care, and palliative care recommendations (American College of Cardiology Foundation/American Heart Association, 2013). The care process can be coordinated with the use of clinical pathways to guide care (Ranjan,

Tarigopula, Srivastava, Obasanjo, & Obah, 2003). What remained to be discovered was if the care process could be improved at this outpatient cardiology clinic, if all providers would utilize the clinical pathways, and if the utilization of the clinical pathways would increase over time. Utilizing a logic model as a framework for this study, Chapter 3 reviews full details of design, population selection and sampling, protection of subjects, data collection, and evaluation criteria. Project results and implications are reviewed in Chapter 4 and Chapter 5 contains the project evaluation report.

Chapter 3: Approach

The outpatient HF care project was a process improvement project. The intervention was to develop a coordinated plan of care for the HF patient cared for in the outpatient clinic, with the focus on clinical pathway development, education of the key stakeholders, enrollment of patients in a HF care clinic in order to examine the effects of coordinated care and utilization of EBP guidelines to change the current practice of HF care at an outpatient clinic.

Design

The project to improve the care of the outpatient HF patient was developed as a process improvement pilot study. The initial implementation and data collection portion of the study was carried out over an 4-6 week period (Appendix B), coordinating the care for a group of HF patients cared for at a small cardiology clinic and associated for-profit hospital in Central Florida. The primary goal was to promote standardized continuity and consistency of care including timely, appropriate care through utilization of EBP guidelines and GDMT, in an effort to improve care and documentation, increase patient

self-care through patient adherence to diet, lifestyle, and follow up recommendations, while increasing the patient's understanding of signs and symptoms of disease progression. The secondary goal was to comply with the Joint Commission Core measures for care of the HF patient in the outpatient clinic.

Data on the enrolled patients were collected concerning the current care and frequency of HF admissions. Inputs included the multidisciplinary hospital quality improvement team and the stakeholders involved in the outpatient arena including providers, staff, and patients. The hospital quality improvement team was utilized to establish an avenue for referral to the HF clinic and point of contact for information on hospitalized patients, inpatient care if any, to assist patient transition to outpatient follow up, and for dissemination of project results

The stakeholder group in the outpatient cardiology clinic consists of nurse practitioners, nurses, clerical staff, and collaborating physician. This interdisciplinary, collaborative team reviewed developed HF care pathways, implemented developed care pathways, assessed teaching plan, selected target patients, and initiated interventions. After enrollment of patients, the HF pathway was implemented which included instruction on medication and life style recommendations, diet, treatment adherence, symptom monitoring and management, and follow up visits. Follow up clinic visits for provider assessment and further teaching as needed was performed and nurse call back contacts were scheduled.

Those patients included in the study had an initial evaluation by the nurse practitioner followed by an instruction session with the nurse practitioner or a registered nurse who had been educated on the necessary content. Educational materials were

provided to the patient and/or caregiver. Follow up contact was made within 2 weeks by phone on high-risk patients to assess patient understanding and discern if there were any difficulties with diet, medication, or symptom monitoring adherence. A face-to- face follow up visit was scheduled for those patients with acute symptoms. Assessment by the nurse practitioner or provider occurred at the onset of program admission, within 2 weeks of medication changes, 1 week of hospital discharge, or more frequently if the patient's condition dictated. Those patients with devices had the device interrogated at least once in the study period. The outputs or outcomes were assessed at the completion of the study period and included documentation of total patients enrolled, patients enrolled per week and per provider, appropriate use of medications, NYHA functional class, advanced directives, teaching intervention, number of hospitalizations during the study period, and follow up contacts scheduled.

Population and Sample

The population for the outpatient portion of this project was a convenience, random sample selected from patients attending a cardiology practice associated with a for-profit hospital system, located in Florida. The study participants were selected from each of the two-physician provider's patient population based on availability or recent hospitalization. Inclusion criteria included the adult patients with a diagnosis of HF associated with cardiomyopathy and reduced EF. Patients had a documented EF $\leq$ 40% at some point in time, had a NYHA class II symptoms or greater, and had the ability to consent to study participation and understand instructions or had a responsible caregiver willing to participate and give consent.

Exclusion criteria was a terminal diagnosis with impending demise anticipated, residency in an assisted living or long-term care facility with no ability to regulate food choices, medications, and symptom reporting, inability to understand instructions, no access to a telephone, or unwillingness to participate.

Data Collection

Data as to current medications used, the non-pharmacological interventions, the documentation of symptoms, and hospital admissions for HF were collected on the sample population based on documentation in the clinic medical record and during each visit. Documentation of completion of education, number of sessions, number of telephone contacts, medications, NYHA functional class, symptom exacerbation if any were performed utilizing a portion of a data collection tool that was developed for the IMPROVE- HF clinical trial (Medtronic Inc, 2005) and utilizing and EMR, HF specific flow sheet (Appendix C). Data was not collected regarding prior hospital admission on each patient in the past year; however, follow up data regarding readmissions during and post-intervention began during the implementation and continues, utilizing available reports from the hospital HF quality improvement team and patient self-report if verifiable.

Protection of Subjects

As there is no IRB committee at the designated outpatient clinic or associated hospital, approval for data collection regarding patient information was obtained from the physician practice manager and the patient. Approval for hospital data collection regarding admission statistics was provided by the director of quality improvement, data

collection from office records was prequalified by patients based on the privacy policy signed by each patient seen at this cardiology practice. Patients were de-identified for the purposes of study data analysis. As the education component was considered part of the standard pathway practice the number of HF specific education sessions was reviewed but not reported as a component of the overall analysis. Protection of subjects was insured by submission of standard IRB approval request and verification of approval by the Walden University IRB committee. The IRB approval number for this study was 08-15-14-0365229.

Evaluation Methods

The goals of the program were to improve the process of care of the outpatient HF patient, promote standardized continuity and consistency of care, utilizing EBP guidelines which includes timely follow up, through the development of clinical pathways. The pathway (Appendix D) was used to promote increased understanding by stakeholders including staff and patients regarding HF symptoms, standard medications, lifestyle guidelines, and follow up care recommendations, while establishing the framework for nurse-led HF care. Additionally, promotion of multi-disciplinary collaboration in the outpatient setting while developing the program was evaluated based on provider involvement. The evaluation of implementation effectiveness was assessed based on 3 of the 2014 Joint Commission Standards core measures for outpatient HF care. The core measures examined include documentation of the following: ACHFOP-01: Hospital outpatient documentation of b-blocker therapy (i.e., bisoprolol, carvedilol, or sustained-release metoprolol succinate) prescribed for left ventricular systolic dysfunction (LVSD).

ACHFOP-02: Hospital outpatient documentation of ACE-I or ARB therapy prescribed for patients with LVSD.

ACHFOP-04: Hospital outpatient documentation of NYHA functional classification for patients with HF (The Joint Commission, 2014).

The short-term goal of team development and establishment of a clinical pathway tool with staff education on use was evaluated and considered successful by completion of this portion within 7 days. The intermediate goals of selection and enrollment of appropriate patients on which to initiate the pathway, initial contact and education of these patients, and scheduled follow up contacts was evaluated after 4-6 weeks of clinical pathway initiation. Success was defined as successful completion and documentation of all tasks including; documentation of NYHA heart failure functional class, appropriate medication usage or reasons for not using it, documentation of education, and phone or follow up contact performed on at least 80% of the enrollees. The goal of team collaboration and utilization of clinical pathway was assessed as successful on a pass or fail criteria.

The long-term goals will be evaluated later, after completion of the main project. These will include performing continued quality monitoring using criteria established by the Joint Commission for Hospitals regarding HF care and assessing for signs of increased patient adherence, decreased symptoms, decreased hospital readmission, decreased cost, and improved quality of life to be evaluated on an ongoing basis in 9-12 months after completion of the main project and based primarily on burden or frequency of hospital readmissions or worsened HF class. Further progress regarding the

development of a nurse-led HF clinic will continue to be monitored and based on a succeed/not succeed basis and will likely occur after completion of the main project.

Summary

The project to improve outpatient HF care was performed utilizing the logic model for implementation plan development and educational program development and implementation. A care pathway was used to guide care and an EMR flow sheet was used to document EBP guidelines and assessment of the HF patient. The convenience sample was selected from a cardiology practice population with a documented cohort of heart failure patients. Data were collected utilizing items from the IMPROVE-HF clinical trial tool and the EMR flow sheet which were tailored around EBP guidelines and TJC core measures for outpatient HF care

Chapter 4 reviews the project results, implications, and project limitations. Chapter 4 also discusses analysis as it relates to scholarly growth, practitioner growth, development as a project leader, and future professional development plans. Chapter 5 provides a project evaluation report.

