

Heart Failure-Related Palliative Care through Education and
Standardized Referral

Nikki Harvey

University of Missouri – Kansas City

Approved May 2018 by the faculty of UMKC in partial fulfillment of the requirements

for the degree of Doctor of Nursing Practice

©2018

Nikki Harvey

All Rights Reserved

Abstract

Heart failure is a complex syndrome affecting over 5.7 million Americans. The annual cost of heart failure in the United States is \$31 billion with much of that occurring toward the end of life. Providers struggle with predicting the trajectory of the condition, leaving many patients without resources to make informed decisions and an overall decrease in their quality of life. The purpose of the Standardized Palliative Care Referral for Heart Failure evidence-based quality improvement project was to determine if education and a standardized referral process would increase the number of heart failure related palliative care referrals at an ambulatory heart failure clinic. The project was quasi-experimental with a pretest, posttest assessment of heart failure related palliative care referrals along with provider and patient characteristics. There were 12 cardiology providers who participated in the project. Twelve participating cardiology providers were educated on the palliative care benefits and the supportive guidelines. An alert was built into the electronic medical record based on ICD-10 heart failure codes. The alert fired at the beginning of the encounter and provided patient triggers on when to consider palliative care, allowing the provider to place the palliative care order from the alert. Outcomes measured included palliative care referral rates pre and post intervention along with follow-up care (readmission, emergency room visits, office visits). Results from the pre and post intervention were the same, revealing that 4% of cardiology encounters with heart failure patients resulted in palliative care referrals. Based on these results, further intervention should focus on changing the alert timing from the beginning to the end of the encounter.

Key words: heart failure, palliative care, hospice, end of life, referrals, barriers, quality of life, outpatient, inpatient, and cost

Standardized Referral

Heart failure is a complex, progressive syndrome affecting nearly six million Americans (Benjamin et al., 2017). As the population ages and cardiovascular condition survival improves this number is expected to jump to over eight million by the year 2030 (Heidenreich et al., 2013). Individuals with heart failure suffer from dyspnea, pain, fatigue, edema, and depression (Evangelista et al., 2014). Progression of the condition leads to overwhelming symptom burden which decreases a person's ability to perform activities of daily living (Seo, LaFramboise, Yates, & Yurkovich, 2011) and results in negative effects on quality of life (Hobbs et al., 2002; Yancy et al., 2013). Mortality rates for heart failure remain high despite medical advances, with a one year mortality rate of 29.6% (Chen, Normand, Wang, & Krumholz, 2011; Roger et al., 2004).

It is estimated that one half of the individuals diagnosed with heart failure will die within five years of diagnosis (Benjamin et al., 2017). Palliative care provides a holistic approach across the continuum of care for patients and their families who suffer from life limiting or serious illnesses (Braun et al., 2016). The World Health Organization (WHO, 2016) states palliative care can enhance quality of life for patients with serious illness through early detection and intervention with physical, psychosocial, or spiritual needs. Several guidelines and position statements recommend the incorporation of palliative care into heart failure management to improve quality of care (Allen et al., 2012; Aspromonte et al., 2017; Braun et al., 2016; Yancy et al., 2013). Despite guidelines, providers are not referring patients as often as they should with only 6-34% of qualified patients receiving palliative care services (Beernaert et al., 2013; Greener, Quill, Amir, Szydowski, & Gramling, 2014; Szekendi, Vaughn, Lal, Ouchi, & Williams, 2016).

This Standardized Palliative Care Referral for Heart Failure evidence-based quality improvement (EBQI) project provided heart failure cardiology providers with education on palliative care and a standardized referral process based on disease and symptom severity. The project was designed to improve heart failure patient access to palliative care by increasing the number of failure related palliative care referrals from an ambulatory heart failure cardiology clinic. There were, on average, of 456 heart failure patient encounters per month in the clinic pre-intervention sample. Out of those visits came an average of 18 new palliative care referrals per month, equaling 4% of the total volume of patients seen in the clinic.

Significance with Economic, Policy, Health System

The cost of heart failure treatment increases towards the end of life with most of that expense coming from hospitalizations (Obi, Swindle, Turner, Russo, & Aylin, 2016; Unroe et al., 2011). Heart failure hospitalizations cost \$31 billion annually (Heidenreich et al., 2013). In 2011, the Agency for Healthcare Research and Quality ranked heart failure as the eighth most costly condition in United States hospitals (Torio & Andrews, 2013). Hospital readmissions were a major contributor to those costs but Ryan et al. (2014) found that 20-30% of readmissions were preventable.

In 2015, 13% of Kansas Medicare population had the diagnosis of heart failure (Kansas Health Matters, 2017). The overall financial impact of heart failure to Kansas Medicare was over \$25,000 per capita annually (Centers for Medicare and Medicaid Services (CMS), 2017). Heart failure was one of the most expensive chronic illnesses in the state of Kansas, second only to stroke (CMS, 2017).

Local Issue and Diversity Considerations

The Kansas City metropolitan area consists of 14 counties with 2,064,630 people (The Heller School, 2012). Individuals over 65 years of age makeup 11.6% of that population (Kansas City Government, 2017) and are at the highest risk of heart failure. The culture mix of the Kansas residents with heart failure includes; African Americans (14.5%), followed by American Indian/Alaskans (13.9%), Caucasians (13.2%), Hispanics (10%), and Asian/Pacific Islanders (8%) (CMS, 2017).

Heart failure is one of the leading causes for emergency room visits among Kansas Medicare participants with over 1545 visits per 1000 beneficiaries occurring annually (CMS, 2017). Admission rates for heart failure in Kansas are 180 per 100,000 people (Kansas Health Matters, 2016). The heart failure readmission rates for Kansas Medicare participants have declined over the last five years but remain substantial at 21.8% (CMS, 2017).

Problem

Patients with heart failure often do not understand their diagnosis nor receive the support towards end of life that other patients with serious illnesses receive (Murray et al., 2002). Palliative care has demonstrated it is the best source to provide this resource (Allen et al., 2012; Aspromonte et al., 2017; Braun et al., 2016; IOM, 2014; Yancy et al., 2013). Despite heart failure palliative care recommendations from American College of Cardiology Foundation /American Heart Association Heart Failure guidelines (Yancy et al., 2013), referrals often occur late in the trajectory of the syndrome or not at all.

Purpose

With the identification of benefits for heart failure patients to receive palliative care services (Wong et al., 2016) and the limited number of those who do (Beernaert et al., 2013)

something needs to be done to increase the number of heart failure related palliative care referrals. The purpose of the Standardized Palliative Care Referral for Heart Failure project was to determine if education on the benefits of heart failure palliative care and the development of a standardized referral process would increase the number of heart failure related palliative care referrals at an ambulatory heart failure cardiology clinic.

Facilitators and Barriers

Facilitators

The primary facilitators to this EBQI initiative included; preceptor, palliative care team, cardiology providers, and leaders of the heart failure program (medical director, nurse manager, and heart failure program coordinator). Other essential facilitators were the palliative care nurse practitioner dedicated to heart failure, the informatics team, and quality assurance team. Low cost was the final facilitator. The primary investigator performed program evaluation activities at no additional cost, as part of a Doctor of Nursing Practice student experience. The health system funded development of the electronic alert system as part of its ongoing efforts to improve usability of the electronic medical record (EMR).

Barriers

Potential barriers to the project were related to the attitudes and behaviors of cardiology providers as supported by the literature (Kavalieratos et al., 2014; Ziehm, Farin, Seibel, Becker, & Koberich, 2016). Since providers find it challenging to predict heart failure trajectory, they may have difficulty initiating the palliative care conversation. Providers may have a lack of palliative care knowledge or be uncomfortable with advance care planning discussions. There may be a desire to do everything possible for patients which keeps the providers from initiating the palliative care referral. Some of these barriers may be overcome with education and a

supportive palliative care team, but if providers do not attend the educational offerings these will remain barriers.

Another potential barrier was alert fatigue from the EMR. Providers receive multiple alerts within the EMR. Alerts may become overwhelming. When the provider gets the alert they may choose to acknowledge the alert without considering the appropriateness for the referral. Having a standardized referral should improve the process but cannot replace provider engagement and evaluation of efficacy.

Review of the Evidence

PICOTS

Among (P) cardiology providers caring for advanced heart failure patients, does (I) palliative care education and a standardized palliative care referral process based on patient triggers as compared to (C) no education/no standardized referral process (O) increase the number of heart failure related palliative care referrals (T) within three months (S) in an ambulatory heart failure cardiology clinic?

Search Strategies

A comprehensive literature review was performed to establish evidentiary support for healthcare provider education and standardized referral processes to increase heart failure related palliative care referrals within an ambulatory heart failure clinic. The review of literature was completed using the following key words; heart failure, palliative care, hospice, end of life, referrals, barriers, quality of life, outpatient, inpatient, and cost. Definitions of terms were created for this project (see Appendix A). Databases used for the search included Cumulative Index of Nursing and Allied Health Literature Complete, PubMed, PsycINFO, Cochrane Database for Systematic Reviews; Google Scholar was also employed as a search engine.

Inclusion criteria for the search were adult patients in an ambulatory or inpatient setting, English language, and publication date within the last 10 years. Articles over 10 years old were generally excluded, although a few exceptions were made based on the higher level of evidence of the articles (Melnik & Overholt, 2015) and for topics with lack of more recent literature that were relevant to the project.

Over 150 articles were reviewed initially. In-depth appraisal narrowed the literature to 30 relevant studies. Studies which met inclusion criteria were further evaluated using Melnyk and Overholt's (2015) study design appraisals. The level of evidence (Melnik & Overholt, 2015, adapted, see Appendix B) for these studies included; two systematic reviews/meta-analyses (level of evidence I), six randomized trials (level of evidence II), 11 cohort and case studies (level of evidence IV), seven qualitative studies (level of evidence VI), four expert opinion statements (level of evidence VII), and one evidence-based practice guidelines (see Appendix C).

Evidence by Sub-Topics

A literature search was conducted to review the evidence as it relates to palliative care in heart failure patients. Several key sub-topics were identified in the review. These sub-topics include: (a) palliative care heart failure and quality of life, (b) referral patterns, (c) barriers to referrals, (d) palliative care referrals in the ambulatory setting, (e) improving provider knowledge on palliative care and referrals, and (f) standardized palliative care referral process.

