

Daily Checklist: A Visual Aid to Increase Self-Efficacy in Congestive Heart Failure Patients

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A Project presented to the faculty of
The University of North Carolina at Chapel Hill
in fulfillment of the requirements for
Undergraduate Honors

Date Completed: April 10, 2014

Honors Advisor Approval: _____
Honors Advisor

Abstract

Congestive heart failure (CHF) is a chronic condition that requires daily management by those affected. Readmission and mortality rates are high for congestive heart failure patients (Yancy et al., 2013). Additionally, CHF affects the health related quality of life (HRQOL) experienced by those impacted (Yancy et al., 2013). The health care costs for treatment, hospital readmissions, and management of CHF are very expensive and they are a burden to the health care system (Yancy et al., 2013). Current strategies to increase patient self-management of CHF have not proven sufficient to lower the rate of readmissions and the associated costs (Bradley et al., 2012). In addition to the current methods used to decrease readmission rates, the Daily Checklist should be given to patients upon diagnosis of CHF or before discharge from the hospital. The Daily Checklist which includes medications, exercise, daily weight, and sodium (salt) will help patients remember what steps they must take each day to control their CHF, reduce their symptoms, and prevent readmissions for exacerbations. This will increase the patient's self-efficacy (confidence) in their ability to manage their CHF on their own and activate their motivation to perform self-care behaviors (Shively et al., 2013). The expected outcome of the Daily Checklist is increased self-efficacy and self-management of CHF, decreased hospital readmissions and early mortality, and reduced health care costs associated with managing CHF patients.

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Introduction

Congestive heart failure (CHF) increases a person's risk for hospital admission and mortality. Each year over 650,000 new cases of CHF are diagnosed. Mortality rates for those with CHF are approximately 50% within 5 years of diagnosis (Yancy et al., 2013). From 1993 to 2005 post discharge mortality rates rose from 4.3% to 6.3% (Yancy et al., 2013). As the United States (U.S.) shifts toward an older demographic population the number of people living with heart failure will also increase (Yancy et al., 2013). One in nine death certificates mention heart failure and approximately 75 of all cardiovascular deaths are due to CHF (Yancy et al., 2013). This information highlights the need to improve strategies that will allow patients to cope with their CHF in order to prevent early mortality caused by poor self-management.

Over one million people are admitted to the hospital each year with the primary diagnosis of heart failure (Yancy et al., 2013). CHF is also the number one reason for hospitalization in persons over the age of 65 in the United States (Lambrinou, Kalogirou, Lamnisos, & Sourtzi, 2012). Visits to primary care providers due to CHF in 2013 cost 1.8 billion dollars (Yancy et al., 2013). One alarming statistic is that one fourth of all patients hospitalized for heart failure are readmitted within 30 days. The estimated cost from Medicare reimbursement for hospital readmissions is 17 billion dollars yearly (Bradley et al., 2012). The total cost of CHF in America is over 30 billion dollars annually. This figure includes the cost of medications, health care services, and loss of productivity (Yancy et al., 2013). One study found that CHF readmissions were common after a patient was first diagnosed, 83% of patients were hospitalized once and 43% were hospitalized at least 4 times (Yancy et al., 2013). Treatment for CHF exacerbations is very costly. High readmission rates following discharge show that there is a need for a different

solution to prevent the readmission of CHF patients (Bradley et al., 2012). Current solutions include: patient centered discharge teaching, follow-up telephone calls, patient education on medications, increased coordination between hospitals and primary care providers, and home visits (Bradley et al., 2012). While these strategies should be continued in an effort to decrease readmission rates, mortality rates, and the financial burden on the health care system they are not sufficient on their own. Therefore, additional strategies are also needed (Bradley et al., 2012).

In conjunction with the current methods to reduce high CHF readmission rates, a visual aid should be given to each patient upon discharge to act as a reminder about what they can do to manage their chronic disease. The Daily Checklist will allow patients to indicate, throughout the day, if they have taken their CHF medications, exercised, weighed themselves, and how much sodium they have consumed. The checklist will ideally be located somewhere in the patient's home that they visit frequently throughout the day, such as on the refrigerator. By placing the Daily Checklist in a frequently visited area of their home this will allow for maximum daily exposure to help increase the patient's self-efficacy (confidence) in managing their CHF.

Background

There are several factors that increase an individual's risk of developing CHF. African Americans who are forty years of age or older have a 20% chance of developing CHF during their life (Yancy et al., 2013). Caucasian women have the lowest incidence of CHF and African American men have the highest incidence (Yancy et al., 2013). CHF prevalence in African American males and females is 4.5% and 3.8% respectively; CHF in Caucasian males and females is 2.7% and 1.8% respectfully (Yancy et al., 2013). African Americans have a higher 5 year mortality rate than Caucasians (Yancy et al., 2013). The incidence of developing CHF increases with age. Approximately 5.1 million people in the United States have clinical

manifestations of CHF and this number is increasing. Those who are eligible for Medicare have had an increase in the prevalence of CHF from 9% in 1994 to 12.1% in 2003 (Yancy et al., 2013). By 2050 one in five Americans will be age 65 or older. Since the prevalence of CHF is highest in this population the number of Americans suffering from CHF is expected to increase (Yancy et al., 2013).