Chapter 4: Results and Implications

Overview

The process improvement project to improve the outpatient care of the HF patient through clinical pathway implementation developed over a 6-week period. The study purpose included analyzing the implementation process, team collaboration, and provider utilization of the pathway, as well as to assess the frequency with which GDMT and documentation was performed and expose any deficiencies in recommended care based on EBP guidelines (American College of Cardiology Foundation/American Heart Association, 2013). These data were intended to be used as the basis for needs assessment for a nurse-led outpatient HF clinic. Patient specific data regarding blood pressure, heart rate, arrhythmia, weight, symptoms, medication adherence and life-style adherence were not evaluated for the purposes of this study. There were three goals and hypotheses associated with this project.

The primary goal was to analyze the care of HF patients in an outpatient cardiology clinic related to documented utilization of recommended medications that include ACE-I and b-blockers, documentation of EF, documentation of NYHA functional class, documentation of HF specific teaching, presence of advanced directives, and follow up contact if indicated, and if there was any significant difference in the care rendered to patients utilizing a HF clinical care pathway. The first null hypothesis was that there is no difference in care for patients utilizing the heart failure pathway.

The second goal was to analyze the implementation process by evaluating if the pathways would be utilized by providers and if the pathway would be utilized equally by all providers. Pathway utilization was tested by monitoring the number of eligible

patients in which each provider utilized the pathway. The second null hypothesis was that there would be no statistical difference between provider and pathway utilization.

The final goal was to assess if increased exposure and familiarity to the pathway tool would affect acceptance and pathway utilization. Pathway acceptance over time was tested by tracking the pathway utilization on eligible patients each week. The third null hypothesis was there would be no difference in pathway utilization based on the week of the study.

The initial 4 weeks of the project were spent identifying eligible patients and implementing the pathway. Of all patients seen (N= 296)) by 5 providers, 2 MDs and 3 nurse practitioners, 27% were identified as eligible (n=80). Patients were identified as eligible for inclusion if they had a diagnosis of HF and had documentation, at some point in time, of an EF of less than 40%. The data were classified and examined using the SPSS21 software (IBM, 2013). Frequency statistical data examined on eligible patients included provider, week of implementation in which contact occurred, if the patient was started on the pathway, documented prescription of Ace-I and b-blocker, documentation of EF, documentation of NYHA functional class, initial HF specific teaching, advanced directive documentation, and follow up contact within 6 weeks performed or scheduled.

Correlation data was examined using Pearson chi-square or nonparametric tests to assess pathway utilization by provider and project implementation week. Chi- square was also used to analyze correlations between pathway utilization effect on prescription of Ace-I and b-blocker, documentation of EF, documentation of NYHA functional class, HF specific teaching, advanced directive documentation, and follow up contact scheduled within the 6-week period. The scheduled contact monitored was phone assessments made

by the nursing staff based on recommendations by the provider because of patient high-risk status for hospitalization. This determination was based on the patients past patterns of hospitalization or calls for urgent office visits. Additional frequency data was collected on those scheduled follow up appointments (*n*=12) regarding contact type, number of contacts, teaching, symptom exacerbation, scheduled provider follow up, and any hospitalizations. The analysis of the specific phone interventions was not done for purposes of this study.

Summary of Findings

Examination of pathway utilization on eligible patients (Table 1) showed that there was moderate utilization, with 50% of the eligible patients being started on the pathway (*n*=40). The following is a discussion of the frequency of variable outcomes documented that occurred on all eligible patients (*N*=80), whether they were on or not on the pathway. Documentation of the utilization of appropriate medications on all eligible patients was high with 80% (*n*=64) for ACE-I, and 95% (*n*=76) for b-blockers. Examination was also done on the percent and numbers of patients in which documentation of the following variables was performed, the results are as follows. EF was documented consistently on 98% (*n*=78) of the patients. NYHA functional class was documented a moderate amount occurring on 55% (*n*=44) of the patients. Documentation of Advanced Directives was found to occur very infrequently regardless of whether the patient was on or off the pathway occurring only on 8% (*n*=6) of the patients. HF specific teaching 29% (*n*=23), and follow up contacts 24% (*n*=19) was also inconsistent. The outcome of the frequency data analysis for the variables is highlighted in Table 1

Table 1

Frequency Data on Pathway Utilization and Variables

Variable	Frequency (N)	Percent (%)	Valid percent
Pathway initiated	40	50.0	50.0
ACE-I	64	80.0	80.0
B-blocker	76	95.0	95.0
Ejection fraction	78	97.5	97.5
NYHA class	44	55.0	55.0
Adv. directives	6	7.5	7.5
HF teaching	23	28.8	28.8
Follow up contact	19	23.8	23.8

Following patient enrollment on the HF pathway, higher risk patients were identified by the providers, based on past-history or current symptoms, for follow up phone calls by an RN or clinic appointments with a provider, which was to occur within two weeks. A questionnaire (Figure 1) was utilized for the follow up phone contacts to assess patient status, understanding of disease process, and document any areas of increased educational needs. Of the 12 patients contacted by phone, 3 patients had hospitalizations. Two of the patients were hospitalized with arrhythmias and no related HF symptoms and 1 patient was hospitalized with recurrent HF. One patient had an

urgent clinic visit, which was not HF related prior to the phone contact and was placed back on the call list. Two patients had follow up visits scheduled at the time of the original appointment with a provider to assess medication changes. There were no clinic visits for additional education performed by an RN because of lack of patient interest secondary to time or additional co-pay costs. Offers to waive charges did not increase patient interest.

Patient Name: _____ Date: _____

1. How have you been feeling, have you been to the hospital since we saw you last?
2. Are you having any: Increased Shortness of breath or difficulty lying flat?
3. Are you having any increased fatigue?
4. How much activity are you doing each day or are you having increased difficulty with activity?
5. Are you having swelling in legs
6. Are you weighing yourself daily and have you gained any weight/how much?
7. How is your BP and pulse?
8. How is your appetite, are you following a low sodium diet?
9. Are you taking your medications?
10. Do you have any questions or concerns?
11. Do you know when you should call the Doctor?

Figure 1. Call back patient questionnaire

Correlation Data Outcomes

Pathway Utilization

In many areas, there was no statistically significant difference in care of the patients on the pathway. There were no statistical differences in the utilization of

guideline recommended ACE-I and b-blocker therapy whether patients were on or off the pathway. Additionally, while EF was documented consistently for all patients, there was a statistical difference in documentation of symptoms utilizing the NYHA functional class (x^2 37.12, *df* 1, *p* =.000) and follow up contacts scheduled (^{x2} 5.59, *df* 1, *p* =.018) between those on the pathway and not on the pathway. The conclusion that there was a difference in some aspects of care for those on the pathway leads to rejection of the first null hypothesis.

Pathway Utilization by Provider

Correlation statistics run on the specific provider and pathway utilization (Table 2) indicated that there was a statistical difference between the providers, (x^2 25.32, *df* 4, *p*=.000) suggesting that some providers were more likely to utilize the pathway than others. This led to rejection of the second null hypothesis. While 1 nurse practitioner utilized the pathway on all eligible patients, the other two NURSE PRACTITIONERs utilized the pathway either not at all (*n*=0) or very little (*n*=2, 12%). The two physician providers utilized the pathway at least 50% of the time.

Table 2

Pathway Utilization by Provider

Provider	Pathway (Yes)	Pathway (No)	Percent	X^2	df	Significance
NP1 PD	12	0	100			
NP2 MN	0	3	0			
NP3 DH	2	15	12			
MD1 NJ	15	12	56			
MD2 SW	11	10	53			
Total	40	40		25.32	4	.000

Pathway Utilization by Week

During the implementation process, the utilization of the pathway increased based on the week of pathway implementation indicating that there was a statistical difference in the utilization of the pathway based on the week of project implementation ($x^2$11.94, *df* 3, *p*=.008). Utilization of the pathway increased as the implementation time of the project progressed leading to rejection of Null Hypothesis 3 as shown in Table 3.

