

HEART FAILURE EDUCATION BUNDLE TO IMPROVE SELF-CARE AND REDUCE
HOSPITAL READMISSION

by

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Abstract

Background: The Center for Disease Control and Prevention has identified heart failure has a major health concern in the United States. There are 5.7 million Americans currently diagnosed with HF, with 550,000 cases annually. The total cost to manage HF is predicted to reach \$69.5 billion, with 30-day hospital readmission as the greatest financial expenditure. The lack of patient education was noted as weakness for many healthcare organizations leading to an increase in hospital readmission. The urgency to manage HF more effectively has resulted in regulatory policies requiring healthcare providers and organizations to improve self-care HF management. **Methods:** An education bundle was created for HF patients and presented by a Nurse Practitioner, a Pharmacist, and a Registered Dietician. Patients were invited to attend the special educational sessions from a hospital generated list of HF patients with 1 or more 30-day readmission post hospital discharge. **Results:** The 3 participants who completed the program showed an increase in the total score in each of the 3 sections of the SCHIF V6.2 questionnaire in self-care behavior (6.3), self-care management (5.3) and self-care confidence (5.7), and were able to avoid hospital readmission at 30, 60 and 90 days. **Conclusion:** The HF education bundle has been shown to be an effective non-pharmacological intervention in the management of HF disease.

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Heart Failure Education to Improve Self-Care and Reduce Readmissions

Introduction

The Center for Disease Control and Prevention (2016) has identified heart failure(HF) as a major health concern in the United States. There are 5.7 million Americans currently diagnosed with HF, with 550,000 new cases annually. The prevalence rate for HF is predicted to exceed 8.1 million (Bradely et al., 2013). As the prevalence of HF increases, the direct and indirect costs to manage HF is predicted to rise to \$69.5 billion by 2030, with 30-day hospital readmissions as the greatest financial expenditure (Heidenreich et al., 2013).

The Center for Medicare and Medicaid Services [CMS] (2016) urgent need to contain health care costs to manage HF has resulted in regulatory policies. Section 3025 of The Patient Protection and Affordable Care Act resulted in the addition of Section1886 (q) to the Social Security Act. The addition of this amendment led to the establishment of the Hospital Readmission Reduction Program (HRRP). The most common penalty-driven policy of HRRP focuses on 30-day hospital readmissions. The policy requires the CMS to reduce reimbursement to hospitals with excessive 30-day hospital readmissions for HF or face millions in reimbursement penalties. Hospital readmission for HF is viewed by HRRP as an avoidable expense (Baptiste et al., 2013). Taft (2015) identified self-care behavior deficits for HF as a leading cause of excessive 30-day hospital readmissions. Taft (2015) also noted that the lack of standardized HF education for patients and staff was a weakness for many healthcare organizations and led to higher readmission rates. The purpose of this evidence-based project was to determine if offering a HF education bundle in an out-patient clinical setting will improve self-care behavior and management of HF and, in turn, reduce 30-day hospital readmissions.

Literature Review

Education to Improve Self-care Behavior

The Institute of Medicine defines Self-care management as having two components, one provided by health care staff and the other, the change in the patient as a result of the first. The health care staff must engage in systematic provision of education and supportive interventions to the patient. The patients, as a result, have increased skill and confidence in managing their health (Lockhart, Foreman, Mase, & Heisler, 2014).

Horwitz and Krumholz (2015) HF practice guidelines view HF education as an effective non-pharmacological intervention, and a necessary component in improving self-care behavior in HF management. The Agency for Healthcare Research and Quality's (AHRQ) (2015) summary of a heart failure measure explicitly mentions that improving self-care behavior through education has the potential to lower the cost to manage HF and improve quality of life. Patients who are educated about their medical conditions are more likely to adhere to life-style modifications that will promote self-care behaviors and strengthen the patients' knowledge and development of problem solving skills that are essential in preventing HF exacerbations and unnecessary hospital readmissions. (Argen et al., 2012; Baptist et al., 2013; Blauer et al., 2015; Buck et al., 2014; Manning et al., 2012; Riegel et al., 2009). Regalbutto et al. (2014) provided insight into The Joint Commission's recommendations regarding hospitals and clinics requirement to provide HF education on five essential areas: diet, exercise, weight monitoring, worsening of HF symptoms, and medication management to reduce hospital readmissions and improve self-care behavior.

Riegel et al. (2009) showed in a random controlled trial (RCT) that patients who were educated about their medical conditions were shown to adhere to life style modifications that

promoted quality of life, improved self-care behaviors, reduced mortality, and reduced hospital readmissions. Empowering patients to become involved in the decision-making process and management of HF was shown to be “imperative to managing this chronic condition long-term” (Alspach, 2011, p.11).

Educational programs that encompass the five essential areas of (a) medication adherence, (b) exercise, (c) diet restrictions, (d) warning signs and symptoms of worsening HF, and (e) daily weight monitoring were shown to be beneficial in improving a patient’s knowledge and control over this debilitating condition (Agren et al., 2013; Baptiste, Mark & Taylor, 2013; Manning, 2011; Townen et al., 2015). Patients who improved in their self-care behaviors had fewer exacerbation symptoms, displayed more functional capabilities in managing HF, and were shown to have a better quality of life and empowerment in self-care (Dickson et al., 2014). In a nurse lead HF educational program. Patients showed significant improvement in self-care management and self-care behavior in the long-term management of HF (DeWalt et al., 2010, Horowitz & Krumholz, 2015).

In three different RCTs, conducted in Iran (Zamanzadeh et al., 2013), a multisite in California and North Carolina (DeWalt et al., 2012), and one in the northeast United States (Dickson et al., 2014) evidence was provided that appropriate HF education improves self-care behaviors, outcomes, and quality of life for patients with HF. These positive results are common across geographic location, income levels, and racial and ethnic groups. The Dewalt et al. (2012) groups were comprised of 605 participants, Zamanzadeh et al. (2013) 80 participants, and Dickson et al. (2014), 75 participants. Two of the RCTs used convenience samples while DeWalt et al. (2012) employed a more rigorous selection method and enrolled participants over 2 years from four general medicine and cardiology clinic sites. Dickerson et al. (2014) offered HF

educational classes in a group setting of 4-8 participants, meeting for 60 minutes, twice a week over 4 weeks and were led by a health educator. DeWalt et al. (2012) and Zamanzadeh et al. (2013) offered a one-hour HF educational session led in person by nurses with follow up phone calls every two weeks for three months to reinforce the educational material and to assess self-care behaviors. Zamanzadeh et al. (2013) and Dickson et al. (2014) used interventions that provided education on the definition and symptoms of HF, strategies in prevention and management of signs and symptoms of worsening HF, medication adherence, and recommendations on dietary restrictions related to sodium intake, as well as the importance of exercise and smoking cessation. Dickerson et al. (2014) extended the education by providing education on low salt meal preparations at home, instructions on reading food labels and managing a low salt diet when eating out, and the management of diuretic therapy when traveling. DeWalt et al. (2012) interventions had a greater emphasis on education regarding daily weight monitoring and assessing for signs and symptoms of worsening HF, medication adherence, exercise, and limiting salt and fluid intake. Dickerson et al. (2014) and Zamanzadeh et al. (2013) measured self-care behaviors with the Self-care of HF Index questionnaire. DeWalt et al. (2012) focused on quality of life measurement related to HF education using the HF quality of life scale (HFQOL). Both Dickerson et al. (2014) and Zamanzadeh et al. (2013) noted a significant increase in self-care behaviors among patients who received HF education, while DeWalts et al. (2012) noted improvement in quality of life, self-care behaviors and greater adherence to daily weight monitoring. Overall each of these research groups concluded that HF education was an effective intervention in improving self-care behavior in patients with HF.

Stut, Deighan, Cleland and Jaarsma (2015) conducted a multi-site telehealth RCT in Europe with 123 participants to assess an online education and coaching program to promote

self-care among patients with HF. The nurse led educational classes were based upon the recommendation from the European Society of Cardiology. The classes offered education on daily monitoring of signs of decompensation, physical activity, fluid restriction, low salt diet and medication. Coaches provided the opportunity for additional education and support for adherence to the session topics, and participants' readiness for change was addressed by these coaches. The study showed a 90 % overall adherence to daily weight monitoring and blood pressure measurement. Self-care behavior scores improved significantly for daily weight monitoring, low-salt diet, physical activity ($p < 0.001$) and fluid restriction ($p < 0.05$).

Two different pilot studies provided useful support for HF education, one conducted in the Northern United States urban community (Dickson, Chyun, Varidi, Gregory, & Katz, 2015) and one prospective pilot study conducted in a large Veterans Hospital located in the Southeastern United States (Shaw, O'Neal, Siddharthan, & Neugaard, 2014). Each study assessed the effectiveness of HF education on improving self-care behavior. Dickson et al. (2015) used a convenience sample of 21 low literacy urban patients with HF who had one hospital admission for decompensation within 6 months of the start of the study. Shaw et al. (2014) enrolled 21 participants post hospital discharge. Dickerson et al. (2015) assessed self-care behavior with a pre- and post-test utilizing a paired *t*-test to analyze the results. The participants received self-care management patient education materials delivered by a nurse health educator. Shaw et al. (2014) assessed self-care management in participants who received education during their hospital admission and followed up with phone calls to reinforce the education received post hospital discharge and to assess adherence to self-care behavior. Shaw et al. (2014) incorporated a family member and or caregivers into the educational sessions along with the participants. Both studies provided HF education on daily weight monitoring, signs and

symptoms of decompensation, diet, medication, and lifestyle changes. The Shaw et al. (2014) pilot study results showed patients who received intense education were more knowledgeable about their disease and were better able to self-manage their weight compared to patients who received standard care. Shaw et al. (2014) also noted an improvement in self-care behaviors and fewer hospitalizations in the intervention group. Dickerson et al. (2015) results showed improvements in self-care behaviors and an increase in knowledge related to HF management in the intervention group. The pilot studies contained vastly different population groups; veterans (Shaw et al., 2014) and multi-cultural low-income patients with HF (Dickerson et al., 2015). Both pilot studies provided sufficient evidence of the benefit of HF education in improving self-care behavior in patients with HF from diverse cultures and population groups.

Benefit of HF Education with Family Involvement in Self-care Behavior

Agren et al. (2012); Blauer et al. (2015); Buck et al. (2015) and Riegel et al. (2009) investigated the benefits of incorporating a family member or caregiver into HF educational sessions. The studies showed self-care behaviors were enhanced and patients showed greater adherence to medication management, diet restriction, and daily weight monitoring. The psychological support of a family member or caregiver was shown to have a significant impact on increasing self-care behavior in patients with heart failure. Educating patients and families about HF management to improve self-care behavior may be the key intervention in lowering the cost to manage HF and improving self-care behaviors and quality of care (Alspach, 2011).

HF Education to Improve Self-care Behavior to Reduce Hospital Admission

Heart failure readmission is an expensive adverse patient outcome and is frequently preventable (AHRQ, 2015). Healthcare organizations that were successful in reducing 30-day hospital readmissions for HF exacerbation identified staff, patient, and family education in HF

management as one of the most successful factors in improving self-care behavior and reducing hospital readmission (Carroll-Silow et al., 2011). Patients who received HF education from a specialty trained nurse educator or nurse practitioner had significantly fewer hospitalizations for HF exacerbation (Baptiste, Mark, & Taylor, 2013; Carroll-Silow et. al., 2011; Dickson et al., 2014). Evidence based educational programs in HF management led by a nurse educator has been shown to improve patient outcomes and is recommended as a key intervention in HF management.

Jaarsma et al. (1999) explored the benefit of HF education in 179 participants, 18 years and older. The intervention group received education on the recognition of warning symptoms of worsening HF, sodium restriction and fluid balance with 9 months of in-home follow up post hospital discharge. The researchers noted HF education and support from a nurse in hospital and home settings significantly increased self-care behaviors ($p = 0.005$ at 3 month and $p < 0.001$ at 9 months) in patients with HF, enhanced patients self-care abilities in managing out-patient HF patients and decreased unnecessary hospital admissions. Jaarsma et al. (2013) conducted a second RCT to analyze self-care behavior in patients with HF. The researchers collected data on 5964 patients from the United States, Europe, Australia and South America. Utilizing the European Self-care Behavior Heart Failure Index questionnaire, data analysis showed 50% of the patients reported low exercise levels, less than half of the patients weighed themselves on a regular basis. Patients reported poor adherence to low sodium diets. The authors concluded that self-care behavior was sub-optimal in HF patients and noted a significant need world-wide for clinician improvement in providing quality education to promote self-care behavior. Jaarsma et al. (2013) also noted that education could be the key element in reducing hospital admission in patients with HF. The study in 2013 enhanced the observation of the need for HF education to

improve self-care behaviors and patient outcomes, and the important role providers play in increasing patient self-care and reducing hospital readmissions through education.

Koelling et al. (2005) and Naylor et al. (2009) conducted extensive RCTs on the benefit of HF education in self-care behavior and HF management. These studies showed significant reductions in hospital readmissions and treatment costs. Koelling et al. (2005) enrolled 223 participants' aged 18 years and older and Naylor et al. (2009) enrolled 239 participants aged 65 years and older. The Koelling et al. (2005) intervention group received one 1-hour, one-on-one teaching session by a nurse educator on the basic cause of HF and rationale for pharmaceutical therapies, the cause of intravascular volume overload, mechanism action of diuretics, dietary sodium and free water restrictions, rationale for self-care behavior in daily weight monitoring, smoking cessation, avoiding alcohol and non-steroidal anti-inflammatory medications (NSAIDs). The participants were evaluated at 30, 60 and 90 days to assess symptoms and self-care practice. The Naylor et al. (2009) intervention group received discharge planning and home follow up by an advanced practice registered nurse for three months. At the conclusion of the Koelling et al. (2005) study, the intervention group had fewer hospital admissions and showed a lower risk of hospital readmissions and death (relative risk = 0.65:95%, CI 0.45-0.93, $p = 0.0018$), with a cost to treat HF in the intervention group reduced by \$2923.00 ($p = 0.035$). At 12 weeks, the Naylor et al. (2009) intervention group had a \$439.00 decrease in the mean total treatment cost and, by the end of 52 weeks, fewer admissions for HF. Overall, these two studies showed patients who received HF education had significant reductions in both hospital admissions and in the total cost to manage HF.