As mentioned previously, CHF is a condition most often found in adults over the age of 65 (Hallerbach et al., 2008). The prevalence of CHF increases as a person ages and the risk of developing CHF doubles each decade over age 65 (Gallegher, 2010). Research has found that there are several factors that can predict a patient's susceptibility for readmission after discharge from the hospital for CHF. One predictor is multiple comorbidities that can be measured through the Charlson Comorbidity Index. Other predictors include: noncompliance with medications, diet, and exercise, medication discrepancies such as a change in medications from pre-hospitalization to post hospital discharge, the lack of a cardiology consult during admission to the hospital, receiving Medicare, living alone, and also having pulmonary hypertension (Hallerbach et al., 2008).

CHF can severely impact a patient's health related quality of life (HRQOL) and functional status. When HRQOL does not improve for patients their chances of readmission and mortality are increased (Yancy et al., 2013). Men with CHF have a better HRQOL than women with CHF. Other factors that contribute to a poorer HRQOL include: younger age, higher BMI, depression, lower systolic blood pressure, greater symptom burden, low perceived control, sleep apnea, and uncertainty about prognosis (Yancy et al., 2013). Problems with memory can also lead to poorer HRQOL. Currently the only therapies that have been found to improve HRQOL are cardiac resynchronization therapy (pacemaker implantation) and disease management and

education approaches. Self-care and exercise may improve HRQOL. HRQOL is an important factor determining readmissions to the hospital for exacerbations and increased risk for mortality. Since increased self-care by the patient and exercise can improve HRQOL it is important that these interventions are taught to the patient as key factors for managing their illness (Yancy et al., 2013). The goal of the Daily Checklist is to improve the patient's ability to perform self-care activities, one of which is exercise. Therefore, by giving the checklist to patients they will be less likely to be readmitted to the hospital and have early mortality due to their CHF.

Literature Review

In order to understand CHF it is important to know the pathophysiology behind the condition, how major geriatric syndromes make it difficult for patients to manage their CHF, and how patient noncompliance can lead to increased hospital readmissions and mortality. It is also necessary to understand the current recommendations by The American College of Cardiology Foundation/ American Heart Association Task Force (ACCF/AHA) as well as other credible sources concerning medications, exercise, daily weight management, and sodium restrictions. To understand why the Daily Checklist is important it is also imperative to comprehend how external memory aids and mnemonics increase the likelihood of a patient performing self-management strategies.

Congestive Heart Failure Pathophysiology

CHF occurs due to structural or functional impairment of ventricular filling or the ejection of blood. Clinical manifestations include dyspnea and fatigue (Yancy et al., 2013). CHF “may result from disorders of the pericardium, myocardium, endocardium, heart valves, great vessels, or due to certain metabolic abnormalities, but most patients with heart failure (HF) have

symptoms due to impaired left ventricular (LV) myocardial function” (Yancy et al., 2013, p. 246- 247).

Major Geriatric Syndromes

One study found that patients who presented to the hospital with at least one major geriatric syndrome (MGS) had an increased risk for 12-month mortality and readmission following discharge. This study defined major geriatric syndromes as having one of the following conditions: cognitive impairment, severe functional dependence, depression, or frailty upon admission. Other geriatric conditions that were also analyzed were mobility impairment, recurrent falls, urinary incontinence, hearing and visual impairments, as well as coexisting acute diseases (Sanchez, Vidan, Serra, Fernandez-Aviles, & Bueno, 2011). This study went on to find that having at least one MGS on admission in conjunction with CHF was associated with a greater chance of not only readmission but also, functional decline, and a need for more social support 12 months after discharge (Sanchez et al., 2011). As one ages they are more at risk for MGSs and since most patients diagnosed with CHF are over the age of 65 they are a population who is at increased risk for having MGSs in concurrence to their diagnosis of CHF. MGSs can affect the ability of the patient to manage their CHF and thus they can be a factor in the high readmission rates in the CHF population.

Noncompliance

Noncompliance with their medical treatment plan is a leading factor for high readmissions and it can be prevented (Lambrinou et al., 2012). Comprehensive discharge planning which includes education and information on transition care are key components of enabling the patient to take control of their health (Lambrinou et al., 2012). Discharge planning and teaching is not consistent across facilities or even units within the same facility. Also,

teaching is often not tailored to each patient's individualized risk factors for readmission.