Palliative Care, Heart Failure, and Quality of Care

Palliative care focuses on serious illness through decreasing symptom burden and stress regardless of patient's diagnosis (The Center to Advance Palliative Care (CAPC), 2017). Integrating palliative care has been shown to decrease symptom burden, depression, and improve quality of life (Diop, Rudolph, Zimmerman, Richter, & Skarf, 2017; Evangelista et al., 2012;

Sidebottom, Jorgenson Ann, Richards, Kirven, & Sillah, 2015; Wong et al., 2016). Several guidelines and statements support incorporating palliative care into heart failure care to improve quality of life (Allen et al., 2012; Aspromonte et al., 2017; Braun et al., 2016; IOM, 2014; Yancy et al., 2013).

When heart failure patients have palliative care services on board they experience improved symptoms related to pain, shortness of breath, anxiety, fatigue, and depression (Evangelista et al., 2014; Sidebottom et al., 2015). Patient satisfaction was higher when palliative care was involved (Gade et al., 2008). Readmission rates and cost were reduced (Diop et al., 2017; Nelson, Chand, Sortais, Oloimooja, & Rembert, 2011; O'Connor, Moyer, Behta, & Casarett (2015); Sahlen, Boman, & Brannstrom, 2016; Wong et al., 2016) when palliative care participates in patients' heart failure management.

Referral Patterns

Data suggest heart failure related palliative care referrals were often either underutilized or occur late in the trajectory (Beernaert et al., 2013; Greener, Quill, Amir, Szydlowski, & Gramling, 2014; Szekendi et al., 2016). Szekendi et al. (2016) found that only 39% of hospitalized patients who met criteria for palliative care referral actually received it. Heart failure patients referred to palliative care were often not referred until they were within 21 days of their death (Bakitas et al., 2013; Beernaert et al., 2016). Patients' who have a progression in their illness and experienced recurrent admissions, seem to have better chances of receiving palliative care with their odds increasing to 46% (Greener et al., 2014).

Barriers to Referrals

Barriers to palliative care referrals have been found in the literature. These barriers involved both the provider and patients. Some of the reasons identified were the unpredictability

in heart failure trajectory, lack of provider knowledge on palliative care services, or comfort with end of life discussions (Kavalieratos et al., 2014; Szekendi et al., 2016; Ziehm et al., 2016).

Lack of predictability seemed to be a significant challenge when providers attempted to predict the last year of life. One study demonstrated 20% of heart failure deaths were unexpected (Kheirbek, Alemi, Citron, Afaq, Wu, & Fletcher, 2013). Most providers tried to gauge referral of palliative care based on some trigger but did not have a standardized approach which caused inconsistent referrals of palliative care (Kavalieratos et al., 2014). Several tools were found to help predict end of life but accuracy of prediction was an issue. Haga et al. (2011) demonstrated that neither the Gold Standards Framework Prognostic Indicator Guide or the Seattle Heart Failure Model were accurate in predicting end of life for heart failure patients.

Another barrier was related to the providers themselves and their discomfort with end of life discussions. Szekendi et al. (2016) found provider education on palliative care varies significantly. Some cardiologists reported difficulty in accepting a patient's trajectory and their limitations as providers so they continued with aggressive management instead of consulting palliative care (Ziehm et al., 2016). Other providers felt they had a strong relationship with their patients and did not want to share end of life care with other providers (Szekendi et al., 2016). Another concern with providers was their inability to have conversations about conditions that were difficult to predict, leaving patients confused about their health status and unknowing of potential illness trajectory (Siota et al., 2016).

Patients were found to have a lack of knowledge and understanding of palliative care and hospice (Metzger, Norton, Quinn, & Gramling, 2013). Those that cannot distinguish the difference between palliative care and hospice were reluctant to participate in palliative care

services (Metzger et al. 2013). The patients tend to see palliative care as something for the future (Metzger et al. 2013).

Other provider barriers were related to the lack of policy, standardization, and misunderstanding of roles among providers. Szekendi et al. (2016) identified the lack of standard definition for palliative care impacted providers referral pattern. Hysong et al. (2011) found that organizations which lacked policy and standardization created confusion among providers. The providers were unclear on who or when the referral should occur. Some providers were unclear on what was their role versus palliative care's role. Inconsistency with referrals often overburdened the palliative care service which left some palliative care patients unseen (Hysong et al. 2011).

Palliative Care Referrals in Ambulatory Setting

Ambulatory setting. Benjamin et al. (2017) reported 1,774,000 office visits with heart failure as the primary diagnosis in the United States. This volume of heart failure patients provided the optimal opportunity for providers to initiate palliative care discussions in an ambulatory setting. Beckelman et al. (2011) demonstrated outpatient heart failure patients' benefit from early palliative care and co-management by allowing the patients to focus on areas that were important to them and providing ongoing opportunities for advanced care planning. Another study noted heart failure patients in an ambulatory setting had a decrease in symptom burden when they received palliative care services (Evangelista et al., 2014). Patients experienced a decrease in depression, shortness of breath, and overall symptom burden with ambulatory heart failure palliative care (Wong et al., 2016). Diop et al. (2017) systematic review demonstrated outpatient heart failure patients with palliative care were 42% less likely to be re-hospitalized. Sahlen, Boman, and Brannstrom (2016) demonstrated that ambulatory heart failure

palliative care decreased cost when compared to those patients who did not receive the services. Patients near the end of life who required hospice had longer lengths of service when they received ambulatory palliative care prior to hospice (Scheffey et al., 2014). This increased time demonstrated an improvement at the end of life when palliative care was involved.

Referring providers. Kavalieratos et al. (2014) found that most providers believe primary care or cardiology should be the ones to start the palliative care discussion with their heart failure patients based on their established relationship. Once the conversation was initiated and a palliative care referral placed, provider communication was essential. The American Heart Association/American Stroke Association (Braun et al., 2016) has recommended an integrative approach among patients, specialist, and providers related to heart failure management and palliative care. Ongoing discussions related to goals of therapy and advanced care planning should occur for patients with advanced heart failure based on triggers such as progressive symptoms, re-hospitalizations, increased diuretic needs, and initiation of inotrope use (Allen et al., 2012).

Improving Provider Knowledge on Palliative Care and Referrals

The Institute of Medicine (IOM, 2014) consensus report, *Dying in America*, recommended the healthcare systems support palliative care through increased education and provider knowledge on palliative care. To improve provider knowledge and referral practices for palliative care, several studies implemented educational interventions (DeVader & Jeanmonod, 2012; Thoonsen et al., 2016). These interventions demonstrated improved provider knowledge and increased palliative care referrals. Providers also need to understand that heart failure trajectory do have patterns that they can evaluate patients on to help with their planning of when to incorporate palliative care (Fint et al., 2017).

Standardized Palliative Care Referral Process

Bekelman et al. (2011) identified the need to develop standardized referral triggers to assist providers on knowing when their patients meet criteria for palliative care. Patients would receive an ambulatory referral based on clinical conditions and symptom burden triggers (Bekelman et al. 2011). A study by Hysong et al. (2011) identified the benefits of having a standardized palliative care process through the EMR. Having a standardized process for referrals was identified as an essential component to making the referral process work. When there was no standardization providers had difficulty in utilizing the triggers for the palliative care referral (Kavalieratos et al., 2014).

Theory

Roger's Diffusion of Innovations served as the theoretical framework for this EBQI project. The innovation decision process in the theory has five steps for an individual to go through before they will change behavior; knowledge, persuasion, decision, implementation, and confirmation (Rogers, 2003). In this project the heart failure providers received palliative care education which facilitated transition through the knowledge and persuasion stages of Roger's theory. The decision and implementation stages were entered at the start of the project and inclusion of the alert for palliative care referral within the EMR. Providers moved to the confirmation stage when they implemented the palliative care referral from the alert, when they evaluated the ease of the process, and/or when they saw the patient outcomes as they related to the palliative care referral.

There were five characteristics which describe how the providers would adopt to change (Roger, 2003) (see Appendix D). The participants were seen as adopters, each following into one of these stages; innovators, early adopters, early majority, late majority, or laggards (Roger,

2003). Innovators and early adopters were those providers who were willing to change and have a higher knowledge about the project (Roger, 2003). Level of provider adoption declines when they become more resistant, from the early majority down to the laggards. Laggards were those who wanted to wait to see if the project was a success before they were willing to adopt to the new practice (Roger, 2003).

Methods

IRB Approval, Site Approval

Institutional review board (IRB) approval for this project came from the University of Kansas Medical Center as an EBQI initiative (see Appendix U). The project was approved by the ambulatory heart failure clinic and hospital leadership, the medical director of the heart failure program, the heart failure program coordinator, and the palliative care team.

Ethical Issues

Three ethical considerations for this initiative were confidentiality, privacy, and autonomy. These principles were necessary to ensure fair and ethical treatment to the participants during the project. Confidentiality and privacy were maintained with information gathered from case reviews (Terry, 2015, pp 65-67). Protected health information was de-identified in accordance to Health Insurance Portability and Accountability Act (HIPAA) and the IRB approval requirements prior to initiation of project (Terry, 2015, pp 65-71). IRB approval ensured patients' rights were protected (Terry, 2015, p 66). The project was low risk to heart failure providers and patients. The providers had autonomy to refer a heart failure patient to palliative care and patients were able to make an informed decision on whether or not they followed through with the palliative care referral (Terry, 2015, p 62). The student investigator had no conflicts of interest as it related to this EBQI project.

Funding

Minimal costs were incurred with this project (see Appendix E). Direct costs were associated to educational offerings; the EMR enhancement is an established job expectation within the organization. Educational materials distributed during the educational sessions were the only direct cost of the project. A potential resource for funding for this initiative would have been a grant from the Hospice and Palliative Nurses Foundation.

Setting & Participants

The project took place in an ambulatory cardiology heart failure clinic in Kansas City, Kansas. The heart failure clinic is a part of a large academic health system. Within the system heart failure patients are seen by providers in a variety of clinics (heart failure, general cardiology, family medicine, and internal medicine). The heart failure clinic was chosen for this project because it provided the highest volume of heart failure care within the health system. There were 12 cardiology providers working in the clinic; these included three heart failure cardiologists and nine nurse practitioners. Each cardiology provider cared for adult patients (greater than 18 years of age) who had the diagnosis of heart failure in the clinic. Convenience sampling method with non-random selection was used for the project.

