Early Identification and Intervention of Heart Failure Exacerbation

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As identified by the Centers for Disease Control and Prevention (CDC, 2019), heart failure (HF) is a serious condition in which an individual's heart does not function efficiently enough to pump blood as well as it should (Komanduri, Jadhao, Guduru, Cheriyath, & Wert, 2017). According to Mozaffarian et al. (2016), approximately 5.7 million adults in the United States suffer from HF, with a higher prevalence among individuals who smoke (CDC, 2019). Approximately half of patients who develop HF die within 5 years of diagnosis (CDC, 2019). HF costs the US about $30.7 billion every year in health care–related expenses, including medical care, medication, and missed work (CDC, 2019).

Early detection of HF provides health care professionals the opportunity to test and develop pharmaceuticals and lifestyle interventions that may help manage the condition (Wang et al., 2015). Effective programs in a homebased setting are as efficient in reducing mortality and rehospitalization as in the clinic setting. Home health nurses should be well-equipped with knowledge and skills on how to detect HF exacerbation for early interventions (Stewart et al. 2012). Clinical manifestations associated with HF include the following: shortness of breath during daily activities; weight gain characterized by swelling of the feet, ankles, legs, and stomach; difficulty breathing while lying down; and a general feeling of weakness or tiredness (CDC, 2019). Nurses should continually monitor and promote activities that will reduce their patients' weight.

Home health nurses must be educated on tools that can help their HF patients through education, monitoring, and optimizing adherence to medications and dietary restrictions (Brush et al. 2015); in addition, nurses should be prepared to reconcile medications, which reduces readmissions by as much as 58%. When home health nurses have a guidance tool, they can

clearly understand the signs to look for and the risks facing their patients, including a poor diet, alcohol consumption, lack of exercise, and smoking (Granger et al., 2015). In addition, the tool may help doctors and other health care professionals recognize ways to improve their relationships and communication with patients for early identification and intervention of HF.

Background

The U.S. government implemented the Affordable Care Act in 2012, which included a Hospital Readmissions Reduction Program allowing Medicare and Medicaid to reduce payments to hospitals for readmissions within 30 days of discharge (CMS.org). During hospitalization, discharge planning may entail only providing a patient with an HF handout, a follow-up appointment, and a 20-minute encounter with the staff nurse (Shaw, O'Neal, Siddharthan, & Neugaard, 2014). Inadequate education and follow-up in the home can also lead to readmission, resulting in a hospital penalty and reduced reimbursement rate (Shaw et al., 2014). Chronic obstructive pulmonary disease (COPD), HF, and diabetes are among the most common diseases leading to readmission (Castillo, Edriss, Selvan, & Nugent, 2017).

Problem Statement

The problem is that many health care providers are unable to identify early signs of HF exacerbation and therefore do not act on early warning signs, resulting in delayed patient treatment. Care providers performing standards of care necessary for early HF identification and intervention is essential. Therefore, health care providers should have a superior understanding of the symptoms and warning signs of HF to implement early interventions. The tool proposed in this DNP project should serve as an assessment guide for health care providers in early identification and intervention of HF exacerbation in patients.

Purpose Statement

The purpose of this quality improvement (QI) project is to develop and implement a HF symptom monitoring tool for early identification and intervention of HF exacerbation. The tool can help improve cardiovascular health and reduce hospital readmissions through early HF exacerbation identification and intervention. The overall result of this effort is a reduction of HF hospital readmissions within 30 days. Health care providers to need to be educated on implementation of the HF symptom monitoring tool in the outpatient setting. The HF symptom monitoring tool ensures that health care providers ask their patients an established set of questions to identify HF exacerbation and know when to initiate treatment interventions. The goal of this QI project is the early identification and intervention of HF exacerbation.

Project Question

The population of this QI project is home health nurses caring for patients diagnosed with HF. The intervention is the development and implementation of an HF symptom monitoring tool for early identification and intervention of HF exacerbation. The measure will include a retrospective chart review evaluating hospital readmissions pre- and postimplementation. The outcome will be the reduction of hospital readmission within 30 days over a measurement timeline of 4 weeks. From this PICOT summary, the project question is: “Will the implementation of a heart failure symptom monitoring tool by home health nurses reduce heart failure patients’ hospital readmissions within 30 days?”

Project Objectives

1. Implement the HF symptom monitoring tool at the project site for early identification and intervention of HF exacerbation. Assessment of tool will be through nurse notes

and chart review. The goal is to have at least 90% of nurses in adherence with the tool.

2. During in-service meetings, provide nurse staff education and training for the HF tool before implementation of the DNP project. The use of pre- and post-tests will enable evaluation of staff education and understanding. The goal is 90% or greater nurse attendance for in-service education and training in use of the HF tool.
3. Conduct a chart review to determine if a reduction in HF-related hospital readmissions is apparent after implementing the HF symptom monitoring tool. The goal is an overall reduction in the rate of HF-related readmissions within 30 days.

Literature Review

Review Coverage and Justification

A literature review enabled identification of the barriers to early identification of HF exacerbation by home nurses, as well as the interventions appropriate to solve this problem. Searches of databases including CINAHL, EBSCOhost, Cochrane, PubMed, TOXNET, Medline, and ProQuest provided extensive results on HF, HF education, and cardiac exacerbation. Search terms and combinations used were *heart failure hospital readmission*, *cardiac exacerbation*, *heart failure questionnaire tool*, *HF questionnaire tool*, *home health nurse*, and *provider education*, which returned 235 articles. After applying the inclusion criteria of publication date (1995–2019), English language, and fulltext availability, 87 articles remained. Publication dates went beyond the past 5 years to increase knowledge on these topics. Next excluded from the review were abstracts and articles written by medical students and nonphysician health care workers. Following application of these additional criteria, 13 articles pertained to interventions and 17 were examinations of cardiac exacerbation access and barriers. The addition of MeSH

terms, including *interventions* and *compliance*, increased the number of sources, yielding over 2,300 papers reduced to slightly more than 1,000 after applying inclusion criteria. The addition of *provider education* reduced the qualifying articles to 13. Article inclusion followed a review of abstracts and titles to determine relevance; further, scholars demonstrating health care providers' improved adherence to interventions guidelines for chronic illness, such as HF, were included, as well. Overall, selected articles focused on the PICOT question: In patients with heart failure, does the implementation of a heart failure questionnaire tool used by home health nurses lead to early identification and intervention of heart failure exacerbation within 30 days?

Review Synthesis

Historical Context

The current literature does not include extensive discussion of the home health care setting to examine the link between HF patient outcomes and nursing care. In an early study associating increased nursing visits with reduced admissions for a home health care HF patient sample, Dennis, Blue, Stahl, Benge, and Shaw (1996) found increased nursing time was connected to a higher probability of home care HF patients attaining the pacing activity clinical outcome in managing dyspnea. Other researchers more broadly investigated home employment of health care resources. Fortinsky, Fenster, and Judge (2004) established similar levels of patients' home health care resource utilization regardless of discharge to home self-care or from home care to the hospital, finding home care stay length for those discharged to hospital reduced by half. Overall, these studies provided preliminary information regarding the connection between patient outcomes and skilled home health care utilization.

The home health care sector has responded to changes in coverage guidelines and eligibility interpretation for Medicare home health benefits. Interpretational changes during the

1980s and 1990s led to increases and decreases in use of home care services (Fishman, Penrod, & Vladeck, 2003). Implemented in 2000, the Medicare Prospective Payment System for home care and the provision of the Balanced Budget Act of 1997 reduced use of skilled home health care service and the number of certified home health agencies (Fishman et al., 2003). Due to the different industry contexts, comparing research studies carried out before Prospective Payment System implementation to those conducted after is difficult. Overall, there is paucity of more recent home health care studies to examine the link between HF patient outcomes and home health care, suggesting a need to conduct more studies to fill this gap (Myers, Grant, Lugn, Holbert, & Kvedar, 2016). Despite the close relationship between home health nurses and reduced readmissions for patients with chronic diseases such as HF, nurses continue to face obstacles in identifying early HF exacerbation (Horwich & Fonarow, 2017). HF is one of the most expensive chronic diseases because of the high costs of illness management. The nurses who care for HF patients should, therefore, implement evidence-based HF management care and strategies (Horwich & Fonarow, 2017). For patients with HF, home health nursing helps to prevent the exacerbation of symptoms through regular monitoring (Myers, Grant, Lugn, Holbert, & Kvedar, 2016). As home health nurses provide routine care to a patient, providers should be knowledgeable regarding early identification and treatment of HF system exacerbation (Myers et al., 2016). Nurses, therefore, must be well trained on the early identification and treatment for HF exacerbation in their patients.

Despite the close relationship between home health nurses and reduced readmissions for patients with chronic diseases such as HF, nurses continue to face obstacles in of identifying early HF exacerbation (Horwich & Fonarow, 2017). According to Riley et al. (2016), the nurses need to be educated on recent and evidenced-based identification, management, and care of HF.

One way to identify HF exacerbation early is to develop a tool home health nurses can follow. Medical tools have long been proven highly useful in the nursing process. For example, Guidelines for the Management of Heart Failure (Yancy et al., 2013) is an effective tool to help nurses identify the potential gaps in transitional care that contribute to possible preventable readmissions. According to Yancy et al. (2013), the tool has shown to be effective.

Best Evidence in the Profession

Home health nurses play a significant role in offering outpatient care for patients with HF. They contribute to a patient's optimal health by coordinating, reminding, and escorting patients to all their medical appointments. However, the nurses lack tools and education that can help with early identification and treatment of HF exacerbation; thus, optimizing their knowledge and skills in HF promotes reduced admissions and improves results for patients with HF. Murtaugh et al. (2017) conducted research to determine the effectiveness of two interventions: early intensive home health nursing and physician follow-up within a week versus less-intense and later postacute care in reducing readmissions among patients with HF. Findings showed that closer coordination between home health nurses and patients with HF reduced hospital admissions.

Many home health nurses have failed to identify early signs of HF exacerbation, causing adverse effects such as hospital readmissions, health complications, or even death. Home health nurses occasionally do not act on early warning signs, resulting in delayed treatment (Brown, 2018). Nurses must attend to patients to prevent the exacerbation of symptoms. Society expects home health nurses to be experts in managing this complex chronic condition; however, such is not always the case. Centrella-Nigro et al. (2016) showed home health nurses lacked knowledge of best practices for treating patients with HF. Addressing this lack of knowledge requires the

incorporation of evidence-based clinical practice guidelines that are relevant in home health agencies. In two studies, for example, home health nurses scored less than 30% on a test associated with knowledge about common HF nursing interventions for asymptomatic hypotension, dizziness, and daily weight monitoring (Albert, 2006; Delaney, Apostolidis, Lachapelle, & Fortinsky, 2011).

Provisions of the Affordable Care Act increased the financial accountability of hospitals for preventable readmissions; as a result, hospital administrators have a great interest in identifying system-level interventions to minimize rehospitalizations (Boccuti & Casillas, 2015). However, insufficient education and follow-up in the patient's home can lead to readmission, which results in Medicare penalizing the hospital by providing a reduced reimbursement rate (Acher et al., 2015).

Home health nurses treating HF patients experience more job dissatisfaction, burnout, and frustration (Villalba Mora, Petidier-Torregrossa, Alonso-Bouzon, Carnicero-Carreño, & Rodríguez-Mañas, 2015). As HF reduces a patient's quality of life, the responsibility of home health nurses increases (Aldred, Gott, & Gariballa, 2005). As a result, home health nurses should have a proper understanding of the symptoms and warning signs of HF exacerbation to implement early interventions and prevent hospital readmission and sentinel consequences.

Currently Understood

Society recognizes the importance of early screening and identification of diseases. The medical sector encourages early diagnosis of chronic diseases for timely interventions to reduce the mortality rate. As a result, nurses face the critical task of early identification and treatment of conditions such as HF exacerbation (Myers et al., 2016), thereby averting complications or death. Preventing the exacerbation of HF symptoms helps to reduce the workload of home health

nurses, too, as they will avoid encountering complications such as kidney or liver failure, which increase the morbidity and mortality of their patients. Ultimately, the prevention of symptom exacerbation is critical in HF management, as early treatment averts the consumption of unnecessary time and resources for both nurses and patients (Myers et al., 2016). Home health nurses who detect early symptoms of HF exacerbation prevent unnecessary pain and suffering that may occur due to a lack of necessary medical intervention (Ferrari et al., 2015).

Despite the benefits of early detection, however, home health nurses are often unsuccessful in detecting early HF exacerbation due to numerous issues, including low level of clinical knowledge, disparity in number of agencies, lack of tools to help in early identification of HF exacerbation, and insufficient staffing (Delaney et al., 2011). This QI project will be a means to educate nursing staff at a home health agency in the implementation of a newly developed, early identification and treatment HF monitoring tool for early detection and intervention of HF exacerbation in the outpatient setting. Use of the tool has the potential to improve patients' cardiovascular health and nurses' job satisfaction and reduce hospital readmissions.

Current Management

Some screening tools are available for home health settings albeit with notable weaknesses, thus preventing their employment in identifying the priority for the first nursing visit. Some tools have limited applicability in U.S. settings because of international development, non-rigorous construction, or lack of alignment with the Outcome and Assessment Information Set (OASIS) dataset/assessment conducted during a first-time visit (Topaz et al., 2013). To address this concern, the West Virginia Medical Institute's Quality Improvement Organization developed a hospital risk assessment tool (Fishman et al., 2003). Although based on hospital

predictors established by researchers investigating OASIS data, the tool failed to offer guidance in prioritizing patients; instead, an eclectic list of elements linked to admissions from home health environments (Fishman et al., 2003). According to the tool, the constructed risk is only for ease and as yet uncertified.

The Canadian guidelines for home health nurses in identifying clients with a relatively urgent need for access to care serves as the other internationally developed screening methodology (Ganann et al., 2019). With the tool, home health agencies assign incoming patients into one of six levels according to their risk for poor outcomes. First-ranked patients, for example, fall into two categories: individuals needing a visit/intervention between 12 and 24 hours and individuals requiring a visit within 12 hours. Acute respiratory condition or sudden changes in patient conditions are examples of patients in this category. The agency's intake home health nurses then estimate the priority levels. Nevertheless, in the US, this tool has limited applicability due to the variation in the time frames for the initial nursing visit: 4 weeks in Canada and 48 hours in the US. Despite significant improvements in developing tools to aid in early identification of HF, home health nurses continue to face challenges (Schwarz & Elman, 2003).

Often, home health nurses confuse HF exacerbation symptoms with conditions such as COPD, because there is no standardized screening and no nurse training or education (Schwarz & Elman, 2003). Failure to recognize HF exacerbation symptoms delays treatment and may also lead to implementing incorrect disease processes (Schwarz & Elman, 2003); therefore, this QI project will consist of developing a tool to assist home health nurses in identifying early HF exacerbation symptoms and providing interventions.

Controversies

Early identification and management of HF exacerbation symptoms remain a concern for home health nurses. HF exacerbation places a significant economic and health burden on the health care system as well as the patient (Stafylas et al., 2017). Created under the Affordable Care Act, the Hospital Readmissions Reduction Program initially assessed how frequently patients who received treatment for certain diseases, such as HF and pneumonia, returned to the hospital within 30 days of discharge. According to the program, hospitals face fines in rehospitalizing patients within 30 days of discharge. Therefore, when patients develop complications within 30 days postdischarge, home health nurses may find themselves in a difficult situation in deciding whether to send patients back to the hospital (Boozary, Manchin, & Wicker, 2015).

Issues Still Under Investigation

HF treatment issues are still under investigation, including determining whether home health nurses have helped in the early identification and management of HF symptoms and whether the use of HF tools can help prevent HF exacerbation (Wang et al., 2015). Therefore, more evidence is needed to confirm the significance of HF tools in early identification and treatment of HF exacerbation symptoms (Shaw et al., 2014). Another concern the safety or danger in leaving patients with delicate conditions such as HF in their homes. Most home health nurses do not visit their patients every day; therefore, nurses may fail to detect HF exacerbation early enough, leading to adverse effects for patients (Shepperd, Gonçalves-Bradley, Straus, & Wee, 2016).

Issues Not Yet Addressed

The primary issue that remains unaddressed is that home health nurses are still unable to accurately identify early HF exacerbation. There is a need to train home health nurses on how to use identification tools to increase competency. Also, in need of attention in HF exacerbation are nurses poorly or reluctantly reporting signs and symptoms of HF exacerbation. In addition, although specialist nurses provide sound advice about the range of conditions linked to HF, there is no requirement for hospitals and home health agencies to provide HF patients with specialist nurses (Glogowska et al., 2015).

Review of the Study Methods

This literature review entailed an examination of both qualitative and quantitative studies relevant to the topic under investigation. More specifically, randomized controlled trials, retrospective cohort studies, comparative studies, and integrative studies underwent review. Scholarship discussed in this section was pertinent to the DNP project through examination of home health nurses' lack of knowledge of best practices for early identification of HF exacerbation in patients. Also relevant to the objectives of the project were prior researchers' methods, as the discussions were all based on the PICOT question: "In patients with heart failure, does the implementation of a heart failure tool used by home health nurses lead to early identification and intervention of heart failure exacerbation within 30 days?" The study methods helped in identifying what is known, what is not known, and what is still under investigation, as well as the extent to which the topic has received research.

Significance of the Evidence to the Profession

Home health nurses will potentially improve HF patient outcomes when provided with education and training, as well as the tools they need in their services. This DNP project will

incorporate a discussion of the implementation of early identification and treatment of HF exacerbation tool to prevent readmission and avert the burdens to health care and patients. Due to high readmission rates and the complexity of current medical diseases, the emphasis will be on home health nurses caring for patients diagnosed with HF. There are no tools available that help nurses make crucial decisions related to HF patient care; thus, this project would help improve home health nurses' decision making through development of a tool that will help in early identification of HF exacerbation. The project will entail creation and implementation of an HF tool for use by home health nurses. The proposed tool may aid home health nurses with early identification and treatment of HF exacerbation symptoms.

Overall, the literature review provided information useful in early detection and treatment of HF exacerbation symptoms. Many patients prefer outpatient care to reduce costs, in which cases home health nurses provide treatment. If home health nurses detect HF exacerbation early enough, they can take interventions to avoid severe consequences, such as increased patient morbidity and mortality. As a result, all home health nurses must receive training on the use of these tools.

Theoretical Framework

Stetler's model will be applied in the DNP project. The model helps health practitioners use evidence in daily practice to inform program planning and implementation (Schaffer, Sandau & Diedrick, 2013). Stetler's model aids the health care provider in applying research findings and other relevant evidence into health care practices (Schaffer, Sandau & Diedrick, 2013). The model guides organizations and individuals on how to apply evidence, for development of official changes. Also, the model guides the health care providers on research application as part of practice and critical thinking in organizations (Rycroft-Malone & Bucknall, 2011). According

to Pearson, Wiechula, Court & Lockwood (2005), use of research is the initial step in evidence based practice (EBP). The Stetler model outlines five phases that are applied in evaluation of studies.

I. Preparation. The phase entails identification of the problem with evidence.

II. Validation. Evidence is critiqued and synthesized. Also, the rate and quality of evidence are measured with a table of evidence and non-credible sources are eliminated.

III. Decision making. The summarized findings from all the validated sources are logically analyzed and displayed in terms of their similarities and differences. A decision is then made to determine if the summarized findings are desirable or feasible to be applied in practice, based on the applicability criteria.

IV. Implementation. The practitioner decides on the level of application and develops a proposal for practice

V. Evaluation. Evaluation can either be formal or informal and includes both summative and formative assessment of results.