Discharge teaching can also be rushed due to the need for an open room for a new admission or due to the patient's wishes to go home as soon as possible. These factors can cause the patient to receive inadequate information on how to manage their CHF once they are out of the hospital therefore, leading to an increased risk of the patient being readmitted for a CHF exacerbation (Hallerbach et al., 2008).

In order to reduce factors that influence readmission rates such as noncompliance with disease management routines, education provided to patients needs to come in multiple forms. Different forms could include video, oral, written, or role playing (Hallerbach et al., 2008). It is important to involve the patient in the planning process to improve the likelihood of their involvement in the treatment plan and to determine what learning style they prefer (Inott & Kennedy, 2011). Education given to the patients should explain how, to manage their CHF and how by following their treatment plan they can expect to see a reduction in their CHF symptoms. Patients should feel empowered by the education they receive and understand that they play a key role in preventing exacerbations and reducing their symptoms because adult learners are motivated by their personal "need to know" information (Inott & Kennedy, 2011). Adult learners must be able to understand how the information about managing their CHF relates to the symptoms they experience in order to feel as though their disease is manageable and that they have control over their disease (Inott & Kennedy, 2011). It is also important to note that the educator should assess the patients reading level before selecting materials for them to take home about managing their illness. The average American reads at an eighth to ninth grade reading level. One in five Americans reads at a fifth grade level or lower. Education level does not reflect

literacy. Therefore, all materials designed for patients should be at or below a fifth grade reading level (Inott & Kennedy, 2011).

As mentioned previously, effective teaching must elicit activation of the patient's self-efficacy (motivation) to perform self-management tasks. It is imperative to identify interventions that assist those with CHF to practice optimal self-management strategies due to the progressive nature of the disease, the costs of readmission, the risk for early mortality, and the impact CHF has on their HRQOL (Gallegher, 2010). Patient activation is defined as having the information, behavioral skills, and motivation that is necessary to manage a chronic illness, access appropriate care, maintain functioning, and collaborate with healthcare providers (Shively et al., 2013). Providing new ideas on ways to increase patient activation as it pertains to disease management and self-efficacy is a promising direction that could possibly improve outcomes for CHF care (Shively et al., 2013). A key component to patient activation is self-efficacy which can be defined as the confidence the patient has in their abilities to develop skills that will allow them to manage their CHF. Patients who have a confidence in their ability to manage their disease are more likely to consistently follow their management regimes, even when the demands of the disease are chronic and increase over time (Gallegher, 2010).

One study found that the self-care behaviors most frequently reported by patients with CHF included: exercising, following a low sodium diet, daily weights, and taking their medications (Barnason, Zimmerman, Young, 2011). This study revealed that patients who performed self-management skills routinely in response to signs and symptoms had fewer hospital readmissions. For example, increasing weight led to actions such as taking an extra diuretic pill (Barnason, 2011). The study determined that the factors that could adversely impact self-care were the patients' psychosocial status (depression, lower self-efficacy, less formal

education etc.), having an increased number of symptoms, lower health literacy, age related changes (cognitive and sensory impairments, reduced functioning), and less experience navigating the healthcare system (Barnason, 2011). It was also determined that there were factors that could increase self-care. These factors included: increased levels of mental and physical functioning, social support, and higher levels of education (Barnason, 2011). When determining ways to increase patient self-efficacy and disease management it is important to tailor the intervention to the unique needs of the client and determine the factors that can help promote and adversely affect their ability to manage their CHF.

ACCF/AHA Recommendations

Literature shows that the key components of managing heart failure include: medications, exercise, daily weighing, and reducing the amount of sodium in the patient's diet (Group Health Cooperative, 2014). The American College of Cardiology Foundation/ American Heart Association Task Force (ACCF/ AHA) classifies CHF patients based on risk factors and cardiac structural abnormalities. There are four categories (A, B, C, and D). Progression to the next stage indicates a higher risk of mortality in the next 5 years and an increase in plasma natriuretic peptide concentrations. The stage the patient falls into determines the recommendations for their treatment (Yancy et al., 2013).

Stage A. Patients in Stage A heart failure are recommended to take medications to reduce hypertension and disorders that cause elevated lipids (Yancy et al., 2013). Drug therapy that has been recommended for this group to control hypertension includes: diuretics, angiotensin-converting enzyme inhibitors (ACE inhibitors), angiotensin II receptor blockers (ARBs), and beta blockers. To treat elevated lipid levels, cholesterol lowering medications, often referred to as statins, are recommended. ACE inhibitors are also recommended (Yancy et al., 2013).

Patients in this stage are also recommended by the ACCF/ AHA to consume less than 1,500 mg of sodium per day (Yancy et al., 2013).