EBP Intervention

The project had theoretical support from Roger's team approach for implementation of new practices (Roger, 2003). The student investigator, palliative care team, heart failure clinical leaders, and the health system informatics team developed the intervention plan (see Appendix F). Cardiology providers working in the ambulatory heart failure cardiology clinic were recruited. An initial email was sent to each provider describing the project with dates of palliative care education sessions and start date (see Appendix I). Flyers were placed within the

clinic related to the project and start date (see Appendix J). A follow-up email was sent reminding participants of education sessions and start date. Readability for the flyer and email were determined sufficient for the intended participants (see Appendix K).

A 30 minute education session was conducted for the providers by the palliative care team and student investigator. The educational offerings were scheduled based on provider availability and was repeated four times to ensure each provider had the ability to attend. Education on palliative care has been demonstrated in the literature to increase provider knowledge (DeVader & Jeanmonod, 2012; Thoonsen et al., 2016). The education included information on palliative care and EMR intervention designed to improve the referral process. The topics of the sessions were: (a) general definitions of palliative care, (b) benefits of palliative care for heart failure patients, (c) heart failure guidelines related to palliative care, (d) current procedural terminology (CPT®) codes for advance care planning and (e) referral process within the EMR, refer to Appendix W.

A standardized referral process was developed within the EMR. This standardized process included an EMR alert to the provider at the beginning of a patient encounter. The alert ‘fired’ on each heart failure patient seen in the clinic and asked the provider to consider palliative care if the patient met any of the following triggers: (a) stage D heart failure, (b) two or more heart failure hospitalizations in the last 12 months, (c) inotrope dependence, (d) having required heart failure infusion clinic, (e) patient/provider recognition of persistent, (f) troublesome symptom burden, and/or (g) lives in a nursing home (Supportive & Palliative Care Indicators Tool, 2017; Weissman & Meier, 2011). This list of clinical triggers was determined by the palliative care team, student investigator, and heart failure program leadership. The triggers were based on clinical condition, heart failure trajectory, and palliative care resources to ensure the

workload was manageable based on volume of patients targeted. The provider addressed the alert by acknowledging it (no further action) or agreeing that the patient met criteria and automatically launching into the new palliative care referral order. After the alert was addressed (either acknowledged or referral placed) it would be suspended for one month to help reduce alert fatigue for the providers.

The palliative care referral was sent to the heart failure clinic scheduler, who scheduled the visit with the next heart failure appointment or as patient requested. The palliative care provider saw the patient in the heart failure clinic and developed a palliative care treatment plan. Additional palliative care follow-up was arranged per patient needs as indicated. The student investigator collected baseline data retrospectively and post intervention data prospectively on new palliative care referrals. See Appendix G for the project timeline.

Change Process, EBP Model

Change Model

Rogers' Diffusion of Innovations also served as the change model for this project (Rogers, 2003). The rate at which the providers adopted the change in practice had an impact on the project's success. The key to the model was to engage the providers with solid evidence for practice change and be available to answer questions that may help move them along the spectrum of adoption (innovators, early adopters, early majority, late majority, laggards) (Rogers, 2013) (see Appendix D). By assessing the providers' change characteristics the student investigator evaluated the provider's level of adoption to palliative care referrals and will use that information in the planning of future interventions.

Evidence Base Model

The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care was the evidence-based model for this initiative (The Iowa Model Collaborative, 2015). Permission to use the Iowa model was received from the University of Iowa Hospitals and Clinics (refer to Appendix U). The Iowa Model originated in 1994 and has been revised several times, with the last revision in 2015 (Steelman, 2015). The revised model expands from just quality improvement to whole systems change in order to improve patient care and outcomes (Steelman, 2015). The theory focuses on interdisciplinary collaboration. The first step in the theory was to identify triggers that establish the need for change (The Iowa Model Collaborative, 2015). For this study the triggers were based off of clinical guidelines and the underutilization of palliative care in heart failure. The next steps in the theory required prioritization of the topic, formation of an interdisciplinary team, review of the evidence to decide if the project should continue, and then design of a pilot for practice change (The Iowa Model Collaborative, 2015). With this project an interdisciplinary team was formed and consisted of nursing, palliative care, informatics, providers, and quality assurance. The team reviewed the literature to determine its value and designed this EBQI project under the direction of the student investigator.

Sustainability of this project after its completion is very likely. The project has significant buy-in from the leaders of the heart failure and palliative care teams. Coordination between the multidisciplinary teams occurred throughout the project to ensure its stability both during the project and after. The Informatics team implemented a clinically designed screening tool for heart failure patient referral to palliative care which is now a standard component of the health system's EMR. Upon completion of the EBQI project, implementation of the EMR alert and standardized referral process will be extended to other clinical settings such as the general

cardiology, family practice, and internal medicine clinics. The only limitation for the expansion relates to the palliative care resources. One additional palliative care nurse practitioner has been hired for the heart failure clinic to meet current needs but additional resources may be needed as the project expands.

Study Design

This project had a prospective quasi-experimental design with a pretest, posttest assessment of heart failure related palliative care referrals along with provider referral patterns and patient data. Patient demographic and characteristic data includes: age, gender, race, living condition, marital status, payor source, heart failure diagnosis, last ejection fraction, New York Heart Association score, and co-morbidities. Additional data collected included: provider placing referral, number of palliative care referrals, number of hospital and office visits, and post intervention patient mortality. Baseline data was collected through retrospective case review for 90 days prior to the intervention. Post intervention data was collected prospectively for 90 days as well. Refer to Appendix H for the project's Logic Model.

Validity

Convenience sampling was utilized for this DNP project to improve internal and external validity. The providers were consistent throughout the project which decreased bias. The heart failure clinic had the largest volume of heart failure patients within the system to help generalize to the health system once all heart failure providers are included (general cardiology, family medicine, internal medicine). By selecting the highest volume of heart failure patients in the system and developing a standardized referral process in the EMR with specific triggers, other providers within the system (general cardiology, family medicine, and internal medicine) would be able to replicate the process for their heart failure patient population. The standardized

process for referrals helped with internal validity but hindered external validity since other organizations may not be able to replicate the project. Other facilities may not have an EMR that allows for alerts to drive patient care. There was a concern that the project did not identify which part of the intervention, education or standardized referral process, produced the greater impact on the provider's referral patterns.

Outcomes to be Measured

Numbers of palliative care referrals for heart failure patients was the primary study outcome. Secondary outcomes included: patient demographic factors which were to assure similarity between the baseline retrospective patient sample and the post intervention patient sample. Hospital readmission rates, number of cardiology and palliative care office visits, and patient mortality for the intervention sample was also used to assess outcomes of the intervention.

Measurement Instruments

Reports were generated by the quality assurance team identifying the heart failure patients who received palliative care referrals pre and post intervention. Secondary data was collected from the EMR of referred patients. No measurement instruments were required in this study. It was worthwhile to note that multiple studies support analysis of patient data through case review as a valid means of data analysis (Bakitas, et al., 2013; Bekelman et al., 2011; Chan, Yu, Leung, Chan, & Hui, 2016; Scheffey, et al., 2014; Wong et al., 2016). Raw data was entered in RedCap (see Appendix L) and transferred to SPSS program (see Appendix M).

Quality of Data

No power analysis was indicated for the project since all heart failure providers within the heart failure cardiology clinic were invited to participate. Defined data were collected

objectively from the case review to eliminate any bias from the student investigator. Patient or provider consent was not required for this EBQI initiative. The 90 day pre and post intervention data were evaluated to identify changes in the provider's referral patterns and compared to other studies (DeVader & Jeanmonod, 2012; Thoonsen et al., 2016). Patient data from both groups will also be compared to the literature (Bekelman et al., 2011; DeVader & Jeanmonod, 2012; Evangelista et al., 2012; Wong et al. 2016).

Analysis Plan

Data collected from the case review were assessed using SPSS program (see Appendix M). Descriptive statistics including means, ranges, and standard deviation were conducted on the demographic and patient characteristics data to assure similar baseline and intervention groups. The T test was used to evaluate the numbers of palliative care referrals for heart failure patients as well as the other normal variables such as readmission rates and number of office visits. Chi-square statistics were utilized on nominal variables (i.e. age, gender, race, payor source, referral source). Published data supported the use of palliative care for heart failure patient to improve quality of life (Diop, Rudolph, Zimmerman, Richter, & Skarf, 2017; Evangelista et al., 2012; Sidebottom, Jorgenson Ann, Richards, Kirven, & Sillah, 2015; Wong et al., 2016). The use of demographic and patient characteristics data played a significant role in the literature (Evangelista et al., 2012). Data suggested that palliative care was underutilized in this patient population or occurs very late in the trajectory (Greener et al., 2014). This project aimed to improve heart failure referral volume to palliative care at an earlier stage by initiating the referral within an ambulatory setting as opposed to the hospital setting during an episode of heart failure exacerbation.

Results

Setting and Participants

The project site was a cardiology heart failure clinic within a large academic health system in the state of Kansas from mid-August 2017 to mid-February 2018. Twelve cardiology providers in the heart failure clinic were invited to participate in the project. Each of the providers agreed to participate, with five (42%) attending an education session and seven (58%) not attending. Providers included nine advance practice providers (seven nurse practitioners and one physician assistant) and three heart failure cardiologist with a mean of 5-10 years' experience. Providers characteristics included gender (three males and nine females) and age (range 31-60). Refer to Appendix O.

Intervention Course

Prior to the intervention a 90 day period of baseline data was obtained between mid-August to mid-November 2017. A total of 215 heart failure palliative care cases were reviewed. Fifty four new palliative care referrals occurred within the 215 pre-intervention cases which were reviewed. The pre-intervention case sample was predominately male (56%), with participants ranging from age 46 to greater than 89, and 72% of cases had a NYHA score of 3. Educational sessions were offered to providers in August 2017 prior to interventional phase. Post intervention data collection occurred in a 90 day period from mid-November 2017 to mid-February 2018. Among the post intervention cases, 47 new palliative care referrals occurred within a total sample of 180 patients. Patient characteristics were evaluated between the pre and post intervention groups. In the post-intervention group, 60% of cases were females and 55% had a NYHA score of 3; the age range extended from 31 to greater than 89 years (see Appendix P).