Historical Development of the Model

The Stetler model emerged in 1976 as a prescriptive approach emphasizing the importance of critical thinking in research (Stetler, 2001). The model incorporated a series of steps in decision-making and critical thinking to promote the effective and safe use of research findings. Refined in 1994 based on studies of research utilization, the model provided a set of fundamental assumptions that illuminated the multifaceted nature of research utilization, including applicability criteria used in determining the feasibility and desirability of applying validated research to a discovered catalyst or issue (Sudsawad, 2007). The model underwent

another update in 2001, becoming the Stetler Model of Research Utilization. The newest version of the model has two components: the graphic model with five phases of research utilization, and the second part with clarifying information and options of every phase (Rycroft-Malone & Bucknall, 2011).

Applicability of the Stetler Model to Current Practice

Today, the nursing profession faces the challenges of a rapidly changing medical environment and complex patient needs. There is a need for well-trained professionals and highly skilled providers who are willing to apply their experience and knowledge to the unique needs of every patient to produce better outcomes (Osborn et al., 2015). Applied to nursing, EBP, as described by the Stetler model, provides nurses with scientific research to make well-informed decisions. Through EBP, nurses remain up to date on the latest patient care medical protocols. By researching recognized interventions that fit their patients' profiles, the nurses can increase patients' chances of recovery. Also, EBP helps nurses to evaluate research to determine the effectiveness or risks for a treatment or diagnostic test. The use of EBP helps nurses embrace patients in their care plan; as a result, patients are an active component of their own care, sharing their concerns, preferences, and values (Aglen, 2016).

In accordance with the model, individuals examine how to apply evidence to develop organizational changes; specific to this study, the model is a guide for health care providers to apply causal research as a part of reflective practice and critical thinking. The model relates the use of research as an initial step with EBP. The Stetler model is a way to process the association between research use and EBP. The two ideas are different, and when integrated, they promote the general application of research (Stetler, 2001).

The Stetler model is used by many health care organizations. Today's health care calls for providers to focus on the unique needs of every patient due to increased patients' diversity, and that calls for interaction between the patients and the providers. Ghanbari, Rahmatpour, Jafaraghayee & Khalili (2017) applied the Stetler model to develop evidence based nursing care guidelines in patients with diabetic foot ulcers. The aim of the research was to examine critical appraisal of evidence based nursing care guidelines using the Agree Instrument. The Stetler model was considered effective since the developed guidelines in all the domains were considered acceptable. The guideline helped in prevention, and reduction of complications and hospital length of stay among patients with diabetic foot ulcers. Golden (2016) also demonstrated the importance of the Stetler model in current practice. The aim of the EBP project was to determine whether the implementation of a standardized education intervention for patients admitted to skilled nursing facility with a primary or secondary diagnosis of HF would reduce the readmission rates and enhance patients' knowledge. The results showed that incorporation of evidence based interventions can reduce readmissions to the hospital. The findings of the studies discussed above show that practitioners and researchers are using Stetler model in nursing care and research. The model proves to be flexible due to applicability in different areas. The Stetler model will be effective in the DNP project in implementation of a tool to help in early identification of HF exacerbation.

Major Tenets of the Theory

The Stetler model outlines five phases in the process of evidence-informed nursing practice. The first phase is preparation, during which time an individual identifies a problem or issue with the use of evidence. Validation is the second phase, as the individual critiques and synthesizes the evidence with the use of a table of evidence, subsequently eliminating

noncredible sources. The third phase entails decision-making based on a synthesis of collective results. Phase four is implementation, in which the nurse selects the application level and develops a proposal for practice. The last phase is an evaluation, which can either be formal or informal. Evaluation includes both summative and formative assessments of results (Rycroft-Malone & Bucknall, 2011).

Phase I: Preparation. Phase I focuses on the point, circumstance, and research evidence sources. First, practitioners identify potential problems or issues and confirm their priority; next, they procure evidence in the form of systematic reviews, selecting sources of research with the conceptual fit (Sudsawad, 2007). Identification of the issues affecting health outcomes is essential for the practitioner, because issue awareness determines the interventions selected. In accordance with this DNP project, nurses should improve health care by identifying the problems hindering the delivery of quality care. The practitioner finds potential problems or issues and confirms priority. Purpose of consulting evidence and relevant sources are established. Evidence in the form of systematic reviews is sought and sources of research with the conceptual fit are identified (Sudsawad, 2007). Identification of the issues affecting the outcomes of health care is essential. Nurses improve health care by identifying the problems hindering the delivery of quality care, and using EBP to solve the problems (Ellis, 2019).

Phase II: Validation. In Phase II, the practitioner validates the findings and includes activities such as performing a systematic review, rating the quality of the evidence, and determining the clinical significance of the evidence. Next, the provider decides whether to accept or reject the evidence. When accepting the evidence, the practitioner moves to Phase III; if there is no evidence or the evidence is insufficient, the process ends (Sudsawad, 2007). All practitioners should learn to measure evidence so that they choose information relevant to the

problems identified. The practitioner validates the findings, rates the quality of evidence, and determines the clinical significance of the evidence. Selecting the right evidence determines the validity and usefulness of the findings in practice. Reflecting on the meaning of study findings is important for a practitioner to develop a solution to the issue at hand.

Phase III: Comparative evaluation. The practitioner synthesizes the cumulative findings and decides on what will be used. At this point, the practitioner can choose to conduct his/her own research if the identified conclusions are not viable (Sudsawad, 2007). Practitioners need to be careful when deciding on the evidence to be used and should choose the latest evidence. Selecting the wrong evidence leads to making of the wrong decisions. Practitioners should also consider collecting additional internal information before broadly acting on the evidence.

Phase IV: Implementation. The practitioner focuses on the implementation process. The initial step is confirming the type of use such as symbolic, instrumental, or conceptual then establishing the method of use which can be formal or informal, direct or indirect. The practitioner also confirms the level of use; individual, group, or organization. Also, a proposal for change practice is developed (Sudsawad, 2007). A practitioner plans for formal dissemination and change strategies. Plans and strategies to be used for implementation can also affect the outcomes. Therefore, practitioners should design a comprehensive plan and prepare the resources needed to implement the evidence.

Phase V: Evaluation. The practitioner clarifies the expected results relative to the purpose of seeking evidence. Formal and informal evaluation of the results is performed. Also, the cost benefit of various evaluation efforts is determined. The practitioner should evaluate the

implementation process to find out if there are changes needed for the interventions to be more useful (Sudsawad, 2007). Evaluation can occur through reflection, audit, or peer assessment.

Theory Application to the DNP Project

Stetler (1996) initially developed the Stetler model for nurses. The model is highly flexible and easily applicable to this DNP project. The model can be applied to the HF protocol and to the implementation of the project. Evidence-based solutions should facilitate home health nurses' early identification and interventions of HF exacerbation in their patients.

I. Phase I. The practitioner identified that late identification and intervention of HF exacerbations is a problem. Early identification of HF exacerbation helps in developing pharmaceutical and applying lifestyle interventions early and that may help manage the condition. However, there are currently no tools that can help in identifying HF exacerbation early.

II. Phase II. Sought validation of findings through performing a literature review and found different supportive research studies regarding why nurses experience problems in early identification and management of HF. Found studies which discussed interventions, and cardiac exacerbations access and barriers. The literature review helped in identifying causes of the problem, such as lack of education and experience among the nurses.

III. Phase III. The findings were summarized from all the validated sources in terms of their similarities and differences. The strength of findings was evaluated to determine the most desirable findings. The chosen studies helped in analyzing and coming up with a solution of identifying HF exacerbation early.

IV. Phase IV. A proposal for practice change was developed. The proposal was based on the research findings from the literature review. Development and implementation of a nurse based tool for early identification of HF exacerbation was proposed. The home health nurses will be trained about the tool before use.

V. In Phase V. will evaluate the effectiveness of the intervention chosen. After training, pre- and post-test will be used to evaluate whether the home health nurses understood how to use the tool. More than 90% of the home health nurses will be expected to attend the training on the use of HF tool. The success of the tool will be evaluated by determining reduction in the rate of HF-related readmissions within 30 days.

The project lead will play a great role in implementing the tool for early identification of HF exacerbation. The project lead will be responsible for initiating the idea of change after identifying the problem that needs to be solved. The leader will then seek evidence regarding the problem then create awareness to the stakeholders on the anticipated changes. Finally, the leader will oversee the implementation process and evaluate the effectiveness of the change.

Project Design

A quality improvement (QI) approach will guide this DNP project. The approach fits this project's aim to develop and implement a protocol for early identification and intervention of HF exacerbation. Use of the tool should improve cardiovascular health and reduce hospital readmissions through early HF exacerbation identification and intervention. Hospital readmission remains a challenge in the care of patients with HF. Although there have been small gains over the past 5 years, hospitals still readmit more than 20% of patients within 30 days and up to 50% by 6 months. Predicting who is likely to be rehospitalized is challenging (O'Connor, 2017). Home health nurses need education on the signs and symptoms of HF exacerbation as

well as the implementation of the HFEIP in the outpatient setting. Use of the HFEIP is a means to ensure home health nurses ask patients a systematic set of questions to identify HF exacerbation and determine when to start treatment interventions. Home health nurses play a significant role in identifying and managing chronic diseases; when equipped with the right knowledge and tools, nurses can improve the health care outcomes of patients at home (Murtaugh et al., 2017).

Home health nurses are the population of interest. Participants will undergo training before the implementation of the HFEIP to understand how to use the tool. The independent variable in the project will be the tool used for identification of HF exacerbation. The dependent variables include pre and post test scores, compliance with the use of the tool, and readmission. The general purpose of this project is to reduce HF hospital readmissions within 30 days.

SPSS will facilitate data analysis. A paired t-test will be used to compare the home health nurses' knowledge before and after training. The rate of compliance will be calculated using VassarStats that computes the difference between two independent proportions (Lowry, 2020). The rate of readmission will also be calculated using Vassarstats before and after the training.

The QI approach will contribute to proper training of home health nurses to improve their knowledge regarding early identification of HF exacerbation. With early identification, nurses can improve the quality of HF patient outcomes through early interventions, subsequently preventing HF complications and readmissions. The QI approach facilitates enhanced experiences and outcomes of patients by changing provider behaviors or organizational procedures. The QI project will help in accomplishing the project objectives through ensuring home health nurse adherence to the HFEIP. Prior to tool implementation, at least 90% of the providers will receive training on how to identify early HF exacerbation. Finally, this DNP

project will be a means to reduce or prevent HF readmission within 30 days. Chart reviews will show if there was reduction in HF readmissions.

Population of Interest

The population of interest is 10 home health nurses. All home health nurses who have direct contact with patients will take part in the project. Generally, per diem, part-time, and full-time employees will take part. Home health nurses will include both licensed practical nurses and registered nurses who are familiar with patients and likely to understand the benefits of the HFEIP. Home health nurses who have not received the proper certification from the California Board of Nursing and a Current Basic Life Support card from the American Heart Association will be excluded (Brody et al., 2016). Contracted employees will not take part to avoid training and having them leave part way through. Physical therapists, occupational therapists, speech therapists, and certified nurse assistants will also not participate because they are not involved in symptom monitoring and interventions for patients with HF.

Setting

Implementation of this QI project will be at a selected home health care agency located in Los Angeles County, California, an area with a 2010 population of 10.6 million (United States Census Bureau, 2010). The leading cause of death in Los Angeles is heart disease (United States Census Bureau, 2010); accordingly, there is a need to introduce strategies to address this pronounced health risk. Home health care services vary by home, as patients in different households require different types of care. Health care nurses serving patients residing in houses, apartments, condominiums, assisted living facilities, and board and care homes will take part in the project, with nurses caring for patients in skilled nursing facilities excluded. The home health care agency accepts two forms of insurance, Medicare and Blue Cross. Both pre- and post-tests

will take place in a conference room at the agency. The CEO of the home health agency verbally approved project implementation.

Stakeholders

Agency leaders and home health nurses who have met inclusion criteria will be the main stakeholders in this project. The home health nurses will be responsible for implementing the tool in accordance with the DNP project timeline. The stakeholders have expressed interest in improving the health care of patients with HF exacerbation, a condition that could be manageable or preventable if identified earlier (Choi, Schuetz, Stewart, & Sun, 2016).

A stakeholder meeting held at the agency before implementation of the HFEIP will be a means to establish rapport. Ten home health nurses and two supervisors will attend biweekly meetings for updates on the implementation process, during which they will have an opportunity to discuss any other issues concerning the project. The meetings will be in addition to unscheduled interactions via e-mail, which provide a means to discuss time-sensitive issues in need of addressing before the next biweekly meeting.

Effective communication is one of the pillars of successful projects. The stakeholders must stay informed about the progress to prevent misunderstandings, clarify objectives, and improve productivity (Butt, Naaranoja, & Savolainen, 2016). Due to the HFEIP being newly developed, the stakeholders need to thoroughly discuss the strengths and weaknesses to make the tool more effective. These discussions will take place during the biweekly meetings.

Recruitment Methods

The home health nurses who meet the inclusion criteria have received a request through email to participate in this QI project to improve patient care. However, their employment contract does not make such training compulsory; as such, failure to attend the training will not

lead to repercussions or disciplinary action. Similarly, nurses who participate will not receive any compensation or incentives. Both full-time, part-time employees, and per diems will take part in the project. The privacy and confidentiality of all the participants will be maintained. The participants will not be allowed to use any personal identification information such as names. They will be given numbers by the project lead instead.

Tools/Instrumentation

HF Exacerbation Identification Protocol (HFEIP) (Appendix A) Tool will enable early identification of HF exacerbation. The HFEIP tool is a means for the nurses to assess patients for early signs of HF exacerbation. The nurses will provide patient intervention and education based on the assessment findings. The HFEIP tool is newly developed due to there being no previously developed tools for early identification of HF exacerbation in the home health care setting; rather, most of the tools available for monitoring HF exacerbation are for patient use. One such tool effective in assessing symptoms of HF is the Kansas City Cardiomyopathy Questionnaire (Gwaltney, Tiplady, & Deschaseaux, 2015; Nguyen et al., 2019; Pokharel et al., 2017). The Kansas City Cardiomyopathy Questionnaire is a 23-item, self-administered instrument that quantifies physical function, symptoms, self-efficacy, knowledge, quality of life, and knowledge regarding HF. The Intermountain Risk Scores (IMRS) set of tools is another means to predict HF hospital readmission. Although both patients and providers can utilize the Intermountain Risk Scores, the tools are not effective in identifying HF exacerbation in a home health care setting (Evans et al., 2016).

In creating the tool, the project lead first defined the purpose and objectives, followed by the development of the questions nurses should ask their patients. The questions were grouped into green, yellow, red, and general zones. Last was the determination of interventions applicable

to patients who showed signs of HF exacerbation. American Heart Association guidelines served as a basis for the development of the tool, thus facilitating use of the latest evidence-based HF treatment (Greenland et al., 2010). Russell and Pang (2019) recommended these guidelines in developing clinical tools to ensure the use of evidence-based and current information.

The home health nurses will be trained using power point presentation (Appendix B). The training session will take approximately one hour and cover the early signs of HF exacerbation, interventions, and tool usage. Following the presentation, the participants will have time to ask any questions they may have.

Administration of a pre- and post-test (Appendix C) before and after the training, respectively, will indicate whether there was any change in knowledge on the use of the tool and identification of early HF exacerbation. A content validity index (CVI) tool will be a means to examine the relevance of the pre- and post-test questions. High scores show the items are highly relevant to the topic (Rutherford-Hemming, 2015). For the tool to be considered effective, it should score I-CVIs of 0.78 or higher.

The pre- and post-tests will contain the same questions. A score of 90% or above is required to pass the test, thus indicating that the participant understood the tool and can easily apply it in practice. Those who do not pass the test will undergo another series of training. Participant scores will remain confidential through the use of alphanumeric codes in place of names. Analysis of pre- and post-tests using SPPS will show the difference in the home health nurses' knowledge and the effectiveness of the training.

A chart audit tool (Appendix D) will ensure home health nurses comply with the HFEIP and will help measure the effectiveness of the HFEIP for early identification of HF exacerbation. The audit tool will contain data on patient readmissions, and the information will be compared to

the readmission rate before implementation. The same tool will be used pre and post implementation of the HFEIP. The chart audit tool will contain the initials of the patient, date of home health visit, age, diagnosis, date of admission to home health, whether HFEIP was used, whether the nurse identified the signs and symptoms of HF exacerbations and the interventions used.

Data Collection Procedures

The project data will be collected from all charts with HF diagnosis for pre-implementation and post-implementation of the protocol. All charts for patients with cardiovascular diseases will be reviewed and only charts for patients with a diagnosis of HF will be included. The home health agency's electronic health record (EHR) will be used to filter the charts and identify charts of patients with HF diagnosis. The home health agency utilizes Kinnser EHR. One of the core functions of the Kinnser EHR is efficient and easy retrieval of health information (Rajkomar et al., 2018). The key words to be searched in the Kinnser EHR will be heart failure and cardiovascular diseases. The pre-implementation and post-implementation charts will be reviewed for 30 days readmissions during the post implementation chart audits. Since the Kinnser EHR does not have a tracking system for readmissions, a chart audit tool will be utilized to evaluate hospital readmissions at the commencement of the implementation and post implementation by the project lead. A data codebook will be used to maintain confidentiality; numbers will be used to identify every staff. The numbers used to identify the all participants will be kept in a secured file and stored in a password secured laptop for security purpose.

Intervention/Project Timeline

The timeline for the anticipated project will be approximately 4 weeks. Table 1 presents the planned activities for each week.

Table 1

Project Timeline

Date	Activities
Pre-implementation week 2/24/20–2/28/20	• Hold stakeholders meeting • Conduct pre-test • Train the participants • Conduct post-test • Audit patients' charts
Week 1 3/01/20–3/07/20	• Implement project • Hold weekly meeting
Week 2 3/08/20–3/14/20	• Hold weekly meeting
Week 3 3/15/20–3/21/20	• Hold weekly meeting
Week 4 3/22/20–3/28/20	• Hold weekly meeting
Post-implementation week Week 5 3/29/20–4/04/20	• Hold weekly meeting • Audit charts • Analyze pre and post test • Analyze data • Present to stakeholders

A meeting for all stakeholders will take place on the Monday of the pre-implementation week, with participants meeting the following day for a detailed introduction to the project followed by a pre-test. On Tuesday afternoon, the participants will undergo training on the tool, after which they will sit for a post-test; same-day analysis of results will indicate whether the

participants have gained more knowledge about the tool. Auditing of patient charts will occur on the afternoon of the third day to collect the pre-implementation data.

Project implementation will begin Week 1 with the participants attending weekly meetings for the first 4 weeks to review the project and expectations, as well as discuss any matters arising during the implementation. An audit of the charts that meet the criteria will occur in Week 5, with collected data subsequently analyzed. Lastly, in the fifth week, stakeholders will attend a concluding presentation.

Ethics and Human Subject Protection

This QI project poses no risks to the participants outside of possible minimal discomfort in learning and applying the tool. The project lead will review the Office of Human Research Protections website before project implementation to review matters linked to the protection of human subjects in research. The website details the need to maintain ethical standards through protecting the rights, welfare, and well-being of the subjects (Agency for Health Care Research and Quality, n.d.). The project will also be in accordance with the Health Insurance Portability and Accountability Act (HIPAA) to maintain the privacy, confidentiality, and anonymity of reviewed charts.

The project lead will confirm that the chart audit tools do not have patient names (Arora, Yttri, & Nilsen, 2014). Use of a HIPAA-compliant online data storage vendor will prevent anyone outside the project from connecting the individual participants with their responses. In addition, no participant will disclose any information they are not comfortable with. Prior to participant recruitment, the project lead will submit a project determination form to the Touro University Nevada institutional review board for approval.