Table 3

Pathway Utilization by Week

Week	Pathway(Yes)	Pathway (No)	Total Eligible	X^2	df	Sig.
1	4	20	24			
2	11	8	19			
3	14	8	22			
4	10	5	15			
Total	40	40	80	11.94	3	.008

Findings in the Context of HF Care

EBP guidelines and guideline directed medical therapy recommendations are consistent regarding accurate diagnosis, functional class documentation, treatment modalities which include; medications, life-style modification, monitoring of patients, rehabilitation, discussions regarding prognosis, and palliative care (National Clinical Guideline Cemtre, 2010; American College of Cardiology Foundation/American Heart Association, 2013). Additionally, utilizing clinical practice guidelines and pathways to guide care can contribute to decision making, promote the utilization of guideline directed medical therapy and EBP research, provide patient-centered care, form a basis for inter-professional team cooperation, and facilitate quality improvement efforts (Clutter, 2009).

Ranjan et al. (2003) found an increased utilization of evidence- based care and documentation utilizing clinical pathways and this project showed similar results (Ranjan, Tarigopula, Srivastava, Obasanjo, & Obah, 2003). As indicated, there was a significant correlation between pathway use, documentation of functional class, and

follow up contact with heart failure patients. While many patients not on the pathway versus received appropriate therapies, documentation of heart failure class for those not on the pathway versus those on the pathway (*n*=9, *n*=35) was not consistent. Documentation of NYHA functional class in HF patients is considered part of the initial and serial evaluation process (American College of Cardiology Foundation/American Heart Association, 2013). Failing to document functional class can make assessing disease progression difficult.

Contact with high-risk patients for those not on the pathway versus those on the pathway was also not consistent (*n*=5, *n*=14). For those patients not on the pathway, the follow up contact was a follow up visit with the provider, scheduled at the time of the original visit. For those on the pathway, a majority of the follow up contacts (*n*=12) was by telephone. This contact was generally performed by a nurse, on the request of the provider, at the time of clinic visit. Some studies have shown an improvement in outcomes, a reduction in hospitalizations and emergency room visits with phone telephone follow up and this service should be promoted (Quaglietti, Atwood, Ackerman, & Froelicher, 2000). The other two follow up contacts were provider visits scheduled at the time of the original visit to reassess clinical status two weeks after medication changes.

Patients not on the pathway were less likely to receive HF teaching (*n*=9) than those on the pathway (*n*=14), but the difference was not statistically significant. These areas of deficiency can adversely impact patient care. Non-pharmacological interventions such adequate teaching regarding diet, medication adherence, symptoms, and life-style modification are considered a class 1 recommendation (American College of Cardiology

Foundation/American Heart Association, 2013) and should be included in each office visit. Time constraints at office visits may make this difficult. Additional options for teaching would be to structure group classes to facilitate patient teaching on a larger scale or subscribe to multi-media programs to provide to patients utilizing in office I-pads, television, or provide compact discs for home use.

Recommendations for documentation of advanced directive status and referral to palliative care are considered part of EBP care and guideline recommended therapy (American College of Cardiology Foundation/American Heart Association, 2013), however, this study showed that this is rarely being done at this clinic. Only 6 patients total (*n*=3 on pathway, *n*=3 not on pathway) had documentation of advanced directive choices. Understanding the patient and families' wishes and planning for future care has made advanced directive designation and palliative care a recommended part of standard HF care (American College of Cardiology Foundation/American Heart Association, 2013).

This study showed there was a significant correlation between providers who utilized the pathway and those who didn't (Table 2). The logic model provided the ability to assess inputs and processes during the implementation of the project (Department of Health and Human Services, 2006). Semi-structured interviews during implementation revealed that while the pathway and HF specific flow sheet were considered useful, time constraints and remembering to utilize the pathway were given as reasons for lack of involvement. The pathways were utilized primarily by the nursing staff. These team members showed a genuine interest and commitment to the project therefore, after the first week of implementation, changes were made to the process to facilitate utilizing the

tools. Most providers were not likely to utilize the flow sheet if the nurses did not formally open it in the EMR therefore; the nurses took responsibility for opening the HF specific flow sheet in the physicians chart. Team collaboration was successful with the nursing staff and one of the physician providers. Two of the nurse practitioners were less likely to utilize the pathway and associated flow sheet. Weekly team meetings were performed associated with educational sessions and individual discussion were held to try and promote utilization and answer questions.

The goals of this project were similar to those stated by Allen, Gillon, and Rixson (2009) in a systematic review which included promoting practice change, adherence to best practice guidelines, reducing treatment variations, improving outcomes, and improving quality of care (Allen, Gillen, & Rixson, 2009). The outcomes showed some success at promoting practice change during the course of the implementation period. While some providers were more likely to be involved in this project than others, as shown in Table 3, pathway utilization did increase based on the week of the study which allowed more complete documentation of patient care and facilitated the transfer of information through the patient EMR which is interoperable among all of this hospital systems physician practices.

Implications

For Practice of Nursing

The role of the Doctor of Nursing Practice (DNP) prepared nurse includes the ability to understand and utilize research to guide evidence-based practice in the care of patients with complex health problems, while maneuvering the challenges of a rapidly changing healthcare system, and facilitating growth individually and for nursing

collectively (Zaccagnini & Waud White, 2011). These abilities are recommended by the American Association of Colleges of Nursing (AACN) through their guidelines and objectives created to structure the educational curriculum, thereby the preparation of the DNP professional (American Association of Colleges of Nursing, 1999). Continuing education in nurses is expected to enhance the knowledge and abilities of nurses to promote lifelong learning and flexibility in role adaptation within the healthcare system (Dickerson, 2010).

The project to improve the outpatient care of the HF patient was chosen to help improve the care process and outcomes of patient care, through team building and nursing contribution, while helping to decrease the burden of repeat hospitalizations on the patient, family, and health system. The primary endpoint was to develop a system to better care for the HF patient. During the investigation of literature for this project, advanced learning and expertise in the management of the HF patient was achieved, team development occurred, and education of the nursing staff has been a byproduct. While outcomes have not been miraculous in changing the practice habits of the providers, there has been a change in some practice patterns and an increase in the awareness by the nursing staff regarding important aspects of the assessment and care of the HF patient. A surprising outcome that was revealed was the limited pathway utilization by two of the nurse practitioners An informal interview with these individuals revealed frustrations due to lack of time or failing to remember to utilize the pathway. The MD providers had the assistance of nursing staff when rooming their patients. These individuals played an active role in initiating the pathways.

Additional, areas in need of improvement were highlighted, most specifically, discussion of advanced directives and palliative care. The reasons for hesitancy in this area should be explored. Also, utilizing the phone contact method of triaging patients has been shown to reduce urgent office visits and emergency room visits (Quaglietti, Atwood, Ackerman, & Froelicher, 2000). More investigation into utilization of this service and outcomes related to it should be pursued. Phone triage is an area in which nurses may be able to impact care by using their education and assessment skills.

For System Change

More than 5 million Americans have a diagnosis of HF and it is a significant contributing factor to mortality, with half of the people diagnosed with HF expected to die within 5 years of diagnosis. This occurs at a cost to the healthcare system of approximately 34 million dollars annually, including the cost of treatment and disability losses (Center for Disease Control and Prevention, 2013). The impact on national healthcare spending is tremendous which has prompted efforts by CMS to place a priority on reducing the number of hospital readmissions, for high -risk diagnosis such as HF, with-in a 30-day period by financially penalizing hospitals with unacceptable rates. Avoidance of these penalties has stimulated hospitals and health systems to re-evaluate the care process for the HF patient (U.S. Department of Health & Human Services, 2013). This project has the potential to favorably affect the care of the HF patient by focusing on evidence –based, guideline directed medical care to manage this disease condition and prevent hospitalizations. This care can be guided through the utilization of a clinical pathway to facilitate accurate documentation of treatments, care, and symptoms which can be integrated into the EMR.

The clinical flow sheet utilized for this project was integrated into the EMR, which provided an avenue for transfer of information and supports meaningful, meaningful use of the EMR (Savage, 2013). The developed clinical pathway can be used in an outpatient HF clinic or in other office practices to guide and coordinate care. A disease management clinic such as one that cares for the HF patient is a method to improve care, access, and coordination of care for this population and is an alternative to the typical care as usual (Nash, Reifsnyder, Fabius, & Pracilio, 2011). This project has helped to promote interest by hospital administration for the development of an outpatient HF clinic which would provide a new method of care for the population in the county it would serve.

For Future Research

This small process improvement project revealed areas for further research and study. Utilizing clinical pathways has been shown to be an effective form of care coordination and disease management (Clutter, 2009). A deficiency in this project was the utilization of a hard-copy clinical pathway in a system that was primarily electronically based; therefore, methods to incorporate the pathways into the EMR should be studied.