Outcome Data by Sub-Topic

Impact of Education and Standardized Process on Palliative Care Referrals. The chi square test was conducted to evaluate the association between palliative care education and referrals. Each provider's referral pattern was evaluated pre and post intervention (see appendix Q). No statistical difference was identified between the number of palliative care referrals that came from the providers who attended the education versus those that did not ($p = .655$). Refer to appendix R. Twenty seven palliative care referrals came from cardiology providers who attended an education session and 22 referrals came from providers who did not attend the education in the pre-intervention group. Post intervention there were 27 referrals from the providers who attended education and 15 from those who did not attend. When evaluating the education impact of palliative care CPT documentation, no statistical significance noted between the pre and post intervention groups ($X^2 = 0.5298$, $p = .466703$) (see appendix S).

Pre-intervention there were 1367 heart failure patient encounters seen by the cardiology providers. From those heart failure patient encounters 54 palliative care referrals were generated, 4% of the total cardiology provider visits. Post intervention there were 1244 heart failure patient encounters. The cardiology providers created 47 palliative care referrals during the intervention which was 4% of the total cardiology provider visits. An independent t test determined there was no significance between the pre and post intervention palliative care referral groups ($t = 0.07317$, $p = .474166$). During the post intervention there were only 13 palliative care referrals generated from the EMR alert generated at the beginning of the encounter (out of 772 alerts).

Impact of Palliative Care Referrals. Frequencies of readmission, emergency room visits, provider office visits, and palliative care visits were completed to compare the pre and post intervention data (see appendix P). Post intervention fewer patients were readmitted to the

hospital but there was a higher number of emergency room visits. Cardiology office visits in the post intervention group were slightly decreased and the palliative care office visits had a small increase. An independent t test was used to evaluate the statistical impact of the palliative care referrals to re-admission rates, emergency room or office visits. No statistical difference was noted between the pre and post intervention groups. Refer to appendix S.

Missing Data. Prior to the intervention the palliative care referral was not consistently documented. This created a challenge in determining which provider made the palliative care referral in the pre intervention data. Provider documentation of patient living condition and NYHA score was difficult to find and often missing. There were two providers who did not submit their age or years in practice.

Discussion

Successes

The data did not reflect statistical differences between the pre and post intervention groups with 4% of cardiology provider patient encounters generating a palliative care referral in each group. Providers reported positive views of having the alert for palliative care and that the standardized process did help when they decided to make a palliative care referral. Hardwiring a process within the EMR allows for further development of the referral process.

Study Strengths

There were several strengths in this study. By conducting the study in the heart failure clinic the largest volume of heart failure patients within the health system were used to test the alert and standardized process within the EMR. The alert and standardized referral processes were hardwired into the EMR making it easier to evaluate providers' practices. The providers were engaged in the process and provided informal feedback for suggestion on how to make the alert

more effective. Providers recommended changing the timing of the alert from the beginning of the encounter to the end allowing the provider to assess the patient before receiving the alert. Post intervention data supported this recommendation with only 13 palliative care referrals occurring from the EMR alert.

Results Compared to Evidence in the Literature

Results in this study did not match evidence found in the literature. Hysong et al. 2011 reported lack of a standardized referral process as a significant barrier to palliative care. In this project having the standardized referral process for palliative care did not impact the amount of referrals. Literature demonstrated that education impacted provider knowledge (DeVader & Jeanmonod, 2012; Thoonsen et al., 2016). In this project education did not affect the providers' referral pattern with 4% of total cardiology provider visits generating a palliative care referral in both the pre and post intervention groups. Several studies reported a decrease in resource utilization with palliative care. Diop et al. 2017 found that palliative care services attributed to a significant reduction in health care cost, with the most substantial cost savings in decreased emergency room visits, hospital admissions, and office visits. Sahlen et al. 2015 demonstrated that patients who received ambulatory palliative care had decreased cost in the care management along with fewer hospitalizations. In this project no direct cost were analyzed but there were no significant changes with the number of emergency room visits, readmissions, or office visit.

Limitations

Internal Validity Effects

There were several internal validity concerns in this EBQI project. First, not all providers attended the education. Second, the alert within the EMR was at the beginning instead of the end of the encounter. Providers were unable to utilize the alert and standardized process to its full

effect. Once they acknowledged the alert they did not have a way to return to it to review the indications for palliative care and launch into the referral. Only 13 referrals were generated from over 700 alerts. Potential rationales for the low referral rate were the timing of the alert, patient already receiving palliative care services, and/or patient refusal of palliative care referral. Third, the providers' scheduled clinic days varied significantly so there is no way of knowing if they did or did not change their referral pattern based on their number of clinic days during the pre and post intervention.

External Validity Effects

Several factors impact the external validity of this project. The first relates to the alert timing. With the providers reporting that the alert should be moved to the end of the encounter, this was an intervention that deserves further study. The second variable would be the providers' familiarity with palliative care. These heart failure providers have already demonstrated their commitment to palliative care by incorporated a palliative care clinic within their clinic. It was unclear if they had additional patients who met palliative care or if they were already referring the appropriate patients to palliative care (new referrals were included in study not patients with existing palliative care). The third variable was the limited length of the intervention. The short duration may not allow enough time to know if there would be a change in readmission, emergency room visits, and office visits. The last variable was the alert development in a specific EMR which may not be replicable in another EMR system.

Sustainability of Effects and Plans to Maintain Effects

Sustainability for this EBQI project was good. The alert had been hardwired into the EMR for the cardiology providers. The health system was committed to increasing palliative care referrals and utilization of technology to improve the process. In the future this investigator will

work with the informatics team to change the timing of the alert from the beginning to the end of the encounter. There are some limitations within the EMR that will alter the process with this change but this investigator believes it is necessary before dissemination to the rest of the health system can occur.

Efforts to Minimize the Study Limitations

Efforts were made to minimize the project limitations but unfortunately they did occur. The alert ‘firing’ at the beginning of the encounter was identified early on as a potential barrier to provider utilization but based on the limitations within the EMR it was the only way to make the alert ‘fire’ and the providers have to address it. Moving the alert to the end of the encounter would no longer require an action from the provider. Based on those factors the decision was made to leave the alert at the beginning and evaluate its impact.

Interpretations

Expected and Actual Outcomes

The expected outcome for this EBQI initiative was to increase the number of palliative care referrals for heart failure patients through education and a standardized referral process. Unfortunately no change in providers’ referral pattern was demonstrated. Placement of the alert within the standardized referral process was expected to improve the process for providers but having it in the beginning of the encounter impaired the providers’ ability to use it. Education was expected to increase referrals but the cardiology providers were well versed with palliative care which resulted in education having no impact.

Intervention Effectiveness

The intervention was not effective with increasing the number of palliative care referrals for heart failure patients. Interventions did lay the groundwork for a standardized palliative care

referral process. By having the alert and referral placed within the EMR with the triggers on when to refer to palliative care, all providers could identify the indications for a palliative care referral for heart failure patients.

Intervention Revisions

The cardiology providers were engaged in the process and provided feedback on how to improve utilization by moving the alert to the end of the encounter. Moving the alert will allow the provider to assess the patient and evaluate their palliative care needs before the alert is triggered. This feedback provides opportunity for optimization of the standardized process to improve its' utilization and effectiveness before dissemination to the health system. Tailored education will be developed for each of the other disciplines based on their familiarity of palliative care and the referral process. Data collection will be more specific, creating ordinal data for items like age, to allow for more detailed analysis.

Expected and Actual Impact of Health Systems, Costs, and Policy

There were a few technical issues with building the alert and standardized process which impacted the expected project start date. The issues were small but prioritization of projects within the health system caused the project to be delayed for several months, changing the post intervention from six months to 90 days. The expected and actual cost for the project was minimal based on the setting of the project. Another clinic without the resources of the health system may have found it challenging to implement the project. The expected volume of palliative care referrals was expected to increase to the point of potentially needing additional palliative care providers within the heart failure clinic. Since the referral pattern was unchanged, the program is sustainable with the one palliative care nurse practitioner for heart failure and the health system will need to continue to evaluate their capacity.

Conclusions

This Standardized Palliative Care Referral for Heart Failure EBQI project was designed to see if education on palliative care and a standardized referral process would increase the number of heart failure related palliative care referrals at an ambulatory heart failure cardiology clinic. Guidelines recommend the inclusion of palliative care in heart failure management (Allen et al., 2012; Braun et al, 2016; IOM, 2014; Yancy et al., 2013). Heart failure patients who receive palliative care have seen an improvement in their quality of life and relief from symptoms associated to the progression of heart failure (Evangelista et al., 2012; Sidebottom et al., 2015; Wong et al., 2016). The next steps for this project will be to alter when the alert ‘fires’ within the encounter to evaluate its impact on the palliative care referral process. If there are positive results the standardize referral process will be implemented across the health system to include family practice, internal medicine, and the rest of cardiology. Dissemination across the health system will ensure every heart failure patient has the opportunity to receive palliative care services regardless of who manages their heart failure. By increasing palliative care services, not only will patients benefit but the health system will see a reduction in hospital readmissions and cost related to heart failure.