Stage B. Patients in Stage B are recommended to be on an ACE inhibitor. If they cannot tolerate an ACE inhibitor then ARBs are recommended to prevent symptomatic CHF and to reduce the mortality risk. Anyone in Stage B heart failure who has a history of myocardial infarction (MI) or acute coronary syndrome (ACS) which reduces blood flow to the heart and reduces their ejection fraction (EF) should be on a beta blocker(s) to decrease their risk for mortality. Also, patients in this stage who have a history of MI or ACS should be placed on a statin to prevent cardiovascular events such as future MIs and to prevent symptomatic CHF. ACE inhibitors or ARBs and beta blockers are recommended for all patients with a reduced EF to prevent symptomatic CHF. Diuretics and calcium channel blockers may also be indicated for patients in Stage B (Yancy et al., 2013). Patients classified in this stage may need an implantable cardioverter defibrillator (ICD) to prevent sudden cardiac death (Yancy et al., 2013). Patients in this stage of CHF are also recommended by the ACCF/ AHA to consume less than 1,500 mg of sodium per day (Yancy et al., 2013).

Stage C. CHF patients categorized as Stage C have some of the same drug therapy treatment recommendations as those classified in Stages A and B. Diuretics are strongly recommended for Stage C CHF patients with a reduced or normal EF. ACE inhibitors are recommended or an ARB if they do not respond to ACE inhibitors. An ARB may also be added in conjunction to an ACE inhibitor and beta blocker for those who are symptomatic with or without a reduced EF (Yancy et al., 2013). Beta blockers are recommended for CHF patients who are currently or have previously been symptomatic and who do or do not have a reduced EF. Aldosterone receptor antagonists are recommended for patients in this stage who have had an MI

and now have an EF of 40% or less and those that have diabetes mellitus (Yancy et al., 2013). African American patients should be prescribed hydralazine and isosorbide dinitrate if they have CHF and a reduced EF. Hydralazine and isosorbide dinitrate are also indicated for patients with symptomatic CHF and reduced EF who cannot take ACE inhibitors or ARBs due to hypotension, drug intolerance, or renal insufficiency (Yancy et al., 2013). Digoxin can be prescribed for CHF patients with a reduced EF. Patients with CHF who have atrial fibrillation are recommended to take an anticoagulant to prevent cardioembolic strokes. Statins are not beneficial at this stage if they are prescribed solely due to a CHF diagnosis. Calcium channel blockers are also not recommended for routine treatment of Stage C CHF. Omega-3 polyunsaturated fatty acid supplements are recommended for patients with or without a reduced EF (Yancy et al., 2013).

Patients in Stage C CHF should receive education regarding the self- management of their CHF. This education should include how to restrict their sodium, monitor their weight and symptoms, take their medications, and ways to stay physically active (Yancy et al., 2013). There are not specific recommendations by the ACCF/ AHA about how much sodium a person in Stage C CHF should have. However, the ACCF/ AHA states that clinicians should consider recommending that sodium be restricted to less than 3,000 mg per day (Yancy et al., 2013). The ACCF/ AHA also recommend that patients with CHF should participate in regular physical activity to improve their functional status. They also state that cardiac rehabilitation in stable patients can improve their level of functioning, HRQOL, ability to exercise longer, and decrease their risk of mortality and hospitalization (Yancy et al., 2013). Continuous positive airway pressure (CPAP) can be helpful in patients with a decrease left ventricular EF who have sleep apnea (Yancy et al., 2013). At this point in the disease process an implantable cardioverter defibrillator (ICD) or cardiac resynchronization therapy (CRT) may be recommended for those

patients who meet the criteria for such devices (Yancy et al., 2013). Cardiac revascularization may also be needed for those who meet specific criteria (Yancy et al., 2013).

Stage D. In this stage of congestive heart failure patients have severe symptoms despite the use of maximum treatment efforts mentioned for stages A, B, and C. These patients are recommended to receive short term intravenous inotropic medications when hospitalized. Long term treatment with intravenous inotropic medications is only indicated for palliative care purposes. These patients should be on fluid restrictions of 1.5-2 per day. As with Stage C CHF, Stage D also does not have specific recommendation by the ACCF/ AHA for how much of a sodium restriction the patient should be on. However, like Stage C the ACCF/ AHA recommends the clinician consider instructing their patient in Stage D to consume less than 3,000 mg of sodium per day (Yancy et al., 2013). These patients are recommended to receive mechanical circulatory support if they are expected to recover or have a planned cardiac transplant. Ultimately, cardiac revascularization or transplantation is needed at this stage of CHF to prevent mortality (Yancy et al., 2013).

