HEART FAILURE TRANSITION OF CARE:

AN EDUCATIONAL PROGRAM FOR NURSES

A Major Paper Presented

by

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Abstract

Heart failure (HF) is becoming an epidemic as people are living longer and surviving cardiovascular events. According to the 2015 to 2018 data the American Heart Association estimates 6 million American adults aged twenty or older are living with HF (AHA, 2021). Heart failure is the nation's leading 30-day readmission diagnosis costing the nation an estimated $30.7 billion according to the Division of Heart Disease and Stroke Prevention. Heart failure is a chronic progressive disease that if not managed correctly will lead to increased morbidity and decreased quality of life. A review of the literature on transition of care frameworks for HF patients validated the most effective interventions and best practices to reduce hospitalization in patients with heart failure. Nurses need to possess knowledge of heart failure care best practices to optimize patient outcomes. The purpose of this quality improvement project was to determine if implementation of a Heart Failure Transition of Care education program increased nurses' knowledge of heart failure and heart failure transition of care best practices. The results of the educational program demonstrated improvement in nurses' knowledge in all three categories; Heart failure facts and pathophysiology, best practice nursing interventions, and Heart failure assessment and goal directed medical therapy.

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Heart Failure Transition of Care: An Education Program for Nurses

Background/Statement of the Problem

Heart failure (HF) is becoming an epidemic as people are living longer and surviving cardiovascular events. According to the 2015 to 2018 data the American Heart Association estimates 6 million American adults aged twenty or older are living with HF (AHA, 2021). Fifty percent of people who develop heart failure die within 5 years of diagnosis. Over one million individuals are hospitalized with heart failure each year in the United States. Nearly twenty-five percent of heart failure patients are readmitted within one month of hospital discharge making HF exacerbations the most common cause of 30-day hospital readmissions. Heart failure costs the nation an estimated $30.7 billion each year (Division for Heart Disease and Stroke Prevention, 2019). The Patient Protection and Affordable Care Act established the Readmissions Reduction Program, which required CMS to reduce payments to hospitals with avoidable readmission rates (CMS, 2016). The Readmissions Reduction Program was developed to hold healthcare organizations (HCOs) accountable for the quality of care delivered and coordination of care for a patient's transition from hospital to home. In a systematic review with meta-analysis by Feltner, Jones, Cene & Zheng (2014), evidence demonstrated that despite advances in the quality of acute and chronic HF disease management, gaps remain in knowledge about effective interventions to support the transition of care for patients with HF.

Nurses and healthcare providers must work collaboratively to discover and implement the most effective interventions to reduce rehospitalization of patients with heart failure. Feltner, et al (2014) describe transitional care interventions as interventions

designed to prevent readmissions among populations transitioning from one care setting to another. Assessment of the effectiveness of transitional care interventions is needed to support evidence-based policy and clinical decision making.

Transition of Care frameworks are guides that include multiple transitional care interventions that ensure an effective patient-centered plan of care. Transitional care interventions for HF patients include, but are not limited to; medication reconciliation, follow-up phone calls or appointments, HF education (including signs and symptoms, monitoring weight, when to notify MD), telemonitoring, and home visits by healthcare professionals. Nurses are at the interface of patient care and patient education. Nurses need to possess the knowledge of HF care best practices to optimize individual patient outcomes. The purpose of this quality improvement project was to determine if the implementation of a Heart Failure Transition of Care education program would increase Providence VA Medical Center (PVAMC) nurses' knowledge of HF and HF transition of care best practices.

Literature Review

A literature review was conducted. The databases utilized for this review were Google Scholar, PubMed, CINAHL, and Medline. The keywords searched were heart failure, cardiac failure, CHF, chronic heart failure, congestive heart failure, interdisciplinary care, transitional care, transition of care, readmission, rehospitalization, readmittance, readmission prevention, prevention of readmission, patient education, nursing knowledge, nursing education, and nursing interventions. This literature search included peer reviewed articles between the years of 2010 and 2020 with the full text available in the English language.

Prevalence of Heart Failure

The prevalence of heart failure is continuing to increase as our population ages. According to the 2015 to 2018 data the American Heart Association estimates 6 million American adults aged twenty or older are living with HF (AHA, 2021). Fifty percent of people who develop heart failure will die within five years of diagnosis. There are over one million patients hospitalized with HF each year in the nation. Twenty-five percent of these patients are readmitted to the hospital within thirty days of discharge. Heart failure exacerbations have become the leading cause for thirty-day readmissions in this country (Ogunwole, Phillips, Gossett, & Downs, 2018). Lack of HF patient education, medication non-compliance, dietary indiscretion, and sedentary lifestyles are all contributing factors to these rates. The Patient Protection and Affordable Care Act established the Readmissions Reduction Program, which required CMS to reduce payments to hospitals

with HF readmissions (Almkuist, 2017). Heart failure costs the nation an estimated $30.7 billion each year (Division for Heart Disease and Stroke Prevention, 2019).

Pathophysiology of Heart Failure

The heart receives deoxygenated blood from the venous system via the inferior and superior vena cava into the right atrium of the heart. The deoxygenated blood flows to the right ventricle through the tricuspid valve, then pumped through the pulmonic valve into the pulmonary circulation to become oxygenated. Once the blood is oxygenated it travels from the pulmonary veins into the left atrium then to the left ventricle via the mitral valve. The left ventricle pumps the oxygenated blood into arterial circulation to adequately perfuse the body's organs and tissues. Cardiac output is determined by the volume of blood the heart ejects with each beat and the number of beats each minute, normally 2.6-4.2 liters of blood/minute.

Heart failure diagnosis is determined by any functional or structural disorder that results in, or is likely to result in, low cardiac output or pulmonary or systemic congestion. Diagnosing heart failure requires a complete medical history, a physical exam, and laboratory and diagnostic testing. Dyspnea, fatigue, orthopnea, peripheral edema, and pulmonary congestion are all classic symptoms of HF. An echocardiogram is a standard tool for diagnosis of systolic (Heart Failure with reduced Ejection Fraction, HFrEF) or diastolic (Heart Failure with preserved Ejection Fraction, HFpEF) heart failure through an assessment of left ventricular function. According to the Center for Disease Control and Prevention the most common causes of heart failure are Coronary Artery Disease, Diabetes, Metabolic Syndrome, Obesity, Hypertension, Valvular Heart Disease,

along with other heart disease related conditions (Heart Failure Fact Sheet, 2020). All of these comorbidities can lead to decreased cardiac output by either compromising ventricular compliance, worsening myocardial contractility, leading to cardiomyopathy, or causing further cardiac deterioration while impairing the ventricles from either filling up or ejecting blood.

There are two types of heart failure: Left-sided heart failure and right-sided heart failure. The ventricles of the heart are primarily affected in both left and right-sided heart failure. Left-sided heart failure is then further categorized into two types depending on the left ventricle ejection fraction (LVEF). The ejection fraction is a measurement of the amount of blood being pumped out of the left ventricle with every heartbeat, compared to the amount of blood that was in the left ventricle prior to contraction. According to the American College of Cardiology Foundation (ACCF) and the American Heart Association (AHA) a normal ejection fraction (EF) to be 50-70% of left ventricular volume, a borderline ejection fraction is defined as 41-49%, and a reduced ejection fraction is $\leq$40%. Heart failure with preserved ejection fraction (HFpEF), also known as diastolic heart failure, is classified as an EF $\geq$ 50%. Heart failure with reduced ejection fraction (HFrEF), also known as systolic heart failure, is classified as an EF $\geq$ 40% with the diagnosis of heart failure (Yancy, et al., 2013). Heart failure signs and symptoms significantly worsen as a patient's ejection fraction decreases.

Right-sided heart failure occurs when the right ventricle is weakened and has difficulty pumping the blood into the pulmonary system. The most common cause of right-sided heart failure is left-sided heart failure. There are also multiple pulmonary

diseases that cause pulmonary hypertension which lead to right-sided heart failure. *Cor pulmonale* is defined as right-sided heart failure that is caused secondary to any pulmonary condition (AHA, 2017).

Stages of Heart Failure

The New York Heart Association (NYHA) Classification revised in 1994 has been used to delineate the stages of heart failure and continues to be widely used in healthcare today. The classification system is based on objective assessment and symptoms of heart failure. The symptoms include dyspnea, fatigue, and angina/palpitations. The classifications are as follows:

Patient Symptoms:

I. No symptoms and no limitations in ordinary physical activity.
II. Mild symptoms and a slight limitation during ordinary activity.
III. Marked limitation in activity due to symptoms, even during less-than-normal activity. Comfortable only at rest.
IV. Severe limitations. Experiences symptoms even while at rest. Most often bed bound patients.

Objective Assessment:

A. No objective evidence of cardiovascular disease. No symptoms and no limitation in ordinary physical activity
B. Objective evidence of minimal cardiovascular disease. Mild symptoms

and a slight limitation during ordinary activity. Comfortable at rest.

C. Objective evidence of moderately severe cardiovascular disease. Marked limitation in activity due to symptoms, even during less-than-ordinary activity. Comfort at rest only.

D. Objective evidence of severe cardiovascular disease. Severe limitation. Experiences symptoms even while at rest. (NYHA, 1994)

The AACF/AHA's Stages of heart failure use a classification system based on risk factors and abnormalities of cardiac structure. This classification system is structured on the development and progression of the disease. AACF/AHA Stages of HF:

A. High risk for HF; without structural heart disease or HF symptoms

B. Heart disease is present but there are no symptoms (structural changes in heart before symptoms occur)

C. Structural heart disease is present AND HF symptoms have occurred

D. Presence of advanced heart disease with continued HF symptoms requiring aggressive medical therapy (Yancy, et al., 2013)

Heart failure is a chronic, progressive disease with increased morbidity and mortality as the stages advance. Several factors including comorbidities, compliance with diet, medication management, and exercise can affect a patient's disease trajectory. Advancing heart failure often correlates with worsening of signs and symptoms, increased hospitalizations, and decreased quality of life.

Transition of Care Frameworks

A review of literature was conducted by Burke, Guo, Prochazka, and Misky (2014) to categorize interventions to reduce hospital admissions using the ten domains of the Ideal Transition of Care (ITC) framework, to evaluate which domains have been targeted in prior interventions and then examine the effect intervening on these domains had on reducing hospital readmissions. The ten domains of the ITC framework include 1. Communication of information; 2. Availability, timeliness, clarity, and organization of information; 3. Medication safety; 4. Educating patients to promote self-management; 5. Monitoring and Managing Symptoms after Discharge; 6. Enlisting Social and Community Supports; 7. Advanced Care Planning; 8. Coordinating Care Among Team Members; 9. Discharge Planning; and 10. Follow-up with outpatient providers. The authors' literature search criteria included publishing dates between 1975-2013, English language, and included only randomized control trials and observational designs. Sixty-six articles met inclusion criteria, with a median study size of 283 patients. Thirty-five studies focused on thirty or fewer days post discharge. Monitoring and Managing Symptoms after discharge domain was significantly associated with success in reducing hospital readmissions (Burke, Guo, Prochazka, & Misky, 2014). The authors also noted that the number of domains addressed in an intervention was significantly associated with success in reducing readmissions, even after adjusting for study quality, duration, and size (Or per domain included 1.5, 95% CI1.1-2.0) (Burke et al.). The three domains in the ITC that resulted in most improved outcomes were Monitoring and Managing Symptoms, Educating Patients to Promote Self-Management, and Enlisting Social and

Community Support groups. A limitation of this literature review was the authors' failure to use a standard, formal systematic review process of the data.