Jonkman et al. (2016) conducted a meta-analysis to assess the effect of self-management interventions by patients with HF in reducing hospital readmissions. The meta-analysis allowed

comparison of studies with the same core HF educational components but with different protocols and from a variety of countries. The analysis reviewed data from 20 RCT studies from Sweden, Spain, United Kingdom, Switzerland, Netherlands, United States, Japan, Germany and Canada, representing a total of 5,624 patients. The inclusion criteria for the selection process included self-management interventions with a comparison to usual care in patients with HF. Self-management interventions were defined as educational information on signs and symptom monitoring, education in problem solving skills, medication adherence, physical activity, dietary restrictions, and smoking cessation. Statistical analyses across the studies were conducted and included unbiased comparisons of the treatment groups and control groups. Self-care management was quantified by estimating the hazard ratio with the Cox proportional-hazard models. An analysis of the studies showed significant improvement in self-care management in HF related hospitalizations (hazard ratio, 0.80; 95%, CI 0.71-0.89) and a significant reduction in hospital readmissions (hazard ratio 0.80; 95%, CI. 0.69-0.92) for those patients who received HF education. Jonkman et al. (2016) concluded there was significant data to support the benefit of HF education in improving self-care behaviors and reducing hospital readmissions.

Kato et al. (2016) conducted an RCT pilot study among Japanese patients with HF to assess the effect of a HF educational program in improving self-care management and reducing hospital readmission. A convenience sample was used to recruit participants between 2009 and 2010 from a major hospital in Tokyo, Japan. A total of 32 participants were enrolled in the study. The intervention group received HF education on the disease process and cardiac function, signs and symptoms of worsening HF, medications, daily weight monitoring, sodium and fluid intake, physical activity, and life style changes. The dietary and medication portion of the HF education was instructed by a license dietitian and pharmacist. Participants were required to

complete the European Heart Failure Self-Care Behavior Scale Questionnaire (EHFScBS) to assess self-care behavior pre-intervention and post- intervention. The participants were followed for a total of 2 years. The statistical analysis of the data was completed with a *t-test* and Mann-Whitely *u-test* for continuous variables. A chi-square test or Fisher exact test was used to analyze categorical variables. A liner mixed model was used to compare the relationship between the groups and to assess for changes in the EHFScBS scores and the HF knowledge scores over 6 months. The final analysis of the study noted a greater adherence to a low sodium diet and daily weight monitoring in the intervention group and an improvement in HF self-care ($P < 0.01$), and HF knowledge ($P=0.003$). The EHFScBS scores in the intervention group showed significant improvement ($P=0.04$) at 1-month post intervention. A significant reduction in HF related hospitalization and cardiac death (hazard ratio, 0.23; 95% confidence interval, 0.05-1.09; $P=0.06$) and cardiac related events (hazard ratio; 0.17; 95% confidence interval, 0.03-0.90; $P=0.04$) was noted in the intervention group. Kato et al. (2016) concluded there was significant data to show a multidisciplinary lead HF educational program as beneficial in improving self-care management and reducing early HF readmission and cardiac death in patients with HF.

Summary of the Literature

In review of past and current literature on HF management, multiple RCTs and pilot studies have provided sufficient evidence to support a nurse led HF education bundle that embraces the core components of medication adherence, daily weight monitoring, dietary restrictions (sodium and fluid), identifying worsening heart failure symptoms, importance of exercise, and smoking cessation. This is an effective intervention to improve self-care behaviors and reducing hospital readmissions across several age groups and multiple populations. The

evidence gained from the research studies in this literature review was utilized for this project to create an education bundle for patients with HF.

Project Framework

The Iowa Model Revised: Evidence-based Practice to Promote Excellence in Health Care (2015; Appendix A) will be used as the theoretical framework. The model was designed to assist with the implementation of evidence-based research into clinical practice. The model emphasizes the need for support for evidence-based practice through-out the entire health care system, from clinicians to the highest level of management. It highlights the role of nurse practitioners in the identification and development of evidence-based practice within the clinical setting (Dontje, 2007). There are seven steps to the model with a special focus on the patient population and the stakeholders affected by the change (Brown, 2014). The seven steps are

- (1) Identify the trigger that initiates the need for change.
- (2) Articulate the focus question and prioritize its need.
- (3) Form a team to investigate and advocate practice change.
- (4) Review sufficient literature to support activities.
- (5) Design and pilot the practice change.
- (6) Integrate and sustain the change.
- (7) Disseminate results.

Each algorithmic step of the model served as a guide for the development and implementation of a HF education bundle in an out-patient clinical practice setting. The detail step by step guidance in introducing evidence-based research into a clinical setting, and the simplicity of use are just two of the main reasons the Iowa Model was considered an appropriate framework for this project.

This project began as the lead NP perceived a need for a reduction in the number of HF patients who were being readmitted frequently and did not seem to be empowered in their self-care. This led to the development of a healthcare provider team to address this trigger. The team consisted of the NP, the registered dietician, the pharmacist, the HF case manager, and the cardiac REHAB nurse.

The next step was to review the evidence. A systematic review of the literature was conducted by the NP to identify resources of sufficient quality, quantity, and consistency, and that met risk assessment criteria. This evidence was reviewed with the team. The HF education bundle was developed from these resources. The practice changes were designed and piloted as recommended by the model. Decisions were made by the team for each decision point of the project.

The HF education bundle was implemented in a small rural hospital. At the conclusion of the project, the team members discussed whether the project protocol should be formally implemented into practice, as recommend by step 6 of the Iowa Model. The team members noted that there were multiple natural disasters as a result of several hurricanes that affected many potential participants. The members hypothesized that the impact of natural disasters may have caused some patients to resist committing to the HF education bundle classes or forced them to drop out early. Even though this was a major concern, the team members decided that the practice change should be continued. Once another quarter pass, the stakeholder team will determine if a third round of HF classes is resource effective. The clinical practice change will be reevaluated based upon the Iowa Model recommendations and will be disseminated to other providers within the healthcare system.

Project Purpose

PICOT

What is the effectiveness of a HF education bundle, in an out-patient clinic classroom setting, with adults who have a diagnosis of HF and their caregivers, in improving self-care behaviors and management of HF and reducing hospital readmission, as compared with patients who receive education as usual?

Objectives

1. To assess the benefit of a formal HF education bundle in improving self-care behavior and adherence to daily weight monitoring.
2. To determine if improving self-care behavior with an education bundle will improve HF management and reduce hospital readmissions.

Methods

Project Design

This evidence-based practice project on patient HF education and self-care empowerment through structured educational sessions and information bundles was provided by nurses, a pharmacist and a registered dietician. Patient knowledge and behavioral change was evaluated using pre and post-tests. The practice change was informed by Iowa model revised (2015). The education bundle included information on (1) the physiological effect of HF, (2) medication adherence and pharmacological management, (3) daily weight monitoring, (4) sodium (salt) and fluid restriction, (5) exercise and (6) smoking cessation and medications HF patients should avoid. All these components were incorporated into four self-care HF classes to empower the patient to care for themselves by improving self-care behaviors and reducing hospital readmissions.

A pre and posttest design was considered appropriate for this evidence-based project. The data collection tool selected for the project contains specific behavioral self-evaluation questions pertaining to HF management. A pre and posttest design is executed by measuring baseline behaviors prior to an intervention and using the same assessment protocol upon completion of the program to assess for changes in a specific set of behaviors in a population or group (Dimitrov and Rumrill, 2003).

Population/Setting

The setting for this project took place in an out-patient clinic on the campus of a small 177 bed not-for-profit hospital in a central United States rural area. A convenience sample was utilized for selecting participants for this evidence-based project. The potential sample group was recruited from private practice HF cardiology groups, internal medicine groups with practicing privileges within the hospital, and an electronic medical records search of patients readmitted to the hospital within 30 days of a hospital discharge for HF. A power analyses was not needed for this evidence-based practice project.

The population criteria included adult patients (male or female), 18 years or older, who have systolic HF, and provider documentation of an ejection fraction equal to or less than 40%, diastolic HF, or New York Heart Association HF class II or higher. Each patient also had to have medical documentation of one or more hospital readmissions within 30 days of hospital discharge. The participants were required to speak, read and write and understand the English language at a minimum of a 6th grade literacy level and either have dependable transportation to the clinical site or ask for help with transportation to attend all four HF educational classes. A family member or care-giver was required to attend the class sessions with the participants. Excluded were patients who had post-partum HF or cardiomyopathy, had HF related to

arrhythmias or cancer chemotherapy, or were on hospice services awaiting a heart transplant or LVAD placement.

An attrition rate of 25% was expected from patients who indicated they would participate but either did not start or did not finish the program. Reasons for noncompletion could range from physical difficulty related to HF symptoms to reconsideration based on individual psychosocial variables.

Measurement Method

The objective of the program was to provide a level of patient education that would significantly improve self-care and thereby reduce avoidable health care interventions. As a function of this goal, changes in patient knowledge and behaviors were important data. The English language version of the Self-care Heart Failure Behavior Index (SCHFI.v. 6.2) (Appendix B) was utilized for this project to gain knowledge of the participants' self-care behavior. The SCHFI consists of 23 items on a 4-point Likert scale. The questionnaire is composed of three sections, self-care maintenance, self-care management, and self-care confidence. These address self-care behaviors in the areas of compliance with daily weight monitoring, dietary management in the areas of sodium and fluid restriction, confidence in the ability to identify signs and symptoms of worsening HF and interventions to prevent HF exacerbations, and exercise and medication compliance. The 4-point Likert scale consist of a rating of 1-4, with 1 being not confident, 2- somewhat confident, 3- very confident and 4- extremely confident.

The reliability of the SCHFI v.6.2 questionnaire was evaluated in 154 patients by Riegel et al. (2009). The ten-item self-care maintenance score had a standardized Cronbach's α of .542, with the six-item self-care management and six-item self-care confidence having .597 and .827

respectively. The reliability of the SCHFI v.6.2 was shown by Riegel et al. (2009) to be an accurate scale for measuring self-care behavior in patients with HF. A score of ≥ 70 was suggested as indicating self-care adequacy although the SCHFI v.6.2 showed sufficient evidence that self-care adequacy occurred at even lower levels. As a result of these adequacy indicators, Reigel et al. (2009) noted even a score change by even one half of a standard deviation can be considered clinically relevant.

Absolute scores can range from 10 to 40 for self-care maintenance, 4 to 24 for self-care management, and 6 to 25 for self-care confidence. Each scale was having been standardized to a possible score of 100 to make the SCHFI v.6.2 comparable across numerous studies. Self-care was evaluated by Section A (self-care maintenance) and Section B (self-care management). Self-care confidence is separate, assessing the relationship between self-care and outcomes.

Riegel et al. (2009) assessed the validity of the SCHFI v.6.2 using the results of 34 people who completed both tools and by comparing SCHFI summary scores to the European Heart Failure Self-care Behavior scale (EHFSB). The EHFSB 12 item questionnaire uses a 5-point Likert scale with 1 representing completely agree, and 5 representing I don't agree at all. Lower scores on the EHFSB indicate improvement in self-care behavior, whereas higher scores on SCHFI v.6.2 indicate improvement. Some of the poor and negative coordination between the two tools may be a result of reverse scoring methods and that the EHFSB does not assess a self-care maintenance construct (maintenance: $r = -.65, p < .001$; management: $r = -.18, p = .43$; and confidence: $r = -.05, p = .76$). Confirmatory factor analysis was used to assess construct validity. Data from 154 patients were used to assess correlation with both its model and prior versions of the SCHFI. The SCHFI v.6.2 was considered adequate when compared to previous SCHFI v.4 (Riegel et al., 2009). The incremental non-centrality measures (comparative fit index = .73),

independent model comparison (normal fit index = .67 and non-normed fit index = .69) were all adequate.

After reviewing reliability and validity Riegel et al. (2009) recommended calculating each separate domain of the tool individually for a better statistical outcome rather than using a total scoring system. A limitation of SCHFI v.6.2 is that only two domains assess self-care management. Riegel et al. (2009) indicated that the strength of the tool is its mixed validity testing method to evaluate self-care behavior in patients with HF. Mix method collection tools can obtain and evaluate two types of data by asking closed-ended questions (quantitative/numeric) and open-ended questions (qualitative/text) which can enhance the validity and dependability of the data being collected (Zohrabi, 2013). The SCHFI v.6.2 is a valid and reliable tool to report self-care maintenance and management and self-care confidence.

Adherence to daily weight monitoring was evaluated with a daily weight log sheet (Appendix C) designed for the participants using Microsoft Word. Further, it was designed to be consistent with the calendar month and date of the practice change. The daily weight sheet was utilized to evaluate adherence to daily weight monitoring, and to assist the patient with identifying signs and symptoms of worsening HF in conjunction with the American Heart Association HF symptom-checker tool (Appendix D).

Hospital readmission data was provided by the participants at 30, 60, and 90-day intervals. Participants were asked if they were readmitted to any hospital in the area within 30 days of completing the HF education bundle and with his follow up meeting at 60 and 90 days. The role of monitoring hospital admissions was to assess the benefit of self-care behaviors in reducing hospital readmissions.

Procedure

Participants were selected from a convenience sample of patients readmitted to the hospital within 30 days of discharge. The medical records department provided an electronic medical records (EMR) search report that identified patients with HF who had been admitted within the previous 6 months. The medical records HF case manager RN identified 100 candidates from a list of patients with a primary admitting diagnosis of heart failure ICD-10 codes of I 50, I 50.1, I 50.2, I 50.21, I 50.23, I50.3, I50.31, I 50.33, and I 50.41 (Appendix E), and subsequently readmitted within 30 days of a hospital discharge. The list of potential participants name, patient identification number, contact number and discharge disposition to either home, REHAB or a nursing home facility was transcribed to a Microsoft Excel spreadsheet (Appendix F). The NP project manager reviewed each of the records of these 100 candidates to confirm primary admission diagnosis for HF and to ensure each potential participant met the inclusion criteria for the project. A total of 50 patients met the inclusion criteria.