References

- Allen, L. A., Stevenson, L. W., Grady, K. L., Goldstein, N. E., Matlock, D. D., Arnold, R. M., ... & Havranek, E. P. (2012). Decision making in advanced heart failure. *Circulation*, 125(15), 1928-1952.
- American Heart Association (2017). What is heart failure. Retrieved from http://www.heart.org/HEARTORG/Conditions/HeartFailure/AboutHeartFailure/What-is-Heart-Failure_UCM_002044_Article.jsp#.WP9w0mnyuUk
- Aspromonte, N., Gulizia, M. M., Di Lenarda, A., Mortara, A., Battistoni, I., De Maria, R., ... & Di Tano, G. (2017). ANMCO/SIC Consensus Document: cardiology networks for outpatient heart failure care. *European Heart Journal Supplements*, 19(suppl_D), D89-D101.
- Bakitas, M., MacMartin, M., Trzepkowski, K., Robert, A., Jackson, L., Brown, J. R., ... & Kono, A. (2013). Palliative care consultations for heart failure patients: how many, when, and why?. *Journal of Cardiac Failure*, 19(3), 193-201.
- Beernaert, K., Cohen, J., Deliens, L., Devroey, D., Vanthomme, K., Pardon, K., & Van den Block, L. (2013). Referral to palliative care in COPD and other chronic diseases: a population-based study. *Respiratory Medicine*, 107(11), 1731-1739.
- Bekelman, D. B., Nowels, C. T., Allen, L. A., Shakar, S., Kutner, J. S., & Matlock, D. D. (2011). Outpatient palliative care for chronic heart failure: a case series. *Journal of Palliative Medicine*, 14(7), 815-821.
- Benjamin, E. J., Blaha, M. J., Chiuve, S. E., Cushman, M., Das, S. R., Deo, R., ... & Isasi, C. R. (2017). Heart disease and stroke statistics—2017 update: a report from the American Heart Association. *Circulation*, 135(10), e146-e603.
- Braun, L. T., Grady, K. L., Kutner, J. S., Adler, E., Berlinger, N., Boss, R., ... & Higgins, P. (2016). Palliative care and cardiovascular disease and stroke: a policy statement from the American Heart Association/American Stroke Association. *Circulation*, 134(11), e198-e225.
- Center to Advance Palliative Care (CAPC) (2017). *Definition of palliative care*. Retrieved from <https://www.capc.org/about/palliative-care/>
- Centers for Medicare and Medicaid Services (CMS), 2017. Utilization / spending state level: All beneficiaries, 2007 - 2105. Retrieved from https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Chronic-Conditions/Downloads/CC_Util_Spend_State.zip

- Centers for Medicare and Medicaid Services (CMS), (2017). Prevalence state level: Race / ethnicity and age, 2007 - 2015. Retrieved from https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Chronic-Conditions/Downloads/CC_Prev_State_All_Race_Age.zip
- Chen, J., Normand, S. L. T., Wang, Y., & Krumholz, H. M. (2011). National and regional trends in heart failure hospitalization and mortality rates for Medicare beneficiaries, 1998-2008. *Journal of American Medical Association*, 306(15), 1669-1678.
- DeVader, T. E., & Jeanmonod, R. (2012). The effect of education in hospice and palliative care on emergency medicine residents' knowledge and referral patterns. *Journal of Palliative Medicine*, 15(5), 510-515.
- Diop, M. S., Rudolph, J. L., Zimmerman, K. M., Richter, M. A., & Skarf, L. M. (2017). Palliative care interventions for patients with heart failure: a systematic review and meta-analysis. *Journal of Palliative Medicine*, 20(1), 84-92.
- Evangelista, L. S., Liao, S., Motie, M., De Michelis, N., Ballard-Hernandez, J., & Lombardo, D. (2014). Does the type and frequency of palliative care services received by patients with advanced heart failure impact symptom burden?. *Journal of Palliative Medicine*, 17(1), 75-79.
- Evangelista, L. S., Lombardo, D., Malik, S., Ballard-Hernandez, J., Motie, M., & Liao, S. (2012). Examining the effects of an outpatient palliative care consultation on symptom burden, depression, and quality of life in patients with symptomatic heart failure. *Journal of Cardiac Failure*, 18(12), 894-899.
- Flint, K. M., Schmiede, S. J., Allen, L. A., Fendler, T. J., Rumsfeld, J., & Bekelman, D. (2017). Health status trajectories among outpatients with heart failure. *Journal of Pain and Symptom Management*, 53(2), 224-231.
- Gade, G., Venohr, I., Conner, D., McGrady, K., Beane, J., Richardson, R. H., ... & Penna, R. D. (2008). Impact of an inpatient palliative care team: a randomized controlled trial. *Journal of Palliative Medicine*, 11(2), 180-190.
- Greener, D. T., Quill, T., Amir, O., Szydowski, J., & Gramling, R. E. (2014). Palliative care referral among patients hospitalized with advanced heart failure. *Journal of Palliative Medicine*, 17(10), 1115-1120.
- Haga, K., Murray, S., Reid, J., Ness, A., O'donnell, M., Yellowlees, D., & Denvir, M. A. (2012). Identifying community based chronic heart failure patients in the last year of life: a comparison of the Gold Standards Framework Prognostic Indicator Guide and the Seattle Heart Failure Model. *Heart*, 98(7), 579-583.

- Heidenreich, P. A., Albert, N. M., Allen, L. A., Bluemke, D. A., Butler, J., Fonarow, G. C., ... & Nichol, G. (2013). Forecasting the impact of heart failure in the United States. *Circulation: Heart Failure*, 6(3), 606-619.
- Hobbs, F. D. R., Kenkre, J. E., Roalfe, A. K., Davis, R. C., Hare, R., & Davies, M. K. (2002). Impact of heart failure and left ventricular systolic dysfunction on quality of life. A cross-sectional study comparing common chronic cardiac and medical disorders and a representative adult population. *European Heart Journal*, 23(23), 1867-1876.
- Hysong, S. J., Esquivel, A., Sittig, D. F., Paul, L. A., Espadas, D., Singh, S., & Singh, H. (2011). Towards successful coordination of electronic health record based-referrals: a qualitative analysis. *Implementation Science*, 6(1), 84.
- Institute of Medicine (IOM) (2014). *Dying in America: improving quality and honoring individual preferences near the end of life*. Retrieved from <http://www.nationalacademies.org/hmd/~media/Files/Report%20Files/2014/EOL/Report%20Brief.pdf>
- Kansas City Government (2017). Kansas City planning and development: Kansas City overview. Retrieved from <http://kcmo.gov/planning/kcmo-overview/>
- Kansas Health Matters (2016). Congestive heart failure hospital admission rate. Retrieved from <http://www.kansashealthmatters.org/index.php?module=Indicators&controller=index&action=view&indicatorId=1361&localeId=19>
- Kansas Health Matters (2017). Heart failure: Medicare population. Retrieved from <http://www.kansashealthmatters.org/index.php?module=indicators&controller=index&action=view&indicatorId=2060&localeId=19>
- Kavalieratos, D., Mitchell, E. M., Carey, T. S., Dev, S., Biddle, A. K., Reeve, B. B., ... & Weinberger, M. (2014). "Not the 'grim reaper service'": An assessment of provider knowledge, attitudes, and perceptions regarding palliative care referral barriers in heart failure. *Journal of the American Heart Association*, 3(1), e000544.
- Kheirbek, R. E., Alemi, F., Citron, B. A., Afaq, M. A., Wu, H., & Fletcher, R. D. (2013). Trajectory of illness for patients with congestive heart failure. *Journal of Palliative Medicine*, 16(5), 478-484.
- Melnyk, B & Overholt, E (2015). *Evidence-based practice in nursing and healthcare: A guide to best practice* (3rd ed.). Philadelphia: Wolters Kluwer. The levels of evidence adapted by Lindholm, L (2017) from Melnyk & Overholt, Rating System for the Hierarchy of Evidence for Intervention/Treatment Questions (p.11).
- Melnyk, B. & Overholt, E. (2015). *Evidence-based practice in nursing and healthcare*. (3rd ed.). Philadelphia: Wolters Kluwer.

- Metzger, M., Norton, S. A., Quinn, J. R., & Gramling, R. (2013). Patient and family members' perceptions of palliative care in heart failure. *Heart & Lung: The Journal of Acute and Critical Care*, 42(2), 112-119.
- Murray, S. A., Boyd, K., Kendall, M., Worth, A., Benton, T. F., & Clausen, H. (2002). Dying of lung cancer or cardiac failure: prospective qualitative interview study of patients and their carers in the community. *British Medical Journal*, 325(7370), 929.
- Nelson, C., Chand, P., Sortais, J., Oloimooja, J, Rembert., G. (2011). Inpatient palliative care consults and the probability of hospital readmission. *The Permanente Journal*, 15(2) 48-51.
- Obi, E. N., Swindle, J. P., Turner, S. J., Russo, P. A., & Altan, A. (2016). Health Care Costs for Patients with Heart Failure Escalate Nearly 3-Fold in Final Months of Life. *Journal of Managed Care & Specialty Pharmacy*, 22(12), 1446-1456.
- O'Connor, N. R., Moyer, M. E., Behta, M., & Casarett, D. J. (2015). The impact of inpatient palliative care consultations on 30-day hospital readmissions. *Journal of Palliative Medicine*, 18(11), 956-961.
- Rogers, E.M. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press.
- Roger, V. L., Weston, S. A., Redfield, M. M., Hellermann-Homan, J. P., Killian, J., Yawn, B. P., & Jacobsen, S. J. (2004). Trends in heart failure incidence and survival in a community-based population. *Journal of American Medical Association*, 292(3), 344-350.
- Ryan, J., Andrews, R., Barry, M. B., Kang, S., Iskandar, A., Mehla, P., & Ganeshan, R. (2014). Preventability of 30-day readmissions for heart failure patients before and after a quality improvement initiative. *American Journal of Medical Quality*, 29(3), 220-226.
- Sahlen, K. G., Boman, K., & Brännström, M. (2016). A cost-effectiveness study of person-centered integrated heart failure and palliative home care: based on a randomized controlled trial. *Palliative Medicine*, 30(3), 296-302.
- Scheffey, C., Kestenbaum, M. G., Wachterman, M. W., Connor, S. R., Fine, P. G., Davis, M. S., & Muir, J. C. (2014). Clinic-based outpatient palliative care before hospice is associated with longer hospice length of service. *Journal of pain and symptom management*, 48(4), 532-539.
- Seo, Y., Roberts, B. L., LaFramboise, L., Yates, B. C., & Yurkovich, J. M. (2011). Predictors of modifications in instrumental activities of daily living in persons with heart failure. *Journal of Cardiovascular Nursing*, 26(2), 89-98.
- Sidebottom, A. C., Jorgenson, A., Richards, H., Kirven, J., & Sillah, A. (2015). Inpatient palliative care for patients with acute heart failure: outcomes from a randomized trial. *Journal of Palliative Medicine*, 18(2), 134-142.