This project did not monitor patient outcomes related to the interventions as the focus was on process and utilization. Additional investigation into the potential impact of the clinical pathway and flow sheet utilization, in regards to; improving patient recognition of symptoms, increasing utilization of guideline directed medical therapy by providers, and preventing hospital readmissions through outcome monitoring in this area. In this way, documentation of pathway effectiveness could be monitored.

Of significance was the lack of pathway utilization by two of the nurse practitioners. Two reasons for this were stated as lack of time, or difficulty remembering to utilize the pathway. Further research into why this occurred and methods to increase utilization is warranted. Also, recommendations for potential solutions to encourage utilization should be researched.

The effectiveness of the clinical pathway in regards to improving the understanding of recommended care of the HF patients by the nursing staff should be explored, focusing on outcomes related to nurses understanding guideline directed medical care. Assessing the nurse's knowledge base before and after pathway implementation may shed light on areas of knowledge deficit or methods to improve pathway effectiveness.

Lastly, advanced directive and palliative care are a recommended part of HF care guidelines (American College of Cardiology Foundation/American Heart Association, 2013). This study found that advanced directives were rarely documented in the patient EMR. Data were not collected on whether the discussion was approached but not documented; advanced directive discussion may be an area to investigate further. Research may be needed into the hesitancy to address advanced directives and palliative care or lack of understanding regarding this recommendation by providers.

Given the opportunity to repeat this project a different approach may include educational sessions for the nurses and nurse practitioners to assure understanding of the clinical pathway and evidence-based, guideline directed medical therapy. These sessions should include a method for assessing comprehension, prior to institution of the pathway. More structure would be given to promoting physician provider and clerical staff

understanding to help facilitate proper patient scheduling and pathway utilization by all providers. Also, an anonymous feedback questionnaire regarding the pathway and its utilization may help to tailor the pathway to the providers. A more structured approach to gaining stakeholder input may be helpful to promote increased utilization of the pathway and HF flow sheet chart tool.

Project Strengths and Limitations

The strengths of this project included the wealth of information and consistency of recommendations for GDMT and follow up care of the HF patients. These guidelines provided a firm foundation and rationale for the project variables that were selected. A second strength was the access to patients at the cardiology clinic who met criteria for the project. This access offered ample opportunity for patient enrollment. Additionally, there was support for the project and efforts to find solutions to prevent HF readmissions because of the profound impact HF readmissions have had on the chosen healthcare system and the financial bottom line of the associated hospital system (Center for Medicare and Medicaid Services, 2011). Support for the project by the office administration and some of the nurses helped to facilitate data collection.

While the physician providers and nurse practitioners were supportive, some did not play an active role in pathway utilization. This caused a limitation to including all eligible patients in the study. A second limitation was taking the convenience sample from one cardiology practice which may have limited data accuracy compared to other cardiology practices and general practice. A third limitation was utilizing a cardiology practice which may have skewed the results of pathway effectiveness. The providers may have preexisting knowledge related to evidence-based, guideline-directed

recommendations for the HF patient care; therefore, the actual effectiveness of the pathway may not have been fully assessed. Another limitation was the relatively small sample size (*N*=80). Utilizing a larger sample size may have revealed more care differences. A final limitation was the brief data collection time that did not allow for ongoing assessment of continued or increased use of the pathway.

Recommendations for Reduction of Limitations

To help reduce the limitations of this project the first recommendation is to provide a method to include the pathway in all relevant patients EMRs, to increase the potential for the participation of all providers at the associated clinic. Building a hard stop into the EMR on the HF patients which would trigger the pathway may increase utilization. An additional recommendation is to test the pathway and its effect on patient care in other cardiology and general practice clinics to increase the sample size and evaluate its effect on practices that may not be as familiar with the care of the HF patient. A third recommendation is to attempt to document any changes in care related to the pathway through additional data collection over a more prolonged period. The use of care pathways has been found to be most beneficial when there is identified service or quality deficiencies. (Allen, Gillen, & Rixson, 2009). Documenting the care deficiencies and then any changes in care after pathway initiation can help to delineate the effect of the pathway. Lastly, continuing data collection regarding utilization of the pathway for a more prolonged time may reveal additional information regarding pathway utilization and guideline compliance.

Analysis of Self

Research and project development can provide opportunities for learning from the standpoint of the practitioner and project developer. The lessons learned can influence future projects. An important component to continued development as a scholar, practitioner, and project developer is to analyze the growth after completion studies and projects. This analysis can provide insight into areas of strengths, weakness, and directions for future development.

Evaluation of Scholarly Growth

This process has helped me to develop an increased understanding of the appropriate guideline-directed medical care through research and translation into practice of evidence-based recommendations. It also has augmented my understanding of the United States health system at large, at the associated hospital system in which the project was implemented, and the available resources for and needs of the HF patient. This understanding is grounded in the AACN essentials for the DNP prepared professional including essential II, to develop organizational system changes for quality improvement in healthcare delivery in response to local and/or global needs and essential III which includes improving clinical scholarship and analytical methods while integrating bio-psychosocial, nursing and health theories, research, and evidence-based practice that exemplifies professional nursing standards (Association of Colleges of Nursing , 2006).

Evaluation of Practitioner Growth

This project has helped me to increase the scope of my understanding regarding the care of the HF patient and provided motivation to become involved in other aspects of

nursing practice. I now have the increased desire to become involved in hospital-based committees that benefit the in-patient population and out patient population while increasing my understanding of the symbiotic relationship between the two, and plan to remain current as to developments impacting patient care and reimbursement. It also has promoted my understanding of the value of and development of professional association between nursing leaders and facilitated my involvement with a personal network of advanced practice nurses who remain actively committed to system change and patient care improvement. It provided the stimulus to change my thinking from an isolated, independent practitioner, to a member of a team promoting common goals.

Evaluation as Project Developer

The essentials of successful project development include having a research strategy, finding and selecting appropriate tools, retrieving sources, examining, understanding, and evaluating research, proper documentation of sources, and understanding social and systems issues (Zaccagnini & Waud White, 2011). I have utilized these skills throughout the development of this project; however, I will need further practice and efforts at developing these skills, in particular the development of an appropriate intervention strategy as a necessary component of project planning and implementation (Kettner, Moroney, & Martin, 2008). These skills include techniques to engage stakeholders, which is a skill that I need to refine. While I had some success at the development of an implementation strategy, further experience and skill utilizing techniques to encourage participation is needed. The TRA and TBA were utilized to attempt to understand motivating factors for stakeholders involved (Azjen, 2014). This

was effective with the nursing staff and two of the providers. Further understanding of methods to promote involvement is needed to ensure success of future programs.

Understanding the various methods of needs assessment and the interpretation of those findings contributes to the project success (Kettner, Moroney, & Martin, 2008). A firm grasp of the importance and methods of needs assessment was gained during the undertaking of this project including the needs of the individual clinic, the associated hospital system, and the community. All of these areas were considered when developing this project. More practice with project planning, development, and implementation is needed to refine these skills. Additionally, further development is needed to understand the hospital specific budgeting process and documentation requirements for garnering approval for new project implementation.

Future Professional Development Related to the HF Project

Innovation and change management of practice and healthcare delivery should be goals for the future (Bevan, 2010).To continue professional development related to the project to improve outpatient care of the HF patient, the next step is to disseminate the findings and utilize them to improve HF patient care beyond the scope of the individual cardiology practice. Efforts to establish an outpatient disease management clinic caring for the HF patient at the associated hospital will continue. Two physician champions have been identified and an interdisciplinary team has been developed. Additionally plans to increase my understanding and expertise in caring for the HF patient include attendance at specialty meetings and pursuit of certification in HF nursing. Future classes related to grant writing are being considered to improve my ability to fund and promote community programs.

Conclusion

The preparation of the DNP project required a systematic investigation of a practice issue with a possible outcome to effect a system change (Zaccagnini & Waud White, 2011). The project to improve the outpatient care of the HF patient was developed as a process improvement project and focused on care improvement at a specific cardiology clinic associated with a for-profit hospital system. The interest began with the realization that this hospital had suffered a significant financial penalty in 2013 based on the readmission of HF patients to the hospital.

The undertaking of this project required a needs assessment, team development, process and pathway development, integration with the EMR, utilization of statistical analysis, and understanding of human nature. The logic model provided a framework that allowed for ongoing evaluation and adjustment to the process during development and implementation based on feedback from the team members (Department of Health and Human Services, 2006; Knowlton & Phillips, 2013). The theory of reasoned action and planned behavior were utilized to help motivate stakeholders (Azjen, 2014). Evidence-based practice guideline and GDMT are well established as methods for the treatment and management of HF patients (ACCF/AHA, 2013; Fonarow et al., 2008; Hauptman et al., 2008) and were utilized as the basis for the pathway intervention. Clinical pathways are an established way to translate and integrate research (Ranjan, Tarigopula, Srivastava, Obasanjo, & Obah, 2003) and were utilized to coordinate care. The EMR was utilized to store the HF specific documentation on each patient.