The NP project manager contacted each of the potential participants by phone to assess interest in participation in the HF educational program. Each candidate was given specific information about the project which included (1) why the project was being offered, (2) its purpose, and (3) an overview of the educational material for each four-class session. An initial verbal commitment to attend all four educational sessions and follow-up at 30, 60 and 90 days was requested. Transportation issues were addressed, including the opportunity of up to \$25 for necessary financial assistance, to ensure participants could attend all project time commitments. The importance of completing the entire project was also discussed in detail. Participants who expressed interest in the project were selected as final participants. Within the 3 weeks prior to

the beginning of the project, each interested participant was contacted to reassess interest and to confirm participation. A total of 4 group times over several dates and times (mornings or evenings; Monday/Wednesday [M/W] or Tuesday/Thursday [T/T]) for class sessions were offered to encourage participation. The institutional review board (IRB) did not require informed consent for this project.

Two weeks prior to the start of the first-class session a total of 12 potential participants continued to express interest and agreed to attend. Of the six participants who agreed to attend the four M/W morning class sessions, only four were able to be contacted the night before the first session. Three participants attended class the following morning (50% drop out). One of these participants attended only the first, resulting in two people who completed the remaining three classes with the dietician, pharmacist, and cardiac-rehab nurse respectively. One participant did not complete the 30, 60 and 90- day follow up. One individual completed the entire project through to completion of the 90-day post-test SCHIF v.6.2 questionnaire.

The M/W afternoon class was cancelled for lack of interest. None of the T/T participants chose to begin the sessions and an offer of a second, later round of classes garnered no interest. Reasons for nonparticipation included (a) forgetting, (b) purported transportation difficulties, (c) upcoming surgery, or (d) family concerns, including the impact of Hurricane Harvey. Attrition for the first round of the project was significant. Of the 50 candidates who were identified and contacted, 12 people agreed to participate of whom six were able to commit to an available class time. The night before the first education session, four of these six candidates repeated their intention to attend the education session, and three participants attended the first class. Two participants continued on to attend all four classes and one of these two individuals was able to complete all the post-intervention assessments.

To gain more participants for the project, several private practice cardiology offices in the area were contacted. The lead project NP met with each provider to provide information about the project and to address any questions and concerns. Each cardiologist expressed interest, applauded the project, and emphasized the need for a HF educational program, but no candidates came forth.

A second review of electronic medical records search was conducted to gain more participants for the project. A total of 20 potential participants meeting the project criteria were identified. Each of the 20 potential participants were contacted, and 7 agreed to participate, but only two confirmed when contacted the night before the first-class session. The second round of HF education sessions met on M/W, midafternoon, the time of the participants preferred. These two participants completed the SCHIF v.6.2 questionnaire, attended all four-educational sessions and the 30, 60 and 90 days follow-ups.

The participants for each group session received a folder with a variety of patient educational handouts and materials provided by the lead project NP, dietitian and pharmacist. The project took place over approximately five months. The HF education bundle was taught over four class sessions with follow up at 30, 60 and 90-days. The classes were held in a selected conference room within the hospital adjacent to the clinic, a location familiar to the participants.

Informed Consent

The participants who agreed to participate in the project were not required to sign a consent form because this EBP project used only aggregated data. The IRB, upon being informed this was an EBP project, accepted the approval by the Graduate Nurse Review Committee (GNRC) to proceed without a need for consent.

The Process

The NP project manager conducted the initial class session. The first part of the initial class session was a review of the requirements for participation and the participants were asked to verbalize their understanding of this commitment. After each participant confirmed their agreement, he or she completed the English version of the SCHIF v.6.2 questionnaire to assess the participant's base line knowledge in HF management. The family member or care-giver was not required to complete the SCHIF v.6.2 questionnaire.

The second half of the initial class session covered the physiological effects of HF and worsening signs and symptoms of an acute exacerbation (Appendix G). The American Heart Association HF Color Zone Symptom Checker (Appendix D), divided into green, yellow and red zones was provided to each participant to help identify signs and symptoms of worsening HF and when to seek medical care. The green light section includes signs and symptoms that will indicate the participant's HF is stable and recommendations to continue current practice. The yellow zone includes signs and symptoms of concerns for possible worsening HF and the need to contact the participant's provider for assessment and further medical follow up. The red zone includes signs and symptoms indicating the participant is in trouble and in need of emergent heart failure care, with instructions to report to the closest emergency room or activate 911. Each participant received a HF Color Zone Symptom Checker to place in the home on the refrigerator or other convenient location.

The registered dietician participated in teaching the second session. Information, materials, and activities regarding using food label data and calculating sodium content, recipes and preparing meals at home, and how to make healthy food choices when eating out were provided (Appendices H & I). Participants received information on fluid measurement and

importance of tracking fluid intake, and how to identify liquid content of food items. The United States Department of Health and Human Services (2009) heart healthy recipe cook book, *Keep the Beat™ Recipes: Deliciously Healthy Dinners* (Appendix J, example pages) was provided to the participants. The cookbook offers healthy low salt recipes, complete with sodium content per serving. The cook book was considered a great solution for assisting with calculating sodium intake when preparing meals at home. The Academy of Nutrition and Dietetics *Heart-Healthy Eating Label Reading Tips* (Appendix K) was used when teaching participants how to read food labels and identify sodium content in a serving size. The registered dietician provided additional educational material on HF Nutrition Therapy (Appendix L) which was utilized to teach participants. This handout included information on the percentage of sodium intake recommended for patients with HF, comprehending food labels, fluid restriction, daily weight monitoring and a list of recommended and non-recommended food items for HF patients. The document also included a heart healthy sample meal plan.

The third-class session was presented by the pharmacist who discussed medication management and the physiology and side effects of the most commonly prescribed HF medications. A handout by the American Heart Association (Appendix M) and the University Heart on *Common Medications for Heart Failure Patients* (Appendix N) were used to teach this portion of the HF education bundle. The pharmacist emphasized the importance of taking all HF medications as prescribed, and not changing the medication schedule without consulting the provider. Information detailing which medications HF patients should avoid in order to prevent acute exacerbations was provided to each participant (Appendix O)

The final and fourth-class session was present by the cardiac-rehabilitation specialist who presented a general overview of the importance of a daily structured exercise program to

strengthen their hearts. The importance of daily blood pressure and pulse monitoring, and information on qualifications for cardiac rehab was discussed. There were no educational handouts provided in this session. During this final session, additional tools that were provided to each participant included a sodium intake log sheet (Appendix P) and fluid intake log sheet (Appendix Q) to assist with tracking dietary restrictions. Time was allocated at the end of the final session to address any questions, to clarify information from the previous classes, and to allow for open discussion. The open discussion with the participants focused on self-care behaviors and reinforcement of the educational materials related to medication adherence, daily weight monitoring, salt and fluid restriction, signs and symptoms of worsening HF and exercise, smoking, alcohol use, and non-steroidal anti-inflammatory drugs and over the counter medication that may worsen their HF.

A copy of all the educational materials for the HF education classes was provided, in a folder to each participant. Since weight monitoring is an important self-care activity, a home scale was provided to participants who did not have one. Participants were asked to review the daily weight sheet and to write their dry weight at the top of each daily weight monitoring log sheet. Each participant was instructed to monitor their weight daily at home, and to bring the daily weight log sheet and their HF class folder with them to each follow up sessions at 30, 60 and 90 days.

Statistical Analysis

Participants enrolled in the project were required to complete a hard copy of the SCHIF v.6.2 questionnaire to identify changes of self-care behaviors. The questionnaire was completed twice, once at the beginning of the first-class session and once during the 90-day follow-up session. The NP project manager transcribed the pre and post assessment data into an Excel

spreadsheet (Appendix R) for statistical processing. These transcriptions were checked three times to assure accuracy. Participants identifying data elements were anonymized. Each participant was assigned a special identification code at the beginning of the project for data entry purposes only. The participants created these codes by a random drawing a specified quantity of numbered or lettered slips from a paper bag. The SCHIF v.6.2 questionnaire items were enumerated for transcription into Excel and the responses coded, with 1 = yes, 2 = no or 1 to 4 for Likert responses of least to most. The spreadsheet was imported into the statistical software R version 3.4.2. for analysis

One person, the lead project NP collected of the SCHIF v,6.2 questionnaire, ensuring good intrarater reliability of the collection process. Participants were instructed to answer each question on the SCHIF v.6.2 questionnaire with complete honesty to properly evaluated self-care behavior. A descriptive statistic procedure was used to analyze the data collected from the participants' SCHIF v.6.2 questionnaires to assess changes in self-care behavior at the beginning of the project and at the end of 90 days.

Descriptive statistics are provided to show characteristics of the sample (Appendices S & T). Originally, the statistical plan to analyze the survey results was to use a paired-sample *t*-test to compare the pre and post- test data (or a Wilcoxon-Sign-Rank test is the data was shown to be non-normal). Due to problems encountered recruiting and keeping patients in the educational classes, only descriptive statistics are provided. No inference or conclusion can be made on the effectiveness of the interventions since 2 out of 5 patients did not complete the classes, nor the posttest.

Participant compliance with the program was going to be evaluated by counting the number for weight, blood pressure and pulse recordings that each patient had recorded at 30, 60

and 90 days. If a patient had five or more recordings a week, that week would be considered compliant. The number of compliant weeks were going to be recorded per patient in each of weight, blood pressure and pulse. Only descriptive statistics are provided because, due to the small sample size, no inference or conclusion can be made on the effectiveness of the intervention. Reporting of continuous variables is done with means, standard deviation, and range with the understanding that there is not a large enough sample size to assess if the variables are normally distributed.

Project Outcome

There were five participants enrolled in the project with only three completing the after-intervention questionnaire. The average age of these five patients was 63.2 years (19.5, 35 - 83) with 60% males. All subjects had high school level education and a household income of less than \$25,000. One participant had insurance from employment, two were on Medicare and one on Medicaid. Four of the five participants had diabetes (80%), and none smoked or were former smokers. None of the three patients who completed the study (a) had a 30-day, 60 or 90-day readmission, (b) showed greater adherence to daily weight monitoring, (c) a noticeable increase in self-care behavior.

Section A of the SCHIF v.6.2 questionnaire assessed self-care maintenance, and how well the participants followed guidelines to stay healthy. Two of the three participants who completed the project improved their salt intake tracking from sometimes on the scale to either frequently or always. There was an average increase in the mean total score in self-care maintenance of 6.3 points (out of a possible 40 points) for the three participants who remained enrolled in the project (Table 1; Appendix T).

Table 1.*SCHIF v.6.2. Section A: Self-care Maintenance Response Descriptive Statistics*

	n	q1	q2	max
Pre-Intervention	5	23	27	2.3
Post-Intervention	3	29	33	4.6
Difference post- pre	3	4.5	8.5	4.0

Section B of the SCHIF v6.2 questionnaire assessed self-care management and evaluated the participants' ability to recognizing the symptoms of HF and to respond appropriately. Of the three participants who completed the project, one had not experienced the symptoms of ankle swelling or difficulty breathing. By the end of the study, all three patients had experienced the additional symptoms. After the intervention, two of the three patients were able to recognize the symptoms; with all three reporting that they reduced their salt intake when having symptoms and two reporting reducing fluid intake to correct the problem. There was an increase in the mean total score of 5.3 points (out of a possible 24 points) in self-care management for the three participants who remained in the study (Table 2; Appendix T). Participants reported an increase of the frequency of reviewing the routine instructions provided in the education bundle for patients with HF.

Table 2.*SCHIF v.6.2. Section B: Self-care Management Response Descriptive Statistics*

	n	q1	q3	max
Pre-Intervention	5	9	12	16
Post-Intervention	3	13.5	14	14
Difference post- pre	3	3.5	7	9

The last section, C, evaluated self-care confidence in managing the participants' condition (HF). All three participants gained confidence in their ability to evaluate the importance of their symptoms. There was an increase in the mean total score of 5.7 points (out of a possible 24 points) in self-care confidence for the three participants who remained in the study (Table 3; Appendix T). These participants reported an increase in their self-care confidence to manage their HF and felt confident in their ability to recognize worsening symptoms of HF. They indicated an increased confidence in developing a response plan and when to contact their provider for assistance.

Table 3.

SCHIF v.6.2. *Section C: Self-care Confidence Response Descriptive Statistics*

	n	q1	q3	max
Pre-Intervention	5	13	22	23
Post-Intervention	3	18.5	20.5	22
Difference post- pre	3	5.5	6	6

Daily weight, blood pressure and pulse monitoring were based upon the number of days out of the week the participants showed adherence to self-care management behavior post-intervention. The main purpose of encouraging daily weight monitoring was to assist the patient with identifying worsening HF symptoms, as outlined in the American Heart Association Symptom checker sheet. Two of the three remaining participants checked their blood pressure daily, seven days a week, for the entire project. One of these three participants missed weight checking for two weeks post- intervention. This participant cited the lack of adherence to daily weight monitoring as equipment malfunction. A new weight scale during the 30 days follow up

period was provided to the participant, and thereafter the individual showed better adherence to daily weight monitoring, as noted at the 60 and 90 days follow up.

Although there was a small number of participants, there was an overall noted improvement in the participants' self-care behaviors post-intervention. Each participant improved in the areas of self-care maintenance, self-care management and self-care confidence (Figure 1; Appendix S).

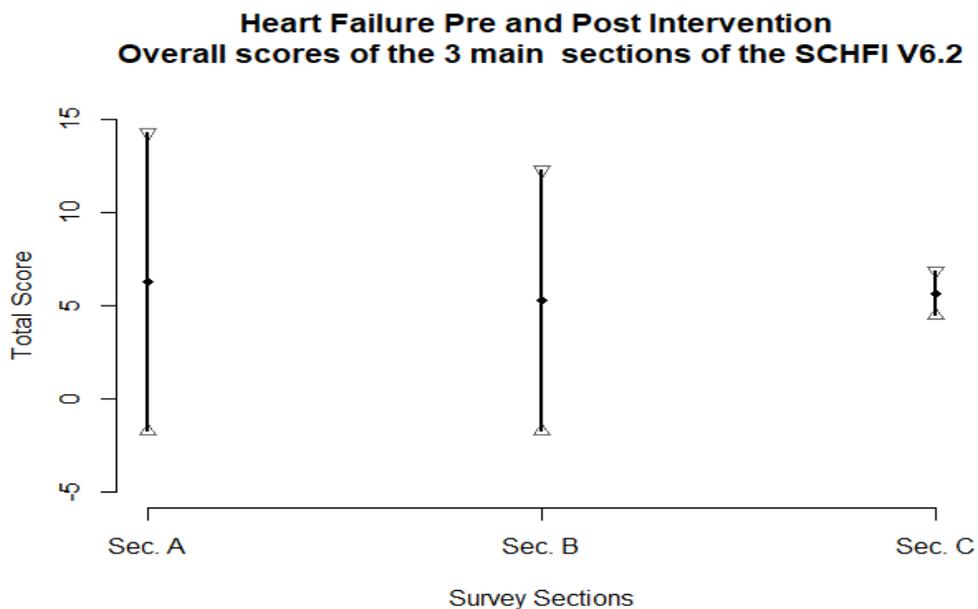


Figure 1. Heart Failure Pre and Post Intervention overall scores of the three main sections of the SCHFI V.2.