The AACF/ AHA also recommend that certain information be discussed with all CHF patients during hospitalization, before discharge, and at all follow up visits. The first recommendation is to initiate guideline directed medical therapy which are the recommendations made by the AACF/ AHA. The second recommendation is to discuss precipitating factors to CHF, barriers that could impact the patient's transition to caring for themselves on their own, and any issues with post-discharge support. Next the patient's volume status should be assessed along with assessing for orthostatic hypotension. The clinician should titrate the patient's medications to optimize their benefits and assess renal function and electrolyte balances. Comorbidity conditions should also be assessed. The clinician must also reinforce education on

CHF, what the patient needs to do to manage their care, the importance of adherence to their CHF management plan, and what to do in emergency situations. Those patients who are candidates for palliative care should be informed about this service. Finally, it is recommended that those who are at high risk for hospital readmission should be followed by a multidisciplinary team and become enrolled in a disease-management program (Yancy et al., 2013).

Medication Recommendations

The ACCF/ AHA recommendations thoroughly describe medications that are prescribed to patients at each stage of CHF. Similarly, other articles show that the medications mentioned in the ACCF/ AHA recommendations are appropriate for CHF patients. MedlinePlus not only describes the medications that CHF patients may be prescribed but it also gives a simple description as to what they do to control a patient's CHF and common side effects. The article describes that some medications may only be prescribed to be taken once daily while others could be needed two or more times per day. It also advises patients to take their medications at the time prescribed by their doctor and to never stop taking their medications, alter their dosage, or start taking any new medications without consulting their doctor first (National Institutes of Health [NIH], 2013). The first medications mentioned are ACE inhibitors and ARBS. These medications work by opening up blood vessels which helps lower blood pressure (NIH, 2013). Beta blockers are also listed, which act to slow down the heart rate and decrease the forces used by the heart to contract. Diuretics help to rid the body of excess fluid. The article also advises that regular blood work will need to be taken while on a diuretic to measure kidney function and potassium levels. Some patients with heart disease may be prescribed aspirin or Plavix to prevent blood clots from forming that can cause a stroke or MI. Another drug that can be prescribed to prevent blood clots is Warfarin. Less commonly used drugs for heart failure include: digoxin,

which increases the hearts contractility while reducing pulse rate, hydralazine and nitrates to open arteries up, and calcium channel blockers to control blood pressure or angina (NIH, 2013).

Exercise Recommendations

The AACF/ AHA do not have specific exercise guidelines for patients with CHF (Yancy et al., 2013). They do mention that regular physical activity is recommended and that cardiac rehabilitation can be beneficial to CHF patients (Yancy et al., 2013). However, “American Heart Association Recommendations for Physical Activity in Adults” includes specific recommendations for physical activity for all adults (American Heart Association, 2013). At least 30 minutes of moderate-intensity aerobic activity five days a week is recommended. Another option is at least 25 minutes of vigorous aerobic activity three days per week coupled with moderate to high intensity muscle training activities two days per week (American Heart Association, 2013). To lower cholesterol and blood pressure the recommendation is to exercise 40 minutes three to four times a week performing moderate to vigorous intensity exercise (American Heart Association, 2013). These are substantial goals for CHF patients especially those who are symptomatic. The recommendations state however, that you can still receive benefits by splitting the exercise periods into 10-15 minute segments throughout the day to accomplish the total recommended amount of exercise. They also offer motivation by saying that even exercising a little bit is better than doing nothing at all and that with consistent effort the amount of time one can exercise will increase (American Heart Association, 2013).

The Heart Failure Society of America has their own exercise recommendations specifically for people with CHF. They recommend that one should consult their physician before starting an exercise program. The goal for most people with CHF is to be active for at least 30 minutes each day. The 30 minutes of activity does not have to be done in one specific

period of time; it can be broken down into small increments (Heart Failure Society of America, 2006). When starting an exercise routine the patient should move at a pace that they are comfortable with. One can start out exercising as little as 5 minutes and increase the amount of time as they build up their endurance (Heart Failure Society of America, 2006). The recommendations also include warming up before exercising and cooling down after exercise. It also advocates strength training exercises using elastic bands.

The Heart Failure Society of America warns patients that they should not choose to be more active on days they are experiencing increased CHF symptoms, feel exhausted, have a fever or are sick, have chest pain, or are changing their medications (Heart Failure Society of America, 2006). Signs of overexertion are also mentioned including: shortness of breath even once activity is stopped, dizziness or lightheadedness; chest pain radiating to arms, shoulders, neck, or jaw; irregular pulse rate; unusually severe sweating; and nausea or vomiting. More recommendations for activity include: allowing periods of rest during exercise, using slow fluid movements during exercise, avoiding activities that need quick bursts of energy, using good body mechanics, avoiding activities when it is very hot or cold, and avoiding activities right after a meal (Heart Failure Society of America, 2006).

The recommendations also address sexual activity in people with CHF. They recommend to teach patients to talk openly with their partner about sex, to pick a time for sex when they feel rested, avoid having sex after a large meal or drinking alcohol, have sex in a room that is not too hot or cold, use foreplay to help the heart get used to increased exertion experienced during intercourse, avoid positions that require them to support themselves with their arms, and use positions that are less strenuous (Heart Failure Society of America, 2006).