Participating in the project will have the benefit of contributing to educational development for home health nurses. Taking part in nursing quality improvement projects promotes lifelong professional development and supports nursing as a professional discipline (Grove, Burns, & Gray, 2012). Another benefit of participation is improved clinical expertise of nurses caring for patients with HF. There will be no compensation for participation.

Plan for Analysis/Evaluation

The QI project will entail developing and implementing a tool for early identification and intervention of HF exacerbations to reduce HF readmissions. A quantitative approach is appropriate for data collection, with a paired t-test utilized for the sample assessment of staff skills and knowledge. These procedures will help in determining whether the home health nurses have acquired the necessary knowledge to use the tool for early identification and intervention of HF exacerbations. The results of the pre- and post-tests entered into SPSS will enable the generation of the final report. The assumption is that the chosen sample will be representative of all home health nurses.

Assumptions are underlying such that the study could not exist without them (Leedy & Ormrod, 2013). A chart audit tool will enable manual data extraction, before and after implementation of the HFEIP. There will be subsequent analysis of compliance using z-ratio to determine the readmission rate. Home health nurses' compliance with the HFEIP greater than 90% and a decreased rate of readmission from HF would indicate that the HFEIP for early identification of HF exacerbation was effective. Pre- and post-tests of the staff will be analyzed using a paired T-test. A paired T-test determines if there is a statistically significant difference between the means of two groups which may be related in certain characteristics (Kim, 2015).

Compliance and readmission rates will be analyzed using z-ratio that measures the significance of the difference between two independent proportions.

Implication for Nursing

Implementation of the HFEIP at the project site should enable early identification and intervention of HF exacerbation. Project success means that at least 90% of nurses will adhere to using the tool. The home health nurses will receive HFEIP tool training before implementation to ensure 90% or greater compliance. There is an anticipated reduction in HF-related hospital readmissions within 30 days after implementing the HF symptom monitoring tool.

Early identification and intervention of HF exacerbations will enable nursing leaders to identify more solutions to problems in the health care industry. The home health nurses will understand the importance of early identification and intervention of HF exacerbations by the positive results in the presentation at the end of the project. Better health outcomes for the patient with HF will indicate that doctorally prepared nurses have a significant role to play in identifying problems affecting health care and finding solutions to improve health care (White & Dudley-Brown, 2016).

With early identification of HF exacerbations, it is possible to mitigate or prevent readmissions, complications, and deaths (Bui & Fonarow, 2012). This QI project will be a means to transform evidence-based research into nursing practice. The project's results should reaffirm findings in current literature that early identification of HF exacerbations can reduce hospital readmissions (Goldgrab, Balakumaran, Kim, & Tabtabai, 2019).

Data Analysis and Results

The project's four objectives underwent analysis using online statistical tools and SPSS. Ratio tests enabled the determination of the percentage of nurses who attended training and the

percentage who adhered to HF tool, the goals were both 90%. Calculations occurred with the use of paired data for both pretest and posttest scores and the number of readmissions before and after implementation of the HF symptom monitoring tool. The project objective was to have greater nurse comprehension after the presentation, followed by an overall reduction in the rate of HF-related readmissions within 30 days.

Staff Training Attendance

Eight nurses received an invitation to training on the usage and benefits of the HF tool, seven (87.5%) of whom attended. The goal was to achieve 90% or greater nurse attendance for in-service education and training in the use of the HF tool. It would be trivial to test if the attendance is significantly different from 0.

Fisher et al. (2011) proposed ratio tests and the use of *F* statistics to compare ratios in a sample. A statistic is a numerical value calculated from data based on the sample size (in this case, the number of nurses invited) and the interested outcome (in this case, the number in attendance). Fleiss et al. (2013) concurred with Fisher et al.'s proposition that sample size and outcome provide sufficient information to run a ratio test using the *F* statistic to construct a 95% confidence interval as a means to assess whether the percentage of attendance is significantly different from 90%.

Figure 1 is a snip from VassarStats, a recommended online tool for analysis of proportions. The 95% confidence interval for the proportion of nurses who attended the training was 52.91% to 97.76%. Because a 90% value falls within this interval, it is, therefore, statistically shown that more than 90% of the nurses attended the training on the HF tool.

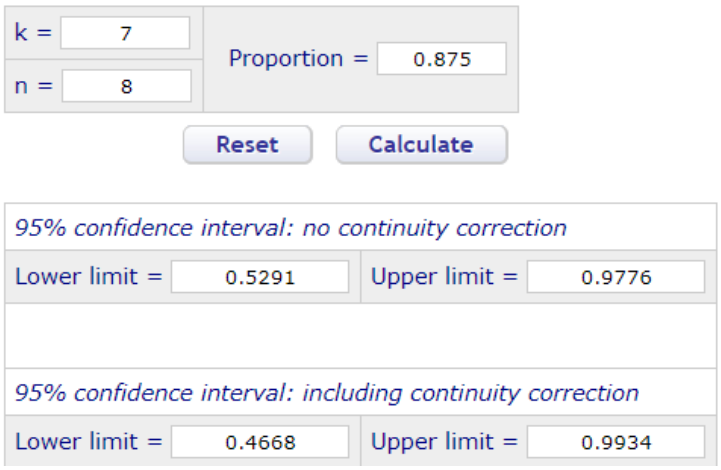


Figure 1. Ratio test for the proportion of nurses who participated in the training.

Staff Understanding of the HF Tool

Measuring staff knowledge came by posing questions to the staff and awarding scores, ranging from 0% to 100%, with 100% being the highest level of understanding. The two tests conducted—a pretest before the presentation and a posttest afterward—enabled the determination of whether staff comprehension increased after the presentation. The goal was to have greater comprehension and achieve 90% scores posttest. Table 2 shows an average posttest score of 95%. It was necessary to construct a confidence interval to investigate if the posttest scores were significantly greater than or equal to 90%. Kallogjeri et al. (2019) argued that a review of confidence intervals improves the quality of research. The mean of posttest staff scored has a 95% confidence interval of 94.32, 95.68. There was enough data to conclude that the nurses' average posttest scores were 95%. Also shown in Table 2 is that the lower quartile is higher than the preferred 90% average score.

Table 2

Measures of Central Tendencies and Dispersion of Pretest and Posttest Scores

	Pretest score	Posttest score
Mean	89	95
Mode	87	92
1st quartile	85	92
Median	88	95
3rd quartile	95	97

From Figures 2 and 3, it is evident that nurses' comprehension was higher on the posttest (mean 95%) compared to the pretest (mean 89%). It was necessary to determine whether there was a statistically significant difference in staff comprehension before and after training. Fisher et al. (2011) proposed the use of an *F* statistic with its associated probability value for comparison of means of paired data. Fong et al. (2018) proved that the Wilcoxon test is an appropriate tool to test the difference in means of paired data. The *t*-test is a way to assess if the mean of the differences is significantly different from 0 (Kim, 2015).

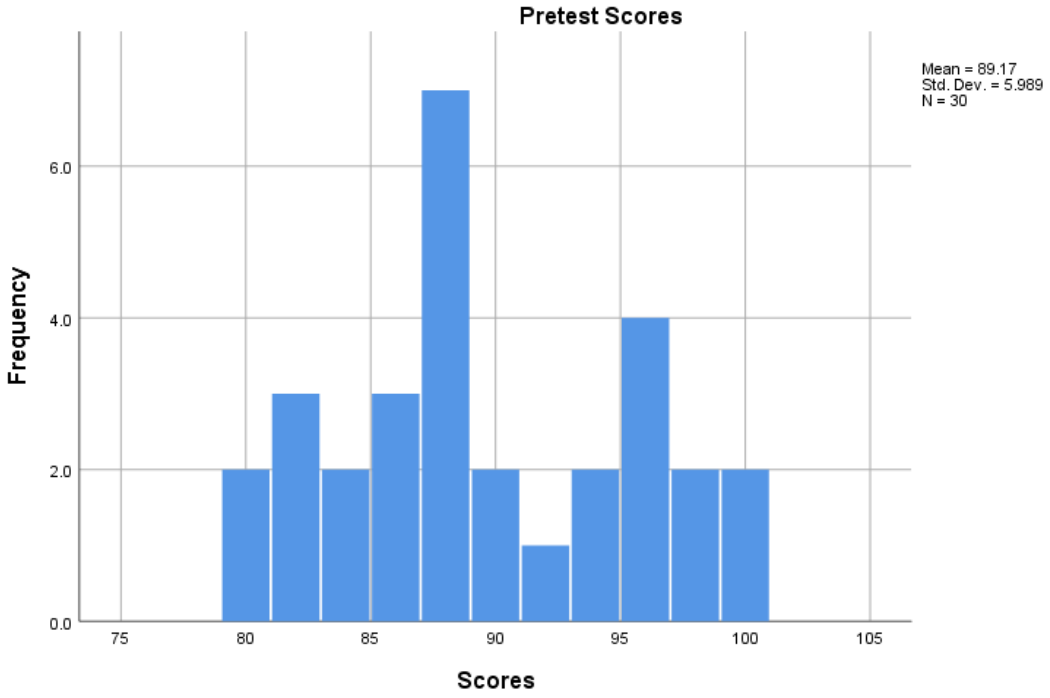


Figure 2. Histogram of the distribution of pretest scores.

Figure 3. Histogram of the distribution of posttest scores.

Figure 4 shows the results of a *t*-test conducted for pretest and posttest paired data. The 95% confidence interval for the mean of the difference in scores (pretest-posttest) is -8.217, -2.550; zero is not included in this confidence interval. The data reflects that the posttest scores are significantly higher than pretest scores, indicating that staff comprehension significantly increased after the presentation. The probability value of the *t*-test was less than the chosen 5% alpha significance level. Accordingly, there was enough data to conclude that posttest scores were higher than pretest scores, indicating that staff comprehension improved after the presentation.

```
T-TEST PAIRS=Pretest WITH Posttest (PAIRED)
  /CRITERIA=CI(.9500)
  /MISSING=ANALYSIS.
```

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	89.17	30	5.989	1.093
	Posttest	94.70	30	3.323	.607

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pretest & Posttest	30	-.425	.019

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pretest - Posttest	-5.533	7.990	1.459	-8.517	-2.550	-3.793	29	.001

Figure 4. Results of *t*-test paired data for pretest and posttest scores.

Staff Adherence to the Tool

The categorization of staff adherence was 1 for staff who adhered to the HF tool and 0 for those who did not, thus providing a dichotomous variable to assess adherence to the HF tool. Out

of the eight nurses, six (75%) adhered to the tool. Further tests were a means to evaluate the significance of the proportion (see Figure 5). Fisher et al. (2011) proposed ratio tests and the use of *F* statistics to compare ratios in a sample. A 95% confidence interval was appropriate for the proportion of nurses who adhered to the tool (Newcombe, 1998). The lower and upper limits were 40% and 93%, respectively. Because 90% is included in the interval, it can be concluded with 95% confidence that 90% of the nurses complied with the use of the HF tool.

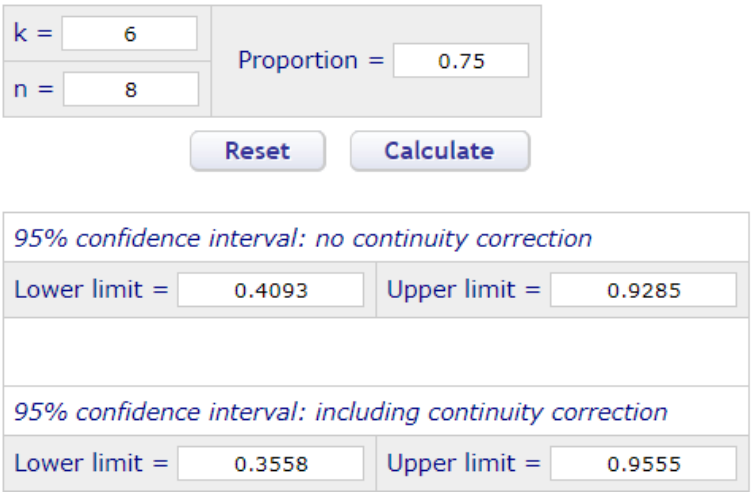


Figure 5. Ratio test for the proportion of nurses who adhered to the HF tool.

Readmission

Before the implementation of the HF tool, the number of readmissions ranged from 10 to 15 within 30 days; after implementation of the HF tool, the number of readmissions dropped to between 6 and 13. The average number of monthly readmissions pre–HF tool implementation was 12, a value less than the average after implementation, which was 10 (see Figures 6 and 7). However, this information was not sufficient to conclude that the use of the HF tool reduced the number of monthly readmissions. Testing the difference in the means is possible with a paired sample *t*-test (Misha et al., 2019).

The results of the *t*-test (see Figure 8) show a 5% alpha level of significance. The probability value of the *t*-test is 0, which is less than the chosen alpha level of significance. In addition, the 95% confidence interval of the mean differences between the pre- and postimplementation pairs was 1.28, 2.92; zero is not included in this interval. It was possible to conclude with 95% confidence that the mean of the difference in the pairs was not 0; therefore, there was enough evidence to support the finding of an overall reduction in the readmission of HF-related problems.

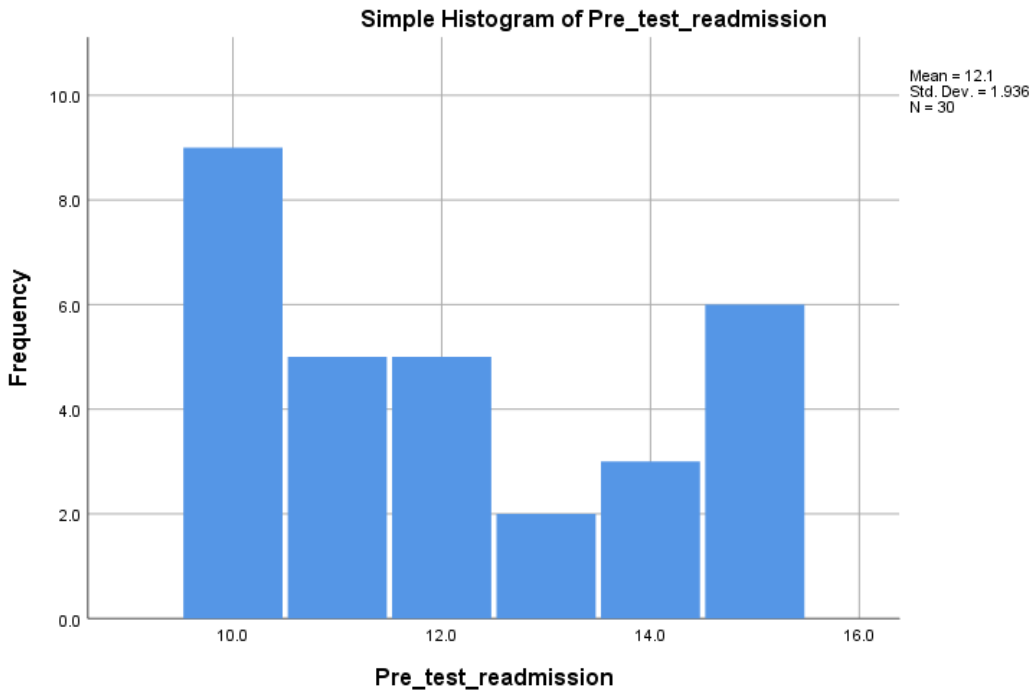


Figure 6. Histogram of the distribution of the number of readmissions preimplementation.

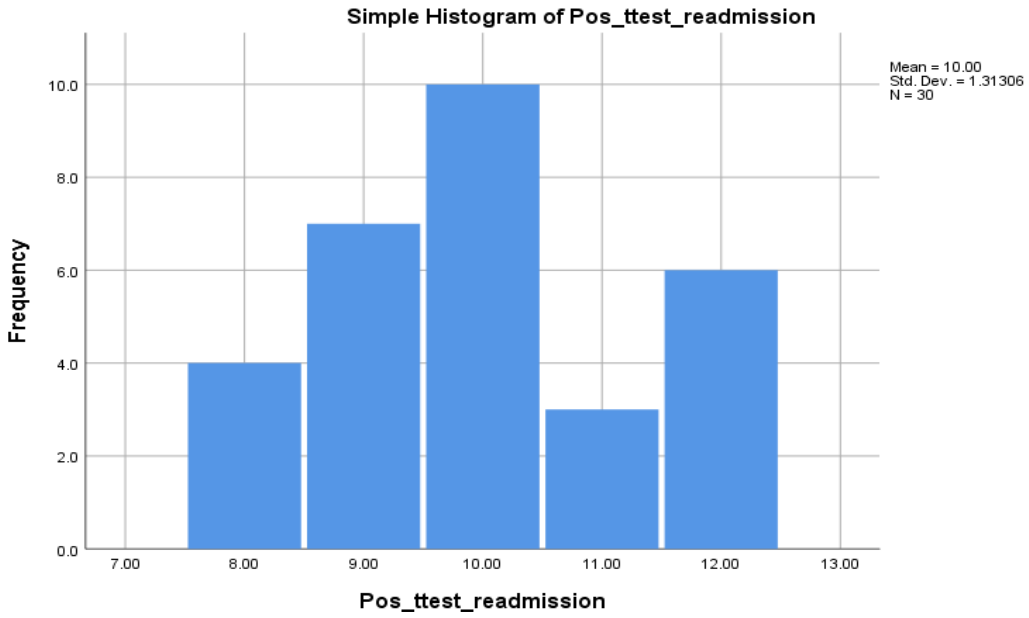


Figure 7. Histogram of the distribution of the number of readmissions postimplementation.

```
T-TEST PAIRS=Pre_test_readmission WITH Pos_ttest_readmission (PAIRED)
  /CRITERIA=CI(.9500)
  /MISSING=ANALYSIS.
```

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre_test_readmission	12.100	30	1.9360	.3535
	Pos_ttest_readmission	10.0000	30	1.31306	.23973

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre_test_readmission & Pos_ttest_readmission	30	.122	.520

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Pre_test_readmission - Pos_ttest_readmission	2.10000	2.20266	.40215	1.27751	2.92249	5.222	29	.000

Figure 8. Results of *t*-test paired data for the numbers of readmissions before and after implementation of the HF tool.

Discussion

Data analyses indicated that the implementation of the HF symptom monitoring tool resulted in early identification of HF exacerbation. Thus, administering early treatment helped to reduce the risk of hospital readmission, achieving all of the project objectives. The first objective was to ensure as many nurses as possible were aware of the proposed tool, with at least 90% of nurses attending the training on the tool. This percentage would indicate that a sufficient number of health care providers would possess knowledge of the implemented HF symptom monitoring tool, and, therefore, would adhere to the tool and pass the knowledge to other health care providers. Out of the eight nurses invited to participate in the study, seven attended the training, or 87.5%. Although this percentage was less than the target objective, ratio tests indicated that the statistical significance of the proportion of nurses who attended the training was 97.76%. Because the statistical significance is greater than the target objective, the objective was achieved. Considering each care providers attends to a different groups of patients (Schwarz & Elman, 2003), nurses' awareness of the HF tool will affect a large proportion of potential HF patients.