Discussion

The participants enrolled in this evidence-base project were shown to improve in self-care maintenance, management and confidence post intervention. Even with these few participants, the bundle of HF education shows improvement in patient self-care behavior, adherence in daily weight monitoring, and avoidance of unnecessary hospital readmission at 30, 60 and 90 days.

As the number of Americans with HF increases so will the need to reduce the long-term costs of managing HF. The American College of Cardiology (2017) recommends providing self-care education to improve self-care in HF management and encourages programs that embrace the core components of HF education, as is offered in this education bundle.

The Texas Medical Foundation and the Central Texas Council of Government on Aging has given support for a comparable HF educational program for patients with HF living within the community, and assisted living and retirement communities. Administrators at several assisted living facilities in the program area have admitted having no HF educational programs in place, despite the governmental regulatory requirements to prevent hospital readmission for Medicare patients with HF. Under the auspices of the hospital charity community outreach program, offering a free HF education bundle program to those will help to expand the HF educational program to the Medicare and Medicaid population as well as the private sector.

Creating a mentorship of retired nurses, pharmacists and dieticians to help teach HF education within free community healthcare clinics can also help reach more patients. A grant may need to be obtained for the first few years so that this collaboration can be better sustained. These mentors further their involvement by enlisting and training parish nurses and people in other service valuing disciplines to teach HF education classes within the community centers, churches, or free community base outreach facilities. Volunteering is recommended as an avenue to expanding the HF educational program to the underserved population within the community and in rural areas. An alliance with the Hispanic American Chamber of Commerce outreach healthcare and advocacy program may also assist with developing a Spanish language HF education bundle to help reach patients living with HF in the Hispanic community.

Limitations

Spanish-language only patients were excluded from participating in the project. The educational materials for the HF classes were presented in English. There were no bilingual instructors available to assist with the classes, and therefore a sizeable number of potential participants were unable to enroll in the project.

Potential barriers to the success of this program were hypothesized and addressed prior to the start of the project. Poor access to transportation was viewed as a major potential barrier to attendance. Funds were allocated to assist with transportation and were offered to candidates, however, some patients continued to cite transportation as a limitation. Some patients lived over 10 miles from the hospital and were concerned they would exceed the \$25.00 reimbursement cap. The option to pre-reimburse transportation costs by mailing the funds to participants' homes was considered a financial risk by the grantors as there was no guarantee the participants would subsequently attend the classes. Participants who may not have had the funds and could not wait for reimbursement were not able to participate.

Barriers to Overcome Moving Forward

The small number of participants enrolled in the project may be viewed by administration as a lack of patient interest in a HF education bundled program. The financial support to continue the program within the organization will need to have the support of the administrative team, physicians, NP, PA, and nursing staff. This is an essential component to maintaining the out-patient HF educational classes as part of the hospital's free community outreach educational programs. If more people were trained and available to teach the classes, there could be classes offered at times that are congruent with other healthcare provider visits. Clustering these visits together could eliminate the additional transportation cost.

The healthcare organization, as a whole, will need to see reductions in hospital readmissions as an economic benefit of a bundled HF educational program in improving self-care behavior. There is a monetary gain in reimbursement when a hospital can reduce the percentage of patients readmitted to the hospital within 30 days of discharge and a monetary penalty if HF readmission is high. Patient participation will be required to sustain the program long-term. Physicians, NPs, PAs, and all healthcare providers within the organization must support the education bundle program and encourage participation. The social services department must provide assistance to help address financial barriers and transportation issues that may inhibit future participation. Sometimes even small considerations can make a difference, for example, providing free bus passes or working with the local city busing systems to help arrange for transportation to and from class would help those who do not have transportation.

Implications

Future Projects Moving Forward

A future quality improvement project of the process could help develop a home-based HF education bundle program. A home-based focus might further improve self-care and reduce hospital readmission. The process might include the possibilities of having the HF education bundle delivered asynchronously over the internet or live through conference calls or other teleconferencing service.

Several HF patients expressed an interest in attending a HF education bundle program but were unable to attend secondary to mobility issues. Assessing the benefit of a HF home focused program may help to emphasize the need for a home health HF nurse educator that provides a

HF education bundle in the patient's personal home or via tele-nurse or a teleconferencing service.

Many patients within the county live in rural areas and lack necessary transportation and support to travel to the physician's office as needed. A sizable percentage live far from larger metropolitan areas or cities where many HF outreach programs are offered. Being able to connect with HF patients in the rural area may help to improve self-care and reduce hospital readmission in this patient population. Patients living in rural areas who have chronic conditions have benefited from health care via telemonitoring. Lin et al. (2016) reported that HF patients who received telemedicine had a significant reduction in the all-cause mortality rate and hospital related admissions. Anker et al. (2011) noted telemedicine self-empowered patients to take an initiative in their own care. Providers were able to intervene sooner, providing crisis prevention, treatment, and stabilization of the patient's home, instead of the delay as patients wait for an appointment or seek emergency care treatment.

Advantages of telemonitoring include patient participation in healthcare by entering their own weight, vital signs, and symptoms through a practice data system and transmitting through the internet while at home (American Telemedicine, 2018). Telemedicine or videoconferencing may provide a more cost-effective way to reduce health care cost to manage HF, though more research is recommended to assess the long-term benefit of a HF telemonitoring program (Gensini et al., 2017). The majority of the research has shown telemonitoring to be a positive and cost-effective alternative to in-office visits, and an effective approach to HF management (Anker et al., 2011). Future projects to evaluate the benefits of a telemonitoring program in the management of HF in this NP patient population has been considered and may be an avenue to offering a HF education bundle.

Future Research Opportunities

A descriptive study would help us to understand why patients who were unaffected by the natural disaster did not choose to attend the classes. A longitudinal study is recommended for observation of the effectiveness of a HF education bundle program in improving long-term self-care behavior and reducing hospital readmission in patients with HF. This would help to assess the need for additional booster education for maintaining self-care behavior in patients with HF.

Conclusion

This evidence-based project has shown patients with HF who are educated by professionals from different disciplines in a bundle program have a greater understanding of their medical condition and report greater confidence in managing their own care. They have improved adherence to daily weight monitoring and dietary restrictions and are able to identify worsening HF symptoms to avoid an unnecessary hospital readmission at 30, 60 and 90 days. Participants enrolled in the project showed an increase in the mean total score for each of the three sections of the SCHIF v.6.2 questionnaire in; self-care behavior (6.3), self-care management (5.3), and self-care confidence (5.7).

The small number of participants enrolled in the project was a barrier to evaluating the significant statistical impact of a HF education bundle program in HF management in this patient population. The benefits of a HF education bundle on improving self-care behavior will require a quality improvement process to improve this specific program. Research in this NP patient population may be required to identify factors affecting patient motivation. This program has shown improvement in self-care behavior for the members of the small sample who were involved in the EBP project and provides insight for a potential greater impact of a HF educational bundle program.

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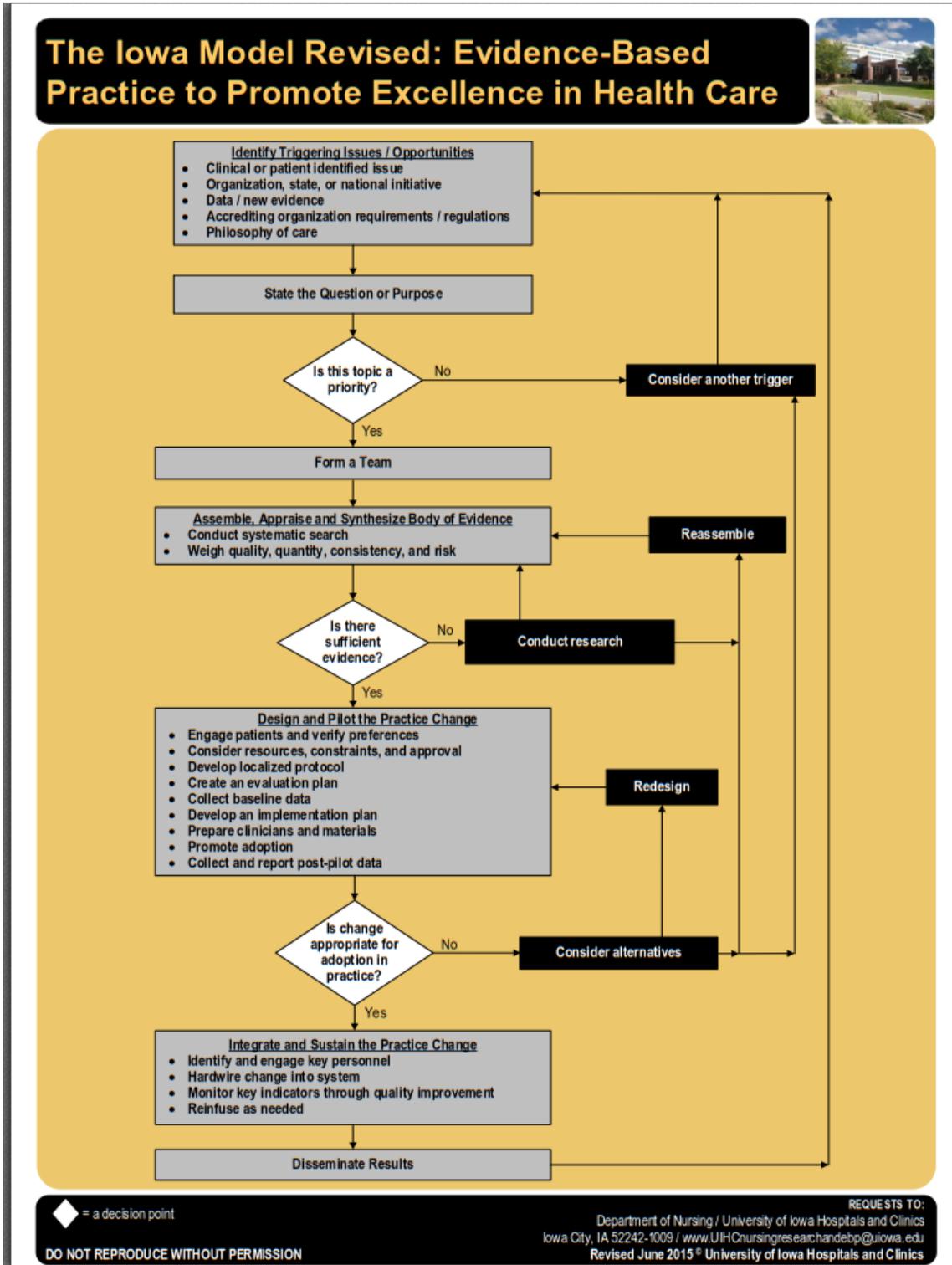
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Appendix A

Iowa Model Revised



Appendix B**Self-care Heart Failure Behavior Index (SCHFI.v. 6.2)****SELF-CARE OF HEART FAILURE INDEX***All answers are confidential.*

Think about how you have been feeling in the last month or since we last spoke as you complete these items.

SECTION A:

Listed below are common instructions given to persons with heart failure. How routinely do you do the following?

	Never or rarely	Sometimes	Frequently	Always or daily
1. Weigh yourself?	1	2	3	4
2. Check your ankles for swelling?	1	2	3	4
3. Try to avoid getting sick (e.g., flu shot, avoid ill people)?	1	2	3	4
4. Do some physical activity?	1	2	3	4
5. Keep doctor or nurse appointments?	1	2	3	4
6. Eat a low salt diet?	1	2	3	4
7. Exercise for 30 minutes?	1	2	3	4
8. Forget to take one of your medicines?	1	2	3	4
9. Ask for low salt items when eating out or visiting others?	1	2	3	4
10. Use a system (pill box, reminders) to help you remember your medicines?	1	2	3	4

SECTION B:

Many patients have symptoms due to their heart failure. Trouble breathing, and ankle swelling are common symptoms of heart failure.

In the past month, have you had trouble breathing or ankle swelling? Circle one.

11. No

12. Yes

13. If you had trouble breathing or ankle swelling in the past month...

(circle **one** number)

	Have not had these	I did not recognize it	Not Quickly	Some what Quickly	Quickly	Very Quickly
How quickly did you recognize it as a symptom of heart failure?	N/A	0	1	2	3	4

Listed below are remedies that people with heart failure use. If you have trouble breathing or ankle swelling, how likely are you to try one of these remedies?

(circle **one** number for each remedy)

	Not Likely	Somewhat Likely	Likely	Very Likely
14. Reduce the salt in your diet	1	2	3	4
15. Reduce your fluid intake	1	2	3	4
16. Take an extra water pill	1	2	3	4
17. Call your doctor or nurse for guidance	1	2	3	4

18. Think of a remedy you tried the last time you had trouble breathing or ankle swelling,

(circle **one** number)

	I did not try anything	Not Sure	Some what Sure	Sure	Very Sure
How <u>sure</u> were you that the remedy helped or did not help?	0	1	2	3	4

SECTION C

In general, how confident are you that you can:

	Not Confident	Somewhat Confident	Very Confident	Extremely Confident
19. <u>Keep yourself free of heart failure symptoms?</u>	1	2	3	4
20. <u>Follow the treatment advice</u> you have been given?	1	2	3	4
21. <u>Evaluate the importance</u> of your symptoms?	1	2	3	4
22. <u>Recognize changes</u> in your health if they occur?	1	2	3	4
23. <u>Do something</u> that will relieve your symptoms?	1	2	3	4
24. <u>Evaluate</u> how well a remedy works?	1	2	3	4

Adapted from “An update on the self-care of heart failure index,” by B. Riegel, C.S. Lee,

V. V. Dickson, and B. Carlson, 2009, *Journal of Cardiovascular Nursing*, 24(6),

485-497, p. 497.