According to Shah, Forsythe, and Murray (2018) addressing heart failure (HF) readmissions is the responsibility of healthcare professionals, regardless of specialty practice, to ensure the patient is safe to transition home. The authors stated that 37% of Medicare spending covers inpatient care, and 18% of all hospital admissions and readmissions, especially within 30 days of discharge which encompasses about $15 billion annually (Shah et al.). The authors noted that an estimated $17 billion of the total expenditure for all hospital readmissions is preventable. Poor coordination of services, medication nonadherence, and inadequate access to follow-up care have contributed to poor patient outcomes and related hospital readmissions (Shah, Forsythe, & Murray, 2018). Shah et al. performed a systematic review to identify studies that implemented an interprofessional team approach in HF care with improved communication, education, and discharge transitions leading to reduction in 30-Day readmission rates (Shah et al.). The search found systematic reviews, meta-analyses, randomized control trials, and case reports that included both experimental and nonexperimental studies about HF, patient readmissions, and inter-professional team interventions for reduction of patient readmissions in the English language (Shah et al., 2018). Articles that included pharmacological therapy and/or changes to medical guidelines were excluded. Ten studies were included in the review. The inpatient interventions assessed in the studies included: patient and family (caregiver) education, medication reconciliation, discharge planning, clinical assessments, referrals as needed, scheduling follow-up appointments, information packets, and nutritional counseling. The outpatient interventions included

post-discharge telephone calls within a certain time frame, home-based nursing assessments and teaching, patient help hotlines, close follow-up appointments, and motivational interviewing. Seven out of the ten studies evaluated the effect of their interventions on the 30-Day readmission rate, two assessed the effect of the intervention on the 90-Day readmission rate, and one assessed the effect on readmissions within a 12-month period. Six of the seven studies demonstrated a statistically significant improvement in the 30-Day readmissions. One of the two studies assessing 90-Day readmission rates and the only study assessing 12-Month readmission rates showed a statically significant decrease in readmission rates (Shah et al., 2018). Included studies varied in the quality of research. Small sample sizes, small evaluation time frame, non-blinding, and selection bias were all limitations identified by the authors. However, this systematic review demonstrated that working under specific guidelines with multiple disciplines, both registered nurses (RN) and advanced practice registered nurses (APRN's) can improve the outcomes of their patients with HF.

When a multidisciplinary team of health care providers function as liaisons and educators during transition from hospital to home, they help prepare patients for life with chronic HF and may mitigate the need for readmission (Albert, 2016). Albert (2016) performed a systematic review of the literature to evaluate existing transition-of-care models and identified common themes that may minimize exacerbation and rehospitalization and improve quality of life for patients with HF. Twenty-three research articles were included, two articles involved multidisciplinary teams. Inclusion criteria consisted of articles from 1990 through 2015, English language, the research included HF patients, and one transition component from one setting to another, and evaluated the

interventions in North America. The author identified the following eight common themes: planning for discharge, multi-professional teamwork, communication, and coordination, timely, clear and organized information, medication reconciliation and adherence, engaging social and community support groups, monitoring and managing signs and symptoms of HF after discharge, and delivering patient education, outpatient follow-up, and advanced-care planning and palliative and end-of-life care. Post-acute hospitalization for decompensation of chronic HF, timely, thorough, coordinated medical care, combined with detailed, individualized, reinforced patient education and medication reconciliation may optimize quality of life and reduce hospitalization (Albert et al.). Seven of the 23 studies demonstrated lower 30-Day readmission rates or all-cause readmission rates. Amarasingham et al. 2013 showed the readmission rate was 17.3% for patients who received 1 or 2 outpatient interventions vs. 7.4% for patients who received >3 interventions (Albert et al.). Health care providers have a unique opportunity to educate our patients and their caregivers with knowledge to engage in self-management and promote communication, decreasing their likelihood of rehospitalization.

Hoover, Plamann, and Beckman conducted a quasi-experimental, descriptive study to evaluate the effectiveness of a care transitions quality improvement (QI) intervention on self-management and readmission rates in older adults with HF. The authors cite self-management as a critical element in successful treatment of HF and require that the patient and/or caregiver are aware of the importance of HF care guidelines, follow those guidelines closely, and seek medical attention when changes in health status occur (Hoover et al., 2017). The study of 66 participants included an intervention group (N=30), and a usual care group (N=36), admitted to three medical

units in a 489-bed Midwestern acute care hospital (Hoover, Plamann, & Beckel, 2017). The Coleman Care Transitions Intervention (CTI) was implemented on two additional units located away from the two control medical units. The CTI included an evidence-based HF order set on admission to the hospital, medication reconciliation at admission and prior to discharge by a pharmacist, one-on-one medication education by a pharmacist with the patient and caregiver, a provider visit scheduled within 10 days of discharge, HF education with a RN HF Specialist, a visit from a RN Transition Coach prior to discharge, and three follow-up phone calls over a four-week span. Readmission rates were found to be statistically significant between the control group and CTI group. Readmission rates to the hospital were 13% for the CTI group compared to 44% for the control group (Hoover et al., 2017). The self-reported confidence level and self-management level were significantly improved in the CTI group according to the study. Limitations, cited by the authors, include no blinding, small sample size which decrease its validity and quality of the study.

Patient Education

Patient education is a major focus for successful transition from the hospital to home. The teach-back method, asking a patient to explain, in their own words, the information just presented and asking patients open-ended questions regarding the educational topic presented, are accepted methods to assess patient knowledge. These approaches allow the nurse to assess a patient's health literacy and how much information is understood. Almkuist (2017) performed a systematic review to assess the effectiveness of the teach-back method to assess patient comprehension of discharge

instructions. The inclusion criteria included patients over the age of eighteen, English language articles, articles published between 2011-2016, and the use of teach-back methods in chronic disease. Five articles were reviewed including one meta-analysis. The authors found that three of the studies resulted in decreased readmission rates. Studies included were limited in value due to small sample size and lack of reporting any 30-day all-cause hospital readmission rates. Limitations included 1 of the 4 studies with only 23 patients, lacking validity, another study included patients post CABG, and yet another study did not show any all-cause reduction but did trend toward significance ($p=0.15$) in patients readmitted for HF (Almkuist, 2017). Finally, Dinh et al. (2016) reported the effects of the teach back method was effective but not always statistically significant. The effectiveness of the teach-back method alone was inconclusive in the meta-analysis. The authors conclude the use of teach-back positively impacts health outcomes, self-care ability, and increased disease-specific knowledge when combined with other readmission reduction interventions such as scheduling close follow up with Cardiologist, medication reconciliation, and dietary and social work consultations. They also hypothesize the teach-back combined with several evidence-based tactics remains the best approach to reduce an organization's 30-Day readmission outcomes (Almkuist, 2017).

The most effective interventions that reduce rehospitalization of patients with heart failure require health care providers to work collaboratively. The APRN scope of practice includes all the domains within the Transition of Care framework; however a multidisciplinary approach is necessary for completion of all ten domains. Nurses educated in HF best practice can contribute to the improved outcomes of the

interdisciplinary HF team thus leading to improved patient outcomes. Next the theoretical framework will be discussed.

Theoretical Framework

The American Association of Critical-Care Nurses (AACN) Synergy Model for Patient Care and the Kellogg Foundation's Logic Model are the theoretical frameworks used for this project.

Synergy Model for Patient Care

Synergy Model for Patient Care aligns patient needs with nurse competencies. The patient's needs drive nurse competencies. When nurse competencies and patient characteristics complement (or synergize) each other, patient outcomes will be optimized. Synergy derives from responsive interdependence, intersubjectivity, shared commonality, and equity within the patient-nurse relationship (Curley, 1998).

Figure 1.

American Association of Critical-Care Nurses Synergy Model (Curley, 1998)

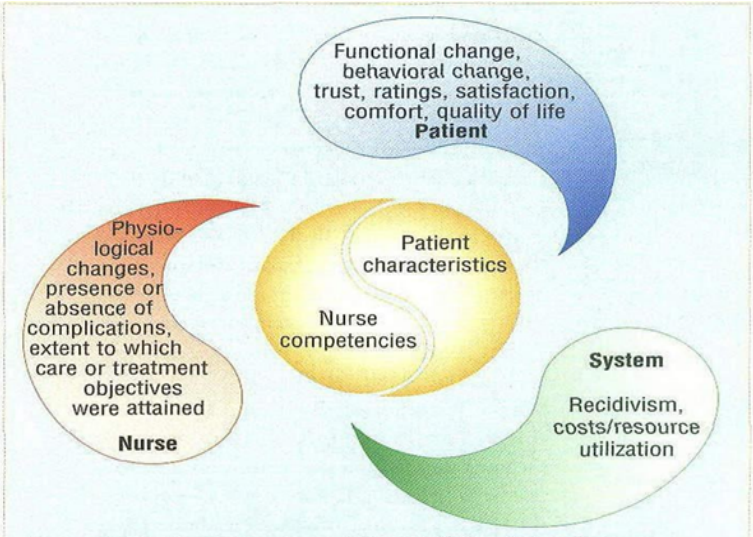


Figure 1 The American Association of Critical-Care Nurses Synergy Model. Optimal patient care via matching patient's need and nurse's competencies.

From Curley M. Patient-nurse synergy: optimizing patients' outcomes. *Am J Crit Care.* 1998;7:69. Reprinted with permission.

There are eight patient characteristics considered holistically: stability, complexity, predictability, resiliency, vulnerability, participation in decision making, participation in care, and resource availability. Stability refers to the patient being able to maintain both physiologic and psychological homeostasis. Complexity is the intricate entanglement of two or more systems, such as body, family, or therapies (Curley, 1998). Predictability is the characteristic that allows the nurse to expect a certain course of illness. Resiliency is the ability to use coping mechanisms or compensatory mechanisms to return to a restorative level of function. Vulnerability is seen as the susceptibility to adverse outcomes. Participation in decision making includes both the patient and their families and their ability to actively make decisions in aspects of care. Resource availability refers to individual, family, and community resources that are brought to the care situation; personal, psychological, social, technical, and fiscal.