The second objective of the project was to increase nurses' comprehension of the HF detection protocol incorporated in the implementation tool. The project lead set the target comprehension score after staff education and training on the HF tool to be at least 90%. The analysis of the pre- and post-tests' ratios indicated that the mean comprehension score was 89% and 95% before and after the training, respectively. T-tests showed the statistical significance of the posttest data was 95%, with a mean 95% confidence interval of 94.32, 95.68. These statistics showed that, post-training, nurses had a proper understanding of the symptoms and warning signs of HF exacerbation and strategies, allowing them to address early HF symptoms to prevent

progression. The increased comprehension was likely due to knowledge received during the training as well as the experience gained when administering the tool (Ferrari et al., 2015). Therefore, the second objective was achieved.

The third objective of the project was to attain at least 90% of staff adherence to the implemented tool. Out of the eight nurses recruited for the study, six adhered to the implemented, or 65% of participants. Ratio test analysis indicated the statistical significance of the proportion of adherence among the nurses who attended the training was 93%. Because the target objective was 90% adherence, the third goal was achieved, indicating that more than 90% of nurses identified HF symptoms early, thus promoting early treatment. The lack of adherence by some nurses might have been due to not all nurses attending the training; accordingly, some nurses were not familiar with the HF early identification strategies incorporated in the proposed tool.

The final objective was reducing the rate of HF patient hospital readmissions within 30 days after discharge. The pre- and post-implementation *t*-tests indicated that the mean or average number of readmissions within 30 days before the implementation of the proposed HF tool was greater than the average number of readmissions within 30 days after the implementation, with a reduction from 12 to 10 readmission. This reduced number of readmissions is an indicator of nurses identifying more HF patients' early, thus facilitating efficient and adequate treatment. The mean finding also shows that timely interventions significantly reduced nurse workload and resource strain (Castillo et al., 2017).

T-tests indicated the confidence level of the findings to be 95%; thus, the findings were statistically significant. Because the researcher did not specify the targeted rate of reduction in the readmission rate, any positive value was acceptable; accordingly, the project objective was

attained. As such, the project findings support the implementation of HF symptom monitoring tools to enable early identification and treatment of HF exacerbations. The project findings also aligned with the existing literature on the role of HF symptom monitoring tool in early identification and treatment of HF exacerbation to reduce hospital readmission rates. A study by Ziaeian & Fonarow, (2016) established that implementation of a HF symptom monitoring tool facilitated early identification and intervention of HF exacerbations. This project approved this and many other studies regarding effectiveness of tools used in early identification of heart failure exacerbations.

Significance

The current project proposal is significant to the nursing profession. Implementation of an HF symptom monitoring tool helps in early diagnosis and treatment of HF, thus reducing resource constraint and hospital readmission. Use of the tool will also reduce the risk of other adverse effects of HF, such as patient mortality. Consequently, there is less likelihood of nurse burnout and job stress related to resource constraint and patient mortality. The project better enables nurses to fulfill their role in diminishing various health problems in both community and health care settings. Health problems minimized include high mortality rate, disease burden, hospital congestion, resource constraint, and high hospital readmission rate (Jaarsma, Cameron, Riegel, & Stromberg, 2017).

Nurses can contribute to the reduction of these problems by proposing evidence-based solutions, participating in designing the proposed strategy, as well as mobilizing other nurses to adhere to the changes in HF treatment (Salmond & Echevarria, 2017). The project also helps nurse leaders appreciate their contribution in the mitigation of various issues in the health care sector. As the largest segment of the health care workforce, nurses are best suited for addressing

health care issues (Ziaeian & Fonarow, 2016). Through the project, nurses gain knowledge on the procedure of implementing change in their respective health care settings. They also increase critical appraisal skills and can effectively translate research findings into practice as well as adopt rational, evidence-based strategies (Powers et al., 2018).

Limitations

There were several limitations to this project. The most significant limitation of the study design was the quality improvement proposal was tested in a single health care setting. Thus, there was a risk of failure to yield identical outcomes if applied in a different health care setting (Wolniak, 2018). The data recruitment limitation was the sample of just seven health care providers. Small samples present the risk of biased findings and weakened application of the conclusions to a larger population (Olteanu, Kıcıman, & Castillo, 2018). Additionally, using just seven participants limited the ability to yield statistically significant data. The data collection method limitation was the evaluation timeframe was relatively short, especially in light of the rate of heart failure progression (Fusch et al., 2017). Heart failure symptoms advance at a slow pace, resulting in an inadequate time to collect sufficient data to confirm or deny the attainment of project goals (Shepperd et al., 2016). The major limitation of data analysis was the failure to assess the nurses' ability to correctly recognize early heart failure symptoms versus heart failure comorbidities in order to determine an accurate rate of patient readmission. In patients presenting with multiple conditions, heart failure symptoms can overlap with symptoms of other comorbidities, thus going unidentified (Nguyen et al.,2019). In this situation, even healthcare providers who attended the project's training and showed a significant improvement in knowledge after the training were likely to face difficulties applying the HF symptom-monitoring tool.

Dissemination and Sustainability

Wide dissemination of the project findings will ensure extensive knowledge-sharing. The problems of limited literacy on early HF symptoms among health care providers and high hospital readmission rates of HF patients are global (Wang et al., 2019). Therefore, a broad distribution of findings could have a significant impact on lessening the problem. Dissemination of the project will be through four platforms.

The first platform will be online via the DNP repository (Battaglia & Glasgow, 2018). The second platform will be through a poster presentation at the annual DNP conference organized by the American Nurses Association, whose 2020 focus is quality improvement in health care delivery (Rabin & Brownson, 2017). The third platform will be a presentation at a local workshop for nurses on Quality Improvement in Nursing Care. The health care organization where the project was conducted, presents monthly workshops to train nurses on quality improvement. Social media will be the fourth platform for sharing findings via the Los Angeles County Nurse Practitioners Facebook group (Reynolds, 2018).

The project will be sustainable in the current outpatient care setting because it does not require additional staff or financing, only staff training on the proposed tool. The organization seeks to decrease the cost of health care through reduced hospital readmissions; therefore, the organization will implement the HF symptom-monitoring tool through policy actions. Other local and national health care organizations will also apply the HF symptom-monitoring tool to promote a continuous reduction in readmission rates. To ensure nurses have the necessary knowledge for the continued sustainability of the project, staff will receive regular training on the tool. The formation of a strong interdisciplinary team will allow health care organizations to manage the tool implementation, thus achieving their targeted goals. Sustainability is feasible

because tool implementation is attainable within a short timeframe and minimal cost. These features make continued implementation realistic in light of the urgency to address the current problems in health care coupled with limited resources.

Conclusion

Heart failure is one of the most prevalent and high-risk health conditions across the US (Mozaffarian et al., 2016) affecting approximately 5.7 million Americans, and is associated with high mortality, morbidity and frequent hospitalization, making it one of the most costly healthcare problems in the US (Mozaffarian et al.,2016). Heart failure is a chronic disease process and is characterized by acute exacerbations (Golden, 2016). Evidence based studies have indicated that early identification of HF symptoms can lead to early interventions, thus reducing potential complications and deaths from heart failure (Golden, 2016). This DNP project utilized a quality improvement design, where the pre and post intervention outcomes of HF symptom monitoring tool were evaluated regarding early treatment implementation and hospital readmission rate. The data analysis indicated that implementation of HF symptom monitoring tool resulted in an increase of healthcare providers' knowledge on HF symptom monitoring, early identification and treatment of HF, and a significant reduction in the rate of hospital readmission of HF patients. This DNP project is significant to the nursing profession because a reduction in hospital readmission ultimately leads to reduced workload, nursing profession stressors and increased job satisfaction.

References

Acher, A. W., LeCaire, T. J., Hundt, A. S., Greenberg, C. C., Carayon, P., Kind, A. J., & Weber, S. M. (2015). Using human factors and systems engineering to evaluate re-admission after complex surgery. *Journal of the American College of Surgeons*, *221*, 810-820. https://doi.org/10.1016/j.jamcollsurg.2015.06.014

Agency for Health Care Research and Quality. (n.d.). Protection of human subjects in research. Retrieved from https://www.ahrq.gov/funding/process/grant-app-basics/hsubjects.html

Aglen, B. (2016). Pedagogical strategies to teach bachelor students evidence-based practice: A systematic review. *Nurse Education Today*, *36*, 255-263. https://doi.org/10.1016/j.nedt.2015.08.025

Albert, N. M. (2006). Evidence-based nursing care for patients with heart failure. *AACN Advanced Critical Care, 17*, 170-185. Retrieved from http://acc.aacnjournals.org/content/17/2/170

Aldred, H., Gott, M., & Gariballa, S. (2005). Advanced heart failure: Impact on older patients and informal careers. *Journal of Advanced Nursing, 49*, 116-124. Retrieved from https://doi.org/10.1111/j.1365-2648.2004.03271.x

Arora, S., Yttri, J., & Nilsen, W. (2014). Privacy and security in mobile health (mHealth) research. *Alcohol Research: Current Reviews*, *36*(1), 143. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4432854/

Battaglia, C. and Glasgow, R., 2018. Pragmatic dissemination and implementation research models, methods and measures and their relevance for nursing research. *Nursing Outlook*, 66(5), pp.430-445.

Boccuti, C., & Casillas, G. (2015, January). Aiming for fewer hospital U-turns: The Medicare hospital re-admission reduction program. *Henry J. Kaiser Family Foundation* [Issue brief]. Retrieved from http://slcsuperiorhomecare.com/wp-content/uploads/2015/06/Kaiser-Readmission-paper.pdf

Boozary, A. S., Manchin, J., & Wicker, R. F. (2015). The Medicare hospital readmissions reduction program: Time for reform. *JAMA, 314*, 347-348. https://doi.org/10.1001/jama.2015.6507

Brody, A. A., Gibson, B., Tresner-Kirsch, D., Kramer, H., Thraen, I., Coarr, M. E., & Rupper, R. (2016). High prevalence of medication discrepancies between home health referrals and Centers for Medicare and Medicaid Services home health certification and plan of care and their potential to affect safety of vulnerable elderly adults. *Journal of the American Geriatrics Society*, *64*(11), e166-e170. Retrieved from https://onlinelibrary.wiley.com/journal/15325415

Bromley, E., Mikesell, L., Jones, F., & Khodyakov, D. (2015). From subject to participant: Ethics and the evolving role of community in health research. *American Journal of Public Health, 105*, 900-908. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4386538/

Brown, M. M. (2018). Transitions of care. In T. P. Daaleman & M. R. Helton (Eds.), *Chronic illness care: Principles and practice* (pp. 369-373). Cham, Germany: Springer.

Bryant-Lukosius, D., Valaitis, R., Martin-Misener, R., Donald, F., Peña, L. M., & Brousseau, L. (2017). Advanced practice nursing: a strategy for achieving universal health coverage and universal access to health. *Revista latino-americana de enfermagem, 25*. Retrieved from http://www.scielo.br/scielo.php?pid=S0104-11692017000100301&script=sci_arttext

Brush, J. E., Handberg, E. M., Biga, C., Birtcher, K. K., Bove, A. A., Casale, P. N., & Wyman, J. F. (2015). 2015 ACC health policy statement on cardiovascular team-based care and the role of home health providers. *Journal of the American College of Cardiology, 65,* 2118-2136. https://doi.org10.1016/j.jacc.2015.03.550/

Bui, A. L., & Fonarow, G. C. (2012). Home monitoring for heart failure management. *Journal of the American College of Cardiology*, *59*(2), 97-104. https://doi.org/10.1016/j.jacc.2011.09.044

Butt, A., Naaranoja, M., & Savolainen, J. (2016). Project change stakeholder communication. *International Journal of Project Management, 34,* 1579-1595. Retrieved from http://www.projcp.com/

Cash, J. C., & Glass, C. A. (2016). *Adult-gerontology practice guidelines*. New York, NY: Springer.

Castillo, A., Edriss, H., Selvan, K., & Nugent, K. (2017). Characteristics of patients with congestive heart failure or chronic obstructive pulmonary disease readmissions within 30 days following an acute exacerbation. *Quality Management in Healthcare*, *26*, 152-159. https://doi.org/10.1097/QMH.0000000000000143

Centers for Disease Control and Prevention. (2019). *Heart failure fact sheet*. Retrieved from https://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_heart_failure.htm

Centrella-Nigro, A., Bognar, L., Burke, K., Faber, K., Flynn, V., LaForgia, M., & Wiklinski, B. (2016). The readmitted patient with heart failure. *MEDSURG Nursing*, *25*(3), 163-168. Retrieved from http://www.medsurgnursing.net/

Choi, E., Schuetz, A., Stewart, W. F., & Sun, J. (2016). Using recurrent neural network models for early detection of heart failure onset. *Journal of the American Medical Informatics*

Association, 24, 361-370. Retrieved from https://academic.oup.com/jamia/article/24/2/361/2631499

Cui, C., Li, Y., Geng, D., Zhang, H., & Jin, C. (2018). The effectiveness of evidence-based nursing on the development of nursing students' critical thinking: A meta-analysis. *Nurse Education Today, 65*, 46-53. https://doi.org/10.1016/j.nedt.2018.02.036

Delaney, C., Apostolidis, B., Lachapelle, L., & Fortinsky, R. (2011). Home care nurses' knowledge of evidence-based education topics for management of heart failure. *Heart & Lung: Journal of Acute and Critical Care, 40*, 285-292. https://doi.org/10.1016/j.hrtlng.2010.12.005

Dennis, L. I., Blue, C. L., Stahl, S. M., Benge, M. E., & Shaw, C. J. (1996). The relationship between hospital readmissions of medicare beneficiaries with chronic illnesses and home care nursing interventions. *Home Healthcare Nurse, 14*, 303-309. Retrieved from https://journals.lww.com/homehealthcarenurseonline/pages/default.aspx

Ellis, P. (2019). *Evidence-based practice in nursing* (4th ed.). Thousand Oaks, CA: Sage.

Evans, R. S., Benuzillo, J., Horne, B. D., Lloyd, J. F., Bradshaw, A., Budge, D., . . . Garrett, T. (2016). Automated identification and predictive tools to help identify high-risk heart failure patients: Pilot evaluation. *Journal of the American Medical Informatics Association, 23*, 872-878. Retrieved from https://academic.oup.com/jamia/article/23/5/872/2379879

Ferrari, R., Böhm, M., Cleland, J. G., Paulus, W. J., Pieske, B., Rapezzi, C., & Tavazzi, L. (2015). Heart failure with preserved ejection fraction: Uncertainties and dilemmas. *European Journal of Heart Failure, 17*, 665-671. https://doi.org/10.1002/ejhf.304

Fisher, M. J., Marshall, A. P., & Mitchell, M. (2011). Testing differences in proportions. *Australian Critical Care, 24*(, 133-138. https://doi.org/10.1016/j.aucc.2011.01.005

Fishman, E. Z., Penrod, J. D., & Vladeck, B. C. (2003). Commentary: Medicare home health utilization in context. *Health Services Research, 38*(1), 107-112. https://doi.org/10.1111/1475-6773.00107

Fleiss, J. L., Levin, B., & Paik, M. C. (2013). *Statistical methods for rates and proportions*. Hoboken, NJ: John Wiley & Sons.

Fong, Y., Huang, Y., Lemos, M. P., & Mcelrath, M. J. (2018). Rank-based two-sample tests for paired data with missing values. *Biostatistics*, *19*(3), 281-294. https://doi.org/10.1093/biostatistics/kxx039

Fortinsky, R. H., Fenster, J. R., & Judge, J. O. (2004). Medicare and Medicaid home health and Medicaid waiver services for dually eligible older adults: Risk factors for use and correlates of expenditures. *Gerontologist, 44*, 739-749. https://doi.org/10.1093/geront/44.6.739

Fouka, G., & Mantzorou, M. (2011). What are the major ethical issues in conducting research? Is there a conflict between the research ethics and the nature of nursing? *Health Science Journal*, *5*(1). Retrieved from http://www.hsj.gr/

Fusch, P. I., Fusch, G. E., & Ness, L. R. (2017). How to conduct a mini-ethnographic case study: A guide for novice researchers. *The Qualitative Report*, *22*(3), 923.

Ganann, R., Weeres, A., Lam, A., Chung, H., & Valaitis, R. (2019). Optimization of home care nurses in Canada: A scoping review. *Health & Social Care in the Community, 27*(5). https://doi.org/10.1111/hsc.12797

Ghanbari, A., Rahmatpour, P., Jafaraghayee, F., & Khalili, M. (2017). 41: Critical appraisal of evidence-based nursing care guideline by using the Agree II instrument. *BMJ Open*, *7*(Suppl 1), bmjopen-2016. http://doi.org/10.1136/bmjopen-2016-015415.41

Glogowska, M., Simmonds, R., McLachlan, S., Cramer, H., Sanders, T., Johnson, R., . . . Purdy, S. (2015). Managing patients with heart failure: a qualitative study of multidisciplinary teams with specialist heart failure nurses. *Annals of Family Medicine, 13*, 466-471. https://doi.org/10.1370/afm.1845

Golden, S. A. (2016). The effect of heart failure education on knowledge and readmission. *Evidence-Based Practice Project Reports*, 85. Retrieved from https://scholar.valpo.edu/ebpr/85/

Goldgrab, D., Balakumaran, K., Kim, M. J., & Tabtabai, S. R. (2019). Updates in heart failure 30-day readmission prevention. *Heart Failure Reviews*, *24*, 177-187. https://doi.org/10.1007/s10741-018-9754-4

Granger, B. B., Ekman, I., Hernandez, A. F., Sawyer, T., Bowers, M., DeWald, T., & Hayden, B. (2015). Results of the chronic heart failure intervention to improve medication adherence (CHIME) study: A randomized intervention in high-risk patients. *American Heart Journal, 169*, 539-548. https://doi.org/10.1016/j.ahj.2015.01.006

Greenland, P., Alpert, J. S., Beller, G. A., Benjamin, E. J., Budoff, M. J., & Fayad, Z. A. (2010). American College of Cardiology Foundation; American Heart Association. 2010 ACCF/AHA guideline for assessment of cardiovascular risk in asymptomatic adults: A report of the American College of Cardiology Foundation/American Heart Association Task Force on practice guidelines. *J Am Coll Cardiol, 56*(25), e50-103. Retrieved from

http://my.americanheart.org/idc/groups/ahamah-public/@wcm/@sop/documents/downloadable/ucm_319826.pdf

Grove, S. K., Burns, N., & Gray, J. (2012). *The practice of nursing research: Appraisal, synthesis, and generation of evidence* (7th ed.). St. Louis, MO: Saunders.

Gwaltney, C., Tiplady, B., & Deschaseaux, C. (2015). Using the clinical summary score from the Kansas City cardiomyopathy questionnaire as an endpoint in clinical trials: Psychometric support. *Value in Health*, *18*(3), A24. Retrieved from https://www.valueinhealthjournal.com/article/S1098-3015(15)00204-1/pdf

Horwich, T. B., & Fonarow, G. C. (2017, January). Prevention of heart failure. *JAMA Cardiology*, *2*(1), 116. https://doi.org/10.1001/jamacardio.2016.3394

Jaarsma, T., Cameron, J., Riegel, B., & Stromberg, A. (2017). Factors related to self-care in heart failure patients according to the middle-range theory of self-care of chronic illness: a literature update. *Current Heart Failure Reports*, *14*(2), 71-77. https://doi.org/10.1007/s11897-017-0324-1

Jacobs, J. A., Jones, E., Gabella, B. A., Spring, B., & Brownson, R. C. (2012) Tools for implementing an evidence-based approach in public health practice. *Preventing Chronic Disease*, *9*, E116. https://doi.org/10.5888/pcd9.110324

Kallogjeri, D., Francis, D. O., & Piccirillo, J. F. (2019). Use of confidence intervals to improve the quality of research results reporting and interpretation. *JAMA Otolaryngology–Head & Neck Surgery*, *145*, 491-493. https://doi.org/10.1001/jamaoto.2019.0793

Kang, S. J., & Lee, M. (2005). Q-convergence with interquartile ranges. *Journal of Economic Dynamics and Control*, *29*, 1785-1806. https://doi.org/10.1016/j.jedc.2004.10.004

Kim, T. K. (2015). T test as a parametric statistic. *Korean Journal of Anesthesiology*, *68*, 540-546. https://doi.org/10.4097%2Fkjae.2015.68.6.540

Komanduri, S., Jadhao, Y., Guduru, S. S., Cheriyath, P., & Wert, Y. (2017). Prevalence and risk factors of heart failure in the USA: NHANES 2013–2014 epidemiological follow-up study. *Journal of Community Hospital Internal Medicine Perspectives*, *7*, 15-20. https://doi.org/10.1080/20009666.2016.1264696

Leedy, P. D., & Ormrod, J. E. (2013). The nature and tools of research. In P. D. Leedy & J. E. Ormrod (Eds.), *Practical research: Planning and design* (1st ed., pp. 1-26). London, England: Pearson.