Appendix C

Daily Weight Log

<u>Participants ID:</u>	AUGUST 2017						<u>Dry Weight:</u>
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
		1 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	2 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	3 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	4 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	5 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	
6 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	7 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	8 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	9 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	10 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	11 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	12 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	
13 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	14 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	15 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	16 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	17 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	18 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	19 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	
20 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	21 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	22 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	23 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	24 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	25 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	26 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	
27 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	28 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	29 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	30 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>	31 <u>Weight:</u> <u>B/P:</u> <u>Pulse:</u>			

Appendix D

Heart Failure Symptoms Checker



Self-Check Plan

for HF Management



✔ **Excellent – Keep Up the Good Work!**



No new or worsening shortness of breath



Physical activity level is normal for you



No new swelling, feet and legs look normal for you



Weight check stable
Weight: ____



No sign of chest pain

GREAT! CONTINUE:

 **Daily Weight Check**

 **Meds as Directed**

 **Low Sodium Eating**

 **Follow-up Visits**

⚠ **Pay Attention – Use Caution!**



Dry, hacking cough



Worsening shortness of breath with activity



Increased swelling of legs, feet, and ankles



Sudden weight gain of more than 2-3 lbs in a 24 hour period (or 5 lbs in a week)



Discomfort or swelling in the abdomen



Trouble Sleeping

CHECK IN!

Your symptoms may indicate:



A need to contact your doctor or provider

A need for a change in medications



⚠ **Medical Alert – Warning!**



Frequent dry, hacking cough



Shortness of breath at rest



Increased discomfort or swelling in the lower body



Sudden weight gain of more than 2-3 lbs in a 24 hour period (or 5 lbs in a week)



New or worsening dizziness, confusion, sadness or depression



Loss of appetite



Increased trouble sleeping; cannot lie flat

WARNING! You need to be evaluated right away.



Call your physician or call 911



www.RiseAboveHF.org

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Appendix E

ICD-10 Heart Failure Codes

ICD – 10 Diagnosis Codes for Heart Failure

I 50.0	Heart Failure
I50.1	Left Ventricular Failure, unspecified
I50.21	Systolic (Congestive) HF
I50.23	Acute on Chronic Systolic (Congestive) HF
I 50.3	Diastolic HF
I50.31	Acute Diastolic (congestive) HF
I50.33	Acute on Chronic Diastolic (congestive)HF
I50.41	Acute Combined Systolic and Diastolic HF
I50.43	Acute on Chronic Combined Systolic and Diastolic HF

Appendix F

Potential Candidate Screening Tool

A	B	C	D	E	F	G	H	I
Index Discharge Date	Index Hospital	Index Condition	Medicare	Index Attending Physician	Index Discharge Disposition	Patient FIN#	Patient MRN#	Patient Last Name

J	K	L	M	N	O	P	Q
Patient First Name	Patient DOB	Patient Age	Patient Gender	Readmit Condition	Readmit Patient FIN#	Readmit Primary Diagnosis	Days to Readmission

R	S	T	U
Readmit Registration Date	Index Discharge To Organization	Index Discharge To Organization Post Acute Type	Index Discharge To Organization Service

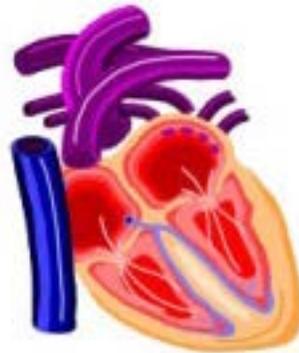
Appendix G

Basic Heart Failure Patient Education Handout

What Is Heart Failure?

Heart failure, also called **Congestive Heart Failure** (CHF), means your heart does not pump blood as well as it should. This does not mean your heart has stopped working, but that it is not as strong as it used to be and fluid builds up in the lungs and other parts of your body. This can cause shortness of breath, swelling in the legs, feet, and stomach.

Heart failure starts slowly and can get worse over time.



Signs & Symptoms

- Trouble breathing that is worse during exercise or when lying down
- Swelling in your ankles, legs, and stomach
- Feeling restless, tired, or weak
- Gaining weight
- Feeling hungry, feeling full quickly when you eat, or having a loss of appetite
- Having a dry cough that does not go away
- Coughing up white frothy phlegm (spit)
- Needing 2 or more pillows at night or having to sleep in the chair

Taking Care of Yourself

The treatment of heart failure typically involves several steps. The steps are listed here and explained later in this booklet.

- Weigh yourself daily
- Take your medications exactly as directed
- Follow a low sodium diet
- Avoid drinking excess fluids
- Avoid alcohol consumption
- Maintain a normal body weight
- Get regular exercise
- Know the warning signs of heart failure
- Stop Smoking
- Keep follow-up appointments.
- Make this plan a permanent part of your life



Appendix H

Diet Tips

Following a Low Sodium Diet

Getting Started:

- Salt (sodium) can make your body hold on to too much water and make your heart work harder.
- A moderate 2 gram (2000 mg) per day diet restriction is essential
- **One teaspoon of table salt contains about 2300 mg of sodium!**
- High amounts of sodium are found in many canned, pickled, convenience, packaged, processed and "fast" foods.
- Remember, salt is an acquired taste and it can be unlearned.
- Be patient and learn to enjoy new flavors in foods.

Salt Substitutes:

Before using salt substitutes (NuSalt or No Salt), you should consult with your primary doctor

You should discuss use of potassium chloride (or KCl) as a salt substitute with your primary healthcare provider before using it. This compound may act as a strong drug for some people. On the other hand, herb seasonings can be enjoyed by almost everyone.

Herbal Seasoning Suggestions

Basil	Sage	Cloves
Bay Leaf	Thyme	Lemon Rind & Juice
Onion or Garlic	Nutmeg	Oregano
Mushrooms	Parsley	Pepper
Applesauce	Ground Pepper	Oregano
Chives	Pineapple	Tomato
Cranberry	Paprika	Vinegar
Allspice	Extracts of other flavorings	
Cinnamon	Ginger	
Cilantro	Vanilla	

Spice Blend Recipe

1 tsp chili powder	2 tsp ground Italian season mix
2 tsp black pepper	1 Tbs garlic powder
3 Tbs paprika	6 Tbs onion powder

Combine all ingredients and store in an air tight container.

Appendix I

Dining Out

Dining Out

Here are some suggestions for reducing sodium when eating in restaurants:

- Choose foods without sauces or ask for the sauce on the side so you can control the amount you eat.
- Visit restaurants where food is cooked to order.
- Ask your server for chopped onions, chives, lemon, or other fresh herbs to use as flavorings.
- Ask the server to suggest some low salt menu items.
- Carry your own herb seasoning blend with you.

Tips For Reducing Sodium In Your Diet:

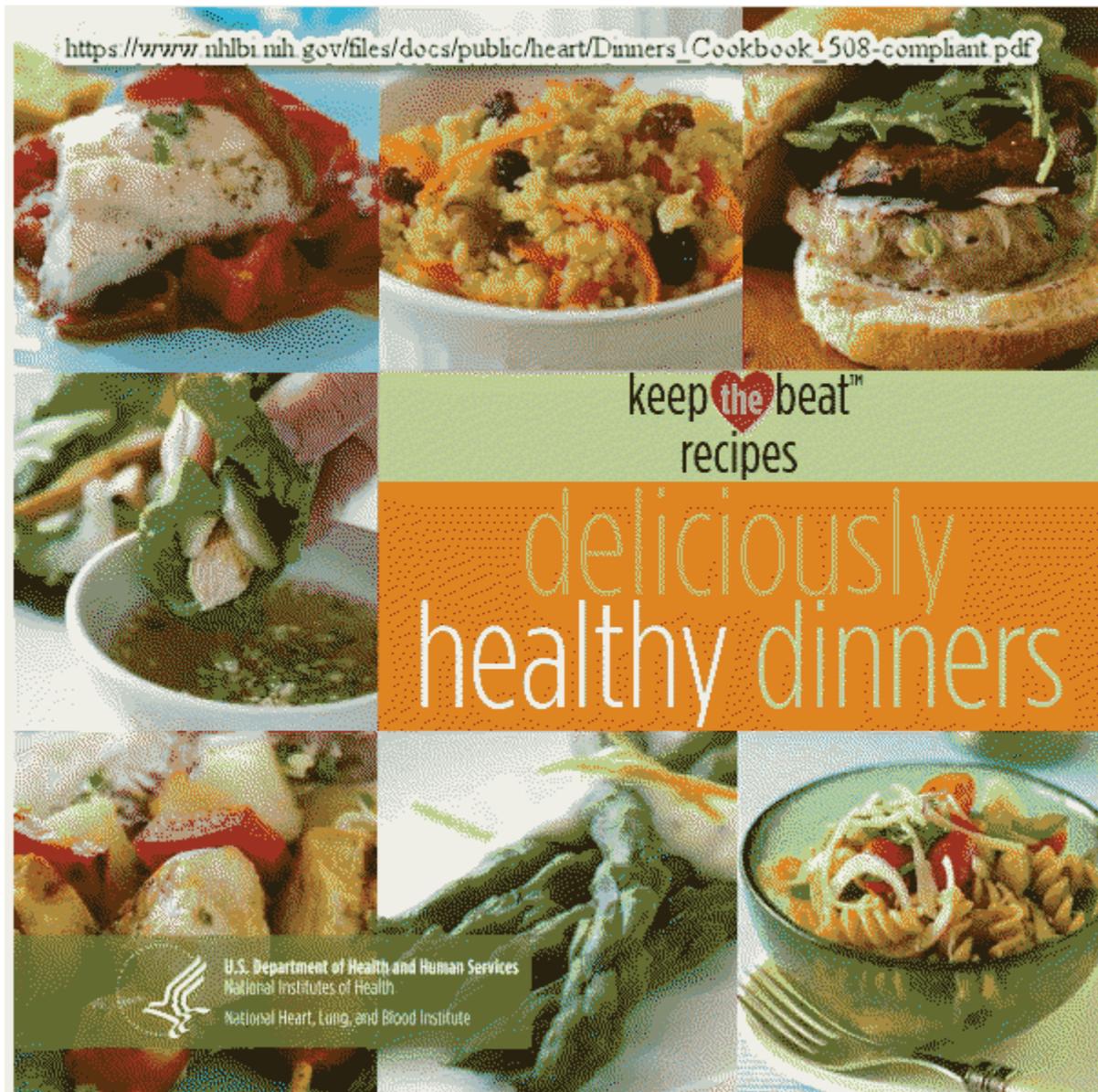
- Avoid foods like canned soup, frozen or canned prepared main dishes such as "TV" dinners, ravioli, pot pies, and pizza.
- Avoid sausages, luncheon meats, hot dogs, ham, bacon, and other cured or smoked meats, poultry and fish.
- Season with lemon, onions, spices and herbs such as pepper, paprika, curry, or dill.
- Avoid seasoned salts like garlic salt and onion salt.
- Use "Low Sodium" or water-packed canned vegetables, or rinse and drain regular canned vegetables before cooking.
- Avoid hidden sources of sodium such as soy sauce, steak sauce, teriyaki sauce, barbecue sauce, monosodium glutamate (MSG), and meat tenderizers.

Dining Out

- Avoid pickled foods or foods packed in brine such as relish, pickles, and sauerkraut.
- Avoid salty snacks such as corn or potato chips, salted nuts, and salted crackers.
- Limit intake of coffee, black tea, or soda with caffeine.
- Avoid drinks high in sodium such as tomato or vegetable juice.

Appendix J

Heart Healthy Recipe Cook



U.S. Dept. of Health and Human Services, National Heart Lung, & Blood Institute. (2009). *Keep the Beat™ Recipes: Deliciously Healthy Dinners*. Author.

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First recipe

cocoa-spiced beef tenderloin with pineapple salsa

Prep time: 20 minutes
Cook time: 20 minutes

Latin American flavors come alive in this festive beef dish with fruity salsa

½ Tbsp vegetable oil
1 beef tenderloin roast (16 oz)

For salsa:

½ C canned diced pineapple, in fruit juice, chopped into small pieces
¼ C red onion, minced
2 tsp fresh cilantro, rinsed, dried, and chopped (or substitute ¼ tsp dried coriander)
1 Tbsp lemon juice

For seasoning:

1 tsp ground black pepper
1 tsp ground coriander
1 Tbsp ground cinnamon
¼ tsp ground allspice
1 Tbsp cocoa powder (unsweetened)
2 tsp chili powder
¼ tsp salt

- 1 Preheat oven to 375 °F.
- 2 For the salsa, combine all ingredients and toss well. Let sit for 10–15 minutes to marinate while preparing the seasoning and cooking the meat.
- 3 For the beef tenderloin seasoning, combine all ingredients. Lightly oil the tenderloin and spread an even layer of the dry seasoning over the entire roast.
- 4 Place the seasoned roast on a roasting or broiling pan and roast for 10–15 minutes (to a minimum internal temperature of 145 °F). Let cool for 5 minutes before carving into 16 slices (1 ounce each).
- 5 Serve four slices of the tenderloin with ¼ cup salsa on the side.