There are eight nurse competencies reflected in the AACN Synergy Model of Nursing: clinical judgment, advocacy and moral agency, facilitation of learning, collaboration, caring practices, systems thinking, diversity of responsiveness, and clinical inquiry. These competencies are used to assess how well a patient's needs are met and to optimize patient outcomes. Following the Synergy model nurse's competencies will match the patient's characteristics and create a safe transition from hospital to home. Nurses will make a significant contribution to the patient's quality of care and patient outcomes by enhancing their competencies in HF education.

The Synergy model is the theoretical model implemented because the Heart Failure Educational Program has the potential to increase nurses' competencies to meet

the individual needs of each HF patient and improve outcomes for individual patients and families.

Logic Model

The Kellogg Foundation's Logic Model will be used as a framework to develop a HF education program for nurses. The Logic Model allows an organization to visualize and share understanding of how assumptions and theories work. The program logic model systematically links all desired outcomes with the program activities, resources, and principal assumptions of the program. The Kellogg Foundation's model supports effective program evaluation giving you the ability to continually collect program specific information, learn from the data which provides rationale to continuously improve a program and its outcomes.

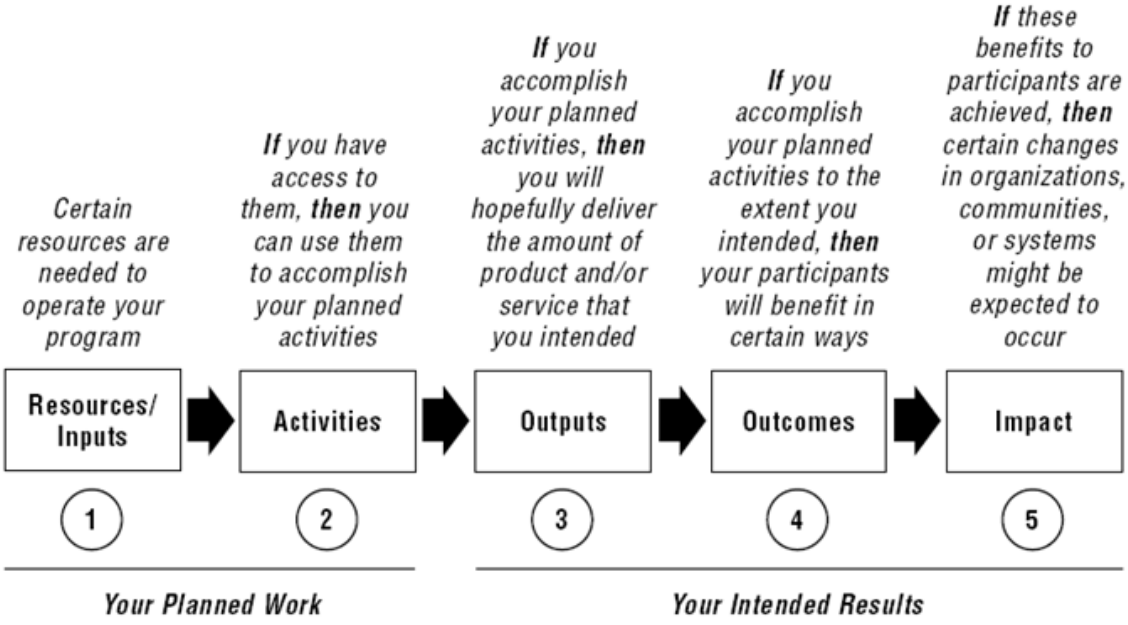
There are five major concepts in the logic model framework. The first two are described as your planned work for the program and consists of resources/inputs and activities. The model defines resources, or inputs, as any resource that are human, financial, organizational, and community available and required to implement an education program. Program activities are the interventions utilized to bring intended results such as: processes, tools, events, technology, and program actions that are implemented. The last three concepts fall under intended results which consist of outputs, outcomes, and impact. The outputs are the direct products of program activities and may include types, levels and targets of service to be delivered by the program (Kellogg, 2004). Outcomes are defined as the specific changes that the participants will benefit

from. The fundamental intended or unintended change to the community, organization, or system that was brought about as the direct result of the program is known as the impact.

The program theory's assumptions are listed in the model below in the form of the "if…then" statements above the major concepts:

Figure 2.

The Kellogg Foundation's Logic Model (Foundation, 2004)



The logic model is well defined with linkages that are explicit. The concepts and assumptions are logical, congruent, and very well organized. It uses words and/or pictures to describe the sequence of activities thought to bring about change and how these activities are linked to the results the program is expected to achieve (Foundation, 2004). You can visualize the expected outcomes of the program and the activities and

resources utilized to accomplish them. The logic model allows changes to the approach and activities as the program develops. This program theory can be used to develop current and future quality improvement projects, new system design projects, along with organizational redesign research studies. It is currently being used nation-wide to attempt to increase health outcomes by individual states, independent health care organizations, and on a national level (Foundation, 2004).

According to the Center for Disease Control, heart disease and stroke, the primary components of cardiovascular disease (CVD), are leading causes of death and disability in the United States. The CDC currently uses the logic model for their heart disease and stroke prevention program. The logic model defines the processes and events that are expected from combined state and federal resources and activities to prevent heart disease and stroke. The CDC and State activities are outlined in terms of capacity building, surveillance, and interventions. The intermediate outcomes are changes in policy and environmental support which will have a direct impact on their long-term outcomes of improving the populations' health status. The CDC is also utilizing the logic model in different programs in the Division of Adolescent and School Health, The Division of Oral Health, and the Prevention Research Centers Program (State Heart Disease and Stroke Prevention Program Evaluation Guide: Developing and Using a, 2019).

The Kellogg Foundation's Development Logic Model was used as a framework to develop a Heart Failure Transition of Care Education Program. The program model systematically identified all aspects of the Heart Failure Transition of Care Education Program. Planning and designing the program started with the impact and outcomes well

defined. The outcomes included: (A) Increasing nurses' knowledge of HF including pathophysiology, signs and symptoms, medication management, and nursing interventions (B) Increasing nurses' knowledge of best practice interventions for safe transition of care. The impact was to increase nurses' knowledge of heart failure and best practice interventions. This would, in turn, decrease annual heart failure readmission rates, decrease morbidity and mortality for HF patients, while decreasing healthcare costs for organizations. The activities included a 20-question pretest, a 20-minute heart failure educational intervention, and the same 20-question posttest. The resources included approval from the PVAMC Cardiology nurse manager, nurse managers on both inpatient units as well as the Nurse Executive. This project was submitted to both the PVAMC and the Rhode Island College institutional review boards and approved as a quality improvement project.

Method

Purpose

The purpose of this quality improvement project was to determine if the implementation of a Heart Failure Transition of Care education program would increase inpatient medical surgical nurses' knowledge of HF and HF best practice interventions.

Design

This quality improvement project employed a quasi-experimental design using a pretest, intervention, and posttest.

Sample

A convenience sample of registered nurses working on two inpatient medical units was used. Inclusion criteria consisted of current registered nurses who work in the Step-down unit (N=33) and the telemetry unit (N=35). Exclusion criteria included non-registered nurses (LPN's) and ancillary staff (CNA's), and nurse managers.

Site

The study site was the Providence VA Medical Center, a 73-bed hospital affiliated with Brown University, Alpert Medical School.

Procedures

The Logic Model Framework

Resources/Inputs

Approval from the PVAMC Cardiology nurse manager was obtained. Approval from the Nurse Managers on both inpatient units as well as the Nurse Executive was acquired. This project was submitted to both the PVAMC and the Rhode Island College institutional review boards for approval as a quality improvement project. Nurse managers were asked to inform staff of this quality improvement project. A convenience sample of Step-Down and Telemetry registered nurses (N=68) was targeted for the educational intervention.

Recruitment for participation in the program was initiated once the program was approved by all PVAMC administrations and both the PVAMC and Rhode Island College IRB. Fliers, (Appendix A) describing the program and purpose, were placed on each unit, as well as break rooms, requesting voluntary participation and to advertise the program two weeks prior to the Survey Monkey pretest. Nurse managers were asked to inform staff of this quality improvement project via email and during pre-shift huddles. An informational email (Appendix B) was sent to all inpatient nurses on both units two weeks prior to the Survey Monkey pretest, with the same information as the fliers, describing the program and purpose, requesting voluntary participation. The email emphasized the voluntary nature of participation, and that no identifying participant information was requested.

Activities

The activities included a 20-question pretest (Appendix C), a 20-minute heart failure educational intervention (Appendix D), and the same 20-question posttest (Appendix E). The pretest, posttest, and the educational intervention were developed by the content experts, including this author, the Cardiology HF RN, the Cardiology APRN, and the Cardiology nurse manager. PVAMC nurses not on the study units were asked to pilot the test for clarity and educational content. Voluntary participation in the study was considered implied consent. No demographic or identifiable information was requested. The pretest was distributed via SurveyMonkey to the Stepdown unit and the Telemetry unit nurses' work email two weeks prior to the beginning of the educational program. The program's educational intervention was scheduled over the course of two weeks at times determined by the nurse managers as most convenient for each shift (nights/days/evenings). The posttest was distributed via SurveyMonkey to the Stepdown unit and the Telemetry unit nurses' work email upon completion of all the educational presentations.

The National Heart Lung and Blood Institute's "Caring for Your Heart: Living Well with Heart Failure" brochure as well as the PVAMC's "Managing Heart Failure" signs and symptoms refrigerator magnet were distributed to each unit as they are the PVAMC's approved patient education materials for heart failure.

Educational Program:

Content	**Objectives**	**Allotted Time**
Introduction: AHA HF Facts and Pathophysiology	Identify HF as leading readmission diagnoses, impact, and prognosis Define heart failure and ejection fraction	5 minutes
HF assessment, classic signs and symptoms, GDMT and side effects	Lab values, electrolyte monitoring, identify HF signs and symptoms; left-sided vs. right-sided HF State goal directed medical therapy HF management, common side effects of Ace-Inhibitor, Entresto, and need for 'wash-out'	10 minutes
Best practice nursing interventions and patient self-management education	State nursing interventions and patient self-care management interventions State PVAMC's available resources for HF patient/, Transition of Care RN consult and when to order	10 minutes

Outputs

The goal was 100% participation of all registered nurses (N= 68) on both the Step Down and Telemetry units. The PVAMC utilizes SurveyMonkey, a web-based survey where data can be directly analyzed.