Daily Weight

Patients with CHF are recommended to take their weight daily. The ACCF/ AHA recommend patients weigh themselves daily (Yancy et al., 2013). The recommendations do not however include parameters to instruct the patient as to when to call their health care provider regarding weight changes. Most recommendations related to CHF identify daily weighing as an important part of self-management. One article explains that daily weighing is an important part of self-management because the patient is the best person to pick up on slight changes in their health status that may require further investigation from their health care provider (Gallegher, 2010). Others have recommended specific guideline parameters for patients to follow as it pertains to monitoring their weight. Once such guideline commonly used is that if a patient gains 2 to 3 pounds in 24 hours or 5 pounds or more in a week then they should contact their healthcare provider immediately because they are retaining fluid (Group Health Cooperative, 2014). Other resources give even more direction to patients as it pertains to weighing themselves daily. MedlinePlus advises CHF patients to weigh themselves in the morning, using the same scale, before they eat and after they use the restroom (National Institute of Health [NIH], 2012a). They also advise wearing similar clothing each time one weighs themselves and writing the weight down every day so the patient can keep track of any fluctuations. In addition to recommending that patients call their healthcare provider if they gain 2 to 3 pounds in one day or 5 pounds in one week, they also recommend calling if a patient loses “a lot of weight” (NIH, 2012a).

Sodium Restrictions

As mentioned previously, patients who are diagnosed with heart failure should be on a low-sodium diet. The ACCF/ AHA recommend that patients in Stages A and B consume no

more than 1,500 mg of sodium per day. However, the ACCF/ AHA suggests it may be beneficial for patients in Stages C and D to limit their sodium intake to less than 3,000 mg per day but that there is not enough evidence to support an exact recommendation for these patients (Yancy et al., 2013). One article found in an academic journal data base suggests that there is new research supporting that 1,500 mg of sodium per day should be the target for populations at risk for cardiovascular disease (Lennie, Chung, & Moser, 2013). The Heart Failure Society of America recommends 2,000-3,000 mg of sodium per day and The Dietetic Association recommends less than 2,000 mg of sodium per day (Lennie, Chung, & Moser, 2013).

For patients to effectively follow a low sodium diet, they must be informed about what their target goal of sodium is and how to obtain this information through the nutritional labels on the food they consume (Lennie, Chung, & Moser, 2013). The lack of evidence to support an exact amount of sodium that is appropriate for patients in classes C and D could lead to confusion not only from providers but also from patients suffering from CHF. Confusion can also arise in patients when they are told to follow a low sodium diet but are not shown how to properly read nutritional labels on the foods they eat (Lennie, Chung, & Moser, 2013). When considering that in order to read the food labels the patient must be literate and have basic math skills to calculate the daily total another barrier to compliance to a low sodium diet is recognized. An article written by Son, Lee, and Song, noted that there is a lack of consensus as to how to instruct patients to follow a low sodium diet (Son, Lee, & Song, 2011). They determined that patients do not understand the correlation between a high sodium diet and worsening of their symptoms. This highlights the need to inform patients of the correlation and empower them to take control over the factors that exacerbate their symptoms of CHF. This also once again cites

that one reason patients have trouble following a low sodium diet is that they do not understand the sodium content in the foods they eat (Son, Lee, & Song, 2011).

One website that CHF patients might commonly use to learn more about their condition is WebMD. In an article titled “Heart Failure and a Low-Salt Diet” it discusses the amount of sodium that patients with CHF should consume daily (WebMD, 2014). People with CHF should limit their sodium intake to no more than 2,000 mg a day but that ideally they should consume less than 1,500 mg per day (WebMD, 2014). Another website that could be frequently visited by patients for advice about how much sodium they should ingest is MedlinePlus. In an article titled “Sodium in Diet” the authors suggest that people with high blood pressure should consume no more than 1,500 mg of sodium per day and that people with CHF may need even lower amounts of sodium daily (National Institute of Health [NIH], 2013b). There is a lack of consensus in the literature surrounding appropriate amounts of sodium for patients in all ACCF/ AHA stages of CHF. Therefore, further research needs to be conducted in order to devise definitive sodium restriction levels. This lack of consensus could cause patients to consume too much or too little sodium both of which affect their control over their disease process.

External Memory Aids and Mnemonics

External memory aids can be used to encourage a patient to act upon what is depicted in the aid. There are two categories of external memory aids passive and active reminders. Passive reminders include: calendars, diaries, lists, or post-it notes (McDonald et al., 2011). Passive reminders require the user to check them. Active reminders include pagers, computers, and mobile phones (McDonald et al., 2011). Active reminders prompt the user to complete a task at a specific time. Some researchers believe passive reminders may be more effective than active reminders because they allow the user to check things off once they are completed. Researchers

believe that memory aids assist individuals to encode, trigger, and retrieve their intentions (McDonald et al., 2011). McDonald et al. (2011) found that participants who suffered from brain injuries affecting their prospective memory (the process of being able to perform specific intentional actions in the future) who used memory aids were 15% more likely to complete the tasks they intended to perform.