- Siouta, N., van Beek, K., Preston, N., Hasselaar, J., Hughes, S., Payne, S., ... & Hodiament, F. (2016). Towards integration of palliative care in patients with chronic heart failure and chronic obstructive pulmonary disease: a systematic literature review of European guidelines and pathways. *BMC Palliative Care*, 15(1), 18.
- Steelman, V. M. (2015, July). The 2015 Revised Iowa Model for Infusing Evidence-Based Practices Globally. In *Sigma Theta Tau International's 26th International Nursing Research Congress*. STTI.
- Supportive & Palliative Care Indicators Tool (SPICT) Programme (2017). SPICT. Retrieved <http://www.spict.org.uk/>
- Szekendi, M. K., Vaughn, J., Lal, A., Ouchi, K., & Williams, M. V. (2016). The prevalence of inpatients at 33 US hospitals appropriate for and receiving referral to palliative care. *Journal of Palliative Medicine*, 19(4), 360-372.
- Terry, A. J. (2015). *Clinical research for the doctor of nursing practice*. (2nd ed.), (pp. 62,65 – 71), Massachusetts: Jones & Bartlett.
- The Heller School (2012). Data for diverse and equitable metropolitan areas: Kansas City. Retrieved from <http://www.diversitydata.org/Data/Profiles/Show.aspx?loc=728>
- The Iowa Model Collaborative. (In press) 2015. *The Iowa Model Revised: Development and validation*. Worldviews on Evidence-Based Nursing.
- Thoonsen, B., Gerritzen, S. H., Vissers, K. C., Verhagen, S., van Weel, C., Groot, M., & Engels, Y. (2016). Training general practitioners contributes to the identification of palliative patients and to multidimensional care provision: secondary outcomes of an RCT. *British Medical Journal Supportive & Palliative Care*, bmjpscare-2015.
- Torio, C.M., & Andrews R.M. (2013). National inpatient hospital costs: the most expensive conditions by payer, 2011. HCUP statistical brief #160. Agency for Healthcare Research and Quality. Retrieve from <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb160.pdf>
- Unroe, K. T., Greiner, M. A., Hernandez, A. F., Whellan, D. J., Kaul, P., Schulman, K. A., ... & Curtis, L. H. (2011). Resource use in the last 6 months of life among Medicare beneficiaries with heart failure, 2000-2007. *Archives of Internal Medicine*, 171(3), 196-203.
- Weissman, D. E., & Meier, D. E. (2011). Identifying patients in need of a palliative care assessment in the hospital setting a consensus report from the Center to Advance Palliative Care. *Journal of Palliative Medicine*, 14(1), 17-23.
- Wong, F. K. Y., Ng, A. Y. M., Lee, P. H., Lam, P. T., Ng, J. S. C., Ng, N. H. Y., & Sham, M. M. K. (2016). Effects of a transitional palliative care model on patients with end-stage heart failure: a randomised controlled trial. *Heart*, 102(14), 1100-1108.

World Health Organization (WHO) (2016). *WHO definition of palliative care*. Retrieved from <http://www.who.int/cancer/palliative/en/>

Yancy, C.W., Jessup, M., Bozkurt, B., Butler, J., Casey, D.E., Drazner, M.H., ... Januzzi, J.L. (2013). 2013 American College of Cardiology Foundation/American Heart Association 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, 147-239.

Ziehm, J., Farin, E., Seibel, K., Becker, G., & Köberich, S. (2016). Health care professionals' attitudes regarding palliative care for patients with chronic heart failure: an interview study. *BMC Palliative Care*, 15(1), 76.

Appendix A

Definition of Terms for Standardized Palliative Care Referral for Heart Failure Project

Heart Failure: condition in which the heart cannot pump enough blood to support bodily tissues (American Heart Association, 2017)

Cardiology Providers: for the purpose of this project, cardiology providers is defined as heart failure cardiologist and nurse practitioners caring for patients in the ambulatory heart failure clinic

Standardized Palliative Care Referral Process: process within the EMR in which the provider can automatically place order for palliative care for patients that meet criteria

Patient Triggers: criteria for heart failure patients that may indicate the patient is a candidate for palliative care referral

Appendix B

Hierarchy of Evidence for Standardized Palliative Care Referral for Heart Failure Project

	EBPG	Level I SR, Quant	Level II RCT	Level IV Quant, Non-exp	Level VI Qual	Level VII Expert
Studies*	1	2	6	11	7	4

*Level of Evidence, Melnyk (2015)

Rating System for the Hierarchy of Evidence For an Interventional Inquiry (Modification by Dr. Lindholm for course N5613)	
Level I	Evidence from a systematic review or meta-analysis of all relevant RCTs. <i>Evidence-based clinical practice guidelines based on systematic reviews of RCTs).</i> *
Level II	Evidence obtained from well-designed RCT. <i>Quantitative systematic review of well-designed controlled trial without randomization.</i>
Level III	Evidence obtained from well-designed controlled trial without randomization (<i>quasi-experimental</i>). <i>Quantitative systematic review of case-control, cohort, or correlational studies.</i>
Level IV	Evidence from well-designed case-control or cohort study (<i>or cross-sectional study</i>)
Level V	Evidence from systematic review of <i>quantitative</i> descriptive (<i>no relationships to examine</i>) or qualitative studies.
Level VI	Evidence from a single <i>quantitative</i> descriptive (<i>no relationships to examine in the study</i>) or qualitative study
Level VII	Evidence from the opinion of authorities and/or reports of expert committees

Melnyk, B.M. & Overholt., E. (2015). Evidence-based practice in nursing and healthcare. Philadelphia Lippincott Williams & Wilkins.

*Italics, appropriate in this category, modification by LL 2017 based on opinions from experts to place SR at one level higher than single study design level.

Appendix C

Synthesis of Evidence Table

PICOT						
Among (P)cardiology providers caring for primary heart failure patients, does (I) palliative care education and a standardized palliative care referral process as compared to (C) no education/no standardized referral process (O) increase the number of heart-failure related palliative care referrals (T) within six months (S) in an ambulatory cardiology clinic?						
First author, Year, Title, Journal	Purpose	Research Design¹, Evidence Level² & Variables	Sample & Sampling, Setting	Measures & Reliability (if reported)	Results & Analysis Used	Limitations & Usefulness
Palliative Care, Heart Failure, and Quality of Care						
Diop (2017). Palliative care interventions for patients with heart failure: a systematic review and meta-analysis. Journal of Palliative Care Medicine.	SR with meta-analysis on interventions and effect	SR with meta-analysis, Level I	15 studies with HF / PC	NA	Interventions integrating HF /PC and HF with improved QOL, inconsistency in quality of death variables, decrease in resource utilization with PC interventions	Limitations: NA Usefulness: Improved QOL and decrease in resource utilization (i.e. readmission, ED visits)
Wong (2016). Effects of a transitional palliative care model on patients with end-stage heart failure: a randomized controlled trial. Heart.	Exam effects of home based transitional PC program for HF pts post hospital	Quantitative, randomized CT, exp, Level II	Inpatient (multi-site), home based, N = 84	Descriptive statistics – poisson regression – generalized estimating equation – ESAS, PPS, MQOL-HK, CHQ, SPSS V.22. 0	Intervention group lower readmission 33.6% vs 61%, intervention group improved depression, dyspnea, and total ESAS, improved PPS and MQOL-HK scores	Limitations: Loss of pts in follow-up, small sample size, question generalizability, uses other QOL measures Usefulness: Improved symptoms and readmission with PC program
Sidebottom (2015). Inpatient palliative care for patients with acute heart failure: outcomes from a randomized trial. Journal	Determine if inpt PC for HF pts improves symptoms, depression, QOL	Quantitative, RCT, exp, Level II	Inpt PC – nonblinded, sample size needed of 500 to have an effect size (Cohen's d) .25, N = 232, follow up at mos at	α .05, 80% power, SPSS version 18 Confidence intervals calculated for each component, ESAS, PHQ-9, MLHFQ	Improvements - ESAS 11% (3.69/32.7), PHQ-9 17% (1.42/8.3), MLHFQ 10% (4.92/47)	Limitations: Underpowered, unable to reach sample size, some randomized to PC did not receive, losses to f/u Usefulness: Benefits from reduced HF

of Palliative Care.			3 mos			symptom and improved QOL
O'Connor (2015). The impact of inpatient palliative care consultations on 30-day hospital readmissions. <i>Journal of Palliative Medicine</i> .	Determine impact of inpt PC on 30 day readmits in large academic medical center	Quantitative, control trial, exp, Level II	34,541 hospital, 1430 included PC	Mixed effects logistic regression model, propensity score analysis, CI 95%	PC consults with lower 30 day readmit (adjusted odds ratio 0.66, .55-.78. $p < 0.001$); PC more likely to be referred to hospice, DC with DNR	Limitations: Question generalizability; limited readmission data; unknown treatment courses for groups Usefulness: Demonstrates reduction of readmission rates
Evangelista (2014). Does the type and frequency of palliative care services received by patients with advanced heart failure impact symptom burden? <i>Journal of Palliative Medicine</i> .	Describe outpt PC services and symptom burden from initial consult to 3 mos	Qualitative, descriptive-exploratory, non-exp, Level VI	36 patients receiving advanced care planning and care coordination from PC	ESAS; Cronbach's α for reliability 0.86; SSPSS 18 program; paired Wilcoxon signed rank test; statistical significance accepted at a 2-sided $\alpha < 0.05$	Decreased pain, anxiety, dyspnea ($p < 0.001$) as well as fatigue depression, drowsiness appetite, and nausea (≤ 0.040)	Limitations: cause of symptoms unknown; question generalizability; lack of control group Usefulness: Consistent with other studies r/t PC services and symptom burden reduction
Evangelista (2012). Examining the effects of an outpatient palliative care consultation of symptoms burden, depression, and quality of life in patients with symptomatic heart failure. <i>Journal of Cardiac Failure</i> .	Assess outpt PC consult on QOL on pt recently dc with HF	Quantitative, case control trial, exp, Level IV	Outpt 36 pts randomly selected from another controlled trial, PC consult at time of HF appt	SD, clinical data, CCI, ESAS, PHQ-9, MLHFQ ; descriptive statistics, analysis of covariance equation, exploratory analyses, Pearson product moment or Spearman rho correlation	Physical health improved in PC group at 3 mos (declined in control group), PC group showed improvement on symptoms and QOL than control	Limitations: Small sample size; sample were not independently randomized; young age of sample size makes it difficult to generalize to older population; outcomes are short term – 3 mos after 1 PC consultation Usefulness: Benefit of PC consultation on QOL