Outcomes

Desired short-term outcomes:

Improve RN knowledge of:

- Impact HF has on Veterans and PVAMC's readmission rates
- Pathophysiology, Assessments, and Treatments
- Guideline-recommended interventions needed for a safe transition of care
- Educational resources available for HF patients

Desired long-term outcomes:

- Veterans admitted with HF receive the education needed for self-management to reduce morbidity and mortality.
- Decrease HF readmission rates at PVAMC
- Decrease burden of healthcare costs due to HF readmissions

Impact

The VA health care system cares for an increasing population of Veterans with HF, and HF is the leading discharge diagnosis in patients treated at VA hospitals (Silanskas, Bergman, & Kaplan, 2014). PVAMC nurses participating in this HF

educational program received education on the most effective interventions to reduce rehospitalization of patients with heart failure. The goal was to implement evidence-based practices to improve the care for Veterans admitted with heart failure.

Organizational Supporting Factors/Barriers

The Providence VA Medical Center is a teaching hospital which supports educational programs and encourages research and utilizing evidence-based practice. The support of the cardiology clinic nurse manager, the Nurse Executive and the study units' nursing leadership was acquired to successfully complete this quality improvement project. Time constraints and unit staffing were foreseeable barriers.

Ethical Considerations

Participation in this program was voluntary and no personal identifiers were obtained. There were no anticipated ethical considerations.

Evaluation

A 20-question Survey monkey electronic pretest and identical posttest were administered to RNs on both medical units**.** Aggregate results were calculated using descriptive statistical analysis including mean scores. The aggregate pretest responses were compared to the posttest responses using total scores and percentiles.

Dissemination

The results of the project were presented to the staff on both the Step-down and Telemetry units of PVAMC, nurse managers and the Cardiology Department. This educational program is applicable to all nursing units that treat patients with heart failure

including the outpatient diuretic clinic, the Hospital-In-Home program, as well as the critical care unit. The Cardiologist in charge of the Hospital-In-Home program requested this writer disseminate the educational program to his nursing staff. The findings from this project will be presented in May 2022 at the Rhode Island College Graduate Student Symposium.

Results

Twelve educational interventions took place over the course of two weeks and a total of (n=47) forty-seven nurses (69%) attended the educational program (N=68). Thirty nurses (68%) completed the pretest and twenty-five nurses (53%) completed the posttest Seventeen out of the twenty questions had one correct answer. Three of the twenty questions were multiple choice answers. Answers that were left blank were counted as incorrect. The posttest mean score of 76.4 was an increase of 15.7% over the pretest mean score of 60.7.

The pretest and posttest questions were evaluated individually by mean scores (Figure 3).

Question	**Pretest (n=30) Mean Score, % Correct**	**Posttest (n=25) Mean Score, % Correct**
Q: 1 – 6: Heart failure facts and pathophysiology		
1	29 (96.67%)	25 (100%)
2	25 (83.33%)	17 (73.91%)
3	7 (23.33%)	22 (88.00%)
4	21 (75.00%)	20 (83.33%)
5	5 (16.67%)	11 (45.83%)
6	27 (90.00%)	23 (95.83%)

Q: 7-9, 11-14: Heart failure assessment and goal-directed medical therapy		
7	15 (50.00%)	14 (58.33%)
8	16 (53.33%)	16 (66.67%)
9	30 (100%)	24 (100%)
11	25 (83.33%)	22 (91.67%)
12	17 (56.67%)	14 (58.33%)
13	11 (36.67%)	4 (16.67%)
14	9 (30.00%)	15 (65.22%)
10, 15-20: Best practice nursing interventions		
10	29 (96.67%)	24 (100%)
15	15 (50.00%)	19 (79.17%)
16	22 (73.33%)	17 (70.83%
17	29 (96.67%)	23 (95.83%)
18	14 (46.67%)	14 (58.33%)
19	21 (70.00%)	22 (91.67%)
20	20 (66.67%)	21 (87.50%)

Figure 3: Mean Individual Item Scores

Heart failure facts and pathophysiology scores increased by 17% overall after the educational intervention which proved to be the greatest category increase. Questions 1-6 were in this category. Question three asked about the percentage of HF patients who die within five years had the greatest increase from 23.33% to 88.00% (+64.67%). Question five had an increase from 16.67% to 45.83% (+29.16%) which asked about the main causes of heart failure. Question four asked the definition of an ejection fraction and increased from 75.00% to 83.33% (+8.33%). Question six asked if heart failure can be cured, it resulted in an increase from 90.00% to 95.83% (+5.83%). Question one asked about the leading readmission diagnosis, and it had an increase from 96.69% to 100% (+3.33%). Question two asked participants to identify the definition of heart failure and had a surprising decrease from 83.33% to 73.91% (-9.42%). The definition: Answer b: 'The heart can't pump efficiently to provide enough blood to meet the body's needs'. This decline in score could possibly be attributed to the fact that not all the same nurses who completed the pretest completed the posttest.

The second leading category that demonstrated an increased average of 12% in knowledge after the educational intervention was the best practice nursing intervention. This category included questions 10 and 15-20. Question fifteen showed the third greatest improvement with an increase from 50.00% to 79.17% (+29.17%), it asked about patient self-care interventions. Question nineteen was a true/false question and asked if nurses could place a consult for heart failure teaching, it increased from 70.00% to 91.67% (+21.67%). Question twenty showed an increase (+20.83%) from 66.67% to 87.50% and it asked about the best time to place a CHF Transition of Care consult. Question eighteen asked the name of the PVAMC consult for heart failure teaching, and it had an increase

from 46.67% to 58.33% (+11.66%). Question ten asked about the leading nursing interventions. It only had an increase of (+3.33%) however the pretest score was already 96.67% and the posttest score was 100%. Question seventeen asked the timing of initiating HF education, the pretest score was 96.67% and the posttest score was 95.83% (-0.84%), it did show a decrease, however it was the third highest scored question overall. Question sixteen asked which weight changes to report to the provider, it showed a decrease of 73.33% to 70.83% (-2.5%).

Heart failure assessment and goal directed medical therapy category showed only a slight knowledge improvement with an increased average of 6.7% after the educational intervention. It consisted of questions 7-9 and 11-14. Question fourteen showed the second greatest increase from 30.00% to 65.22% (+35.33%), it asked about the wash-out period from an ACE inhibitor to Entresto. Question eight asked about left-sided heart failure symptoms and it increased from 53.33% to 66.67% (+13.34%). Question eleven asked which electrolyte should be monitored after initiating diuretic therapy, it increased from 83.33% to 91.67% (+8.34%). Question seven showed an increase from 50.00% to 58.33% (+8.33%) and it asked about right-sided heart failure signs and symptoms. Question twelve asked about GDMT for heart failure, it showed an increase from 56.67% to 58.33% (+1.66%). Question nine asked about the key lab value to monitor for heart failure, the pretest and posttest scores were both 100% (+0.00). Question thirteen showed a decrease from 36.67% to 16.67% (-20%) and it asked about the side-effects of ACE inhibitors. This question was multiple choice with three correct responses, two of those responses had an increase in knowledge: hyperkalemia (+39.17%) and dry cough

(+4.17%) however the question is marked incorrect if you don't choose all three correct answers.

The graph (Figure 4) depicted below shows the difference in percentile scores for each question comparing the pretest to the posttest. Fifteen of the twenty questions showed improved scores, one question had the exact same result, while four of the questions showed a decrease in score after the educational intervention. Heart failure facts and pathophysiology, heart failure assessment/treatment, and best practice nursing interventions were the three concentrations for each of the questions.

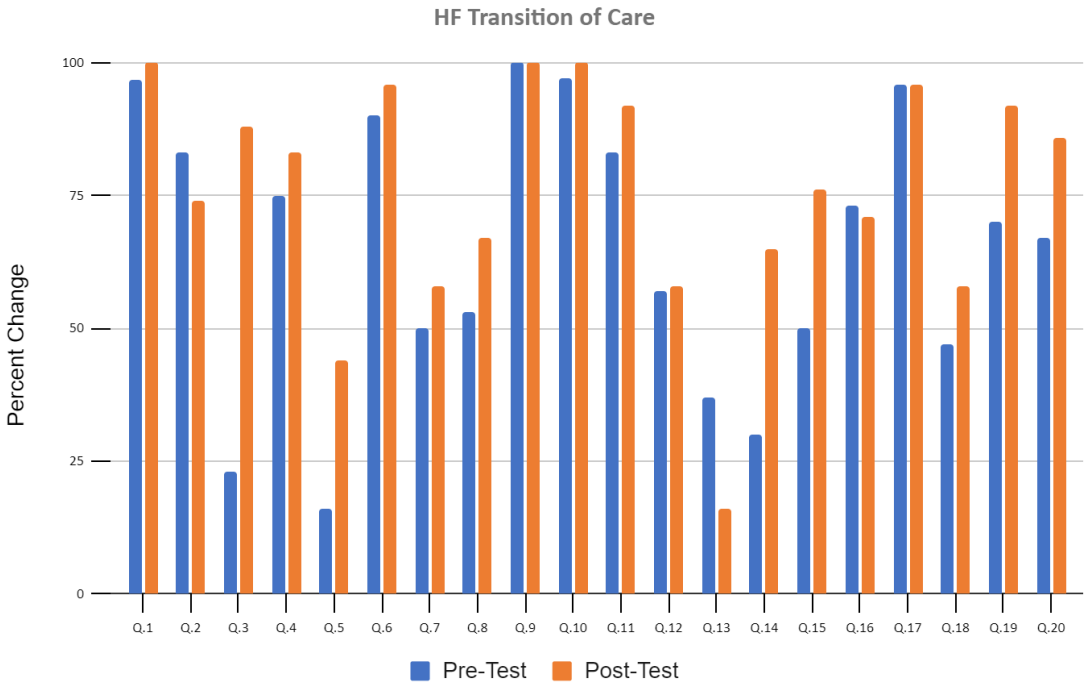


Figure 4: Individual Questions by Pretest and Posttest percentage

The Transition of Care Heart Failure education program demonstrated effectiveness with increased nurses' knowledge in all three categories; Heart Failure facts

and pathophysiology, best practice nursing interventions, and Heart Failure assessment and goal directed medical therapy.

Summary and Conclusions

Heart failure (HF) is becoming an epidemic as people are living longer and surviving cardiovascular events. According to the 2015 to 2018 data the American Heart Association estimates 6 million American adults aged twenty or older are living with HF (AHA, 2021). Fifty percent of people who develop heart failure die within 5 years of diagnosis. Nearly twenty-five percent of heart failure patients are readmitted within one month of hospital discharge making HF exacerbations the most common cause of 30-day hospital readmission.

The systematic review with meta-analysis by Feltner, Jones, Cene & Zheng (2014), demonstrated that despite advances in the quality of acute and chronic HF disease management, gaps remain in knowledge about effective interventions to support the transition of care for patients with HF. Transition of care frameworks are guides that include multiple transitional care interventions that ensure an effective patient-centered plan. Transitional care interventions for HF patients include, but are not limited to; medication reconciliation, follow-up phone calls or appointments, HF education (including signs and symptoms, monitoring weight, when to notify MD), telemonitoring, and home visits by healthcare professionals.