Robert Tobias (2009) has examined the results of changing behavior in individuals through the use of memory aids. Tobias (2009) believes that changing habitual behaviors has to do with a problem in memory. He asserts that behaviors can only be performed if they can be remembered without any effort on the part of the individual. This is why habits are hard to break because they take no memory to perform the task that is engrained in one's memory. Therefore, individuals must be reminded of new behaviors they need to perform in order to change their habitual behavior routines (Tobias, 2009).

Tobias (2009) agrees that memory aids can increase an individual's likelihood of performing a prospective memory task, such as taking a medication. He also mentions that when it comes to a memory aid that is used to elicit a person to take a medication, there should be a way to indicate on the aid if the task has been performed, so that the individual does not repeat it within a certain time period, which could be harmful as it pertains to medication adherence (Tobias, 2009). He asserts that the effectiveness of an external memory aid depends on the time and location of it. Tobias (2009) states that over time the effect of the memory aid fades and that the effect of the aid is also diminished the further the external memory aid is from the task that the individual needs to perform. If a memory aid can lead an individual to repeat behaviors, then over time they will become habitual. The amount of time it takes to form a repeated action into a habit is less than the amount of time that the external memory loses its saliency as a reminder.

Therefore, if an external memory aid elicits a behavior repeatedly, that behavior will turn into a habit and eventually the memory aid will no longer be needed by the individual to perform the behavior (Tobias, 2009). Tobias (2009) does say that in order to perform a behavior enough times for it to be formed into a habit, it takes commitment and consistent action from the individual initially. If a behavior is performed more often and is converted into a habit it is more likely that, even under more stressful circumstances, the behavior will still be carried out. Location was another important factor examined by Tobias (2009) that has a major impact on the development of a behavior or action into a habit. If one puts the external memory aid in a location that is close to where the behavior needs to be performed then the likelihood that the behavior will be initiated increases (Tobias, 2009).

Mnemonics can also be used as a memory aid to remember a list of things to do (Sterling, 2009). In one study by Sterling (2009) the mnemonic RED FRAMES was devised to help healthcare professionals identify risk factors for pressure ulcers and how to prevent pressure ulcers from forming. The mnemonic was laminated and placed on the back of clinician's badges to remind them of ways to prevent ulcers and assess for risk factors. The mnemonic was not intended to replace validated risk assessment tools but was a means to increase awareness of risk factors that could increase an individual's vulnerability to obtaining a pressure ulcer and elicit action from the clinician to prevent their formation. A hospital wide campaign to increase awareness about the mnemonic was also initiated. A survey was conducted in 2007 prior to the hospital wide campaign found that the percentage of hospital acquired pressure ulcers at this facility was 56.3%. A second survey was conducted eight months after the introduction of the mnemonic and the percentage of hospital acquired pressure ulcers at this facility decreased to 18.2 % (Sterling, 2009).

Recommendation

A visual aid, titled Daily Checklist, was created for CHF patients in order to improve their self-efficacy and ability to manage their disease (Appendix A). The visual aid is laminated and the patient would be given a dry-erase marker in order to use it each day. It would ideally go on the patient's refrigerator or another area in the home where they would see it frequently throughout the day and where it would be close to the areas they would perform the components needed to manage their CHF. The checklist includes an encouraging phrase to empower patients to use the tool, "Helping my Heart to Stay Healthy."

The main components of managing one's heart failure are included in the Daily Checklist. These components include: medications, exercise, daily weight, and sodium (salt). They are listed in an order so that the first letters of each component spell out the mnemonic MEDS. This was done in an effort to increase the patient's ability to memorize the daily components of managing their CHF. The first component is medications. Beside the word medications there are three spaces for the patient to check if they have taken their morning, evening, and night time medications. The next component listed in the Daily Checklist is exercise. Beside the words exercise there are two spaces that allow the patient to write what type of exercise they performed and the time they spent exercising. The next component is daily weight. Beside the words daily weight there is a space for the patient to write their weight in pounds for the day. Lastly on the checklist is sodium (salt). Beside these words there is a space for the patient to indicate how many milligrams of sodium they consumed throughout the day. Below the checklist portion of the visual aid there is a reminder that the patient should record the information from the checklist into a journal and take the journal with them to their next doctor's visit. At the bottom there is space to allow the patient's provider to indicate any other

recommendations that would specifically apply to that particular patient such as what medications they are taking and when to take them, how much exercise and what type of exercise they should perform, when to call them about weight increases or decreases, how much sodium they should consume daily or if they should restrict their fluid intake.