While participation by providers in this project was not what was hoped for, the nursing staff was educated on HF care, teamwork was established, and improvement in

the care process was initiated. The groundwork has been established for the further development of improving HF care in the outpatient clinic at this facility and plans for a formal outpatient heart failure clinic are being considered. It is in this area that the HF pathway may be fully utilized and tested. All of this experience has provided a growth opportunity as a scholar, practitioner, project developer, and leader in the health care system, while paving the way for further improvements for the health of the community. Chapter 5 is a project evaluation report that will review project goals, project outcomes, areas for further study, and plans for dissemination.

Chapter 5: Project Evaluation Report

Introduction

In 2011 approximately 5.8 million Americans had a diagnosis of HF, and it is estimated that half of the people diagnosed with HF will die within 5 years of diagnosis with a cost to the healthcare system of approximately 34 million dollars annually, including the cost of treatment and disability losses (Center for Disease Control and Prevention, 2013). A problem exists with the continued care of the HF patient after hospital stabilization and hospital discharge. HF is the cause of 12-15 million office visits and 6.5 million hospital days annually, with the prevalence rising, and expectations that it will continue to do so as the elderly population increases, with the aging of 78 million baby boomers, resulting in 1 in 5 Americans expected to be over the age of 65 by 2050 (Butler, 2012).

Data shows that care of the HF patient is frequently fragmented and hospital readmissions may be prevented with more structured follow up care (Kay et al., 2006) Well-established evidence-based, guideline directed medical therapy (GDMT) recommendations exists for the care of the HF patient, which includes outpatient care (ACCF/AHA, 2013; Hauptman et al., 2008; Mant, Al-Mohammad, Swan, & Laramee, 2011). The challenge to providers has been to put these GDMT to use (Yancy, Krunholz, & Ryan, 2013). Utilizing clinical pathways to guide care can help to integrate evidence-based, guideline-directed, medical care and have been shown to improve care and decrease in hospital length of stay (Ranjan, Tarigopula, Srivastava, Obasanjo, & Obah, 2003). These tools used in the outpatient setting can help to coordinate care and promote appropriate therapy and follow up.

Project Goals

The primary goal of the project was to improve the process of care for the HF patient in the outpatient clinic through promotion of standardized continuity and consistency of care while

- developing a method to promote utilization of evidence-based, GDMT, in the outpatient clinic for care of the HF patient utilizing a clinical pathway to instruct nurses and providers and guide care of the HF patient;
- promoting multi-disciplinary team collaboration;
- instituting practice change and improvement in documentation; and
- improving care of the HF patient in the outpatient clinic.

Patient specific data regarding blood pressure, heart rate, arrhythmia, weight, symptoms, medication adherence and life-style adherence was not evaluated for the purposes of this study. The study purpose was to analyze the implementation process and team collaboration and assess provider utilization of the pathway. Also to assess the frequency with which GDMT and documentation was performed and expose any deficiencies in recommended care based on EBP guidelines (American College of Cardiology Foundation/American Heart Association, 2013).This data is intended to be used as the basis for needs assessment for a nurse-led outpatient HF clinic.

Project Outcomes

The data was collected regarding eligible patients enrolled on the pathway, provider utilization of the pathway, and utilization based on the week of implementation. Documentation in the EMR was facilitated utilizing a HF specific flow sheet regarding

ACE-I use, b-blocker use, documentation of NYHA functional class, documentation of EF, follow up appointments, and advanced directives. The data on frequencies and correlations was analyzed using SPSS 21 (IBM, 2013).

The first and second goals were achieved by developing a HF specific clinical pathway for utilization at the cardiology clinic. The pathway included recommended assessments, GDMT, follow up recommendations, and documentation recommendations. The third goal was met through the development of a core team consisting of clerical staff, nursing, and providers. All office personnel were instructed in the pathway implementation and utilization. The pathway was initiated on 50% of the eligible patients during the implementation time. The fourth goal was partially met. Beginning changes in practice were documented with increased utilization of the clinical pathway as the study period progressed. While a majority of the patients had documentation of ACE-I use (80%), b-blocker use (95%), and EF (98%), areas in need for improvement were revealed. The documentation of advanced directives was found to be rarely performed (6%), NYHA functional class was inconsistently documented (44%), HF specific teaching was not consistently performed (23%), and follow up contacts were inconsistently scheduled (19%).The final goal to improve the care of the HF patient in the outpatient clinic was partially met with the institution of the care pathway, tool for documentation in the EMR, and documentation of areas of care in need of improvement. The beginning process for development of a system wide outpatient HF clinic which would be available to all patients has been initiated.

Areas for Further Study

Additional investigation into methods to incorporate the pathway seamlessly into the EMR is recommended. This may facilitate pathway utilization. Also, investigation into reasoning for limited pathway use by some providers is needed. While the pathway utilization by the MD providers was supported by nursing staff for data entry, the nurse practitioners were responsible for entering the HF flow sheet, which signaled pathway utilization, without assistance from the nursing staff. This may account for the lack of utilization by two of the three nurse practitioners. Understanding the barriers to implementation and eliciting provider specific recommendations may help to promote utilization. Another area for investigation is to understand the reason for the inconsistent documentation of the NYHA functional class. If the deficiency is caused by a lack of understanding of the utility of this documentation, further instruction may be needed. If the problem lies with the ease of documentation in the EMR, potential solutions such as adding a check box to document the functional class level in the patient review of system may be beneficial.

Inconsistencies in HF specific teaching occurred in patients on and off the pathway. Understanding the reason for this lack of documentation may lead to potential solutions. If the education is being done but not documented, perhaps changes can be made to the EMR to facilitate documentation. If the issue is lack of time by the provider during visits, other teaching methods should be considered including; group class, multimedia, waiting room television instruction or referral to cardiac rehabilitation.

There was limited utilization of patient contact via nurse telephone call after office visit on patients on the pathway (n=12). Phone contact to patients has been shown

to decrease unscheduled office visits and prevent emergency room visits (Quaglietti, Atwood, Ackerman, & Froelicher, 2000). Reinforcing the utility of this process of phone contact and triage may be needed to help increase utilization of this activity. Lack of familiarity with this service by provides may have prevented the utilization of it.

Finally, advanced directives were documented very rarely. Only six of the 80 patients had advanced directives documented, three patients were on the pathway and three patients were not on the pathway. The underlying reason for this is unclear. The social history data entry in the EMR, in which the advanced directives is documented, is a function entered in the EMR by the nurse or medical assistant. Lack of attention to this detail may be an oversight or related to the providers underlying feelings regarding palliatives care or a misunderstanding of the functions and services considered part of palliative care. Additionally, discomfort with these types of conversations with patients and families may be at the root of the deficiency in approaching these discussions. Further investigation into the cause of this documentation deficiency is needed to fully understand the motivation of the providers and improve compliance with this important aspect of HF care. This study suggests that teaching opportunities exist regarding current recommendations regarding advanced directive wishes and palliative care.

Conclusion

Overall this process improvement project was a successful beginning to improving the outpatient care of the HF patient at this cardiology clinic. The project utilized a clinical pathway based on EBP and GDMT to create a method to standardize care for HF patients at this clinic. The pathway was utilized as an educational and reference tool for the nurses when caring for the HF patient. During the course of the

project implementation, interdisciplinary collaboration and teamwork helped to promote and refine the process. Additionally, a HF specific flow sheet was utilized in the EMR to facilitate information transfer to other providers. Areas of documentation deficiency need for care improvement, and potential for further research were revealed during this study. Because of this project, steps are being taken to develop a nurse-led outpatient HF clinic that will serve the hospital and community.

Plans for Dissemination

Dissemination of the HF process improvement project results will begin by presenting the information to the hospital HF care improvement team and the readmission prevention team. These teams are members of hospital administration including the chief executive officer, chief financial officer, chief nursing officer, director of the department of emergency medicine and director of cardiovascular services. In order to further disseminate the results of this project to nurses caring for HF patients, a program evaluation report has been submitted to the American Association of Heart Failure Nurses for consideration as part of future symposium content. This is an appropriate forum for presentation of this project's outcomes as this organization specializes in educating nurses in all aspects of HF care.