Nurses are at the interface of patient care and patient education. Nurses need to possess the knowledge of HF care best practices to optimize individual patient outcomes. The purpose of this quality improvement project was to determine if the implementation of a Heart Failure Transition of Care education program would increase nurses' knowledge of HF and HF best practice interventions.

This quality improvement project was performed on the Step-down unit and the Telemetry unit at the Providence VA Medical Center where heart failure is a leading readmission diagnosis. The educational intervention was created from current published guidelines by content experts in the Cardiology department with three main categories: Heart failure facts and pathophysiology, best practice nursing intervention, and heart failure assessment and goal directed medical therapy. The pretest was distributed to the Stepdown and the Telemetry unit nurses' work email two weeks prior to the beginning of the educational program. The program's twenty-five minute educational intervention was delivered to every shift on both units over the course of two weeks. The posttest was then distributed to the Stepdown unit and the Telemetry unit nurses' work email upon completion of all educational presentations.

Twelve educational interventions took place over the course of two weeks and a total of forty-seven nurses attended the educational program. Thirty nurses completed the pretest (63.8%) and twenty-five nurses completed the posttest (53.1%) via Survey monkey. The mean test scores showed an increase from the pretest mean score of 60.70% to the posttest mean score of 76.35%. This shows an improvement of 15.65% in test scores. Fifteen of the twenty questions showed an improvement after the educational intervention on posttest scores. One of the questions (Question 9) had a 100% pre/post test score and showed no improvement. Four of the questions (Questions 2, 13, 16, and 17) showed a decrease in posttest score. Question three asked what percentage of people diagnosed with heart failure will die within 5 years (50%) showed the most improvement in scores with a 64.67% increase from pretest to posttest. Question fourteen asked about

the washout period between administering ACE inhibitors and Entresto (36 hours) showed the second largest improvement in scores with a 35.22% increase.

Interestingly, the two questions (three and fourteen) that showed the highest improvement had the most comments by the nurses during the educational intervention. The nurses seemed genuinely surprised that 50% of patients diagnosed with HF die within five years. Most nurses were also unaware of the potential deadly side-effects (angioedema) of administering Entresto within thirty-six hours of discontinuing an ACE inhibitor.

The purpose of this quality improvement project was to determine if the implementation of a Heart Failure Transition of Care education program would increase nurses' knowledge of HF and HF best practice interventions. The pretest mean score of 60.70% proved the need for HF transition of care education. The results demonstrated an overall increase in knowledge of 15.65%. The scores validate the continued need for HF education to ensure nurses' best practice interventions are consistently delivered to HF patients going forward. The data and research is continually changing in HF therapy and frequent updates in education and evaluation of RN staff is necessary to deliver the best evidence-based care to this population. Guided by the Synergy Model for Patient Care this project demonstrates how nurse competencies align with patient needs to improve patient outcomes.

Limitations

Educational sessions were offered during each shift at times recommended by unit nurse managers (0530, 1400, 1930). The night shift nurses suggested the optimal time to complete this session would have been an hour earlier at 0430 as they are already initiating their patient care and medication administrations rounds by 0500. The day shift nurses who completed the session recommended the educational intervention be scheduled prior to their shift at 0730 in their breakroom. Many nurses completing the sessions could only attend a portion of the session due to patient needs and staffing issues. There were differing opinions as to whether this session should be completed prior to the nurses shift or during their shift.

The delivery of the pretest and the posttest via Survey Monkey was a major limitation as both emails were delivered to nurses' junk email box. The nurses on both units were educated on how to access the pretest/posttest from their Junk email box. This was performed by an email from the Clinical Nurse Specialist explaining the issue and directions on how to move the email from nurses' junk email box to their inbox. Nurses on the survey units were visited each shift and shown how to access the pretest/posttest in their junk email. IT was consulted immediately when the issue was discovered however it was not resolved prior to the end of this project.

During the posttest two-week window, the step-down unit was closed due to COVID-19 which limited the number of responses. Step-down staff nurses were floated to unfamiliar units which limited their time and availability to complete the posttest. The quality improvement project was implemented during the summer vacation schedules impacted pre/posttest participation.

It is significant and remarkable that despite these obstacles 69% of eligible PVAMC nurses attended a heart failure education program, 68% completed the pretest, and over 50% completed the posttest. Validity of this project may be limited due to the small sample size of participants. Thirty nurses completed the pretest, and twenty-five nurses completed the posttest. The small sample size may be attributed to time constraints, closing of the step-down unit, both the pre and posttest being delivered to nurses' junk email box, and prime vacation weeks. For future research it is recommended a larger sample size to increase the validity of this quality improvement project. An electronic education model, with a pretest and posttest embedded, might also be another valuable option so staff can utilize it whenever they are available.

Recommendations and Implications for Advanced Nursing Practice

The Advanced Practice Registered Nurse (APRN) in practice is mentor, educator, researcher, and provider. APRN practice should be consistent with evidence-based principles to meet the needs of colleagues and patients. The literature review and pretest scores strongly suggested that PVAMC nurses on both the step-down and telemetry units could improve care of HF patients through education on heart failure and transition of care best practices. APRN's are essential to fostering education and being agents of change in the nursing practice. The goal of increased nursing knowledge of HF and HF best practice interventions is to improve the care delivered to our Veteran population living with HF. APRN's working collaboratively with nurses can implement the most effective, patient centered interventions to reduce rehospitalization of patients with heart failure.

The APRN can play a pivotal role in leading interdisciplinary team collaboration and implementing evidence-based educational programs. As a result of the outcomes of this quality improvement project the Heart Failure RN requested access to the program to incorporate the program in the PVAMC Post-Baccalaureate Nurse Residency Program. The Cardiology attending physician requested the Hospital-in-Home staff receive the educational intervention as most of their patients are enrolled for heart failure management. The nurses from both inpatient study units requested an informational poster be placed on each unit with instructions on exactly how to place a Cardiology Inpatient CHF Transition of Care consult.

APRN's are agents of change, identifying gaps in knowledge, implementing evidence-based practices to improve processes, interdisciplinary practice, and ultimately positive patient outcomes. Evidence in the literature and quality improvement project data at PVAMC demonstrate the value of HF education for nurses caring for HF patients at high risk for 30-day readmission. This quality improvement project was successful in improving nursing knowledge of heart failure. The long-term desired outcome is well-informed nurses as integral members of an interdisciplinary team improving care and outcomes for Veterans living with heart failure.

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Appendix A

Telemetry and Step-Down Nurses Needed!!

Heart Failure Transition of Care: An Educational Program

I am looking for registered nurses on 5B and 6B to participate in a research project. This project will include a 20 question pretest, a 30-minute educational program, and a 20 question posttest.

Objectives:

- Increase knowledge of heart failure pathophysiology
- Differentiate s/s of left-sided vs. right-sided heart failure
- List essential best practice transition of care interventions
- Increase knowledge of available resources: HF education
- Know how/where to access all resources for HF education

Where and When: On your units and on each shift! During the best times determined by your nurse managers.

Contact: Elizabeth Medbury (401) 273-7100 X12265 or Elizabeth.medbury@va.gov or Cindy Wyatt, VA Principal Investigator (PI), (401)273-7100 X12261 or cindy.wyatt@va.gov

Appendix B

Informational Letter

Heart Failure Transition of Care: An Education Program for Nurses

Dear Telemetry and Step-Down Nurses,

Elizabeth Medbury, an Acute Care Gerontological Nurse Practitioner student in the Master's Nursing Program at Rhode Island College, is completing a research project on 5B and 6B as part of her Master's program. The purpose of this research project is to determine if the implementation of a Heart Failure Transition of Care educational program will improve nurses' knowledge of heart failure and heart failure transition of care best practices. To complete this research project, you are being asked to participate. By taking the pretest and the posttest, you are agreeing to participate in the study. No demographic or identifiable information will be requested. It will involve the completion of a pretest, a 30- minute educational session, and completion of a posttest. The goal of this project is to improve nurses' knowledge of heart failure so they may implement evidence-based practice to improve the care for Veterans admitted with heart failure.

The pretest and posttest will consist of 20 identical questions. There are no questions which should cause you discomfort. The test questions are aimed at heart failure knowledge and available educational resources. Participation in the pretest and posttest is voluntary and you may choose to withdraw at any time. The pretest and posttest will be delivered via Survey Monkey to your work emails. No demographic or identifiable information will be requested from participants or received from Survey Monkey.

If you have any questions or concerns regarding the project, you may contact me at (401) 273-7100 X12265 or Elizabeth.medbury@va.gov . You may also contact Cindy Wyatt, PI, at (401) 273 7100 X12661 or cindy.wyatt@va.gov. I look forward to working with all of you. Thank you for your consideration in participating in the program.

Sincerely,

Elizabeth Medbury

Appendix C

Pretest Posttest

1. What is the number one readmission diagnosis in the United States?
    a. Pneumonia
    b. **Heart Failure**
    c. Urinary Tract Infection
    d. COPD exacerbation

2. Heart failure is a chronic progressive disease where
    a. The heart stops pumping periodically and cannot meet the body's needs
    b. The heart can't pump efficiently to provide enough blood to meet the body's needs
    c. The lungs fill the heart with fluid, and it is unable to pump correctly
    d. The kidneys do not work properly, and fluid retention stops the heart from pumping

3. ___ % of people diagnosed with heart failure will die within five years.
    a. 25%
    b. 30%
    c. **50%**
    d. 40%

4. What is an ejection fraction (EF)?
    a. EF is the percentage blood pumped out of the left atrium with each beat
    b. EF is the percentage of blood pumped into the left atrium from the lungs
    c. **EF is the percentage of blood pumped out of the left ventricle with each beat**
    d. EF is the percentage of blood pumped out of the right ventricle with each beat

5. What are the main causes of heart failure? Select all that apply
    a. Arrhythmias
    b. COPD
    c. Kidney disease
    d. HTN
    e. Infections or toxins
    f. Coronary artery disease
    g. Myocardial infarction

h. **Diabetes**
i. Heart valve disease
j. Congenital condition

6. Heart failure can be cured.
    a. True
    b. False

7. Right-sided heart failure signs and symptoms include
    a. Cough, crackles, JVD, early satiety
    b. Pitting edema, increased abdominal bloating, early satiety, scrotal edema
    c. Dyspnea, crackles, orthopnea, paroxysmal nocturnal dyspnea
    d. Pitting edema, crackles, orthopnea, weight gain

8. Left-sided heart failure signs and symptoms include
    a. **Dyspnea, crackles, orthopnea, cough, paroxysmal nocturnal dyspnea**
    b. Pitting edema, hepatomegaly, nocturia, orthopnea, cough
    c. Abdominal bloating, cough, crackles, dyspnea, early satiety
    d. Weight gain, orthopnea, paroxysmal nocturnal dyspnea, pitting edema