The Daily Checklist has pictures for each of the components listed. For the sodium content component there is a nutritional facts label that shows how to read a food label to know how much sodium is in each serving size and how many serving sizes are in a product. The font is large so that it is easy to read. The words used in the visual aid are relatively simple words that can easily be understood, even by those who have a low literacy level. The colors for the writing of the words are black and the background color is white and light gray in order to add contrast. This tool would be relatively inexpensive to make, it would only require the provider have access to a computer, printer, and machine to laminate the visual aid. A dry-erase marker would also need to be provided to the patient and a journal to record each day's results. The hope is that by providing this Daily Checklist before discharge or upon diagnosis with CHF, patients could better manage their CHF. This would ultimately decrease readmission rates, improve HRQOL, prevent early mortality, and decrease the cost burden of CHF patients on the healthcare system.

Implications for Future Practice

In the future, this tool would need to be tested with a population of CHF patients in order to identify how effective it is at increasing patient self-efficacy (their confidence in managing their disease) and perceived HRQOL. The patients would need to be evaluated before receiving the Daily Checklist to determine their confidence level and perceived HRQOL and then again after they have used the tool to determine if their self-efficacy and perceived HRQOL has improved. A longitudinal study would also need to be conducted. The patients who were given

the tool would need to be compared to a control group to determine if they experience fewer rates of readmission to the hospital due to CHF and a decreased mortality rate than those who did not receive and use the Daily Checklist.

In the future, the Daily Checklist could also be translated into different languages. This could allow for patients who do not speak English as their primary language to better manage their CHF. Similarly, this new tool would also need to be tested to find if patient self-efficacy increased and if readmission rates and mortality rates were decreased.

Additionally, more research needs to be conducted to determine appropriate sodium levels for the various stages of CHF. As of now, there are not definitive sodium recommendations for patients categorized in Stages C and D. In order for these patients to control their CHF symptoms and prevent readmissions and mortality, they need to be informed on how much sodium is appropriate for them. In addition to more research into the appropriate levels of sodium for CHF patients, there also needs to be research initiated to determine how much exercise is appropriate for patients in each stage of CHF.

Summary

CHF is a condition that leads to over a million hospital admissions each year (Yancy et al., 2013). It is the number one reason for hospital admissions in people over the age of 65 (Lambrinou, Kalogirou, Lamnisis, & Sourtzi, 2012). As America shifts toward an older demographic in the coming decades the number of people who live with CHF is expected to increase (Yancy et al., 2013). CHF has a major impact on those who are affected related to their HRQOL. They are also at increased risk for mortality (Yancy et al., 2013). Not only does CHF affect the individual who has it, the cost for care and readmissions place an enormous financial

burden on the health care system (Yancy et al., 2013). Current strategies used to combat readmission rates have not proven to be enough to solve the issue (Bradley et al., 2012).

There are several factors that can be examined as contributing to why readmission rates are high in this population. One area that seems to be promising in helping to prevent high readmission rates for CHF is the activation of the patient's self-efficacy in their ability to manage their disease process (Shively et al., 2013). The Daily Checklist should be given to every patient when they are first diagnosed with CHF or upon discharge from the hospital. In conjunction with the current practices used to prevent readmissions, the Daily Checklist can help to instill confidence in the patient that their CHF is manageable if they take the necessary measures to control their health and wellness. The Daily Checklist will act as a reminder to the patient about the necessary steps that must be completed each day in order for them to prevent readmissions to the hospital, early mortality, and to improve their overall HRQOL.

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Appendix A



Daily Checklist

A Visual Aid to Increase Self-Efficacy
in Congestive Heart Failure Patients

Helping My Heart to Stay Healthy



Medications

Morning

Evening

Night

Exercise

Type of Exercise

Time Spent Exercising

Daily Weight _____ (lbs)

Sodium (Salt) _____ (mg)



Reminder: At the end of each day, please record this information into a journal and take it with you to your next doctor's appointment.

Other Recommendations:

Nutrition Facts	
Serving Size: 1 cup (228g)	
Servings Per Container: 2	
Amount Per Serving	
Calories: 260	Calories from Fat: 120
% Daily Value*	
Total Fat 13g	20 %
Saturated Fat 5g	25 %
Trans Fat 2g	
Cholesterol 30mg	10 %
Sodium 660mg	28 %
Total Carbohydrate 31g	10 %
Dietary Fiber 0g	0 %
Sugars 5g	
Protein 5g	
Vitamin A 4%	Vitamin C 2%
Calcium 15%	Iron 4%
* Percent Daily Values are based on a 2,000 calorie diet.	

There may be more than one serving in the package, so be sure to check serving size.

This number tells you the % DV for sodium in one serving.