Lowry, R. (2020). Significance of the difference between two independent proportions. Retrieved from vassarstats.net/propdiff_ind.html

McCaffrey, R. G., Hayes, R., Stuart, W., Cassell, A., Farrell, C., Miller-Reyes, C., & Donaldson, A. (2010). A program to improve communication and collaboration between nurses and medical residents. *Journal of Continuing Education in Nursing*, *41*, 172-178. https://doi.org/10.3928/00220124-20100326-04

Miotto, R., Li, L., Kidd, B. A., & Dudley, J. T. (2016). Deep patient: an unsupervised representation to predict the future of patients from the electronic health records. *Scientific Reports*, *6*, 26094. https://doi.org/10.1038/srep26094

Mishra, P., Singh, U., Pandey, C. M., Mishra, P., & Pandey, G. (2019). Application of student's t-test, analysis of variance, and covariance. *Annals of Cardiac Anaesthesia*, 22(4), 407.

Mozaffarian, D., Benjamin, E. J., Go, A. S., Arnett, D. K., Blaha, M. J., Cushman, M., & Turner, M. B. (2016). Heart disease and stroke statistics – 2016 update. A report from the

American Heart Association. *Circulation, 133*, e38-e360. https://doi.org/10.1161/cir.0000000000000350

Murtaugh, C. M., Deb, P., Zhu, C., Peng, T. R., Barrón, Y., Shah, S., . . . Siu, A. L. (2017). Reducing readmissions among heart failure patients discharged to home health care: Effectiveness of early and intensive nursing services and early physician follow-up. *Health Services Research, 52,* 1445-1472. https://dx.doi.org/10.1111/1475-6773.12537

Myers, S., Grant, R. W., Lugn, N. E., Holbert, B., & Kvedar, J. C. (2016). Impact of home-based monitoring on the care of patients with congestive heart failure. *Home Health care Management & Practice, 18,* 444-451. https://doi.org/10.1177/1084822306289991

National Institutes of Health. (n.d.). Evidence-based practices and programs. Retrieved from https://prevention.nih.gov/research-priorities/dissemination-implementation/evidence-based-practices-programs

Newcombe, R. G. (1998). Two-sided confidence intervals for the single proportion: Comparison of seven methods. *Statistics in Medicine,* 17, 857-872. https://doi.org/10.1002/(SICI)1097-0258(19980430)17:8%3C857::AID-SIM777%3E3.0.CO;2-E

Nguyen, Q., Wang, K., Nikhanj, A., Chen-Song, D., DeKock, I., Ezekowitz, J., . . . Oudit, G. Y. (2019). Screening and initiating supportive care in patients with heart failure. *Frontiers in Cardiovascular Medicine*, *6*, 151. https://doi.org/10.3389/fcvm.2019.00151

O'Connor, C. M. (2017). High heart failure readmission rates: Is it the health system's fault? *JACC: Heart Failure, 5*(5). https://doi.org/10.1016/j.jchf.2017.03.011

Osborn, R., Moulds, D., Schneider, E. C., Doty, M. M., Squires, D., & Sarnak, D. O. (2015). Primary care physicians in ten countries report challenges caring for patients with

complex health needs. *Health Affairs, 34*, 2104-2112. https://doi.org/10.1377/hlthaff.2015.1018

Pearson, A., Wiechula, R., Court, A., & Lockwood, C. (2005). The JBI model of evidence-based healthcare. *International Journal of Evidence-Based Healthcare, 3*(8), 207-215. https://doi.org/10.1111/j.1479-6988.2005.00026.x

Pokharel, Y., Khariton, Y., Tang, Y., Nassif, M. E., Chan, P. S., Arnold, S. V., . . . Spertus, J. A. (2017). Association of serial Kansas City Cardiomyopathy Questionnaire assessments with death and hospitalization in patients with heart failure with preserved and reduced ejection fraction: A secondary analysis of 2 randomized clinical trials. *JAMA Cardiology, 2*, 1315-1321. https://doi.org/10.1111/j.1479-6988.2005.00026.x

Powers, W. J., Rabinstein, A. A., Ackerson, T., Adeoye, O. M., Bambakidis, N. C., Becker, K., ... & Jauch, E. C. (2018). 2018 guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. *stroke, 49*(3), e46-e99.Retrieved from https://www.ahajournals.org/doi/full/10.1161/STR.0000000000000158

Rabin, B. A., & Brownson, R. C. (2017). Terminology for dissemination and implementation research. *Dissemination and implementation research in health: Translating science to practice*, *2*, 19-45.

Rajkomar, A., Oren, E., Chen, K., Dai, A. M., Hajaj, N., Hardt, M., & Sundberg, P. (2018). Scalable and accurate deep learning with electronic health records. *NPJ Digital Medicine, 1*(1), 18. https://doi.org/10.1038/s41746-018-0029-1

Reynolds, J. F. (2018). A short history of mental health rhetoric research (MHRR). *Rhetoric of Health & Medicine, 1*(1), 1-18.

Riley, J. P., Astin, F., Crespo-Leiro, M. G., Deaton, C. M., Kienhorst, J., Lambrinou, E.,. . . Anker, S. D. (2016). Heart Failure Association of the European Society of Cardiology heart failure nurse curriculum. *European Journal of Heart Failure*, *18*, 736-743. https://doi.org/10.1002/ejhf.568

Rise Above Heart Failure Toolkit for Healthcare Professionals. (n.d.). Retrieved from https://www.heart.org/en/health-topics/heart-failure/heart-failure-tools-resources/rise above-heart-failure-toolkit

Russell, F. M., & Pang, P. S. (2019). Acute heart failure risk stratification in the emergency department: Are we there yet?. *Revista Española de Cardiología (English Edition)*, *72*, 190-191. Retrieved from https://www.revespcardiol.org/en-acute-heart-failure-risk-stratification-articulo-S1885585718303943

Rutherford-Hemming, T. (2015). Determining content validity and reporting a content validity index for simulation scenarios. *Nursing Education Perspectives*, *36*, 389-393. https://doi.org/10.5480/15-1640

Rycroft-Malone, J., & Bucknall, T. (Eds.). (2011). *Models and frameworks for implementing evidence-based practice: Linking evidence to action* (Vol. 2). New York, NY: John Wiley & Sons.

Salmond, S. W., & Echevarria, M. (2017). Healthcare transformation and changing roles for nursing. *Orthopedic nursing*, *36*(1), 12. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5266427/

Schaffer, M. A., Sandau, K. E., & Diedrick, L. (2013). Evidence-based practice models for organizational change: Overview and practical applications. *Journal of Advanced Nursing*, *69*, 1197-1209. https://doi.org/10.1111/j.1365-2648.2012.06122.x

Schwarz, K. A., & Elman, C. S. (2003). Identification of factors predictive of hospital readmissions for patients with heart failure. *Heart & Lung*, *32*(2), 88-99. https://doi.org/10.1067/mhl.2003.15

Shaw, J. D., O'Neal, D., Siddharthan, K., & Neugaard, B. I. (2014). Pilot program to improve self-management of patients with heart failure by redesigning care coordination. *Nursing Research and Practice, 2014*, 1-10. https://doi.org/10.1155/2014/836921

Shepperd, S., Gonçalves-Bradley, D. C., Straus, S. E., & Wee, B. (2016). Hospital at home: Home-based end-of-life care. *Cochrane Database of Systematic Reviews*, (2). https://doi.org/10.1002/14651858.CD009231.pub2

Stafylas, P., Farmakis, D., Kourlaba, G., Giamouzis, G., Tsarouhas, K., Maniadakis, N., & Parissis, J. (2017). The heart failure pandemic: The clinical and economic burden in Greece. *International Journal of Cardiology*, *227*, 923-929. https://doi.org/10.1016/j.ijcard.2016.10.042

Stetler, C. B. (2001). Updating the Stetler model of research utilization to facilitate evidence-based practice. *Nursing Outlook*, *49*(6), 272-279. https://doi.org/10.1067/mno.2001.120517

Stewart, S., Carrington, M. J., Marwick, T. H., Davidson, P. M., Macdonald, P., Horowitz, J. D., . . . Scuffham, P. A. (2012). Impact of home versus clinic-based management of chronic heart failure: The WHICH? (Which Heart Failure Intervention Is Most Cost-Effective & Consumer Friendly in Reducing Hospital Care) multicenter, randomized trial. *Journal of the American College of Cardiology*, *60*, 1239-1248. https://doi.org/10.1016/j.jacc.2012.06.025

Sudsawad, P. (2007). *Knowledge translation: Introduction to models, strategies and measures.* Austin, TX: Southwest Educational Development Laboratory, National Center for the Dissemination of Disability Research. Retrieved from https://ktdrr.org/ktlibrary/articles_pubs/ktmodels/

Topaz, M., Petrovsky, D., Radhakrishnan, K., O'Connor, M., Koru, G., Masterson Creber, R., & Bowles, K. H. (2013). *Exploration of homecare agency admission process for older adults: A qualitative pilot study.* Philadelphia, PA: University of Pennsylvania.

U.S. Department of Health and Human Services. (2019). Healthy People 2020 evidence-based resources. Retrieved from https://www.healthypeople.gov/2020/tools-resources/Evidence-Based-Resources

United States Census Bureau. (n.d.). Artesia City Los Angeles. Retrieved from https://www.census.gov/search-results.html?q=artesia+city+los+angeles&page=1&stateGeo=none&searchtype=web&csp=SERP&_charset_=UTF-8

Villalba Mora, E., Petidier-Torregrossa, R., Alonso-Bouzon, C., Carnicero-Carreño, J. A., & Rodríguez-Mañas, L. (2015). Early detection of heart failure exacerbation by telemonitoring in old people. *International Journal of Integrated Care, 15*, 1-2. https://doi.org/10.5334/ijic.2173

Wang, M., Fan, W., & Jia, X. (2016). Data quality measurement method and system based on a quartile graph. U.S. Patent Application No. 14/655,270.

Wang, Y., Ng, K., Byrd, R. J., Hu, J., Ebadollahi, S., Daar, Z., & Stewart, W. F. (2015). Early detection of heart failure with varying prediction windows by structured and unstructured data in electronic health records. *Conference proceedings: Annual International*

Conference of the IEEE Engineering in Medicine and Biology Society, 2530-2533. https://doi.org/10.1109/EMBC.2015.7318907

White, K. M., & Dudley-Brown, S. (Eds.). (2016). *Translation of evidence into practice: Application to nursing and health care*. New York, NY: Springer.

World Health Organization. (2010). Chronic diseases are the major cause of death and disability worldwide. Retrieved from https://www.who.int/chp/about/integrated_cd/en/

World Health Organization. (n.d.). Ethical standards and procedures for research with human beings. Retrieved from https://www.who.int/ethics/research/en/

Yancy, C. W., Jessup, M., Bozkurt, B., Butler, J., Casey, D. E., Drazner, M. H., . . . Johnson, M. R. (2013). 2013 ACCF/AHA guideline for the management of heart failure: A report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *Journal of the American College of Cardiology*, *62*(16), e147e239. Retrieved from http://www.onlinejacc.org/content/accj/62/16/e147.full.pdf

Ziaeian, B., & Fonarow, G. C. (2016). The prevention of hospital readmissions in heart failure. *Progress in Cardiovascular Diseases*, *58*, 379-385. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S0033062015300165

Appendix A

HF Exacerbation Identification Protocol Tool

Purpose: Early identification of HF exacerbation in a home health setting

Objectives:
- Implement the HF symptom monitoring tool at the project site for early identification and intervention of HF exacerbation.

- The goal is an overall reduction in the rate of HF-related readmissions within 30 days.

- The goal is to have at least 90% of nurses in adherence with the tool.

Indications: HF patients under home health services

Contraindications: Patients without HF diagnoses or in known active exacerbation.

Steps:
1. Nurses will implement the HF exacerbation identification tool on every home health visit with patients with a known diagnosis of HF.

2. Nurse assessment

The nurse will ask the patient the following questions:

Green Zone:

Do you have new or worsening shortness of breath?

Is your physical activity level normal for you?

Do you have any new swelling in the feet or legs? Do they look normal to you?

Is your weight stable? What is your weight today?

Do you have any signs or symptoms of chest pain?

Yellow Zone:

Do you have a dry, hacking cough?

Do you have worsening shortness of breath with activity?

Do you have increased swelling of legs, feet, and ankles?

Have you gained 2-3lbs in 24 hours or 5 lbs in a week?

Do you have any discomfort or swelling in the abdomen?

Do you have trouble sleeping?

Red Zone:

Do you have a frequent dry, hacking cough?

Do you have shortness of breath at rest?

Do you have increased discomfort or swelling in the lower body?

Do you have a sudden weight gain or more than 2-3 lbs in a day or over 5 lbs in a week?

Do you have any new or worsening dizziness, confusion, sadness or depression?

Do you have any loss of appetite?

Do you have increased trouble sleeping or cannot lie flat?

General:

Do you weigh yourself daily?

Do you take your medications as directed?

Any recent changes in your medications?

Are you eating a low sodium diet?

Are you attending your follow up visits?

The RN will assess the following for each patient:

• Weight loss or weight gain

• Blood pressure (supine and upright); assess the width of pulse pressure

• Pulse; assess strength and regularity

• Jugular vein distention

• Presence of extra heart sounds and murmurs

• Size and location of the point of maximal impulse

occurrence of right ventricular heave (lift)

• Pulmonary status: respiratory rate, crackles, pleural effusion

• Hepatomegaly and ascites

• Peripheral edema

3. Plan: Nurse will perform HF checklist at every home visit for patients with HF diagnosis

***4*. Interventions:**

HF Checklist (Perform every visit):

Green Zone:

Patient has:

- No new or worsening shortness of breath
- Physical activity level is normal

- No weight gain or stable weight check
- No edema of feet, ankles, legs, or abdomen
- No chest pain

What to do:

- Educate on medications
- Educate on low salt diet
- Educate to weigh daily and keep a log
- Continue follow-up visits

Yellow Zone:

Patient has one or more of the following criteria:

- Dry, hacking cough
- Worsening shortness of breath with activity
- Increased swelling of legs, feet and ankles
- Sudden weight gain of 2-3 lbs (in a 24 hour period or 5 lbs in a week)
- Discomfort or swelling in the abdomen
- Trouble sleeping

What to do:

- Call doctor to report changes
- Ask the patient if he/she is taking medications as directed
- Ask about sodium in the diet
- Ask about renal output changes

Red Zone:

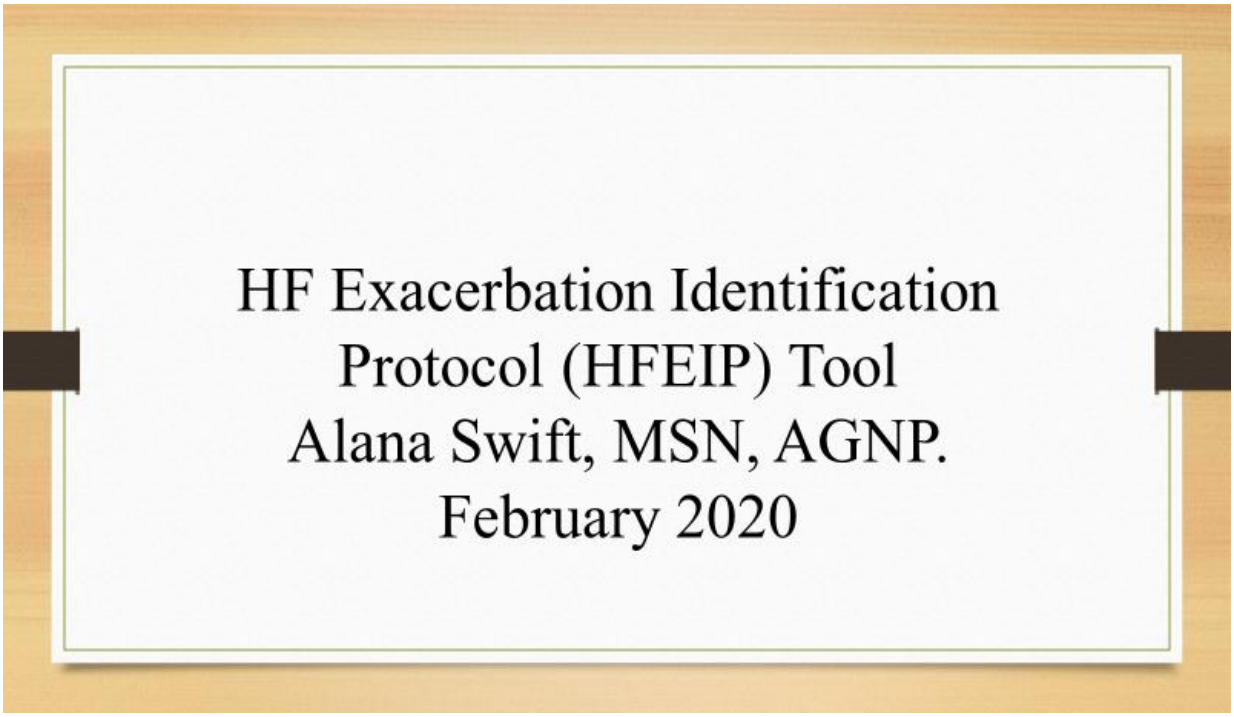
Patient has one or more of the following criteria:

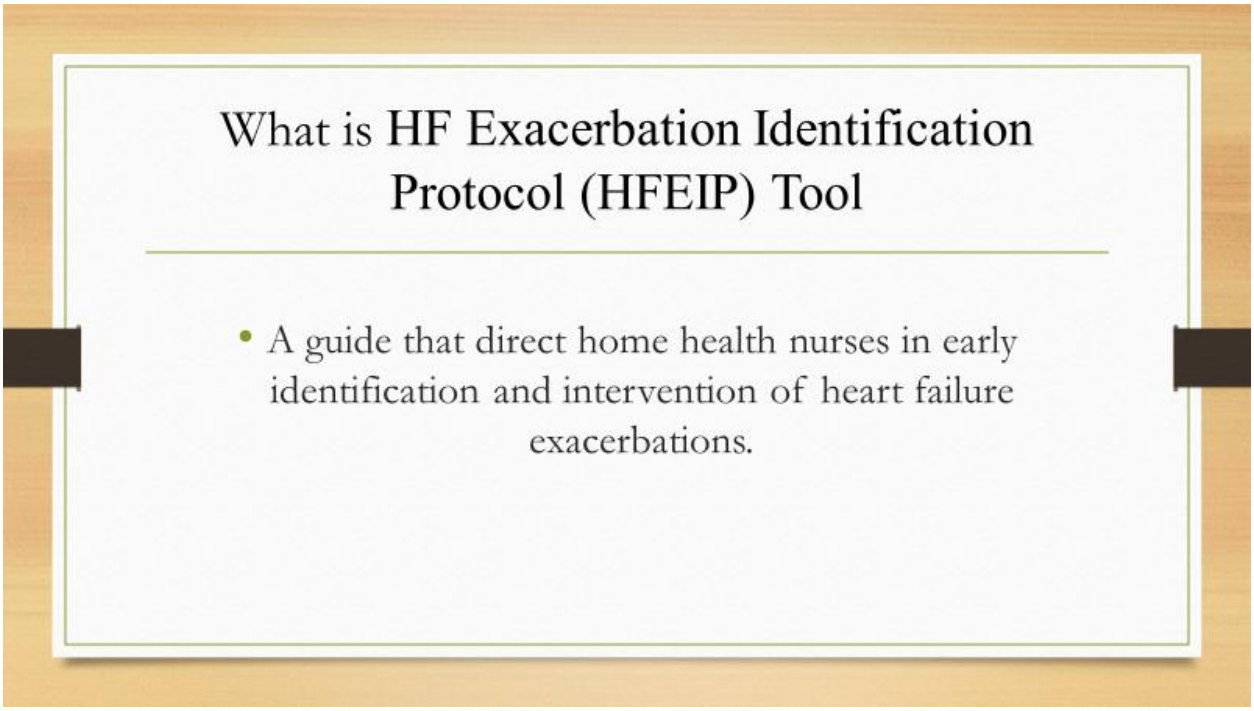
- Frequent/daily dry, hacking cough
- Shortness of breath at rest
- Increased discomfort or swelling in the lower body including abdomen
- Sudden weight gain of more than 2-3 lbs (in a 24 hour period or more than 5 lbs in a week)
- New worsening dizziness, confusion, sadness or depression
- Loss of appetite
- Increased trouble sleeping; cannot lie flat.