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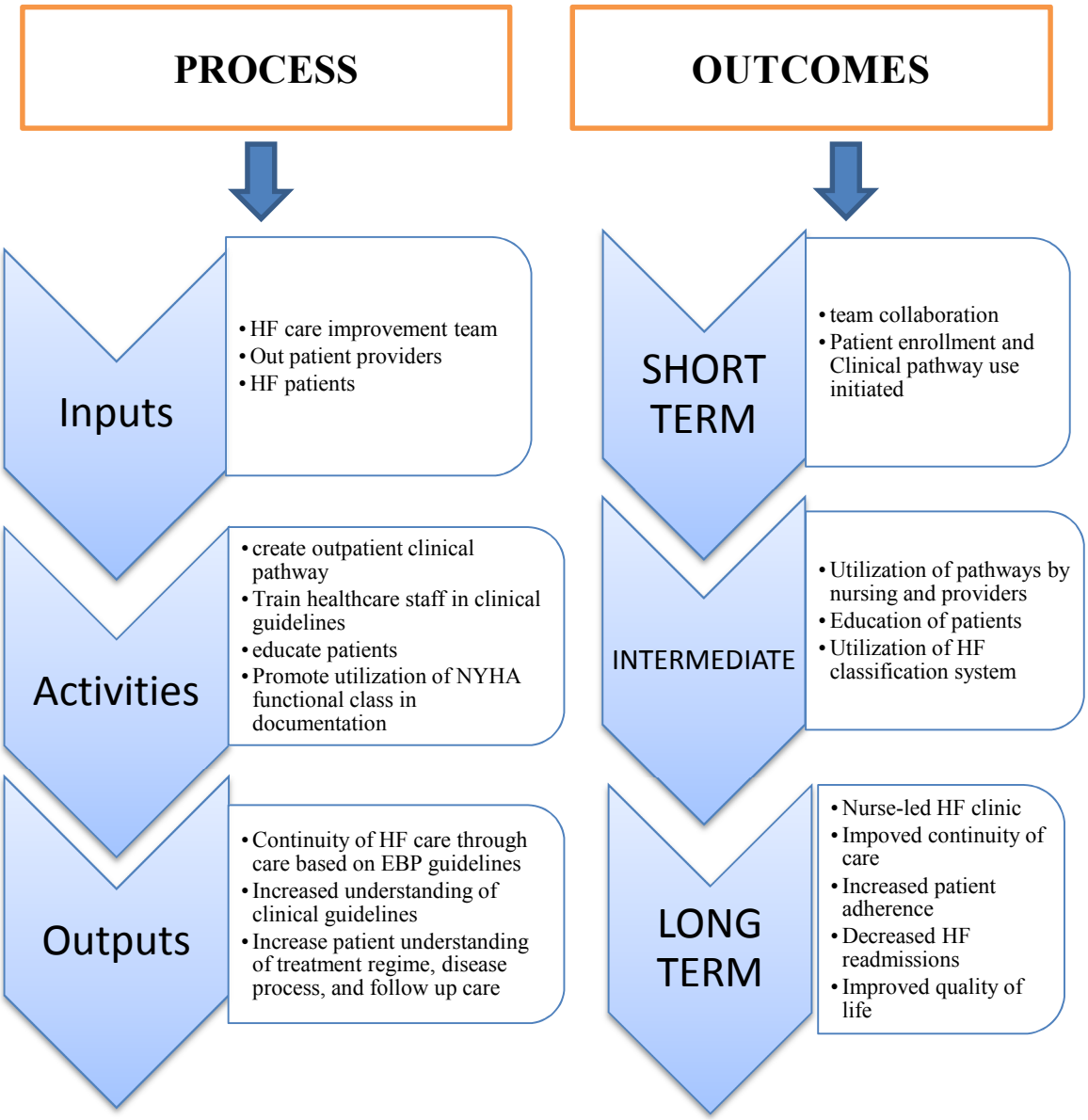
Appendix A: Heart Failure Logic Model

CONTEXT

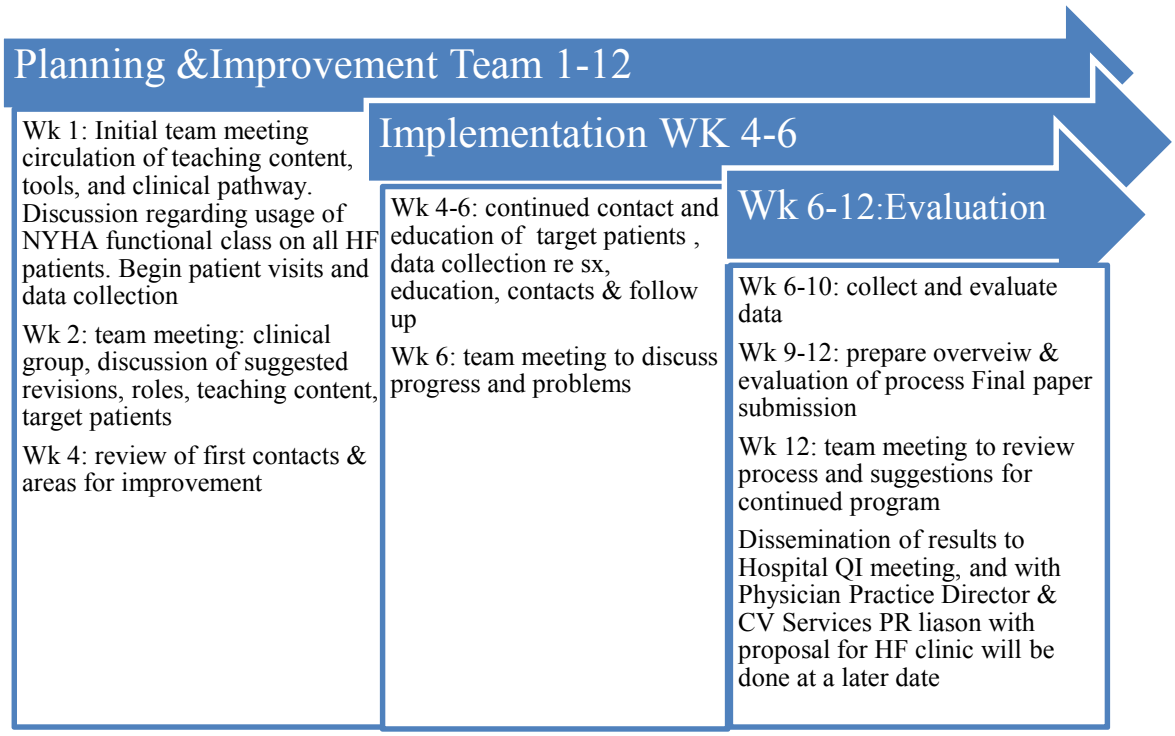
The incidence of HF is increasing, causing increased stress on patients and the healthcare system

ASSUMPTIONS

1. Exacerbation of HF is caused by inconsistent treatment, follow up, and knowledge deficit.
2. Providing standard guidelines for care will result in more consistent care of HF patients.
3. Patient education and monitoring will lead to decreased: exacerbation of HF, hospitalizations, cost, burden on the healthcare system, and improved patient quality of life.



Appendix B: Timeline



Appendix C: HF EMR Flow sheet

ROC_Rockle

[redacted], dob[redacted]1)Congestive Heart Failure

Beta Blockers	Coreg 12.5 mg tablet	Date of last Echocardiogram	
ACE/ARB	losartan 25 mg tablet	Diuretics	metolazone 2.5 mg tablet furosemide 40 mg tablet
Device therapy		Digoxin	digoxin 125 mcg tablet
NYHA Class		Antithrombotics	aspirin 81 mg tablet,delayed release warfarin 5 mg tablet
Notes		Statins	atorvastatin 80 mg tablet