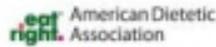
main dishes
beef

Tip: Delicious with a side of rice and **Grilled Romaine Lettuce With Caesar Dressing** (on page 105).

	yield: 4 servings	each serving provides:	
	serving size: 4 oz tenderloin roast, ¼ C salsa	calories 215	total fiber 2 g
		total fat 9 g	protein 25 g
		saturated fat 3 g	carbohydrates 9 g
		cholesterol 67 mg	potassium 451 mg
		sodium 226 mg	

Appendix K

The Academy of Nutrition and Dietetics *Heart-Healthy Eating Label Reading Tips*



Client Name _____ Date _____
 RD/DTR _____
 Email _____ Phone _____

Heart-Healthy Eating: Label Reading Tips

Look for the following on the food label:

Nutrition Facts	
Serving Size 1/2 cup (57g)	
Servings Per Container 15	
Amount Per Serving	
Calories 240	Calories from Fat 70
% Daily Values*	
Total Fat 8g	12%
Saturated Fat 0.5g	3%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 90mg	4%
Potassium 250mg	7%
Total Carbohydrate 37g	12%
Dietary Fiber 4g	16%
Sugars 18g	
Protein 5g	
Vitamin A 0%	Vitamin C 0%
Calcium 4%	Iron 10%
*Percent Daily Values are based on a diet of 2,000 calories per day. Your daily values may be higher or lower depending on your calorie needs.	
	Calories 2,000 2,500
Total Fat	Less Than 65g 80g
Saturated Fat	Less Than 20g 25g
Cholesterol	Less Than 300mg 300 mg
Sodium	Less Than 2,400mg 2,400mg
Potassium	3,500 mg 3,500 mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
	Fat 9 • Carbohydrate 4 • Protein 4

- **Serving size:** All the information on the label about calories and nutrients is for one serving. If you eat more than one serving, you get more calories and nutrients.
- **Calories:** Choose foods that help you get the nutrients you need without going over your daily calorie goal. (Too many calories leads to weight gain.)
- **Total fat, saturated fat, and trans fat:**
 - Choose foods with less than 5 grams (g) of total fat per serving. For someone who needs to eat 2,000 calories per day, 50 g to 75 g per day is a good range. Try to pick foods with heart-healthy fats (monounsaturated and polyunsaturated fats).
 - Choose foods with less than 3 g per serving of saturated fat and trans fat. (These are not heart-healthy.) A person who needs to eat 2,000 calories per day should eat no more than 15 g of saturated fat and trans fat (combined) in one day.
 - Read ingredients. If a food contains partially hydrogenated oils, then it has trans fat. (If it has less than half a gram per serving, the label may still say trans fat-free.)
- **Sodium:** Look for foods that are low in sodium. Each day, eat less than 2,400 milligrams sodium (or the limit set for you by your health care team).
- **Total carbohydrate and sugars:** If you have high triglycerides, choose foods with less than 30 g total carbohydrate and less than 15 g sugars per serving.
- **Dietary fiber:**
 - Aim to get 25 g to 30 g dietary fiber each day.
 - To meet this goal, include foods with at least 5 g fiber per serving.



Appendix L

HF Nutrition Therapy



Prepared For:		Date:	
Prepared By:		Contact:	

Heart Failure Nutrition Therapy

This nutrition therapy will help you feel better and support your heart.

This plan focuses on:

- Limiting sodium in your diet. Salt (sodium) makes your body hold water. When your body holds too much water, you can feel shortness of breath and swelling. You can prevent these symptoms by eating less salt.
- Limiting fluid in your diet. For some patients, drinking too much fluid can make heart failure worse. It can cause symptoms such as shortness of breath and swelling. Limiting fluids can help relieve some of your symptoms.
- Managing your weight. Your registered dietitian nutritionist (RDN) can help you choose a healthy weight for your body type.

You can achieve these goals by:

- Reading food labels to keep track of how much sodium is in the foods you eat.
- Limiting foods that are high in sodium.
- Checking your weight to make sure you're not retaining too much fluid.

Reading the Food Label: How Much Sodium Is Too Much?

The nutrition plan for heart failure usually limits the sodium you get from food and drinks to 2,000 milligrams per day. Salt is the main source of sodium. Read the nutrition label to find out how much sodium is in 1 serving of a food.

- Select foods with 140 milligrams of sodium or less per serving.
- Foods with more than 300 milligrams of sodium per serving may not fit into a reduced-sodium meal plan.
- Check serving sizes. If you eat more than 1 serving, you will get more sodium than the amount listed.

Cutting Back on Sodium

- **Avoid processed foods. Eat more fresh foods.**
 - Fresh and frozen fruits and vegetables without added juices or sauces are naturally low in sodium.
 - Fresh meats are lower in sodium than processed meats, such as bacon, sausage, and hot dogs. Read the nutrition label or ask your butcher to help you find a fresh meat that is low in sodium.
- **Eat less salt, at the table and when cooking.**
 - Just 1 teaspoon of table salt has 2,300 milligrams of sodium.
 - Leave the salt out of recipes for pasta, casseroles, and soups.
 - Ask your RDN how to cook your favorite recipes without sodium.
- **Be a smart shopper.**
 - Look for food packages that say “salt-free” or “sodium-free.” These items contain less than 5 milligrams of sodium per serving.
 - “Very-low-sodium” products contain less than 35 milligrams of sodium per serving.
 - “Low-sodium” products contain less than 140 milligrams of sodium per serving.
 - “Unsalted” or “no added salt” products may still be high in sodium. Check the nutrition label.
- **Add flavors to your food without adding sodium.**
 - Try lemon juice, lime juice, fruit juice, or vinegar.
 - Dry or fresh herbs add flavor. Try basil, bay leaf, dill, rosemary, parsley, sage, dry mustard, nutmeg, thyme, and paprika.
 - Pepper, red pepper flakes, and cayenne pepper can add spice to your meals without adding sodium. Hot sauce contains sodium, but if you use just a drop or two, it will not add up to much.
 - Buy a sodium-free seasoning blend or make your own at home.
- **Use caution when you eat outside your home.**
 - Restaurant foods can be very high in sodium.
 - Ask for nutrition information. Many restaurants provide nutrition facts on their menus or websites.
 - Let your server know that you want your food to be cooked without salt. Ask for your salad dressing and sauces to come “on the side.”

Fluid Restriction

Your doctor may ask you to follow a fluid restriction in addition to taking diuretics (water pills). Ask your doctor how much fluid you can have. Foods that are liquid at room temperature are considered a fluid, such as popsicles, soup, ice cream, and Jell-O. Here are some common conversions that will help you measure your fluid intake every day:

- 1,000 milliliters = 1 liter or 4 cups
- 1 fluid ounce = 30 milliliters
- 1 cup = 240 milliliters
- 2,000 milliliters = 2 liters or 8 cups
- 1,500 milliliters = 1½ liters or 6 cups

Weight Monitoring

Weigh yourself each day. Sudden weight gain is a sign that fluid is building up in your body. Follow these guidelines:

- Weigh yourself every morning. If you gain 3 or more pounds in 1-2 days or 5 or more pounds within 1 week, call your doctor. Your doctor may adjust your medicine to get rid of the extra fluid.
- Talk with your doctor or RDN about what a healthy weight is for you.
- Talk with your doctor to find out what type of physical activity is best for you.

Foods Recommended

Food Group	Recommended Foods
Grains	Bread with less than 80 milligrams sodium per slice (yeast breads usually have less sodium than those made with baking soda) Homemade bread made with reduced-sodium baking soda Many cold cereals, especially shredded wheat and puffed rice Oats, grits, or cream of wheat Dry pastas, noodles, quinoa, and rice
Vegetables	Fresh and frozen vegetables without added sauces, salt, or sodium Homemade soups (salt free or low sodium) Low-sodium or sodium-free canned vegetables and soups
Fruits	Fresh and canned fruits Dried fruits, such as raisins, cranberries, and prunes
Dairy (Milk and Milk Products)	Milk or milk powder Rice milk and soy milk Yogurt, including Greek yogurt Small amounts of natural, block cheese or reduced-sodium cheese (Swiss, ricotta, and fresh mozzarella are lower in sodium than others) Regular or soft cream cheese and low-sodium cottage cheese
Protein Foods (Meat, Poultry, Fish, Beans)	Fresh meats and fish Turkey bacon (except if packaged in a sodium solution) Canned or packed tuna (no more than 4 ounces at 1 serving) Dried beans and peas; edamame (fresh soybeans) Eggs or egg beaters (if less than 200 mg per serving) Unsalted nuts or peanut butter
Desserts and Snacks	Fresh fruit or applesauce Angel food cake Granola bars Unsalted pretzels, popcorn, or nuts Pudding or Jell-O with Cool-Whip topping Homemade rice-crispy treats Vanilla wafers Frozen fruit bars
Fats	Tub or liquid margarine Unsaturated fat oils (canola, olive, corn, sunflower, safflower, peanut)
Condiments	Fresh or dried herbs; low-sodium ketchup; vinegar; lemon or lime juice; pepper; salt-free seasoning mixes and marinades (Mrs. Dash or McCormick's salt-free blend); simple salad dressings (vinegar and oil); salt-free sauces

Foods Not Recommended

Food Group	Foods Not Recommended
Grains	Breads or crackers topped with salt Cereals (hot/cold) with more than 300 milligrams sodium per serving Biscuits, cornbread, and other "quick" breads prepared with baking soda Prepackaged bread crumbs Self-rising flours

Vegetables	Canned vegetables (unless they are salt free or low sodium) Frozen vegetables with seasoning and sauces Sauerkraut and pickled vegetables Canned or dried soups (unless they are salt free or low sodium) French fries and onion rings
Fruits	Dried fruits preserved with sodium-containing additives
Dairy (Milk and Milk Products)	Buttermilk Processed cheeses such as Cheese Whiz, Velveeta, and Queso Cottage cheese (unless a low-sodium variety) Feta cheese; shredded cheese (has more sodium than block cheese); "singles" slices and string cheese
Protein Foods (Meat, Poultry, Fish, Beans)	Cured meats: bacon, ham, sausage, pepperoni, and hot dogs Canned meats: chili, Vienna sausage, sardines, and Spam Smoked fish and meats Frozen meals that have more than 600 milligrams sodium
Fats	Salted butter or margarine
Condiments	Salt, sea salt, kosher salt, onion salt, and garlic salt Seasoning mixes containing salt (Lemon Pepper or Bouillon cubes) Catsup or ketchup, BBQ sauce, Worcestershire and soy sauce Salsa, pickles, olives, relish Salad dressings: ranch, blue cheese, Italian, and French
Alcohol	Check with your doctor.

Heart Failure Sample 1-Day Menu

Breakfast	1 cup regular oatmeal made with water or milk 1 cup reduced-fat (2%) milk 1 medium banana 1 slice whole wheat bread 1 tablespoon salt-free peanut butter
Morning Snack	1/2 cup dried cranberries
Lunch	3 ounces grilled chicken breast 1 cup salad greens Olive oil and vinegar dressing (for greens) 5 unsalted or low-sodium crackers Fruit plate with 1/4 cup strawberries 1/2 sliced orange (for fruit plate) 1 peach half (for fruit plate)
Afternoon Snack	1/2 low-sodium turkey sandwich made with: 1 ounce low-sodium turkey 1 piece whole wheat bread
Evening Meal	3 ounces herb-baked fish 1 baked potato 2 teaspoons soft margarine (trans fat-free) (for potato) Sliced tomatoes 1/2 cup steamed spinach drizzled with lemon juice 3-inch square of angel food cake Fresh strawberries (2) (for cake)
Evening Snack	2 tablespoons salt-free peanut butter 5 low-sodium crackers

Notes

Appendix M

HF Medications, American Heart Association.

Healthcare Provider: Heart Failure Patient

HF Medications



The following list of medications is intended to assist healthcare providers in talking with their patients about the importance of medication adherence to treat heart failure. Use this list to guide your discussion.

Types of heart failure medications	What they do
ACE inhibitors	<ul style="list-style-type: none"> Relax blood vessels. Lower blood pressure and makes it easier for the heart to pump blood.
ARBs	<ul style="list-style-type: none"> Work in much the same way as ACE inhibitors and may be prescribed instead.
ARNIs	<ul style="list-style-type: none"> New class of medication that combines an ARB with a drug that helps the arteries open wider. Help the heart pump blood more efficiently. They also help the body rid itself of salt.
Aldosterone agonists	<ul style="list-style-type: none"> Help the body get rid of salt and fluids. Help reduce the work the heart has to do.
Blood thinners	<ul style="list-style-type: none"> Prevent blood clots from forming and blocking blood flow.
Beta blockers	<ul style="list-style-type: none"> Help slow the heart rate (how fast the heart beats) and help reduce blood pressure.
Calcium channel blockers	<ul style="list-style-type: none"> Help the heart relax more. Help control blood pressure and keep the heart from working so hard.
Digitalis (digoxin)	<ul style="list-style-type: none"> Sometimes used to strengthen the heart's pumping action.
Diuretics	<ul style="list-style-type: none"> Cause the body to rid itself of excess fluids and salt. Help reduce the work the heart has to do. Decrease the buildup of fluid in the lungs and other parts of the body, such as the ankles and legs.
Ivabradine	<ul style="list-style-type: none"> New class of medication that slows the heart rate and reduces blood pressure. It is sometimes prescribed for people for whom beta blockers don't reduce the heart rate enough.
Vasodilators	<ul style="list-style-type: none"> Widen the blood vessels, making it easier for blood to flow. Reduce strain on the heart.

Use this checklist to help your patients understand the importance of taking their medication.

- Take medications exactly as prescribed. Follow directions on the bottle carefully.
- Keep a list of all medications you take (including prescription and over-the-counter drugs, vitamins, supplements, and herbal remedies). Bring this list with you to all medical appointments. Also show it to your pharmacist when purchasing over-the-counter remedies. Some can interfere with your prescription medications.
- Refill your medications with plenty of time before they run out.
- Use a pill box to help you remember to take your medications and take them at the right times.
- Tell your healthcare provider if you have any side effects from the medications.
- Do not stop taking any medications on your own. Talk to your healthcare provider first.
- Ask your healthcare provider or pharmacist if you have any questions about your medications.

More Resources

The American Heart Association offers more to help your patients understand their diagnosis and treatment plan. Visit riseabovehf.org to access these resources.

[My Heart Failure Guide](#)

[Rise Above Heart Failure materials](#)

[Ejection fraction explained \(video\)](#)



American Heart Association | American Stroke Association
life.heart.org

American Heart Association. (n.d.). *Heart Failure Patient Education Checklist*. (Rise Above Heart Failure). Retrieved from http://www.heart.org/idc/groups/heart-public/@wcm/@hcm/documents/downloadable/ucm_492542.pdf

Appendix N

University Heart. *Common Medications for Heart Failure Patients.*

Common Medications for Heart Failure Patients

- Diuretics—help keep off fluid. Also known as water pills.
- ACE Inhibitors—reduce workload and help reduce heart remodeling. Remodeling is when your heart tries to get stronger by becoming bigger.
- Beta Blockers—reduce the work on your heart.
- Aldosterone Antagonists—help keep off fluid and reduce heart remodeling
- Digoxin—helps strengthen your heart
- Bidil (hydralazine/isosorbide)—helps your blood vessels relax. This makes it easier for your heart to pump blood.