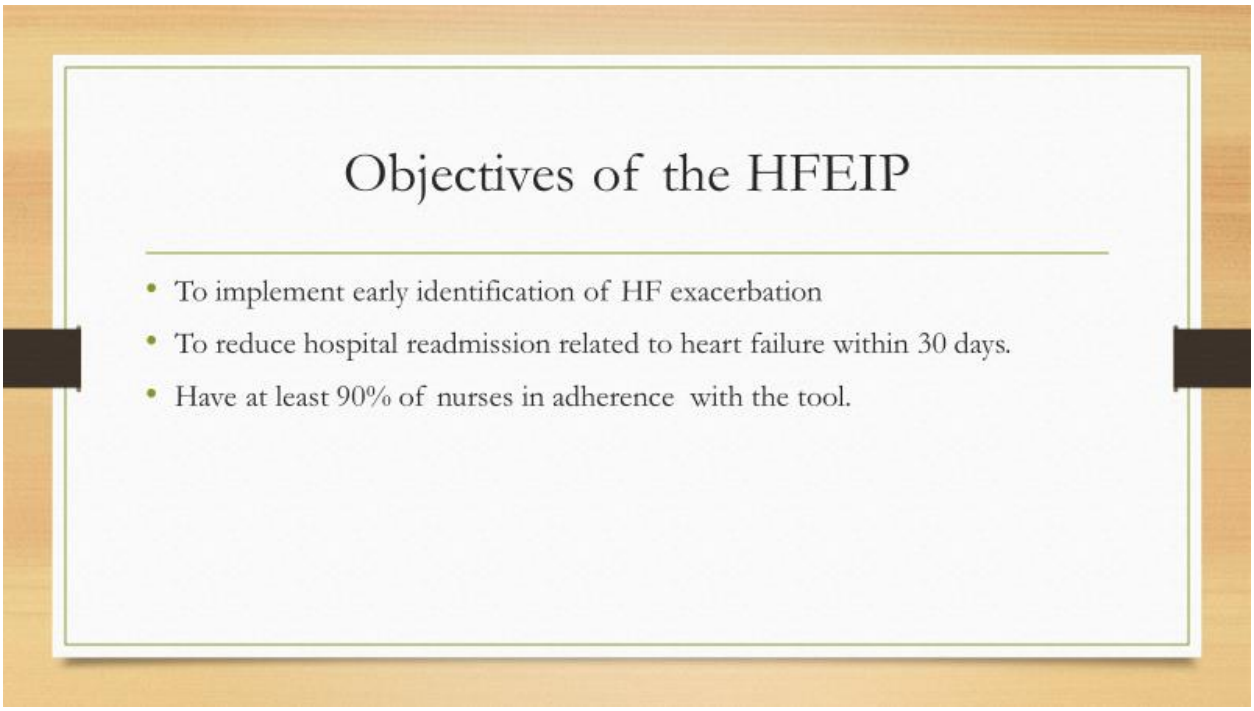
What to do:

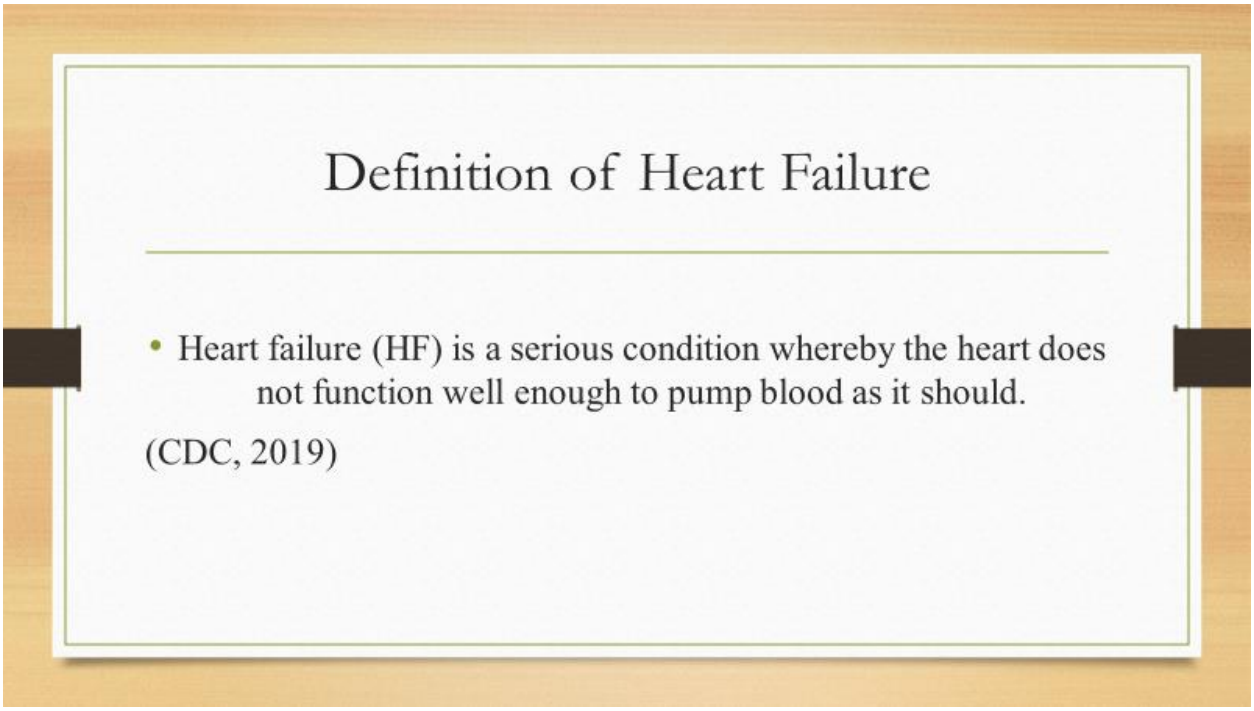
  - Call 911 or ensure patient goes to the emergency room.

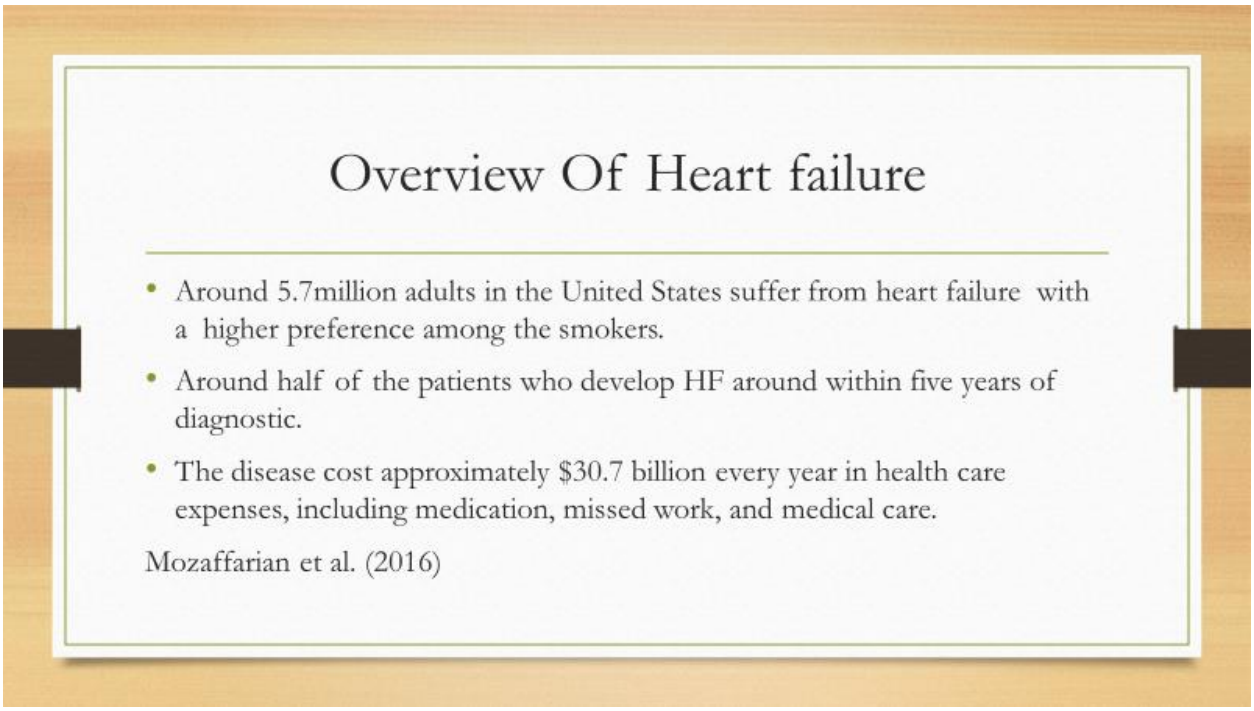
Appendix B

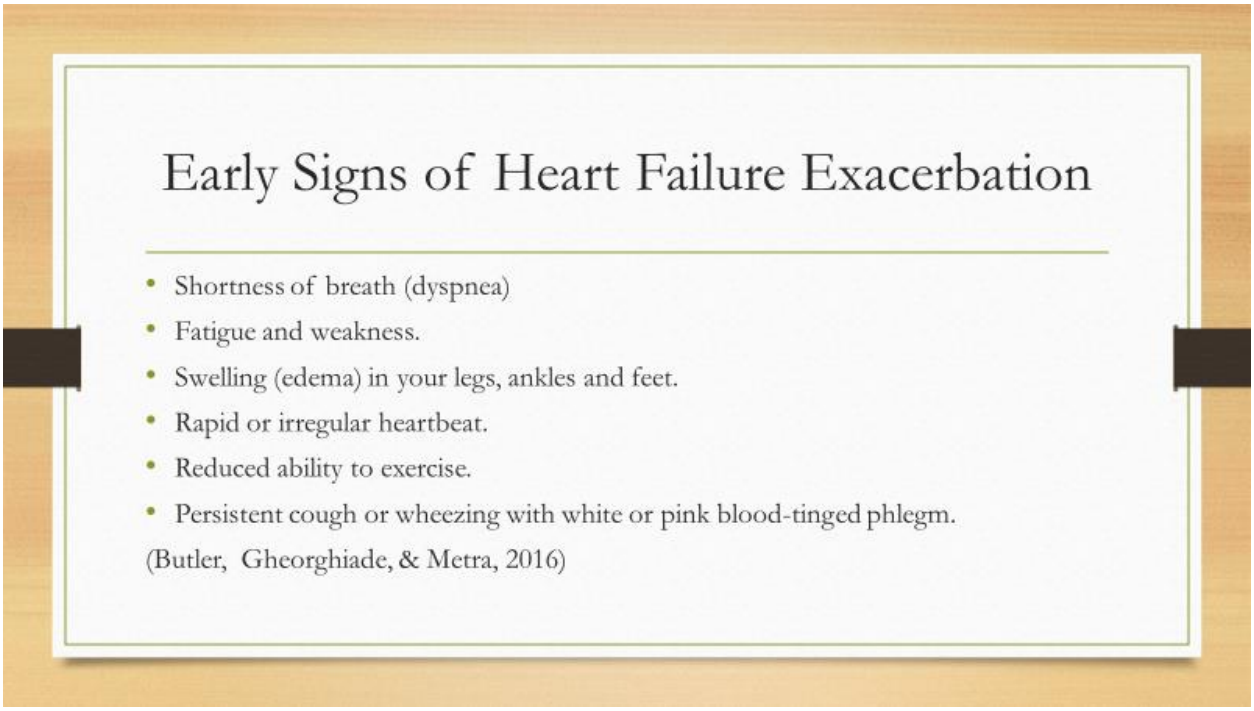

HF Exacerbation Identification Protocol (HFEIP) Tool
Alana Swift, MSN, AGNP.
February 2020

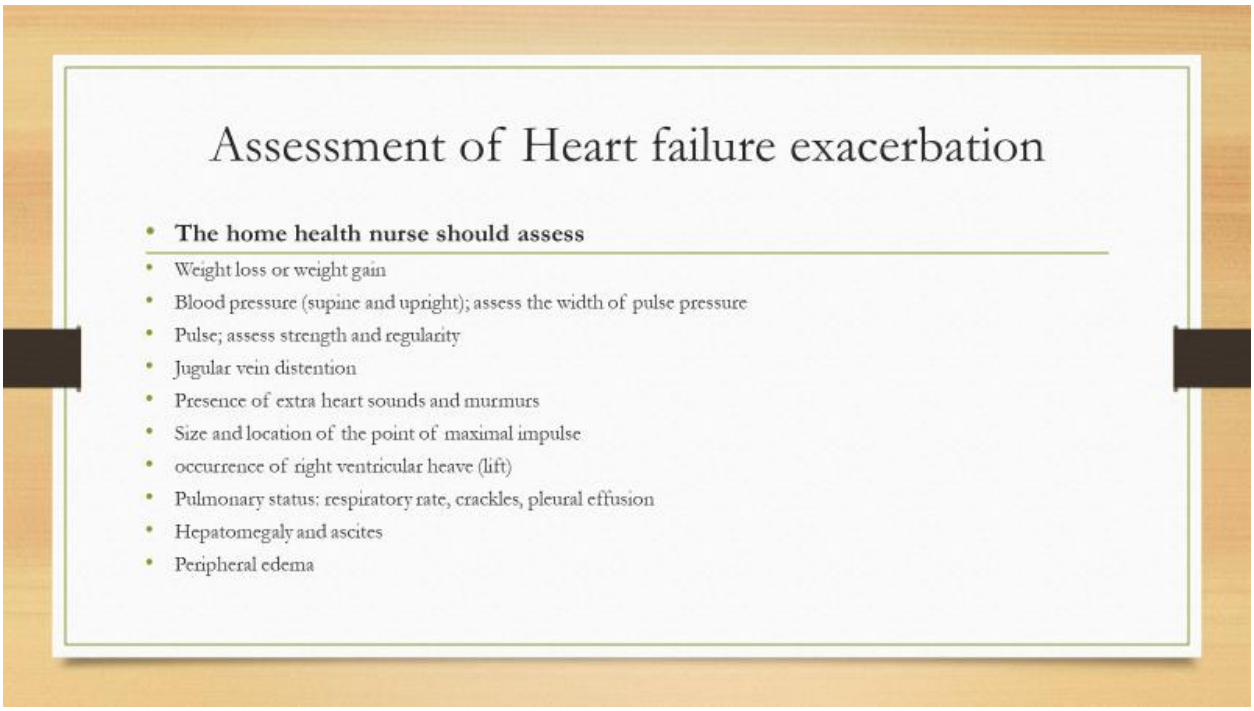

What is HF Exacerbation Identification Protocol (HFEIP) Tool
A guide that direct home health nurses in early identification and intervention of heart failure exacerbations.

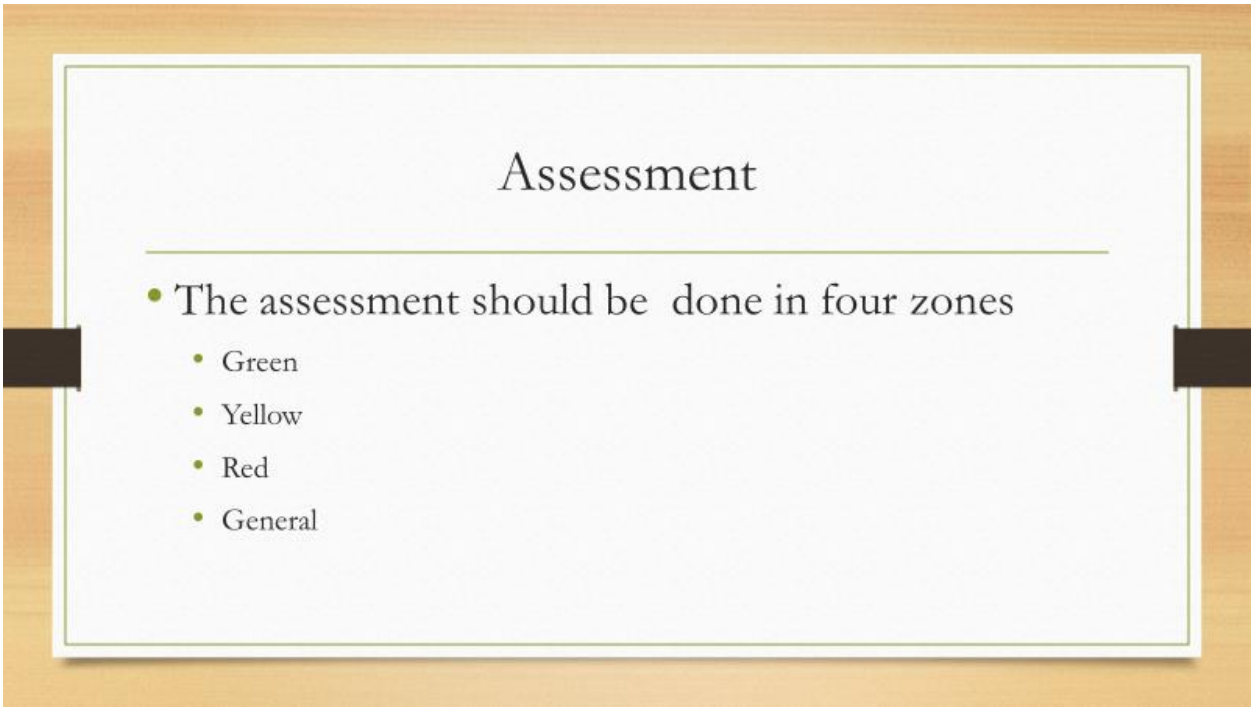

Objectives of the HFEIP
To implement early identification of HF exacerbation
To reduce hospital readmission related to heart failure within 30 days.
Have at least 90% of nurses in adherence with the tool.