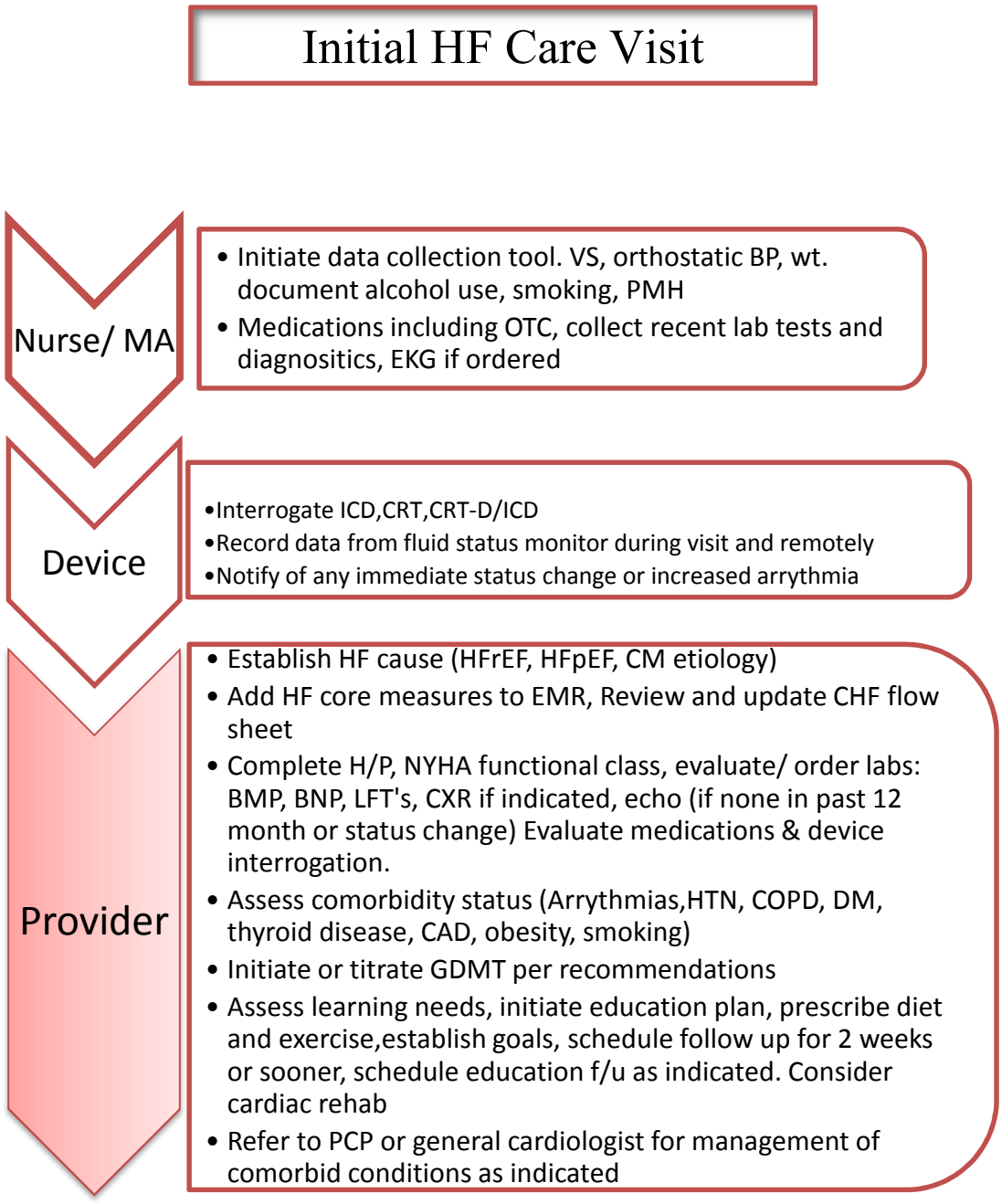
Date	BP	Pulse	Weight	BMI	O2 Sat	BNP	Digoxin	Sodium	Potassium	BUN	Creatinine	Ejection Fraction
10/16/2014	98/60 sitting L arm	65 bpm regular	210 lbs	30.1								
08/28/2014	96/60 sitting L arm 94/60 sitting L arm	60 bpm regular	207 lbs	29.7								
06/19/2014	122/72 sitting R arm	61 bpm	203 lbs	29.1	96% Oxygen 2 L/min							
06/16/2014	130/70	70 bpm	204 lbs	29.3								
05/28/2014							<0.5 mcg/L					
05/22/2014	120/70 sitting L arm	65 bpm	208 lbs	29.8								
05/19/2014	112/70 sitting L arm	70 bpm	209 lbs	30				139 mmol/L	4.1 mmol/L	29 mg/dL	1.26 mg/dL	
05/15/2014	100/48 sitting L arm 80/42 sitting L arm	62 bpm 62 bpm	210 lbs 210 lbs	30.1 30.1	94% Oxygen 2 L/min							
02/03/2014	130/62 sitting L arm	65 bpm	208 lbs	29.8								
09/30/2013	108/60 standing L arm		200 lbs	28.7								
09/27/2013							0.50 NG/ML					
06/28/2013	102/62 sitting L arm		203 lbs	29.1								
06/25/2013							1.40 NG/ML					
06/20/2013	102/60 sitting L arm	58 bpm	207 lbs	29.7								