Nelson (2011). Inpatient palliative care consults and the probability of hospital readmission. The Permanente Journal.	Evaluate effect of PC team at hospital on readmit rates	Quantitative, cohort, exp, Level IV	N = 200, consecutive PC consult pts selected – unknown if randomized to groups	Probability analysis using Bayes theorem, tailed t test	PC team had decreased readmission to hospital per patient per 6 months from 1.15 to .7 admissions / pt	Limitations: Question generalizability, SD/ clinical data not factored in Usefulness: Benefit of PC team with decreased admissions
Gade (2008). Impact of an inpatient palliative care team: a randomized controlled trial. Journal of Palliative Care Medicine.	Measure impact of multi-disciplinary PC on pt outcomes, satisfaction, and cost	Quantitative, RCT, exp, Level II	N=517		Higher scores for the CES (8.3 vs 7.5, p 0.0004); fewer ICU stays on readmits (12 versus 21, p 0.04), lower 6-mos net cost savings of \$4,855 / pt (p 0.001). Longer median hospice stays (24 versus 12 days, p 0.04)	Limitations: Missing measurable process Measures, Question generalizability Usefulness: Higher satisfaction and communication with PC, fewer ICU admits on readmission, lower total health care costs
Murray (2002). Dying of lung cancer or cardiac failure: prospective qualitative interview study of patients and their carers in the community. British Medical Journal.		Qualitative, exploratory, non-exp, Level VI	N=20	Descriptive statistics, QSR NVivo	219 qualitative interviews; HF had different illness trajectory, HF had less information, understanding, and less involved in decision making; HF less health, social, and PC	Limitations: NA Usefulness: Understanding HF trajectory and pts level of understanding
Referral Patterns						
Szekendi (2016). The prevalence of inpatients at 33 US hospitals	Determine size and character of population appropriate	Quantitative, case control, non-exp, cross-sectional, retrospective	33 hospitals – UHC database, 2119 charts reviewed	Descriptive statistics for continuous data, percentages for categorical	Overall need for PC 19%, those who met criteria for referral, 60.9% appropriate for referral did not	Limitations: Underestimates unmet need for PC, making referral need in US hospital up to 23-27%; bias

appropriate for and receiving referral to palliative care. Journal of Palliative Medicine.	for referral to PC at 33 hospitals, also assessed barriers/facilitators to referrals	prevalence design, Level IV Qualitative, exploratory, non-exp, Level VI	Purposeful sampling 7 MD, 6 frontline nursing staff	data; x2 test for categorical variables and t-test for continuous variables	receive, 1141 pts w/ HF, 376 (33%) were appropriate for PC 2618 dx, 1141 HF (44%) Barriers – no standard definition of PC, nonPC specialist not wanting to consult r/t relationship w/ pt and wanting to manage end-of-life care, education on PC varied	in hospital charting and coding practices, variation of chart reviewer's definition of PC service, PC service differed among the hospitals, small sample size Usefulness: Underutilization of PC, of pts looked at majority were HF w/ 33% of those meeting criteria for referral
Greener (2014). Palliative care referral among patients hospitalized with advanced heart failure. Journal of Palliative Medicine.	Identify determinants associated to PC referrals	Quantitative, case control, non-exp, Level IV	Inpatients, N = 2647	Bivariate analyses, chi-square test, $p < 0.005$, statistical analysis system software	6.2% of HF had PC referrals, older/married pts had higher odds of having PC referral, each hospitalization resulted in an 46% increase odds of PC referral	Limitations: Question generalizability, reflections based on referral patterns, case-mix, physician characteristics Usefulness: Small amount of HF pts receive PC referrals
Beernaert, (2013). Referral to palliative care in COPD and other chronic diseases: A population-based study. Respiratory Medicine.	Describe how patients with COPD, HF, dementia, and cancer differ in frequency/timing of PC services	Quantitative, case control, non-exp, Level IV	1197 patient deaths with COPD, HF, cancer, severe dementia	Belgian SNL of GP survey, Pearson chi square test, multivariate binary logistic regression, non-parametric Kruskal-Wallis test	34% HF referral to PC, referral occurs late, GP surveyed who didn't initiate referral 2-3 mos before death were less likely to refer as time progressed	Limitations: NA Usefulness: Describes the referral underutilization of PC for HF and late referral
Bakitas (2013). Palliative care consultations for heart failure patients: How many, when,	Understand the PC consultations for HF pts	Quantitative, cohort, non-exp, Level IV	132 HF inpatients with PC consult	Demographics, clinical data, Seattle HF score, PC consult notes, Atlas Qualitative software	50% consults class IV; 37% class III; Top reasons for consults: goals of care, decision making, hospice/referral/discussion; median	Limitations: Chart audit, documentation, sample homogeneous regarding ethnicity and race – unable to generalize to

and why? Journal of Cardiovascular Failure.					survival time from PCC to death (21 days); 87% died w/in 5 years of audit	general population Usefulness: Describes referral practices for HF PC
Barriers to Referrals						
Siota (2016). Towards integration of palliative care in patients with chronic heart failure and chronic obstructive pulmonary disease: a systematic literature review of European guidelines and pathways. BMC Palliative Care.	SR to assess guidelines/ pathways for integrated PC in patients with HF and COPD in Europe	SR, Level I	17 guidelines, 2 pathways	NA	18/19 – focused on reducing suffering interventions; 13/19 –holistic approach; 15/19 – discussion of prognosis and limitations; 12/19 – assessment of goals; 11/19 – advance care planning	Limitations: NA Usefulness: improvement in integration of PC
Ziehm (2016). Health care professionals’ attitudes regarding palliative care for patients with chronic heart failure: an interview study. BioMed Central Palliative Care.	Assess healthcare providers attitudes about PC for HF and identify potential barriers / facilitators to improve PC	Qualitative, exploratory, non-exp, Level VI	N = 23 (RN, cardiologist, GP) – selected from known contacts, phone book/internet	Mayring’s Qualitative Content Analysis	Need PC but lack knowledge, poor communication, inability for cardiology to accept limits, unkown trajectory /timing for referral Need communication between providers, PC education, incorporate PC into CV clinic	Limitations: German study with different health system, participants were recruited which may lead to bias Usefulness: Identifies barriers with PC and potential ways providers believe will improve PC
Kavalieratos (2014). Not the grim reaper service: An assessment of provider knowledge,	Understand reasons/bar riers for PC consults	Qualitative, exploratory, non-exp, Level VI	18 primary care, cardiology, palliative care MD and providers; stratified	Semi structured interviews, template analysis	Providers lacked PC understanding or experience with PC specialist. Most providers initiate PC referrals based on	Limitations: Generalizability, providers from single state, from similar settings that are familiar with PC

attitudes, and perceptions regarding palliative care referral barriers in heart failure. Journal of American Heart Association.			purposeful sampling		'triggers' but with unknown HF trajectory inconsistent referrals; providers believe they should initiate PC conversation but are uncomfortable doing so	Usefulness: Help with understanding of barriers to PC referrals
Metzger (2013). Patient and family members' perceptions of palliative care in heart failure. Heart and Lung: The Journal of Acute and Critical Care.	Identify HF patient and their family members perceptions r/t PC	Qualitative, descriptive, non-exp, Level VI	40 patients/ family members, purposeful sampling using criterion sampling technique, 48 hrs after PC consult and at DC	In-depth semi-structured interviews w/ interview guides	Initially unprepared for consult, little PC understanding of PC; after consult most felt supported by team; those who associated PC with hospice could not get past the barrier and thought they would need services down the road; those who continued w/ PC thought PC improved care	Limitations: NA Usefulness: Insight on patient/families understanding of PC. Lack of preparation for the initial conversation and association w/ hospice are barriers
Kheirbek (2013). Trajectory of Illness for patients with congestive heart failure. Journal of Palliative Medicine.	Describes progression of death for heart failure patients 12 months prior to death	Quantitative, case control, descriptive, non-exp, Level IV	N = 744 patients w/ known date of death	Not reported	20.5% unexpected deaths, 13.3% progression started 12 mos prior to death, 29.9% increased risk at 6 mos prior to death, 36.3% started at 3 mos prior to death	Limitations: Descriptive w/o QOL, comorbidities to calculate risk of mortality using ICD which may not be true reflection of pt, small sample size, 1 institution Usefulness: Majority of deaths a progression in last 12 mos 79.5%