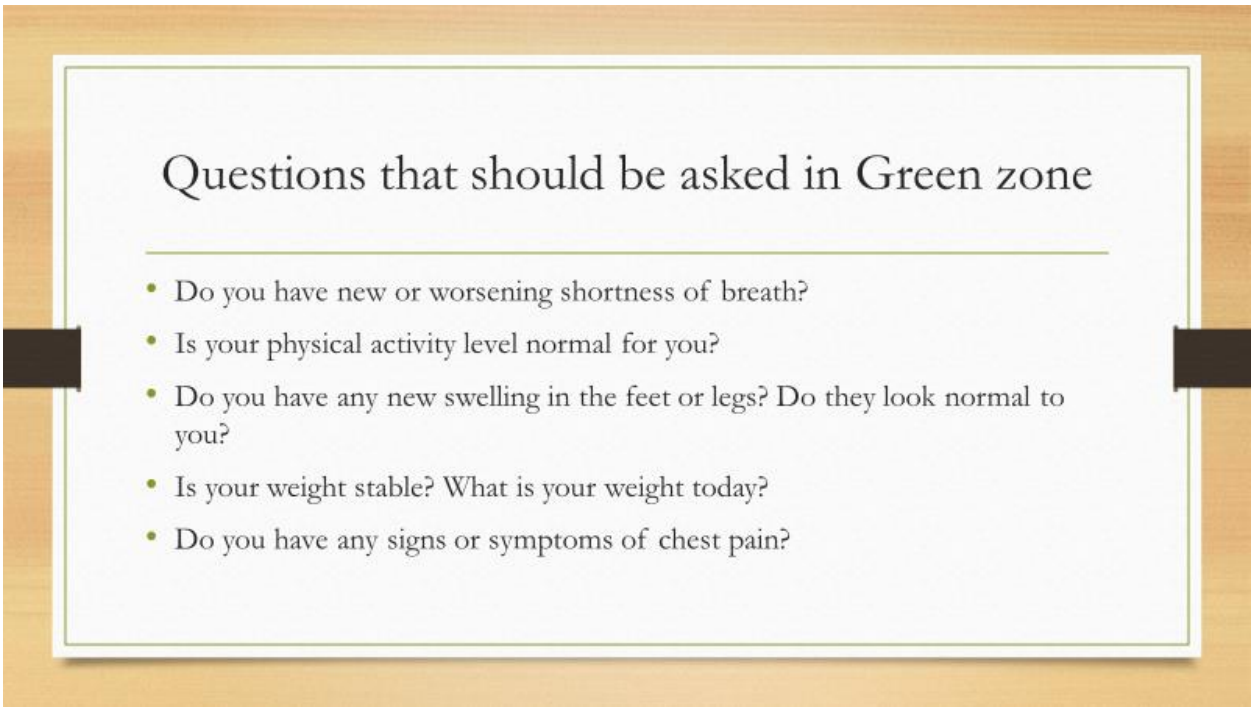

Definition of Heart Failure
Heart failure (HF) is a serious condition whereby the heart does not function well enough to pump blood as it should.
(CDC, 2019)

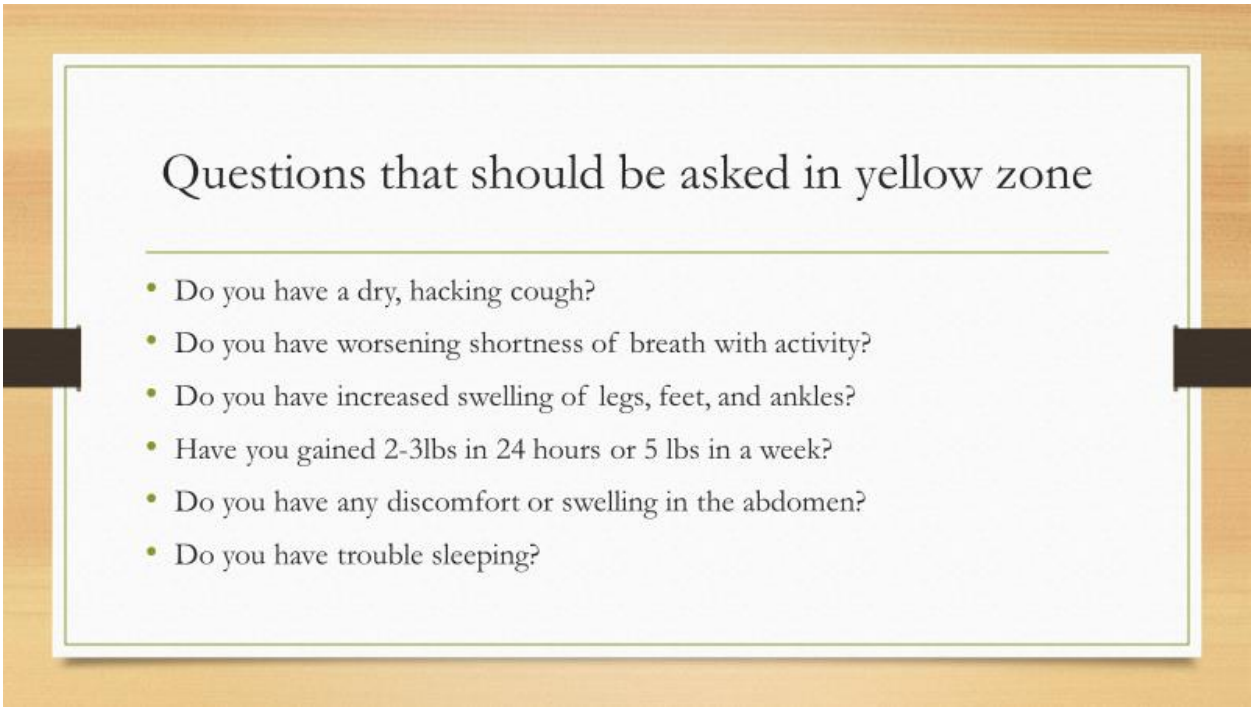

Overview Of Heart failure
Around 5.7million adults in the United States suffer from heart failure with a higher preference among the smokers.
Around half of the patients who develop HF around within five years of diagnostic.
The disease cost approximately $30.7 billion every year in health care expenses, including medication, missed work, and medical care.
Mozaffarian et al. (2016)

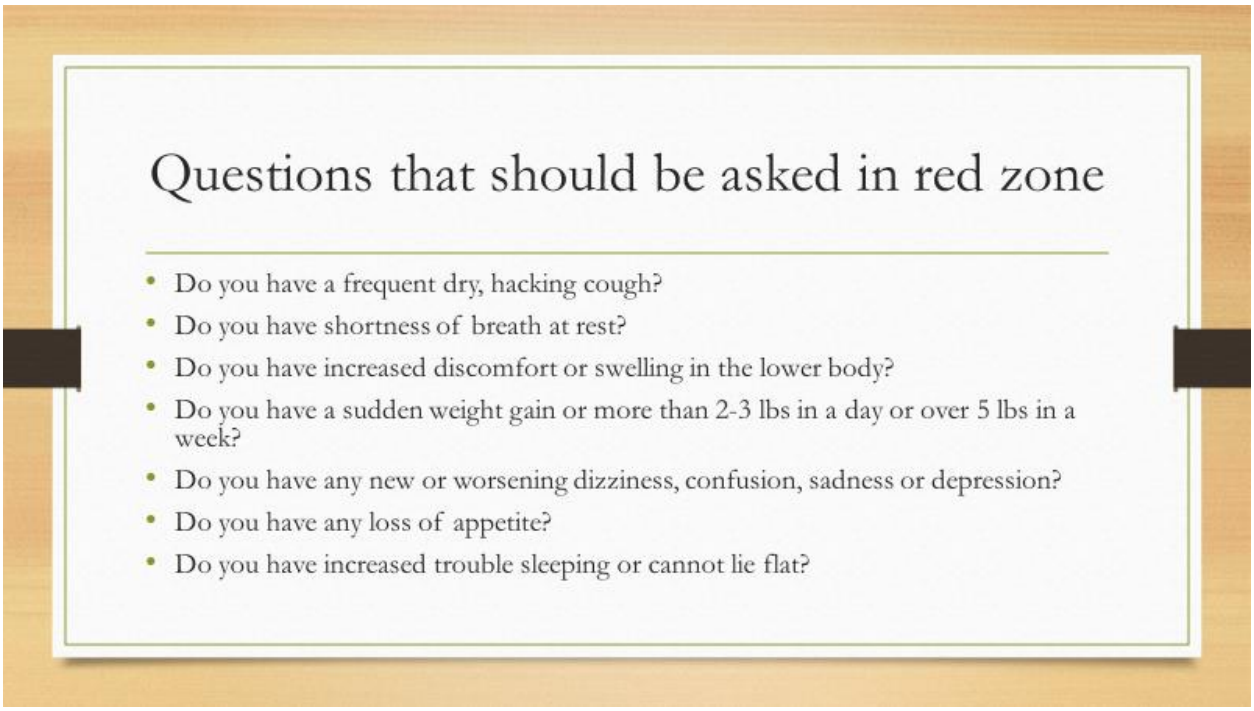

Early Signs of Heart Failure Exacerbation
Shortness of breath (dyspnea)
Fatigue and weakness.
Swelling (edema) in your legs, ankles and feet.
Rapid or irregular heartbeat.
Reduced ability to exercise.
Persistent cough or wheezing with white or pink blood-tinged phlegm.
(Butler, Gheorghiade, & Metra, 2016)

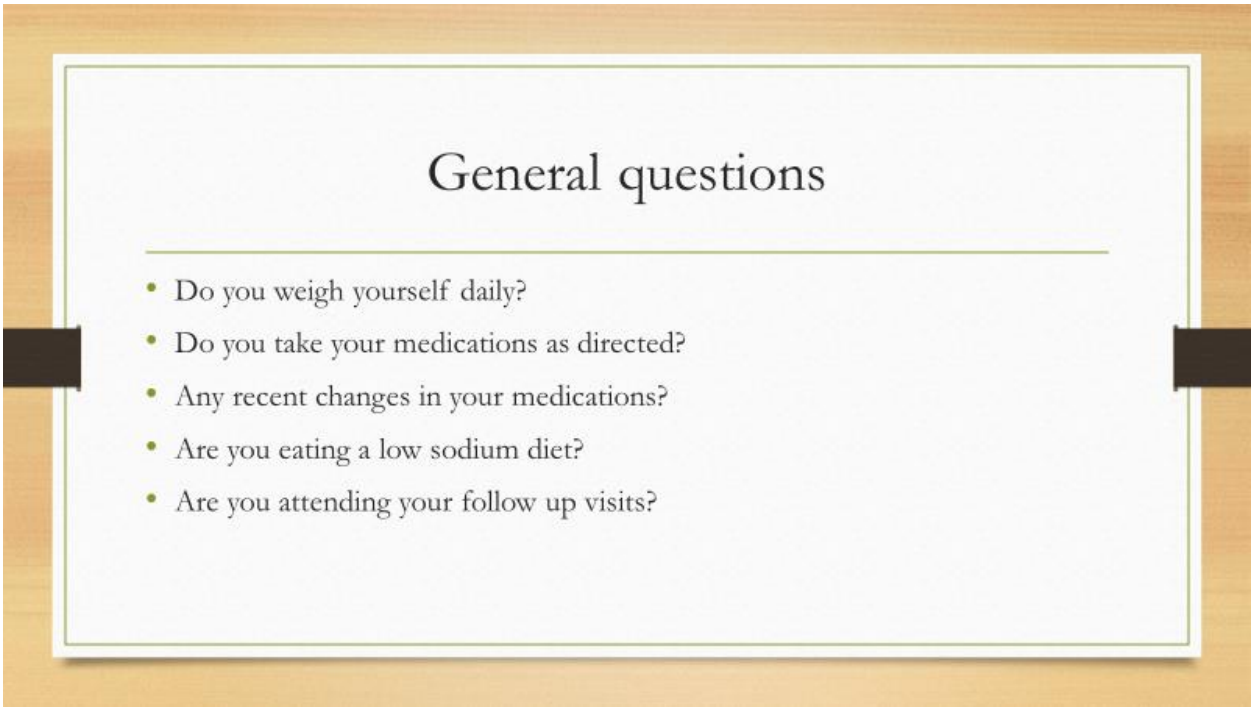

Assessment of Heart failure exacerbation
The home health nurse should assess
Weight loss or weight gain
Blood pressure (supine and upright); assess the width of pulse pressure
Pulse; assess strength and regularity
Jugular vein distention
Presence of extra heart sounds and murmurs
Size and location of the point of maximal impulse
occurrence of right ventricular heave (lift)
Pulmonary status: respiratory rate, crackles, pleural effusion
Hepatomegaly and ascites
Peripheral edema

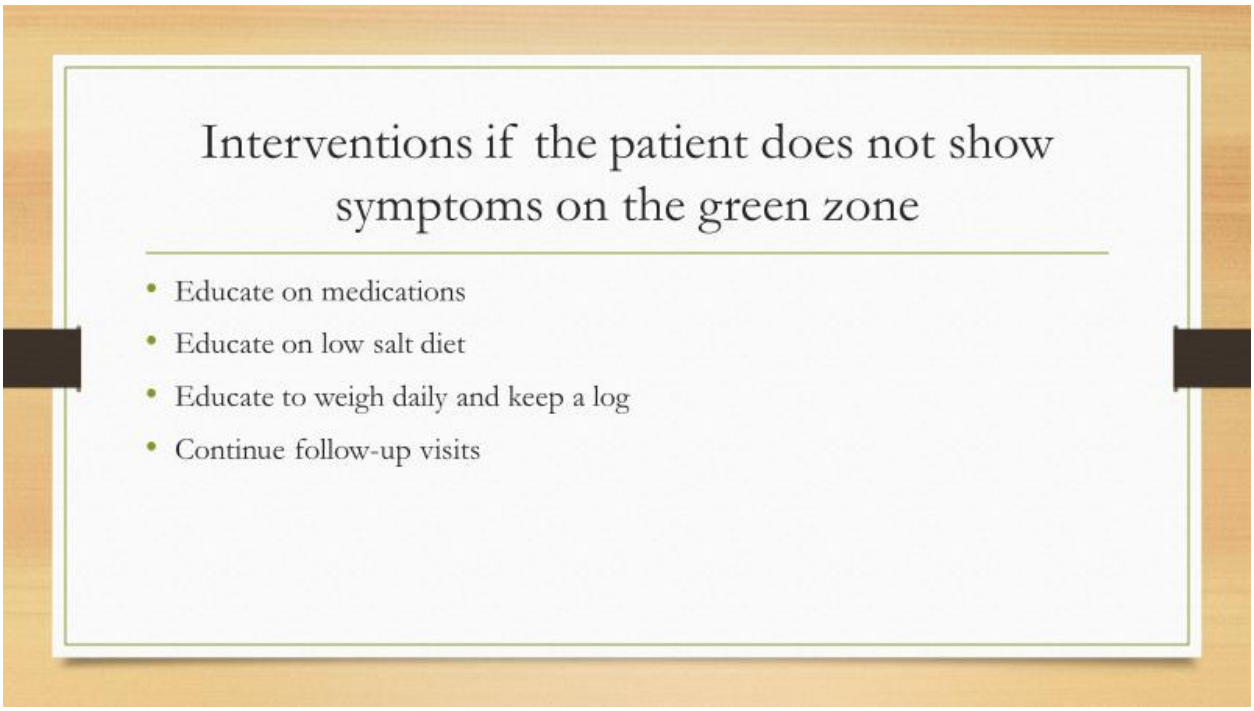

Assessment
The assessment should be done in four zones
Green
Yellow
Red
General

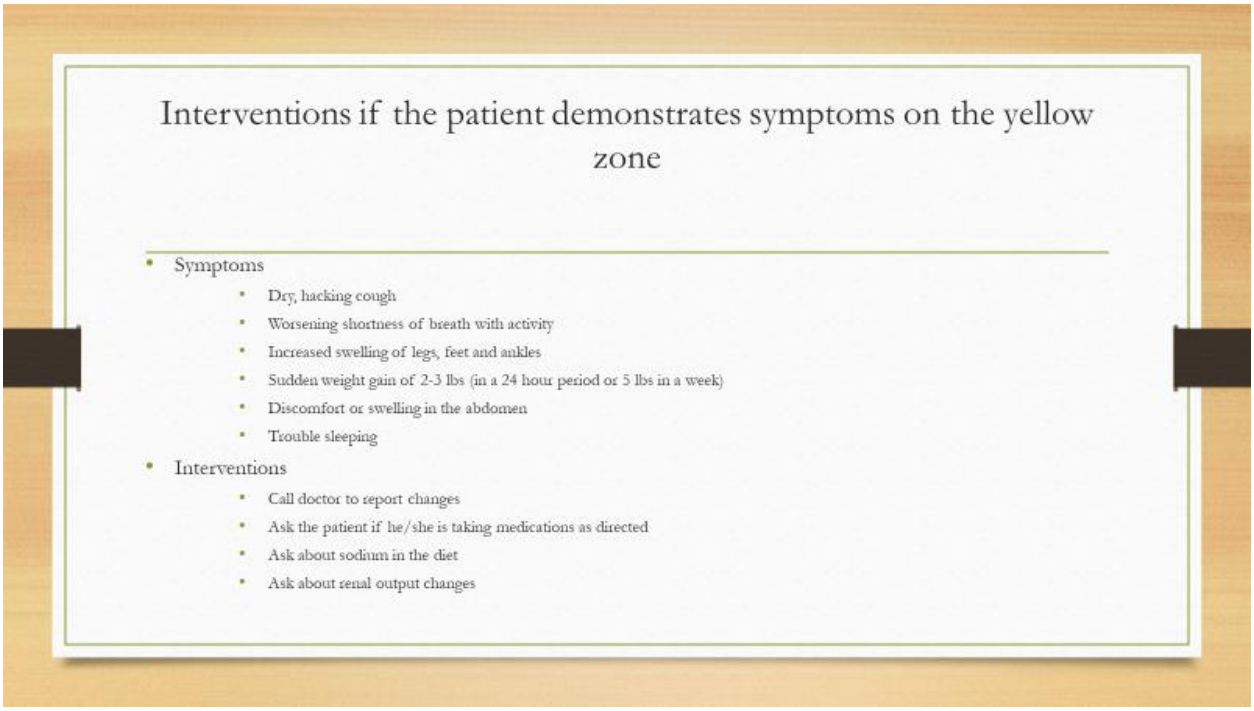

Questions that should be asked in Green zone
Do you have new or worsening shortness of breath?
Is your physical activity level normal for you?
Do you have any new swelling in the feet or legs? Do they look normal to you?
Is your weight stable? What is your weight today?
Do you have any signs or symptoms of chest pain?