Take Your Medicines Exactly as Directed

Common Medications for Heart Failure Patients

Diuretics

Common Diuretics include:

- Furosemide (Lasix)
- Torsemide (Demadex)
- Bumetanide (Bumex)
- Metolazone (Zaroxolyn)—may be added to one of the above

- Help you keep fluid off and make you make more urine.
- Help keep you out of the hospital if taken correctly.
- May make you feel thirsty. Limit yourself to the fluid intake recommended by your doctor.
- Your doctor will need to check labs on your kidneys (BUN and creatinine) and potassium levels from time to time.
- Let your doctor know if you have severe weakness, dizziness, or leg cramps.
- You need to weigh yourself daily. Call your doctor if you gain more than 2 pounds in a day or 5 pounds in a week.
- During warm weather, do not stay in the sun for prolonged periods of times. Being in the sun for long periods can increase the chance of fainting.

Common Medications for Heart Failure Patients

Ace Inhibitors

Ace Inhibitors help reduce heart remodeling. Remodeling is when your heart tries to get stronger by becoming bigger. While this sounds like a good idea, a bigger heart becomes weaker over time.

- Common ACE Inhibitors include:

Lisinopril (Zestril or Prinivil)	Trandolapril (Mavik)
Enalapril (Vasotec)	Fosinopril (Monopril)
Ramipril (Altace)	Benazepril (Lotensin)
Captopril (Capoten)	Quinapril (Accupril)
Moexpril (Univasc)	Perindopril (Aceon)

- Help you live longer! ACE Inhibitors have been proven to help heart failure patients reduce death risk by 20-40%.
- Lower blood pressure by relaxing your blood vessels.
- Let your doctor know if you develop a chronic cough as it might be caused by this medication.
- Get immediate medical attention if your tongue, lips, or face swell. This is a rare event called angioedema. If this does occur, it is usually within the first few doses.
- Your doctor will need to check labs on your kidneys (BUN and creatinine) and potassium level from time to time.

ARBs

ARB's are like ACE inhibitors. They are given when a patient cannot take an ACE inhibitor. ARB's include:

Candesartan (Atacand)	Irbesartan (Avapro)
Losartan (Cozaar)	Valsartan (Diovan)
Olmесartan (Benicar)	Telmisartan (Micardis)
Eprosartan (Tevetan)	

Common Medications for Heart Failure Patients

Beta-Blockers

Beta-blockers used in heart failure include:

- Carvedilol (Coreg)
 - Metoprolol Succinate (Toprol XL)
 - Bisoprolol (Zybetta)
- Help reduce the workload of your heart and slow your heart rate.
 - Have been proven to increase the lifespan of heart failure patients!
 - May make you feel tired, weak, or dizzy when first started. Your body usually adjusts to this over the first couple of weeks. Continue to take them as they will help you live longer.
 - For men: may make it more difficult to obtain an erection. Talk to your doctor if this occurs.
 - Talk to your doctor if you have asthma or diabetes.
 - Always take Coreg with food.

Aldosterone Antagonists

Two drugs are available: Spironolactone (Aladactone) or Eplerenone (Inspra).

- Work like a diuretic and an ACE inhibitor.
- Have been proven to help heart failure patients live longer.
- Your doctor will need to check labs on your kidneys (BUN and creatinine) and potassium levels especially during the first few weeks.
- Contact your doctor if: (Not a problem with eplerenone)
 - Men: you have breast tenderness or trouble getting an erection
 - Women: your menstrual cycle becomes irregular

Common Medications for Heart Failure Patients

Bidil (hydralazine/isosorbide)

Helps relax the blood vessels and reduces the workload of your heart.

- Works very well in African Americans and increases lifespan in these patients.
- Headache often occurs during the first few doses but it is usually not a problem after that.

Digoxin

Digoxin has several different names: Digitek, Lanoxicaps, Lanoxin, Digitalis. Be sure you are only taking one.

- Helps strengthen the heart and allows it to beat stronger.
- Can make you feel better and keep you out of the hospital.
- Do not take if your pulse is less than 60 beats per minutes. Ask your doctor or nurse how to take your pulse.
- Let your doctor know if you experience any of the following:
 - Loss of appetite or unexpected weight loss
 - Nausea or vomiting
 - Changes in vision, especially bluish/yellowish halos
 - Dizziness or rapid heart beats

University of Mississippi Health Care. (n.d.). *Heart failure patient education* (p. 12-17).

Retrieved from

https://www.ummhealth.com/uploadedfiles/umhccom/health_care_services/heart/adult/cardiac_wellness_and_management/heart%20failure%20patient%20education%20booklet.pdf

Appendix O

Medications to Avoid, University Heart

Medications to Avoid

- Do not take any pills for pain except Tylenol (acetaminophen). Do not take more than a total of 4,000 mg daily.
- Avoid all other over-the-counter pills for pain as they can cause you to gain fluid.
- Medications to **AVOID**:

Brand Name	Generic
Advil, Motrin	ibuprofen
Aleve	naproxen
Orudis	ketoprofen
BC Powder	Contains aspirin
Excedrin	Contains aspirin

- Do not take any herbal medications without the approval of your doctor or pharmacist.
- Do not take any aspirin in addition to what is prescribed by your doctor.



Appendix P

Sodium Log Sheet

Sodium Intake Log				
	Food	Serving Size	Calories	Sodium (mg)
Meal 1				
Meal 2				
Meal 3				
Meal 4				
Meal 5				
Meal 6				
Total				

Retrieved from <http://www.makeoverfitness.com/images/sodium-intake-log-sheet.jpg>

Appendix R

Collection Data Sheet

	A	B	C	D	E	F	G	H	I	
1		Demographics & Readmission								
2		1 = High School Diploma 1 = Less than 25K 1 = Employment insurance 2 = Some college, no degree 2 = 25K - 49,999 3 = Associate degree 3 = 50K - 74,999 2 = Medicare 4 = College's degree 4 = 75K - 99,999 3 = Medicaid 5 = Post-college degree 5 = 100K+ 4 = Self-payment 0 = No 0 = No 30_day_ readmission 1 = Yes 1 = Yes 0 = Never 1 = Former 0 = No 1 = Current 1 = Yes								
3	unique identifier	Household Income Diabetes M Smoking								
4	patient_id	Education								
5										
6										
7										
8										

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1		Pre-Intervention																							
2		0 = did not recognize it 1 = not quickly 2 = somewhat quickly 3 = Quickly 4 = Very quickly NA = did not have the symptoms 1 = not likely 2 = somewhat likely 3 = likely 4 = very likely 0 = did not try anything 1 = not sure 2 = somewhat sure 3 = sure 4 = very sure 0 = not confident 1 = somewhat confident 2 = very confident 3 = extremely confident																							
3	unique identifier	q1	q2	q3	q4	q5	q6	q7	q8	q9	q10	q11	q12	q13	q14	q15	q16	q17	q18	q19	q20	q21	q22	q23	
4	patient_id																								
5																									
6																									
7																									
8																									

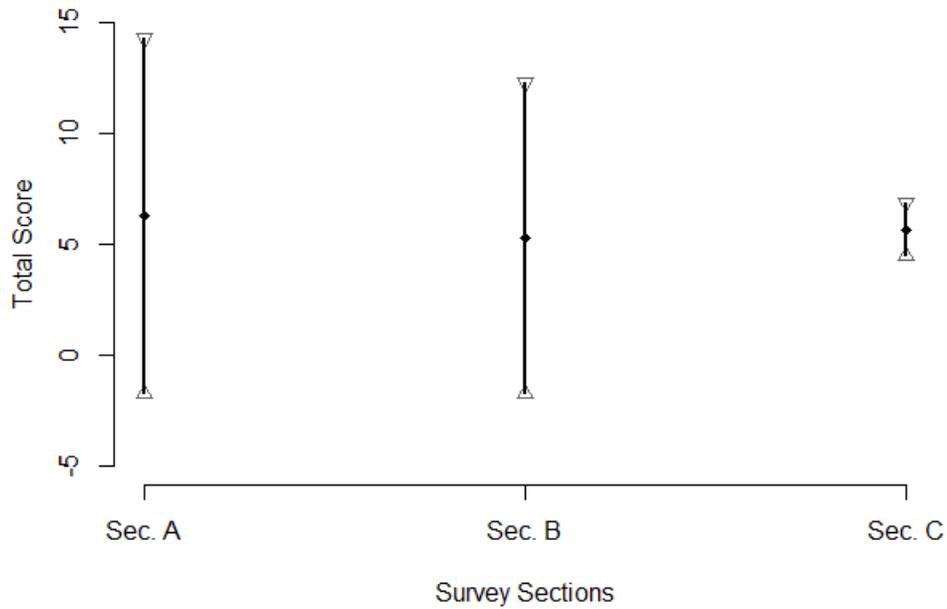
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1		Post-Intervention																							
2		0 = did not recognize it 1 = not quickly 2 = somewhat quickly 3 = Quickly 4 = Very quickly NA = did not have the symptoms 1 = not likely 2 = somewhat likely 3 = likely 4 = very likely 0 = did not try anything 1 = not sure 2 = somewhat sure 3 = sure 4 = very sure 0 = not confident 1 = somewhat confident 2 = very confident 3 = extremely confident																							
3	unique identifier	q1	q2	q3	q4	q5	q6	q7	q8	q9	q10	q11	q12	q13	q14	q15	q16	q17	q18	q19	q20	q21	q22	q23	
4	patient_id																								
5																									
6																									
7																									
8																									

Appendix S

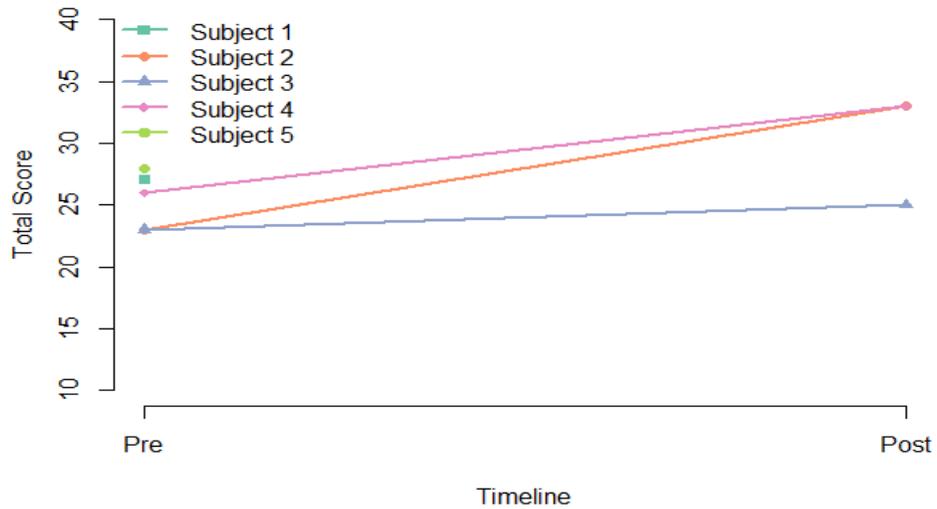
Descriptive Statistics: Characteristics of the Sample (Figures)

Statistical Graphs

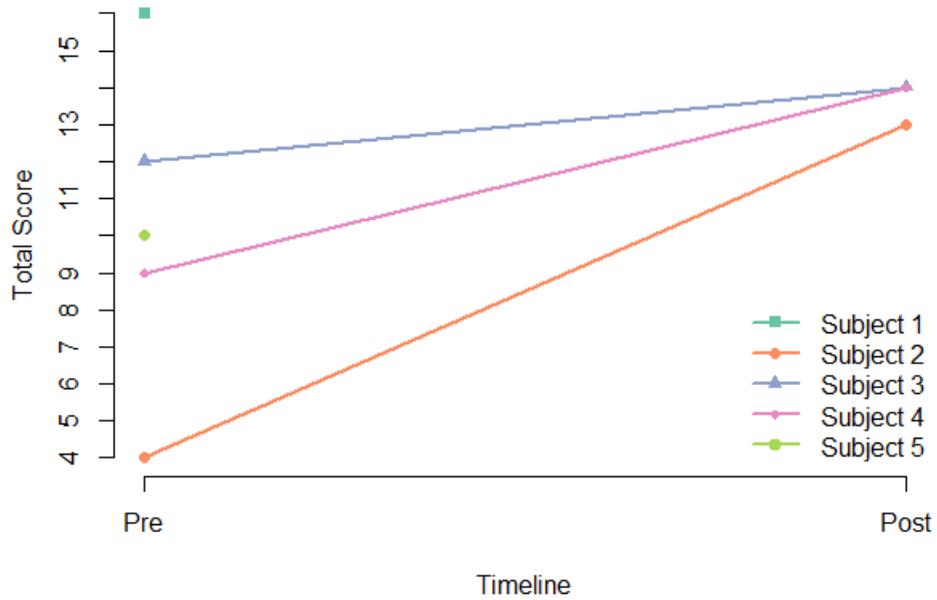
**Heart Failure Pre and Post Intervention
Overall scores of the 3 main sections of the SCHFI V6.2**



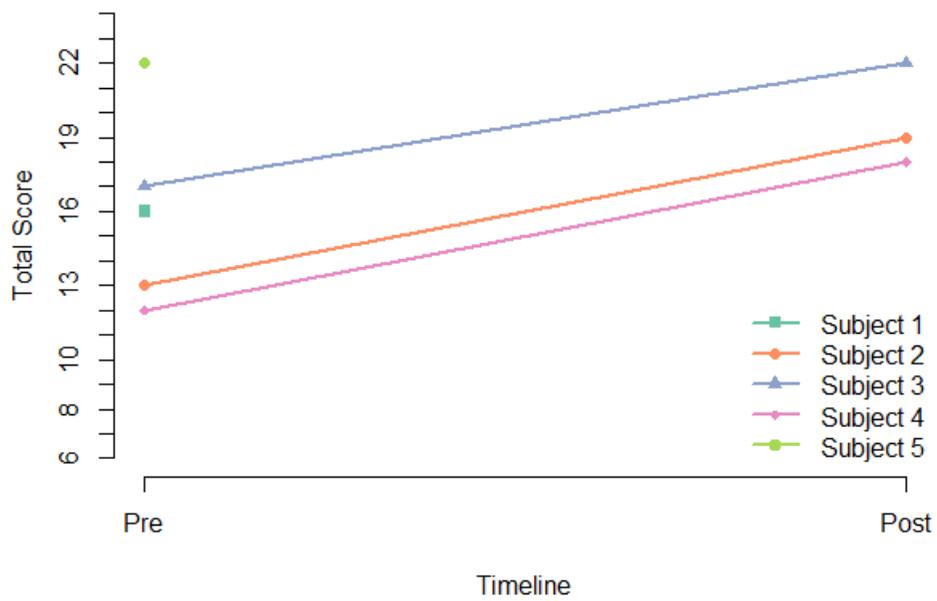
**Heart Failure Pre and Post Intervention
Section A score by individual**



**Heart Failure Pre and Post Intervention
Section B score by individual**



**Heart Failure Pre and Post Intervention
Section C score by individual**



Appendix T

Descriptive Statistics: Characteristics of the Sample (Tables)

Table 1: Summaries of total scores per section. Due to the small sample size no statistical inference can be made.