9. What is the key lab value to assess heart failure?
    a. D-dimer
    b. B-type natriuretic peptide (BNP)
    c. C-reactive protein
    d. Troponin

10. What are the 5 leading nursing interventions to manage Veterans that are admitted with heart failure?
    a. Education, telemetry monitoring, administer fluids, daily weights, low sodium diet
    b. Education, continuous pulse-ox, weekly weights, fluid restriction, regular diet
    c. Education, daily weights, fluid restriction, strict I&O's, ensure low sodium diet order
    d. Education, strict I&O's, administer fluids, Strict I&O's, daily weights

11. Which electrolyte should be closely monitored during the first few days of therapy after starting a diuretic?
    a. Magnesium
    b. Sodium

c. Calcium
d. **Potassium**

12. Initial GDMT (goal directed medical therapy) for heart failure patients include?
    a. Diuretics, beta blockers, calcium channel blockers, aldosterone antagonists
    b. Antiplatelet, diuretics, calcium channel blockers, beta blockers
    c. Aldosterone antagonists, diuretics, ACE inhibitors or ARBs
    d. **Beta blockers, diuretics, ACE inhibitors or ARBs**

13. What are some of the common side effects of ACE inhibitors? Select all that apply
    a. Hypokalemia
    b. **Hyperkalemia**
    c. Dry cough
    d. Transient increase of serum creatinine
    e. Hypo magnesia

14. When transitioning a patient from an ACE inhibitor to Entresto, how many hours do you have to wait in between stopping the ACE inhibitor and starting Entresto?
    a. 12
    b. 24
    c. **36**
    d. 48

15. What are the most important self-care interventions to teach Veterans with heart failure? Select all that apply
    a. Weight yourself daily
    b. Increase fluid intake to >64 oz.
    c. Fluid intake should not exceed 64oz.
    d. Follow a low carbohydrate diet
    e. Follow a low sodium diet
    f. Increase your activity level as tolerated
    g. Quit smoking
    h. Limit your alcohol intake
    i. Elevate your legs whenever possible
    j. Take all your medications as directed

16. Veterans should report which weight changes to the doctor immediately?
    a. Loss of 3 pounds in one day or 5 pounds in one week

b. Gain of 1 pound in one day or 3 pounds in one week
c. Loss of 1 pound in one day or 3 pounds in one week
d. **Gain of 3 pounds in one day or 5 pounds in one week**

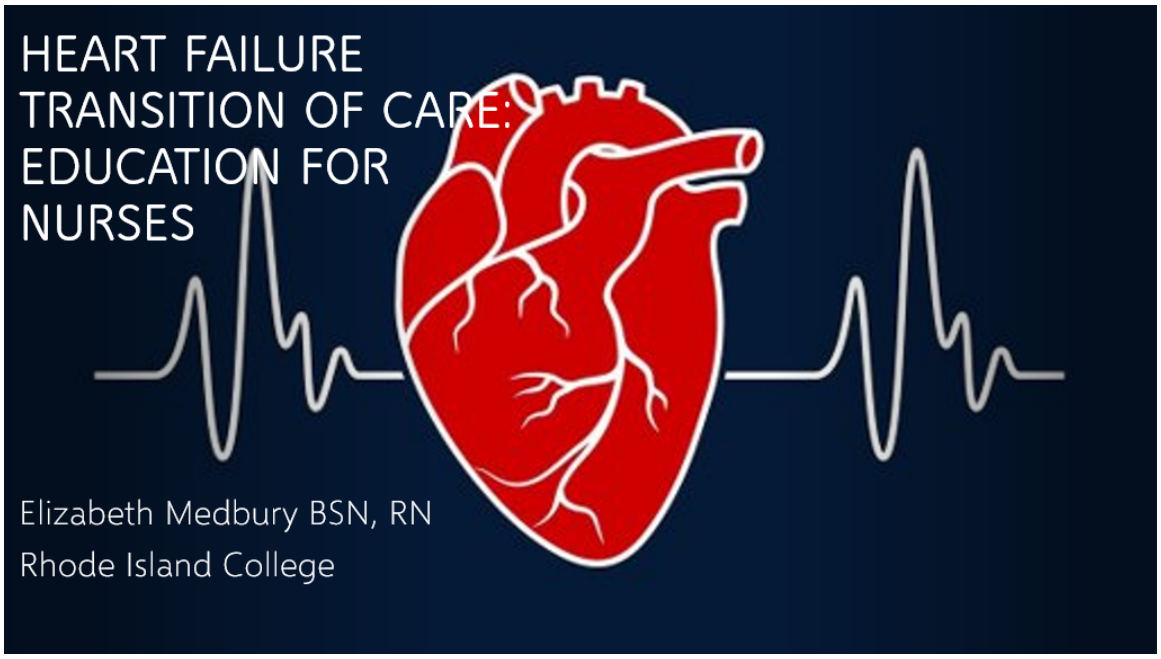
17. When is the appropriate time to initiate heart failure education to Veterans?
    a. Once you have the discharge instructions and medication changes
    b. **Upon admission and throughout hospital stay**
    c. In the morning when they wake up to be discharged
    d. Once they transfer out of the ICU and to medical floor

18. The name of the consult at the PVAMC for heart failure teaching by the Cardiology RN is:
    a. Cardiology Nurse HF Teaching
    b. HF for Veterans
    c. Cardiology Inpatient CHF Transition to Care
    d. Transition of Care CHF education

19. Nurses can place a consult for CHF Teaching by the Cardiology for Veterans.
    a. **True**
    b. False

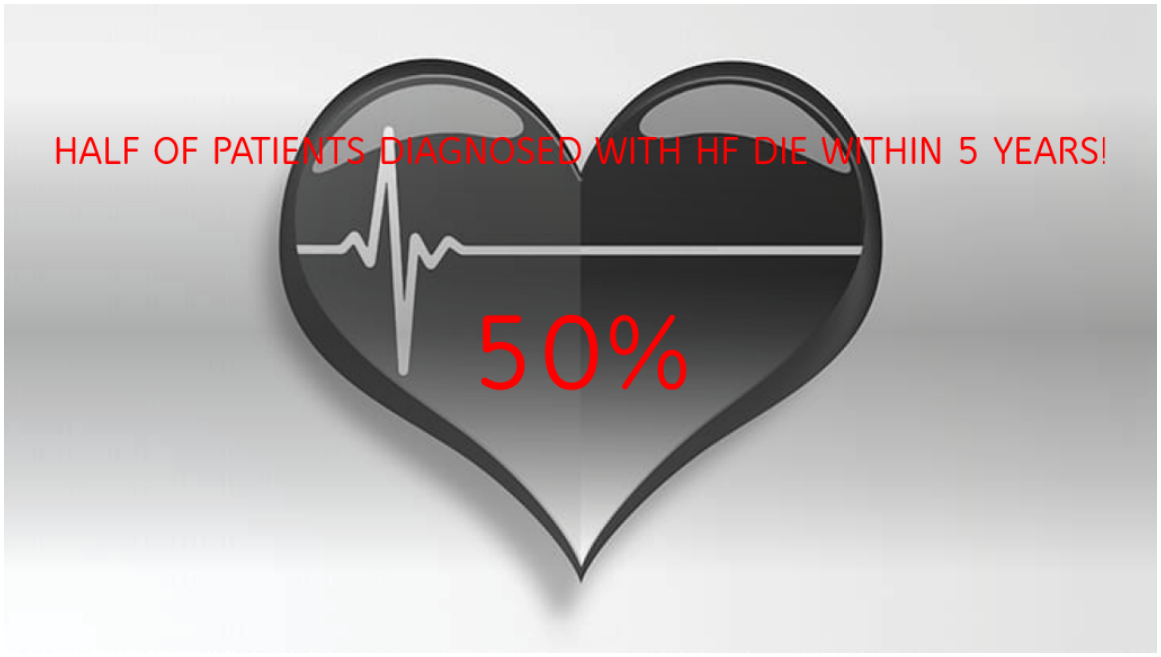
20. The best time to place a CHF Transition of Care consult for Veterans is:
    a. **Upon admission**
    b. On the day of discharge
    c. Anytime during their hospital stay
    d. Once they are hemodynamically stable and discharged

Appendix D



JUST THE FACTS: HEART FAILURE

- #1 READMISSION DIAGNOSIS!
- HF: Chronic progressive disease where the heart can't pump efficiently enough to provide enough blood to meet the body's needs.
- NO CURE!

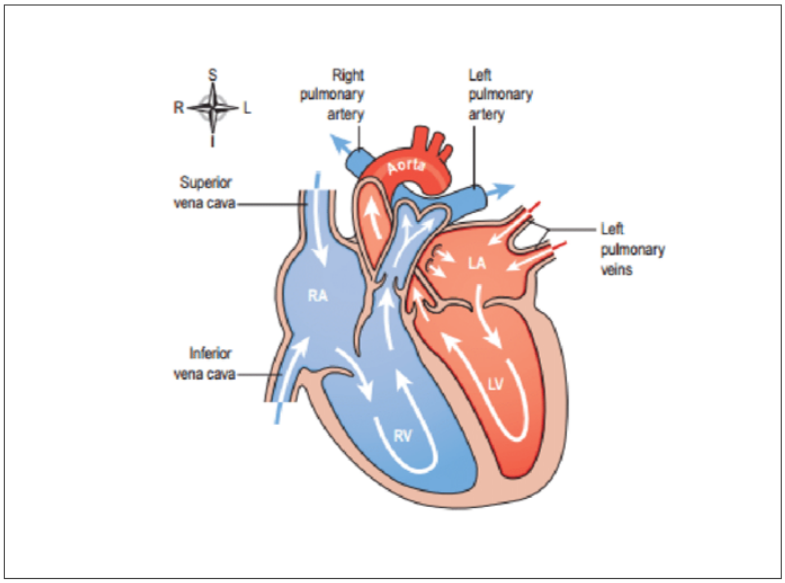

HALF OF PATIENTS DIAGNOSED WITH HF DIE WITHIN 5 YEARS!
50%

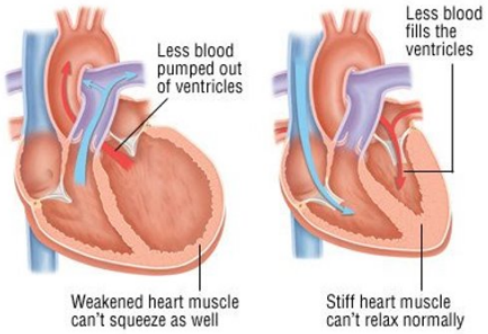

HF CAUSES:
F.A.I.L.U.R.E.
F AULTY VALVES
A RRYTHMIAS; AFIB
I NFARCTION
L INIAGE - CONGENITAL
U NCONTROLLED HTN
R ECREATIONAL DRUGS/TOXINS
E VADERS: INFECTIONS