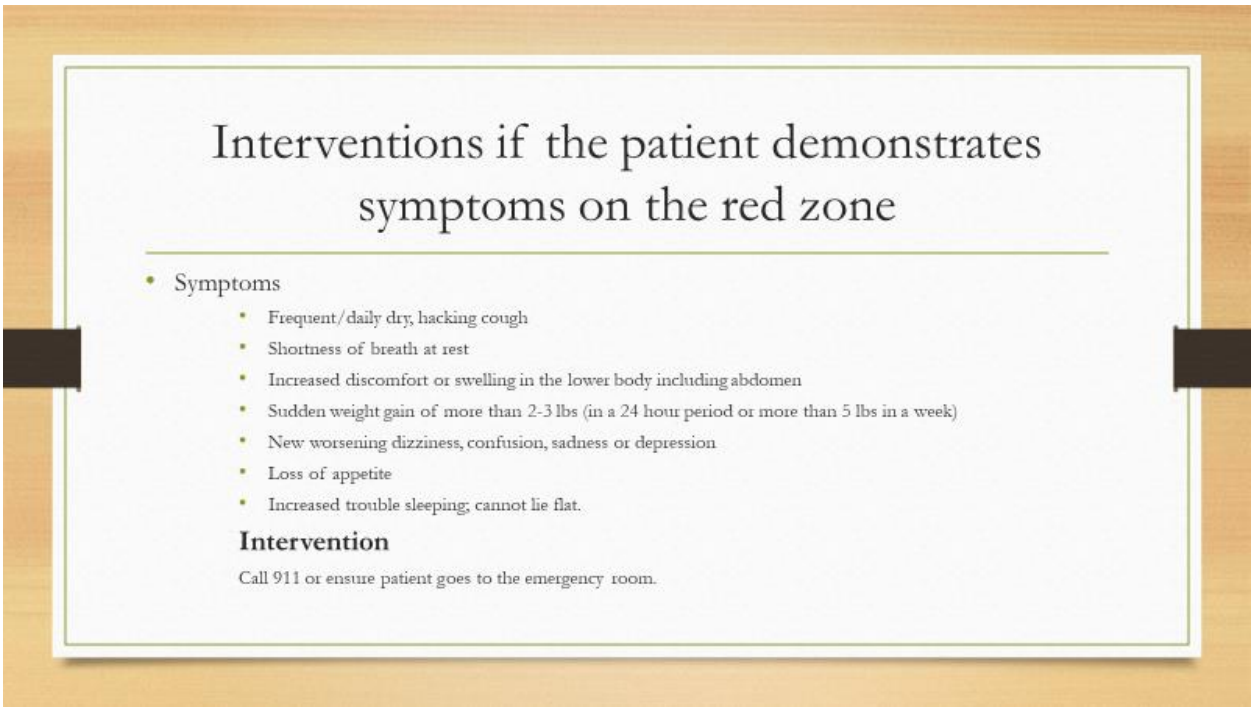

Questions that should be asked in yellow zone
Do you have a dry, hacking cough?
Do you have worsening shortness of breath with activity?
Do you have increased swelling of legs, feet, and ankles?
Have you gained 2-3lbs in 24 hours or 5 lbs in a week?
Do you have any discomfort or swelling in the abdomen?
Do you have trouble sleeping?

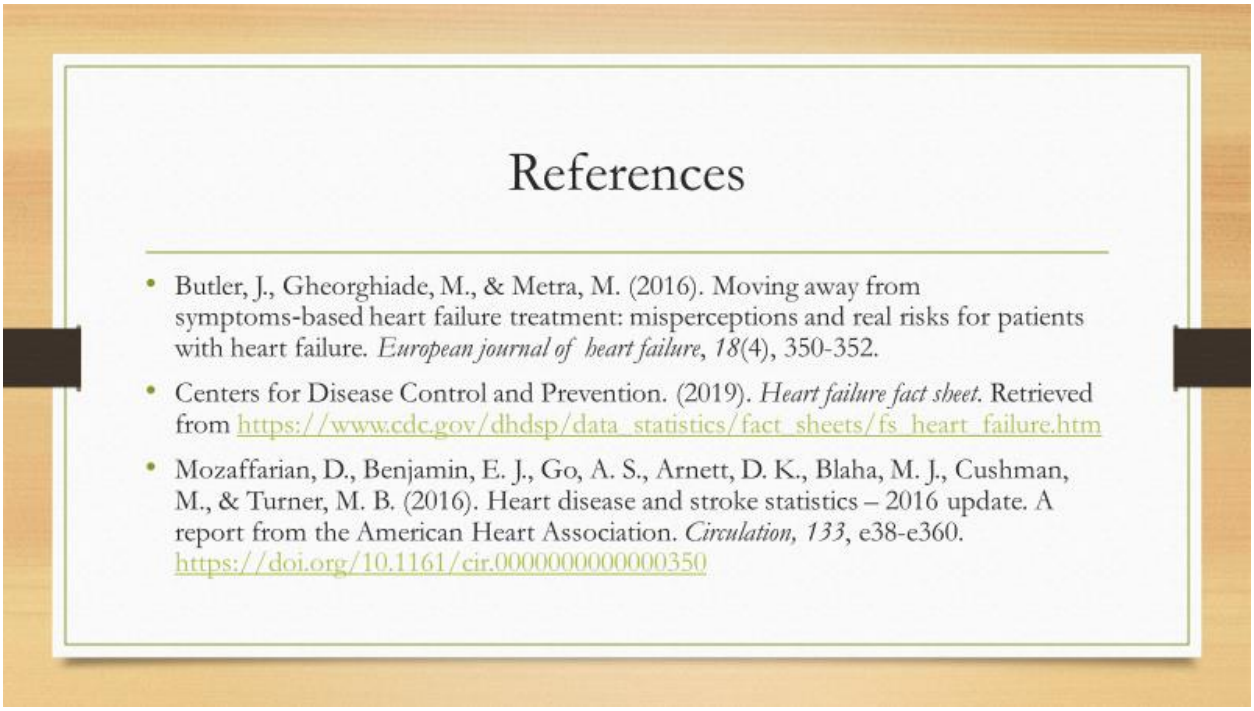

Questions that should be asked in red zone
Do you have a frequent dry, hacking cough?
Do you have shortness of breath at rest?
Do you have increased discomfort or swelling in the lower body?
Do you have a sudden weight gain or more than 2-3 lbs in a day or over 5 lbs in a week?
Do you have any new or worsening dizziness, confusion, sadness or depression?
Do you have any loss of appetite?
Do you have increased trouble sleeping or cannot lie flat?


General questions
Do you weigh yourself daily?
Do you take your medications as directed?
Any recent changes in your medications?
Are you eating a low sodium diet?
Are you attending your follow up visits?


Interventions if the patient does not show symptoms on the green zone
Educate on medications
Educate on low salt diet
Educate to weigh daily and keep a log
Continue follow-up visits


Interventions if the patient demonstrates symptoms on the yellow zone
Symptoms
Dry, hacking cough
Worsening shortness of breath with activity
Increased swelling of legs, feet and ankles
Sudden weight gain of 2-3 lbs (in a 24 hour period or 5 lbs in a week)
Discomfort or swelling in the abdomen
Trouble sleeping
Interventions
Call doctor to report changes
Ask the patient if he/she is taking medications as directed
Ask about sodium in the diet
Ask about renal output changes


Interventions if the patient demonstrates symptoms on the red zone
Symptoms
Frequent/daily dry, hacking cough
Shortness of breath at rest
Increased discomfort or swelling in the lower body including abdomen
Sudden weight gain of more than 2-3 lbs (in a 24 hour period or more than 5 lbs in a week)
New worsening dizziness, confusion, sadness or depression
Loss of appetite
Increased trouble sleeping; cannot lie flat.
Intervention
Call 911 or ensure patient goes to the emergency room.


References
Butler, J., Gheorghiade, M., & Metra, M. (2016). Moving away from symptoms-based heart failure treatment: misperceptions and real risks for patients with heart failure. European journal of heart failure, 18(4), 350-352.
Centers for Disease Control and Prevention. (2019). Heart failure fact sheet. Retrieved from https://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_heart_failure.htm
Mozaffarian, D., Benjamin, E. J., Go, A. S., Arnett, D. K., Blaha, M. J., Cushman, M., & Turner, M. B. (2016). Heart disease and stroke statistics – 2016 update. A report from the American Heart Association. Circulation, 133, e38-e360. https://doi.org/10.1161/cir.0000000000000350

Appendix C

Test Construction

Purpose

The purpose of this education is to promote early identification of heart failure exacerbations. The home health nurses will understand the symptoms to check for in heart failure exacerbations and the best interventions for the patient.

Learning Objectives

Upon completion of the test, the home health nurses will be able to

1. Understand the symptoms of heart failure.
2. Know the interventions for heart failure.
3. Gain a better understanding of heart failure for patients of different ages and how to manage heart failure.

Population

The population is home health nurses.

Length of the Test

The optimum length of the test is 10 questions.

Difficulty and Discrimination Levels of Test Items

Content validity is the degree to which an instrument has a suitable sample of items for the construct being gauged and is an essential procedure in development. The content validity index is the most widely used index for quantitative evaluation (Yusoff, 2019).

Scoring Procedures to be used

The goal is to develop an answer sheet that will generate a computer generated item analysis report.

Item Format

The test will be selected response multiple choice format.

Test Blueprint

Content	Level of Cognitive Skill				
	K	C	AP	AN	Total
Heart Failure	1				1
Sign/symptoms of HF		1			1
Intervention/management of HF	1	1			2
Assessment of HF	11	1	1	11	6

Total	4	3	1	2	10

General Directions for the Test and Prepare a Cover Sheet

The home health nurse will be required to choose the most suitable answer from the multiple choices.

Questions

1. When assessing for jugular vein distension, how should you position the patient?

    a. Sitting upright
    b. Lying flat on his back
    c. Lying on his back, with the head of the bed 30-45 degrees
    d. Lying on his left side

    Answer: **C** **Application- Assessment of HF**

    Rationale: Assess jugular vein distension with the patient in semi-Fowler's position (head of the bed elevated 30 to 45 degrees). If the patient lies flat, their veins will be more distended; if they sit upright, their veins will be flat. (Buttaro, Trybulski, Polgar-Bailey, & Sandberg-Cook, 2017, p. 1100).

2. Heart failure patients are often instructed to record their blood pressure and ____ every day.

    a. Mood
    b. Weight
    c. Sleep durations
    d. Blood sugar

    Answer: B Knowledge- Management

    Rationale: A sudden weight gain may signal fluid retention that should be reported to the health care practitioner. The kidneys are less able to dispose of sodium and water, also causing fluid retention, resulting in weight gain (Buttaro et al., 2017, p.1100).

3. A home health care patient is experiencing exacerbation of heart failure. Which signs/symptoms would the nurse expect to find when assessing this patient?

a. Apical pulse rate of 110 and 4+ pitting edema of feet
b. Thick white sputum and crackles that clear with cough
c. The patients sleeping with no pillow and eupnea
d. Radial pulse rate of 90 and capillary refill time <3 seconds

Answer: A Comprehension- Signs/symptoms of HF

Rationale: An increased heart rate is a compensatory mechanism for the loss in stroke volume. Edema results as blood flow out of the heart is impeded, blood returning to the heart through the veins backs up, causing fluid to build up in the tissues (Buttaro et al., 2017, p.1099).

4. When assessing for third heart sounds (S3), how should you position the patient?

   a. Sitting upright
   b. Lying flat on his back
   c. Lying on his back, with the head of the bed 30-45 degrees
   d. Lying in the left lateral position

   Answer: D **Knowledge- Assessment of HF**

   Rationale: Third heart sounds indicate early diastolic rapid ventricular filling associated with left ventricular systolic dysfunction. S3 is best heard with the patient in left lateral position (Buttaro et al., 2017, p.1099).

5. The nurse is assessing the patient diagnosed with congestive heart failure. Which signs/symptoms would indicate that medical treatment has been effective?

a. The patient's peripheral pitting edema has gone from a +3 to a +4
b. The patient is able to take the radial pulse accurately
c. The patient is able to perform ADLs without dyspnea
d. The patient has minimal JVD

   Answer: C Comprehension-Management

   Rationale: Being able to perform activities of daily living without shortness of breath would indicate the patient's condition is improving. Peripheral pitting edema that has gone from a +3 to a +4 a sign heart failure is worsening. JVD indicates volume overload, a sign of heart failure. The patient's ability to check the radial pulse is not relevant to heart failure (Buttaro et al., 2017, p.1099).

6. A patient is experiencing right ventricular failure. Which of the following assessment findings is most likely to be observed by the nurse?

   a. Bradycardia and circumoral cyanosis
   b. Fatigue and hemoptysis
   c. Dyspnea and pulmonary crackles
   d. Peripheral edema and JVD

   Answer: D Comprehension- Assessment of HF

Rationale: During left-sided heart failure, the left ventricle of the heart no longer pumps enough blood around the body resulting in blood building up in the pulmonary veins, causing shortness of breath, trouble breathing or coughing. During right-sided heart failure, the right ventricle of the heart is too weak to pump enough blood to the lungs, causing blood to build up in the veins. The increased pressure inside the veins can push fluid out of the veins into surrounding tissue, leading to a build-up of fluid in the legs, organs or the abdomen (Institute for Quality and Efficiency in Health Care, 2018).

7. A patient with heart failure tells the nurse, "I felt fine when I went to bed, but I woke up in the middle of the night feeling like I was suffocating!" The nurse can best document this assessment information as?

a. Pulsus alternans
b. Paroxysmal nocturnal dyspnea
c. Two-pillow orthopnea
d. Acute bilateral pleural effusion

Answer: B Knowledge- Heart failure

Rationale: Paroxysmal nocturnal dyspnea is caused by the reabsorption of fluid from dependent body areas when the patient is sleeping and is characterized by waking up suddenly with the feeling of suffocation. Patients describe difficulty breathing while lying flat or waking up tired or feeling anxious and restless (Buttaro et al., 2017, p.1099).

8. When assessing a patient with chronic heart failure, the nurse would expect to identify which of these clinical manifestations?

    a. Inspiratory crackles
    b. Asymmetrical chest expansion
    c. Expiratory wheezing
    d. Subcutaneous crepitus

    Answer: A Analysis- Assessment of HF

    Rationale: Pulmonary fluid transudate moves to interstitial spaces and alveoli, usually in the lung bases resulting in crackles, frothy or pink sputum, and pleural effusions (Buttaro et al., 2017, p.1100).

9. A nurse visits a 78-year-old man with chronic heart failure. Which clinical manifestations, if assessed by the nurse, would indicate acute decompensated heart failure (pulmonary edema)?
    a. Fatigue, orthopnea, and dependent edema
    b. Severe dyspnea and blood-streaked, frothy sputum
    c. Temperature is 100.4 F and pulse is 102 beats/minute
    d. Respirations 26 breaths/minute despite oxygen by nasal cannula

    Answer: B Analysis- Assessment of HF

Rationale: Clinical manifestations of pulmonary edema include anxiety, pallor, cyanosis, clammy and cold skin, severe dyspnea, use of accessory muscles of respiration, a respiratory rate > 30 breaths per minute, orthopnea, wheezing, and coughing with the production of frothy, blood-tinged sputum. Auscultation of the lungs may reveal crackles, wheezes, and rhonchi throughout the lungs. The heart rate is rapid, and blood pressure may be elevated or decreased (Buttaro et al., 2017, p.1100).

10. A patient with heart failure tells the nurse, "I haven't slept at night because I have to urinate all night long." The nurse can best document this assessment information as?

    a. Nocturia
    b. Polydipsia
    c. Dysuria
    d. Polyuria

    Answer: A Knowledge- Assessment of HF

    Rationale: Nocturia diuresis lessens the degree of fluid retention. Nocturnal diuresis results from fluid reabsorption and redistribution in the supine position as well as a reduction in renal vasoconstriction that occurs at rest (Buttaro et al., 2017, p.1099).

Experts Rating Form Instructions

Rating instructions: For each item, please indicate the following:

Please rate how relevant each item is to the overall construct of early identification of heart failure exacerbation by placing a number in the first box to the right of each item.

1 = Not relevant at all

2 = Slightly relevant

3 = Moderately relevant

4= Highly relevant

Your honest feedback is appreciated and will be used to enhance the quality of this questionnaire.

Expert Rating Form

Item	Relevance Rating
1. When assessing for jugular vein distension, how should you position the patient? a. Sitting upright b. Lying flat on his back c. Lying on his back, with the head of the bed 30-45 degrees d. Lying on his left side	
2. Heart failure patients are often instructed to record their blood pressure and ____ every day a. Mood b. Weight c. Sleep durations d. Blood sugar	
3. A home health care patient is experiencing exacerbation of heart failure. Which signs/symptoms would the nurse expect to find when assessing this patient? a. Apical pulse rate of 110 and 4+ pitting edema of feet b. Thick white sputum and crackles that clear with cough c. The patients sleeping with no pillow and eupnea d. Radial pulse rate of 90 and capillary refill time <3 seconds	
4. When assessing for third heart sounds (S3), how should you position the patient? a. Sitting upright b. Lying flat on his back c. Lying on his back, with the head of the bed 30-45 degrees	

d. Lying in the left lateral position	
5. The nurse is assessing the patient diagnosed with congestive heart failure. Which signs/symptoms would indicate that medical treatment has been effective? a. The patient's peripheral pitting edema has gone from a +3 to a +4 b. The patient is able to take the radial pulse accurately c. The patient is able to perform ADLs without dyspnea d. The patient has minimal JVD	
6. A patient is experiencing right ventricular failure. Which of the following assessment findings is most likely to be observed by the nurse? a. Bradycardia and circumoral cyanosis b. Fatigue and hemoptysis c. Dyspnea and pulmonary crackles d. Peripheral edema and JVD	
7. A patient with heart failure tells the nurse, "I felt fine when I went to bed, but I woke up in the middle of the night feeling like I was suffocating!" The nurse can best document this assessment information as? a. Pulsus alternans b. Paroxysmal nocturnal dyspnea c. Two-pillow orthopnea d. Acute bilateral pleural effusion	
8. When assessing a patient with chronic heart failure, the nurse would expect to identify which of these clinical manifestations? a. Inspiratory crackles b. Asymmetrical chest expansion c. Expiratory Wheezing d. Subcutaneous crepitus	
9. A nurse visits a 78-year-old man with chronic heart failure. Which clinical manifestations, if assessed by the nurse, would indicate acute decompensated heart failure (pulmonary edema)? a. Fatigue, orthopnea, and dependent edema b. Severe dyspnea and blood-streaked, frothy sputum c. Temperature is 100.4 F and pulse is 102 beats/minute d. Respirations 26 breaths/minute despite oxygen by nasal cannula	
10. A patient with heart failure tells the nurse, "I haven't slept at night because I have to urinate all night long." The nurse can best document this assessment information as? a. Nocturia b. Polydipsia c. Dysuria d. Polyuria	

Content Validity Index Table

Item	Expert 1	Expert 2	Expert 3	Mean
1	4	4	4	4
2	3	3	3	3
3	4	4	4	4
4	4	4	3	3.67
5	3	3	3	3
6	4	4	4	4
7	4	4	3	3.67
8	3	3	4	3.33
9	4	4	4	4
10	3	3	3	3

The procedure consists of having experts rate items on a four-point scale of relevance. Then, for each item, the item (CVI) (I-CVI) is computed as the number of experts giving a rating of 3 or 4, divided by the number of experts-the proportion in agreement about relevance.

The content validity index is calculated using the following formula:

CVR = [(E-(N/2)) / (N/2)] with E representing the number of judges who rated the item as Moderately Relevant or Highly Relevant and N being the total number of judges.

The mean total of all of the means was 3.567 indicating that all of the questions were moderately/highly relevant.

The calculation is as follows:

CVR = [(3-(3/2)) / (3/2)]

CVR = [(3-1.5) /1.5]

CVR = 1.5/1.5

Appendix D

Chart Audit Tool

Patient initials: _____

Date of visit: _____

Age: _____

Diagnosis: _____

Date of when the patient was initially admitted to home health: _____

Does the patient have a diagnosis of HF? Y/N

Was the HFEIP tool used? Y/N

Did the nurse identify signs/symptoms of heart failure exacerbation? Y/N

If yes to the above question, was the appropriate zone intervention performed? Y/N

Date of last time the patient was hospitalized:_____

Has the patient been hospitalized since admitted to home health? Y/N

If yes, reason for readmission? _____