Results of Section A, B and C

Variable	count	min	q1	median	mean	q3	max	sd
Section A								
Pre-intervention	5	23	23	26	25.4	27	28	2.3
Post intervention	3	25	29	33	30.3	33	33	4.6
Difference post-pre	3	2	4.5	7	6.3	8.5	10	4.0
Section B								
Pre-intervention	5	4	9	10	10.2	12	16	4.4
Post intervention	3	13	13.5	14	13.7	14	14	0.6
Difference post-pre	3	2	3.5	5	5.3	7	9	3.5
Section C								
Pre-intervention	5	12	13	17	17.4	22	23	5.0
Post intervention	3	18	18.5	19	19.7	20.5	22	2.1
Difference post-pre	3	5	5.5	6	5.7	6	6	0.6

Appendix U

DNP Approval Letter

DNP Project Approval Template for the Graduate Nursing Department Review Committee

Student completes the top portion only

Student ID number: 1000903249

Project Title: Heart Failure Education to Improve Self-care and Reduce Hospital Readmission

Project Summary (Brief): The Purposed evidence based project will assess the benefit of offering heart failure education in an educational bundle, and monitor the benefit of improving heart failure self-care behavior management and the benefit in reducing hospital re-admission

Setting: The project will be conducted in an out-patient clinic on the campus of a small 177 bed not-for-profit hospital campus in a central United States rural area.

Population: Adult patients (male or female), 18 years or older with systolic or diastolic HF with an ejection fraction (EF) of less than 40%, and a New York Heart Association class II to IV.

Committee Use Only

The results will be disseminated, but they are not generalizable knowledge. The results will include use of the most current research to translate the knowledge into practice, thus it is not new generalizable knowledge. Agree Disagree

This project is a quality improvement _____ or evidence-based project and will translate the knowledge into the clinical setting. It is not generalizable because it is not generated from a research study that is being conducted.

Yes No This project is not considered Human Subjects Research and does not require IRB HSR review.

This quality improvement project did not satisfy the *definition of research* under 45 CFR 46.102(d). Therefore, it was not subject to the Health and Human Services regulations for the protection of human subjects in research (45 CFR part 46, 2009) or require Institutional Review Board approval.

I recommend approval of this QI project

I recommend approval of this EBP project

use Jessica M. [Signature]

or

I do not recommend approval of this project for the following:

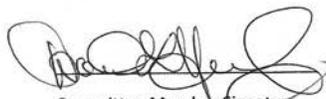
I recommend the student send this project to the University IRB for review

Reason:

I do not recommend this project to be implemented

Reason:

GNRC Form 1: January, 2017


Committee Member Signature

5/12/2017
Date

Appendix V

Copyright Permission requests

Copyright Request email for the Iowa Model

From: Titler, Marita <mtitler@med.umich.edu>
Sent: Monday, April 30, 2018 5:46:50 AM
To: Griffin, Vicki
Subject: [EXTERNAL] RE: Permisson to use the Iowa Model

** WARNING: This email originated outside of AHS. ** DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

Yes you can use it

Marita G. Titler, PhD, RN, FAAN
Rhetaugh Dumas Endowed Chair
Department of Systems, Populations and Leadership
University of Michigan School of Nursing
[400 North Ingalls, Suite 4170](#)
[Ann Arbor, Michigan 48109-5482](#)
734-763-1188

From: Griffin, Vicki [mailto:]
Sent: Thursday, April 26, 2018 6:15 PM
To: mtitler@umich.edu
Subject: Permisson to use the Iowa Model

Dr. Milter:

My name is Vicki Griffin and I am a DNP student at the University of Texas At Arlington. I am currently working on my evidence-base project and I would like to request permission to use the Iowa Model for my project, if by chance I ever publish the study. My project is on HF education to improve self-care and reduce hospital readmission.

If permission is granted, I will need a letter to add to my final dissertation.

Thank you

Copyright Permission Letters

Copy of E-Mail Granting Permission To Use The SCHFI Self-Care Assessment Tool

Reigel, BarbaraFeb 28
Feb 38
To meFeb
28

Hello Vicki, you are welcome to use the SCHFI for your DNP project. I make my instruments freely available on my website shown below. You can use this email as my formal permission for use. Good luck with your project.

Barbara Riegel, PhD, RN, FAHA, FAAN
Professor and Edith Clemmer Steinbright Chair of Gerontology
University of Pennsylvania, School of Nursing
Claire M. Fagin Hall, [418 Curie Boulevard](#)
[Philadelphia, PA 19104-4217](#)
briegel@nursing.upenn.edu
[215-898-9927](tel:215-898-9927) Phone
[240-282-7707](tel:240-282-7707) eFax
Editor, The Journal of Cardiovascular Nursing
<http://journals.lww.com/jcnjournal/pages/default.aspx>
<http://self-care-measures.com/>
Professorial Fellow, Mary MacKillop Institute for Health Research, Melbourne, Australia

From: VICKI GRIFFIN**Subject:** Permission to use SCHFI V 6.2

to briegel

Good evening Dr. Riegel:

My Name is Vicki Myers-Griffin. I am DNP student at the University of Texas at Arlington. I am currently working on my DNP project on heart failure education to improve self-care and reduce 30-day hospital readmission. I am writing to request written permission to use the Self-care of Heart Failure Index questionnaire V6.2 for my DNP project. If permission is granted I will require a formal letter stating permission to use the SCHFI for future publishing.

If you have any questions or concerns regarding my request. Please feel free to contact me by email or phone

Thank you,

Vicki Myers-Griffin, MSN, APRN, FNP-BC

Requests to use log sheets

MakeOverFitness <makeoverfitnessinfo@gmail.com>

pr 27 (3
days
ago)
A

to me

You have permission to use the images, downloads, pdf and word files from the follow links <http://www.makeoverfitness.com/meal-log-sheets> . It includes the meal log templates and sodium intake log sheet.

Clinton Walker III
Makeoverfitness LLC.

VICKI GRIFFIN < >

Apr 29
(1 day
ago)

to MakeOverFitness

Mr. Walker Thank you for the responds. My advisor at my UTA DNP program would like to know if you can place this in a letter format and send to me by email. Keep what you put in the email but adding I have copy right permission to reuse the forms in my DNP paper if ever published.

I hate to keep bugging you, but it is all about the legality.

Thank you

Permission to use the Fluid Tracking Form in Paper request.

VICKI GRIFFIN < >

Apr 27 (4
days ago)

to dpo

To Whom this may Concern:

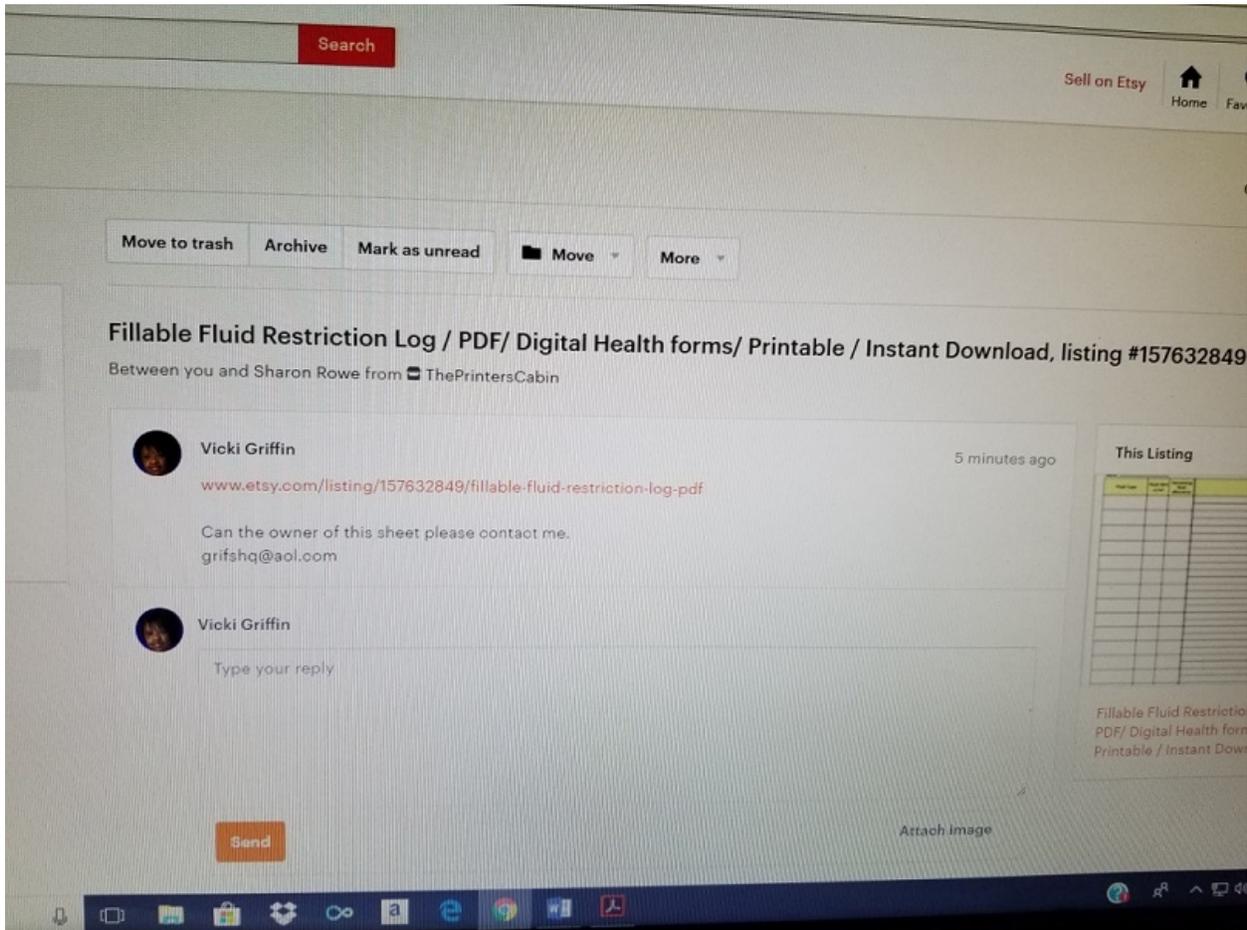
I used a Fluid intake tracking log sheet from your website for a heart failure class I am teaching for my doctorate degree project. Since I used the form for my HF project, I will need to include the form in my paper, which may be subject to copy right laws if published. Please let me know if grant permission for me to re-publish this form in my dissertation, which may be published in the future on the University Web-site. I ordered the form from your web-site, but I am not sure who created the form.

The website/online store where I got the form

<https://www.etsy.com/listing/157632849/fillable-fluid-restriction-log-pdf>

Please reply ASAP,

Thank you



Permission request to use the teaching tool for Medications and Pathology of HF patient teaching tool.

Patricia Freeman

2:03 PM (8
hours ago)

to me

Vicki,

I am working with the legal department and compliance on a letter.

Thanks,

Tricia

Patricia Freeman BSN, RN
Manager of Clinical Outcomes and Analysis
University Transplant/University Heart
University of Mississippi Medical Center
[2500 North State Street](#)
[Jackson, MS 39216](#)
[Office 601-815-1304](#)
pfreeman@umc.edu

Mike:

per our phone conversation. Thanks for helping me with this.

My Name is Vicki Griffin and I am DNP student at the University of Texas at Arlington. My project is on Heart Failure Education to improve self-care and reduce hospital readmission. I am offering HF classes at a local 177 bed hospital in central Texas. The pharmacist who assisted me with the classes likes your HF teaching tool. She used the medication section and several other sections from your teaching tool for class. The teaching tool is great, but the problem I have encounter is concerns for copy right laws if the evidence-based paper is ever published. I would need your permission to list the teaching tool that I used in the appendices of the paper, and if ever published. But, I am not sure who to contact to assistance me with this matter. I would need a formal letter emailed to me granting permission to use to list in the finial paper. Please let me know who can contact to use the great teaching tool.

I have attached the website the information was downloaded from off the internet below.

https://www.ummchealth.com/uploadedfiles/umhccom/health_care_services/heart/adult/cardiac_wellness_and_management/heart%20failure%20patient%20education%20booklet.pdf

Thank you,

Vicki Griffin

254-541-5504

Vickigriffin54@gmail.com

Request sent to the Academy of Nutrition and Dietetics for the tools used by the dietitian for the class.

Apr 29 (1 day ago)

VICKI GRIFFIN <vickigriffin54@gmail.com>
to permission

To Whom this may concern:

I am requesting copy write permission to use the requested form list on my application for my Doctorate of Nurse Practitioner degree.

My DNP project was on Heart Failure Education Bundle to Improve Self-care and Reduce Hospital Readmission. I offered HF education to patients with HF with 1 or more 30- day hospital readmission. The dietitian who help to teach the nutritional part of the classes used your teaching tools on Heart Failure Nutrition Therapy and Heart Healthy Eating label reading Tips, which was fine the tool were great, the problem I cannot included the material in my dissertation without copy right permission, which my DNP adviser informed me of. Even thought at the bottom of the page it says the handouts can reduplicated for client education. If my paper is published or if I include the teaching tools in my paper. I will need copyright permission.

The information will not be sold, and the University may post for free to the DNP dissertation website of the University to be reviewed by nursing students and other nursing programs.

Please call or e-mail me if you have any questions.

Thank you so much and I hope to hear from you soon. I have attached the copy right permission form.

Request Sent to the American Heart Association requesting copyright permission for the tools used for the HF class.