LEFT-SIDED HF SIGNS & SYMPTOMS

THINK LEFT: LUNGS

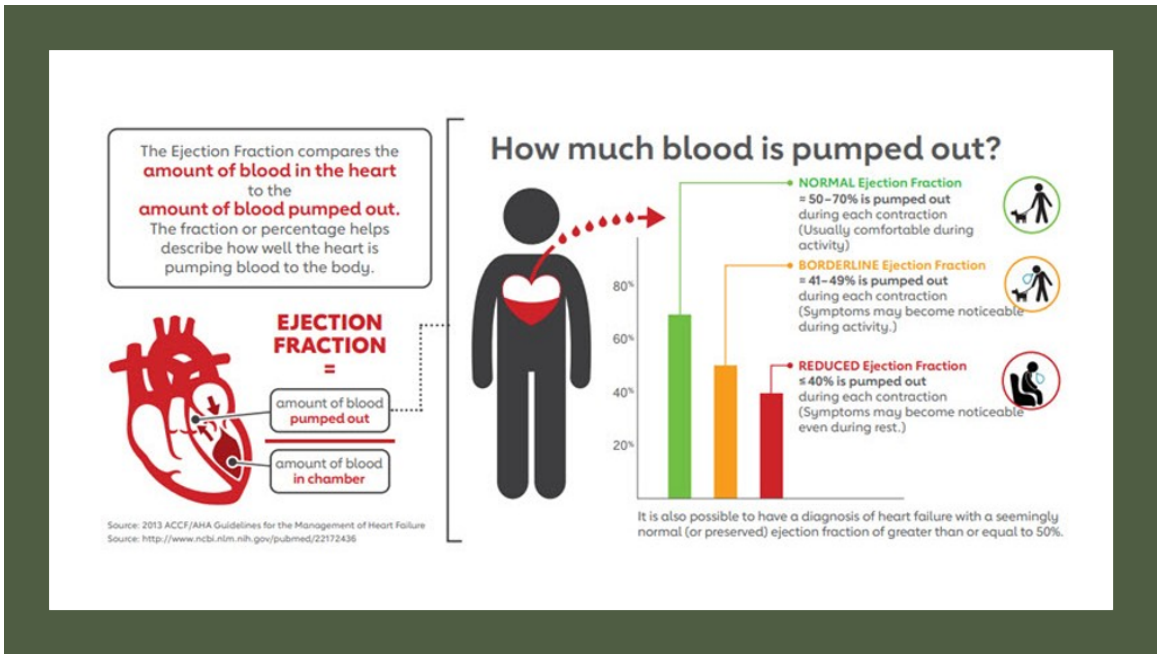
- CRACKLES/WHEEZES
- DYSPNEA
- ORTHOPNEA
- PND (PAROXYSMAL NOCTURNAL DYSPNEA)
- COUGH
- WEIGHT GAIN
- BLOOD TINGED SPUTUM

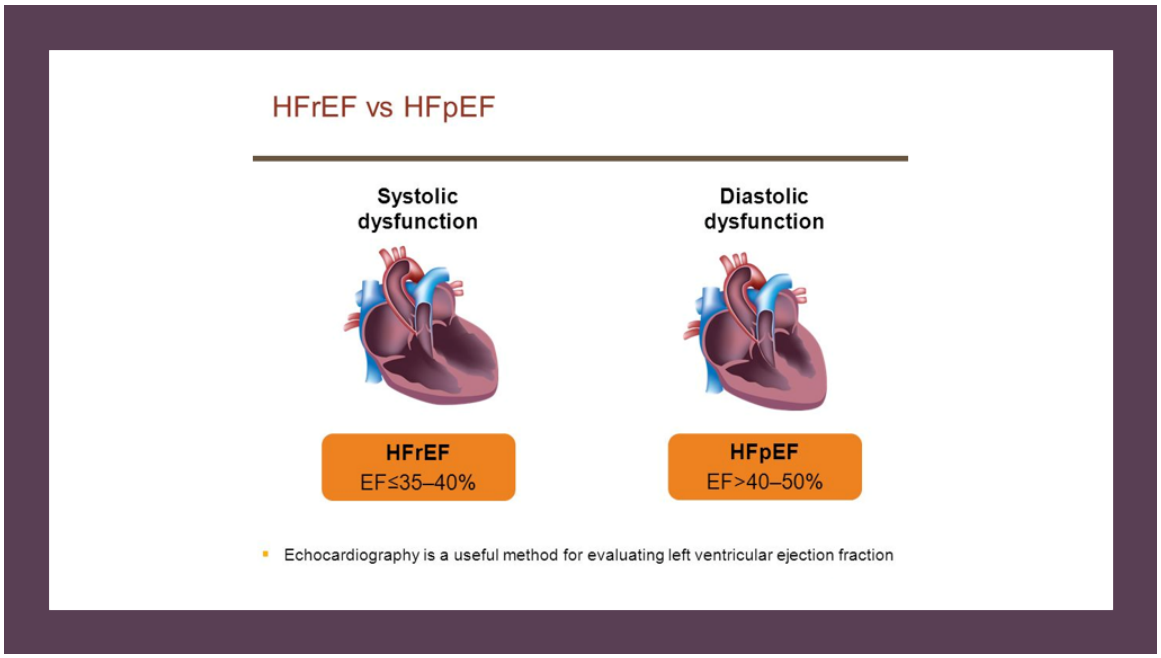




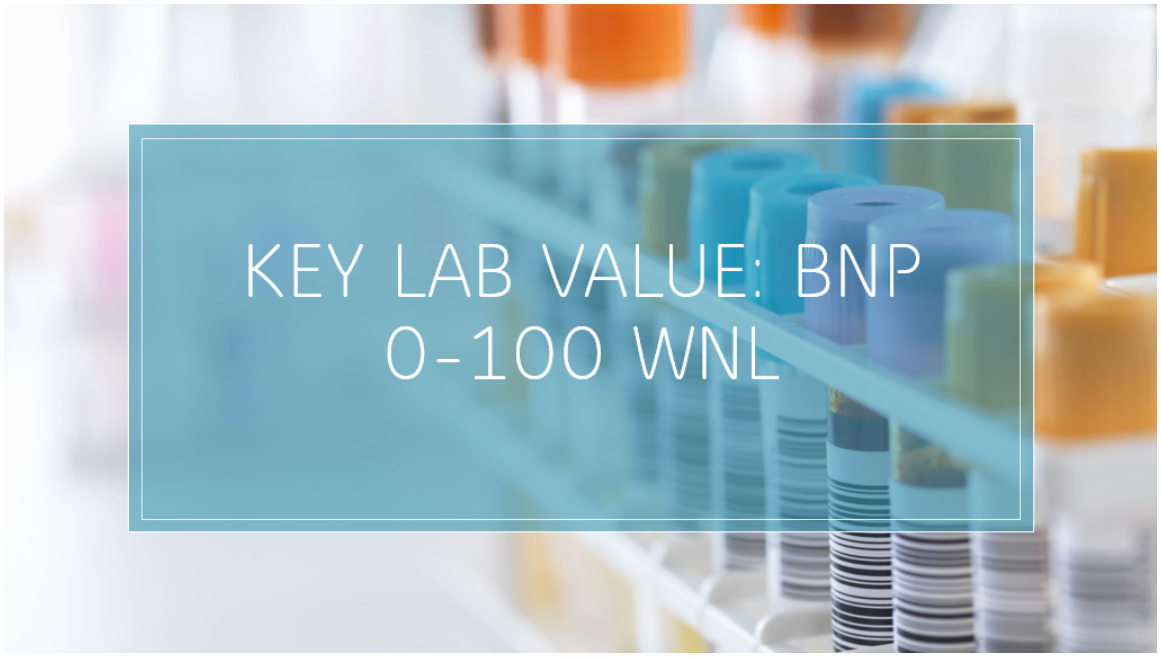
SYSTOLIC VS. DIASTOLIC HF

- SYSTOLE: CONTRACTING PHASE
  - LUNGS CAN BE TOO STIFF TO CONTRACT PROPERLY
  - LOW EJECTION FRACTION
- DIASTOLE: FILLING PHASE
  - STIFF HEART MUSCLE CAN'T RELAX NORMALLY HOWEVER IT CAN CONTRACT PERFECTLY SO ALL OF THE BLOOD EJECTS OUT OF THE VENTRICLE
  - NORMAL EJECTION FRACTION


The Ejection Fraction compares the amount of blood in the heart to the amount of blood pumped out. The fraction or percentage helps describe how well the heart is pumping blood to the body.
EJECTION FRACTION =
amount of blood pumped out
amount of blood in chamber
Source: 2013 ACCF/AHA Guidelines for the Management of Heart Failure
Source: http://www.ncbi.nlm.nih.gov/pubmed/22172436
How much blood is pumped out?
80%
60%
40%
20%
NORMAL Ejection Fraction
= 50–70% is pumped out during each contraction (Usually comfortable during activity)
BORDERLINE Ejection Fraction
= 41–49% is pumped out during each contraction (Symptoms may become noticeable during activity.)
REDUCED Ejection Fraction
≤ 40% is pumped out during each contraction (Symptoms may become noticeable even during rest.)
It is also possible to have a diagnosis of heart failure with a seemingly normal (or preserved) ejection fraction of greater than or equal to 50%.