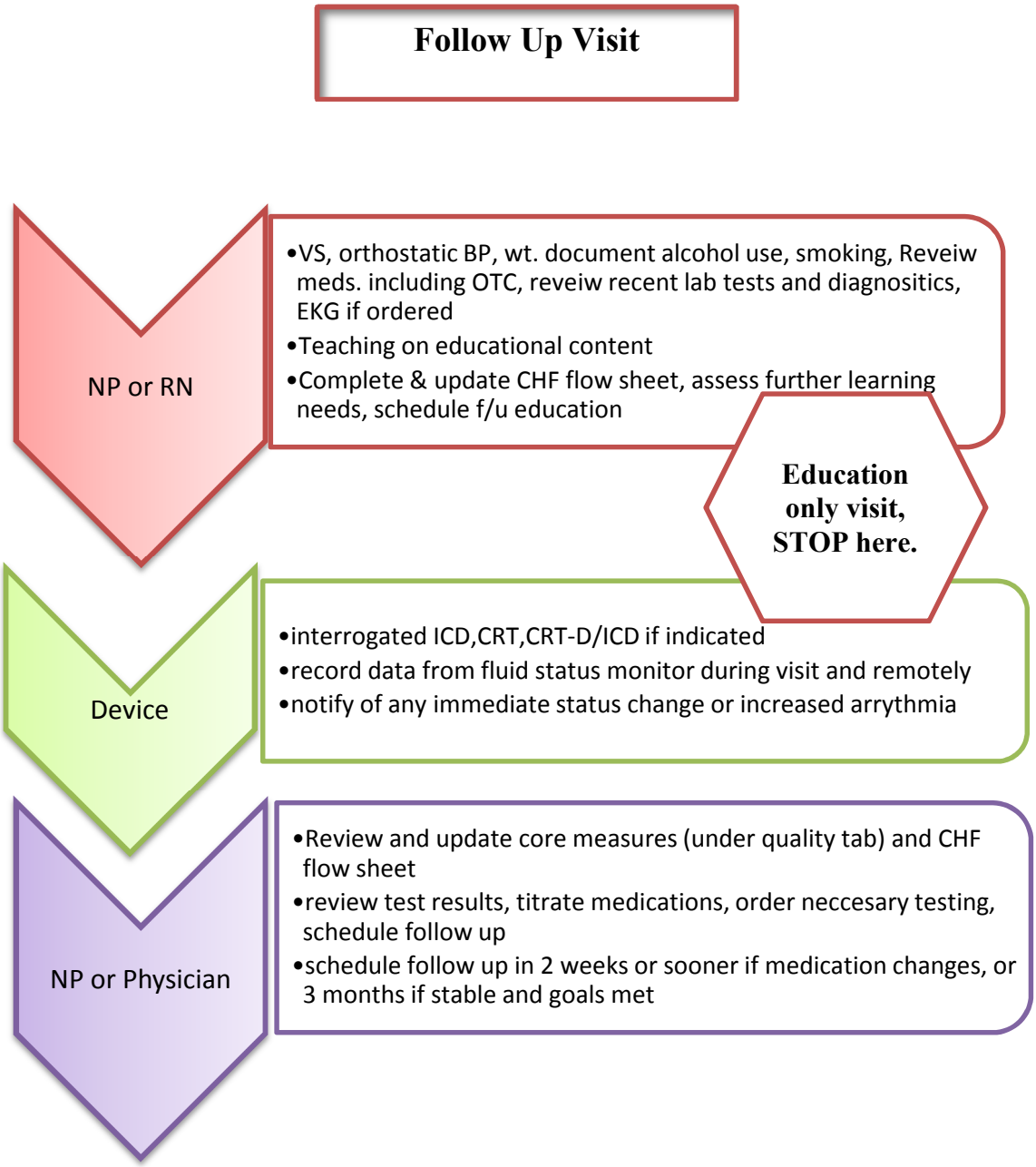
Upcoming Appointments

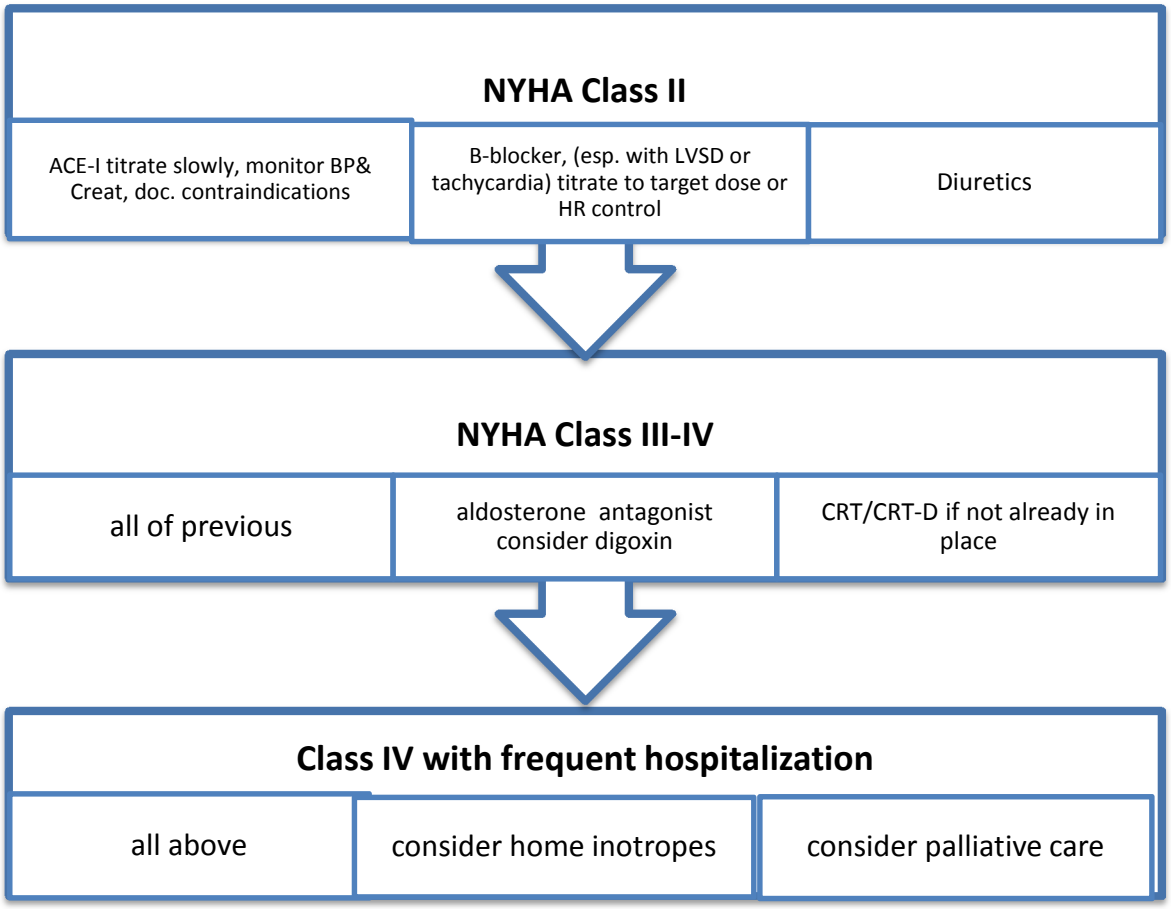
- Donna Hedberg, NP for Established Patient 40 at ROC_HEART RHYTHM ASSOCIATES on 10/20/2014 at 08:20 AM
- HR COUMADIN CLINIC for Lab 10 at ROC_HEART RHYTHM ASSOCIATES on 10/28/2014 at 08:20 AM
- Stephen Watts, MD for Established Patient 20 at ROC_HEART RHYTHM ASSOCIATES on 11/14/2014 at 09:00 AM

[Digital Signature Validated]

Appendix D: Pathways




Follow Up Visit
NP or RN
•VS, orthostatic BP, wt. document alcohol use, smoking, Reveiw meds. including OTC, reveiw recent lab tests and diagnositics, EKG if ordered
•Teaching on educational content
•Complete & update CHF flow sheet, assess further learning needs, schedule f/u education
Education only visit, STOP here.
Device
•interrogated ICD,CRT,CRT-D/ICD if indicated
•record data from fluid status monitor during visit and remotely
•notify of any immediate status change or increased arrythmia
NP or Physician
•Review and update core measures (under quality tab) and CHF flow sheet
•review test results, titrate medications, order neccesary testing, schedule follow up
•schedule follow up in 2 weeks or sooner if medication changes, or 3 months if stable and goals met


NYHA Class II
ACE-I titrate slowly, monitor BP& Creat, doc. contraindications
B-blocker, (esp. with LVSD or tachycardia) titrate to target dose or HR control
Diuretics
NYHA Class III-IV
all of previous
aldosterone antagonist consider digoxin
CRT/CRT-D if not already in place
Class IV with frequent hospitalization
all above
consider home inotropes
consider palliative care

Medications

ACE-I (first line)

Lisinopril 2.5-5 mg: target 20 mg
Ramipril 1.25 mg-2.5 mg: target 10 mg
Enalapril 2.5-5 mg: target 10 mg bid
Captopril 6.25 mg: target 50 mg tid
Fosinopril 5-10 mg: target 20 mg QD

Beta Blocker

Carvedilol 3.125 mg bid :target 25 mg bid or 50 mg bid if > 85 kg
Metoprolol succinate 12.5- 25 mg QD: target 200 mg QD
Bisoprolol 1.25 mg-5 mg QD (titrate slowly)

Diuretics

Furosemide 40-240 mg 3-4 X/day
Bumetanide .5-4mg 2-3 X/day
Toresemide 5-100 mg 1-2 X/day
Metalazone 2.5-5 mg 30 min prediuretic

Aldosterone Antagonist

(Avoid if K >5.0 &/or creat >2.5)
Aldactone 12.5-25 mg, increase to 25-50 mg qd
Eplerereone 25 mg target 25-50 mg qd

ARB (if intolerant of ACE-I)

Losartan 25 mg target 25-100 mg 1/day
Valsartan 40 mg target 40-160 mg 2/day
Candesartan 4-8 mg target 8-32 mg 1/day

Curriculum Vitae

Patricia L. Dunn, RN,DNP, FNP-BC

Experience

4/2007 – present | Heart Rhythm Associates of Brevard | Rockledge, FL

ARNP

- Care of the patient with complex arrhythmias and cardiomyopathy
- Care of patients with devices implanted for cardiac rhythm disturbance
- Care of patients with heart failure

1/17/2006- 3/30/07 | House Calls of Central Florida | Rockledge, FL

ARNP

- Home visits to homebound patients
- ALF and SNF rounds

1/2005- 4/2006 | Dr. Felix Sosa, MD | Cocoa, FL

ARNP

- Care of patients at Internal medicine clinic including, health promotion And disease management for the adult patient

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9/2001- 5/2004 | Sanabria and Sims, MD, PS | Rockledge, FL

ARNP

- All aspects of care for the pre and post Cardiothoracic surgery patient

Education

6/2013-112014	Walden University	Baltimore, MD
Doctor of Nursing Practice		
8/1997-12/1999	University of Central FL	Orlando, FL
MSN - ARNP/Family Nurse Practitioner		
5/1995-8/1997		
BSN	University of Central FL	
8/1980		
Diploma in Nursing	St. Luke's Hospital School of Nursing	Bethlehem, PA

References

References are available on request.

Memberships

American Academy of Nurse Practitioners

American Association of Heat Failure Nurses

Florida Nurse Practitioner Association

Space Coast Clinicians

American Association of Critical Care Nurses 1994-2002

Sigma Theta Tau National Honor Society *1998-2004*

Publications, Accomplishments, and Contributions

Thesis Author: *The Perceived Quality of Life and Functional Outcome of the Octogenarian Following Open Heart Surgery*

Development of learning modules: "Care of the Carotid Endarterectomy Patient", "Care of the Coronary Artery Stent Patient", "Care of the Open Heart Surgery Patient"

Development of the Progressive Care Nursing Orientation Manual

Presenter Wuesthoff Health Systems Critical Care Course 2000-2003

American Heart Association Community Board Member 20032004

Basic Life Support Instructor 1996-2002

American Cancer Society Triple Touch Instructor 1998-2004

Co-team leader Open Heart Surgery Outcome Team (Sterling Award nominee 1994)

Current: Board Member, Community Treatment Center Board of Directors, Cocoa Florida