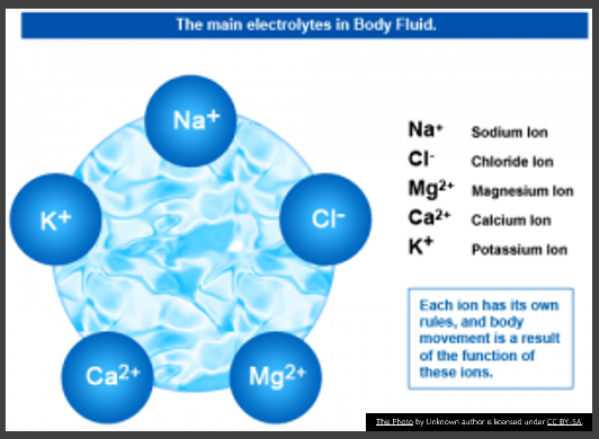

HFrEF vs HFpEF
Systolic dysfunction
Diastolic dysfunction
HFrEF
EF≤35–40%
HFpEF
EF>40–50%
Echocardiography is a useful method for evaluating left ventricular ejection fraction

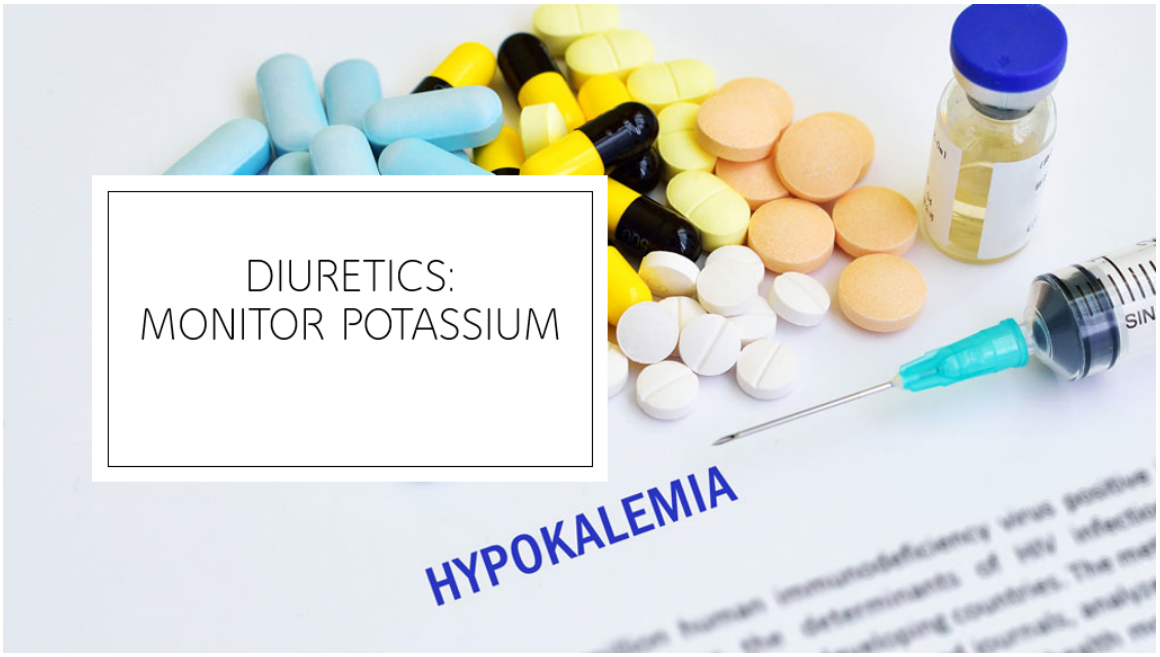

TESTING FOR EF:
◦ ECHOCARDIOGRAM
◦ STRESS TEST
◦ CARDIAC CATHETERIZATION
Powered by
Your Practice Online


KEY LAB VALUE: BNP
0-100 WNL

- Beta Blockers
  - Carvedilol
  - Sustained-release metoprolol (succinate)
  - Bisoprlol
    - Decrease HR/workload
    - Increases blood flow
- ACE Inhibitors
  - Lisinopril
  - Enalapril
  - Quinapril
    - Lowers BP by vasodilation reduces arterial pressure, preload, afterload
- ARB's (for those that can't tolerate ACE)
  - Losartan
  - Valsartan
    - Lowers BP by dilating arteries
    - Vasodilation reduces arterial pressure, preload, afterload
- Diuretics (Loop)
  - Furosemide
  - Bumetanide
  - Torsemide

WHICH ELECTROLYTE SHOULD BE MONITORED AFTER INITIATING DIURETICS THERAPY?





ACE INHIBITORS SIDE EFFECTS:

- COUGH IS #1 SIDE EFFECT WHY PATIENTS STOP MEDICATION
- HYPERKALEMIA
- RENAL INSUFFICIENCY = INCREASE SERUM CREAT

ACE Inhibitor Side Effects

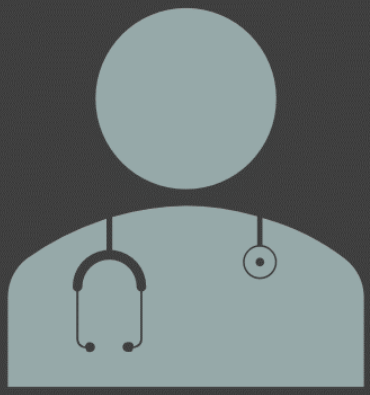
"Captopril"

Cough
Angioedema
Pregnancy Problems
Taste Changes
Other (Rash, Fatigue)
Proteinuria
Renal ~~Insufficiency~~
Increased Potassium
Low ~~Blood Pressure~~

36 HOURS OR ANGIOEDEMA!

1. HF EDUCATION!!!!
2. DAILY WEIGHTS
3. FLUID RESTRICTION
4. STRICT I&O'S
5. LOW SODIUM DIET ORDER
6. PLACE CARDIOLOGY INPATIENT TRANSITION OF CARE CONSULT–UPON ADMISSION

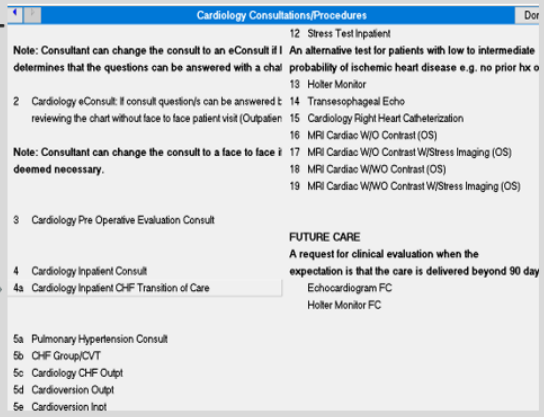
INPATIENT
NURSING
INTERVENTIONS



CHF CARDIOLOGY
INPATIENT
TRANSITION
OF CARE CONSULT

PLACING THE CONSULT UPON ADMISSION

- ORDERS TAB
- Add New Order
- 42 Local Consults/Requests...
- 14 Medical Service Consults/Procedures
- CARDIOLOGY Consultations/Procedures
- 4a Cardiology Inpatient CHF Transition of Care



- 42-->14-->CARDIOLOGY-->4a

WHAT DO OUR VETERANS NEED TO KNOW BEFORE THEY GO?

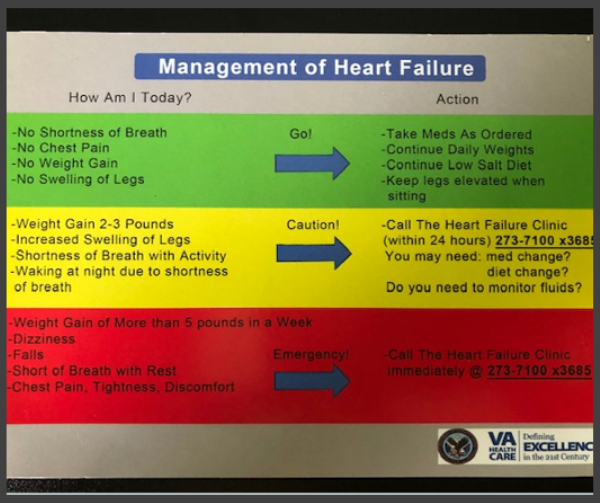
INTERVENTIONS TO PREVENT HF EXACERBATION:

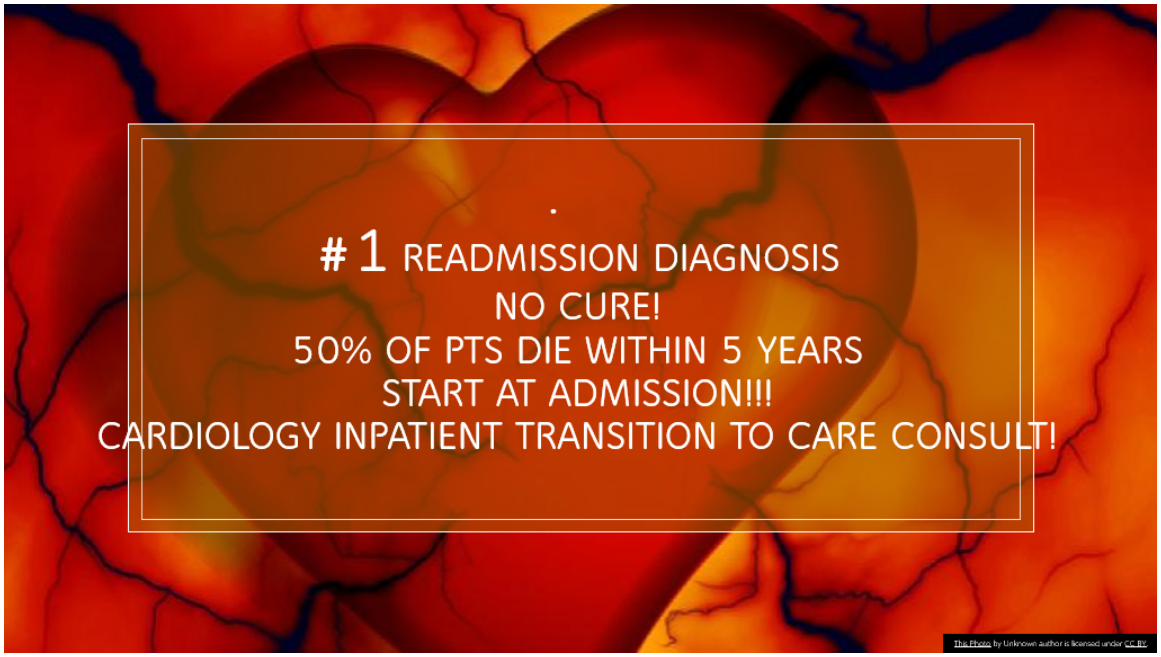
1. TAKE ALL MEDS AS DIRECTED
2. WEIGH YOURSELF DAILY
3. GET ACTIVE! START MOVING
4. LOW SODIUM DIET
5. QUIT SMOKING/LIMIT ETOH

DISCHARGE INSTRUCTIONS & SUPPLIES FOR SUCCESS:

- KNOWLEDGE:
  - SIGNS AND SYMPTOMS OF HF- if they have no idea what to look for how are they supposed to know its worsening?
  - NEW MEDICATIONS PRESCRIBED AND WHY?- this is especially important with diuretics (water pill)
  - PVAMC HF EDUCATIONAL MATERIALS- now located on every unit; delivered by Cards RN if you place consult!!
  - FOLLOW-UP APPOINTMENTS
  - SCALE and BP CUFF

PATIENT EDUCATION MAGNET




#1 READMISSION DIAGNOSIS
NO CURE!
50% OF PTS DIE WITHIN 5 YEARS
START AT ADMISSION!!!
CARDIOLOGY INPATIENT TRANSITION TO CARE CONSULT!
This Photo by Unknown author is licensed under CC BY


THANK YOU FOR ALL YOU DO FOR OUR NATIONS HEROS
This Photo by Unknown author is licensed under CC BY

ANY QUESTIONS??

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