Hysong (2011). Towards successful coordination of electronic health record based-referrals: a qualitative analysis. Implementation Science.	Understand barriers, facilitators, and suggestions to improve communication and coordination of EMR based referrals	Qualitative, exploratory, non-exp, Level VI	Purposeful sampling of PCP, subspecialist, PA, support staff (for diversity)– 30 participants, 6 focus groups	Transcripts codes using ATLAS software, team organized code taxonomy into salient themes (also by consensus)	Referrals – lack of policy standardized process for referrals, unclear roles, lack resources to deal w/ request); template for referrals limiting	Limitations: Study at VA w/ same EMR, limited ability to transfer to other sites Usefulness: Describes process of E-referral process and potential barriers
Haga (2012). Identifying community based chronic heart failure patients in the last year of life: a comparison of the Gold Standards Framework Prognostic Indicator Guide and the Seattle Heart Failure Model. Heart.	Assess clinical utility of GSF and SHF models to identify patients with HF in the last year of life	Quantitative, cohort, non-exp, Level IV	138 HF patients with NYHA class III and IV symptoms from a population of 368 ambulatory HF patients	GSF; SHF; Receiver operator characteristic analysis of SHF revealed a C index of 0.68±0.05 (95% CI 0.58 to 0.77).	Sensitivity and specificity for GSF and SHF in predicting death were 83% and 22%, and 12% and 99%, respectively; CKD was a strong predictor of 12 mos mortality, with a sensitivity of 56% and specificity of 72%	Limitations: Usefulness: Understanding of predictability of GSF and SHF
HF/Palliative Care Guidelines/Policy/Statement						
Aspromonte (2017). ANMCO/SIC Consensus Document: cardiology networks for outpatient heart failure care.	NA	Consensus Statement, Level VII	NA	NA	Recommends PC inclusion in HF care	Limitations: NA Usefulness: Consensus statement to support HF and PC
Braun (2016). Palliative care and cardiovascular disease and stroke: a policy	NA	Policy Statement Based on RCT, cohort/case control, and expert opinion	NA	NA	Recommends PC incorporated into payer structure; collaboration between providers/ payors; increase education to all	Limitations: NA Usefulness: Policy statement to support HF and palliative care

statement from the American Heart Association/ American Stroke Association. Circulation.		Level VII			clinicians	
IOM (2014). Dying in America: improving quality and honoring individual preferences near the end of life. IOM.	Improving QOL through palliative care (PC) for patients near end of life	Consensus Report, Level VII	NA	NA	Improving EOL care with PC – need for technology to support, increased conversation with pt/provider, education for providers, improve payment structures	Limitations: NA Usefulness: Consensus report to support HF and PC
Yancy (2013). 2013 ACCF/ AHA Guideline for management of HF. Journal of the American College of Cardiology.	Broad overview of HF mgmt	Guideline Class 1: Coordinating care for patients with chronic HF – PC is effective for patients with symptomatic advance HF to improve QOL (level B)	NA	NA	PC effective for pts with symptomatic advanced HF to improve QOL, HF and PC teams best to help pts and families with EOL care	Limitations: NA Usefulness: EBPB to support HF/ PC
Allen (2012). Decision making in advanced heart failure. Circulation.	Reviews advance decision making for AHF pts/ families	Scientific Statement, Based on RCT, cohort/case control, and expert opinion, Level VII	NA	NA	Improving advance care planning for advanced heart failure patients and families	Limitations: NA Usefulness: Scientific statement to support advance care planning for HF
Palliative Care Referrals in Ambulatory Setting						
Sahlen (2016). A cost-effectiveness study of person-centered	Assess cost effect of home PC with HF	Quantitative, RCT, exp, Level II	N = 72, home PC vs SC in 6 mos	EQ-5D instrument, descriptive statistics, nonparametric approach with Mann-Whitney U	Decreased cost with home PC, improved QOL	Limitations: single center study in Europe, limited generalizability, unable to capture indirect cost of

integrated heart failure and palliative home care: based on a randomized controlled trial. Palliative Medicine.				test, p values below 0.05 significant		home care Usefulness: Identifies cost savings with home PC and improved QOL
Thoosen (2016). Training general practitioners contributes to the identification of palliative patients and to multidimensional care provision: secondary outcomes of an RCT. BMJ Supportive & Palliative Care.	Determine impact of PC training has on GP practice	Quantitative, RCT, exp, Level II	N = 134 GP baseline, post training, and 1 year	SPSS software, V.20.0, descriptive statistics, questionnaire, RADboud University Medical Centre Indicators for PC needs tool	Trained GP identified more PC pts (median 3vs 2 p 0.046)	Limitations: Questionnaire response rate low for trained GP, Dutch trial, question generalizability, unknown baseline PC patients Usefulness: Training improved PC referrals
Scheffey (2014). Clinic based outpatient palliative care before hospice is associated with longer hospice length of service. Journal of Pain and Symptom Management.	Determine difference in hospice LOS in pts who were seen in outpatient PC before hospice	Quantitative, case control, non-exp, Level IV	N=354 1 year before enrolled in hospice	R statistical language, PDBC, LOS data – log-rank test, sign test, p <.05	PC group had longer LOS (9 days) than nonPC group (95% CI, p < 0.001) – enrolled in hospice sooner	Limitations: clinic and hospice groups were under same provider, loss of f/u for readmissions Usefulness: Enrollment in PC provided patients with understanding of disease process, enrolling in hospice sooner
Devader (2012). The effect of education in Hospice and	Determine if PC education improves residents	Quantitative, Prospective cohort, exp, Level IV	33/40 residents completed survey prior to	Survey 5-point Likert scale, Fisher Exact, descriptive statistics	6 mos post education 80% of residents reported	Limitations: Survey data is subject to recall bias, single center study

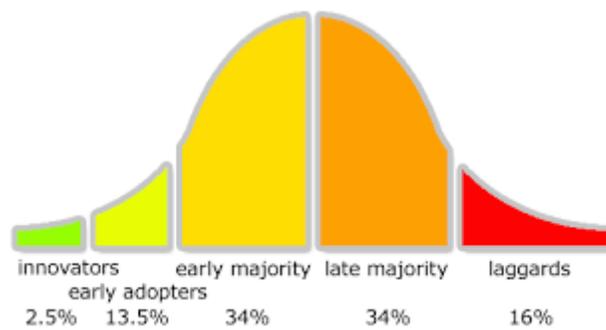
palliative care of emergency medicine residents' knowledge and referral patterns. Journal of Palliative Medicine.	knowledge in discussing end of life and care		intervention, 31/40 completed after intervention, 21/40 completed at 6 months		referring to hospice/PC (61% never had prior to education), increase knowledge, EOL symptoms improved	Usefulness: Brief education was sufficient to teach residents with retention at 6 months
Bekelman (2011). Outpatient palliative care for chronic heart failure: a case series. Journal of Palliative Medicine.	Describes outpatient PC program	Quantitative, case control, non-exp, Level IV	50 patients, 228 visits over 3 ½ years	SD, clinical characteristics, Seattle HF Model, KCCQ, GAD-7, MSAS-SF, chi test	50% only seen once, ACP not initial concern but eventually discussed w/ 48%, most common need was care coordination (58%)	Limitations: Question generalizability, younger population, documentation review issues, inconsistent screening Usefulness: longitudinal PC program with patient concerns and needs

Appendix D

Theory to Application Diagram

Theory Application Diagram: Roger's Diffusion of Innovations

Standardized Palliative Care Referral for Heart Failure Project				
Innovators	Early Adopters	Early Majority	Late Majority	Laggards
5 phases of cardiology provider adoption progressing from early to late adopters				



Rogers, E. M. (2010). *Diffusion of innovations*. Simon and Schuster.

Appendix E

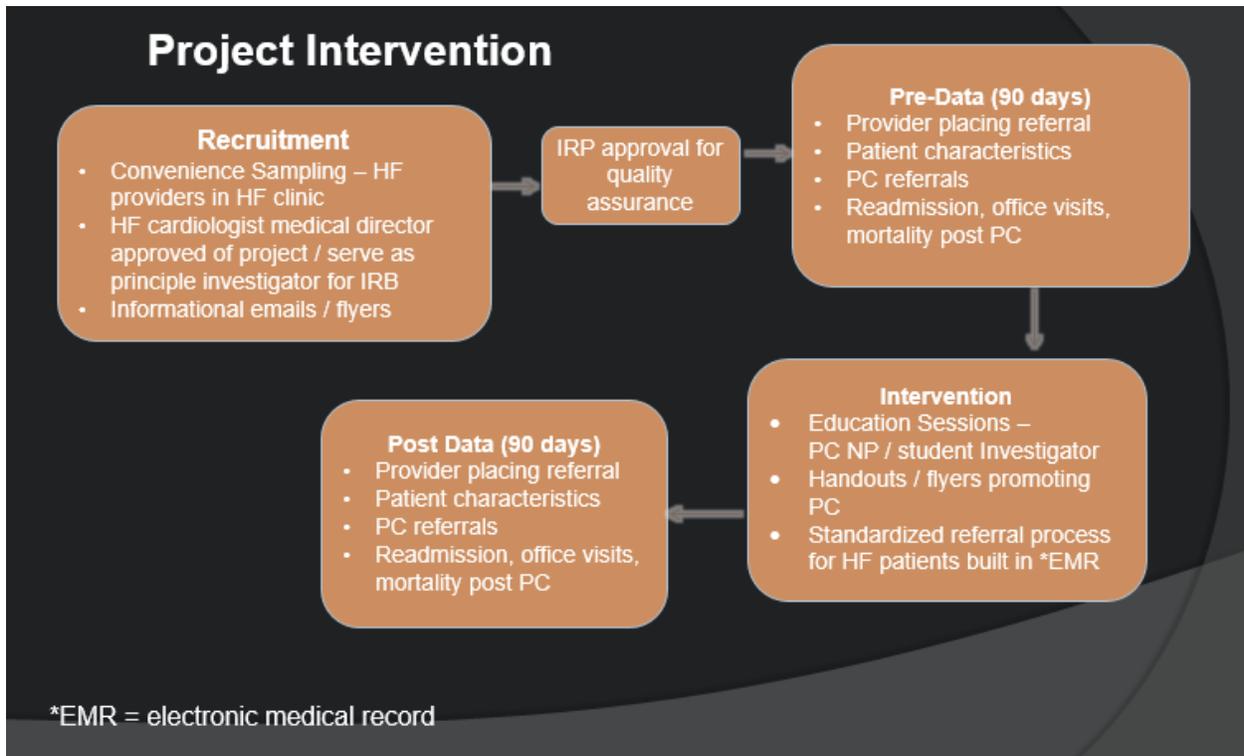
Cost Table for Standardized Palliative Care Referral for Heart Failure Project

Direct Cost			
Personnel Expenses	Unit Cost	Number of Units	Total Cost
In-services (Palliative Care Advance Practice Registered Nurse / Student Investigator)	\$46.54*	2 (4 in-services/30 minute each)	In-kind (job expectation)
Flyers/Handouts	\$.10	20	\$2
Informatics	\$34.32*	1 (20 hours development of referral process in EMR)	In-kind (job expectation)
Indirect Cost			
Student Investigator (data collection/ analysis)	\$46.54*	1 (20 hours)	In-kind (job expectation)
SSPS Program			NA
Computer			NA
Projector			NA
Total Cost			\$2

Note. *Salary data based on data from Bureau of Labor Statistics (2016) for the state of Kansas ()In-kind wage (job expectation) not included in total cost https://www.bls.gov/oes/current/oes_ks.htm#29-0000

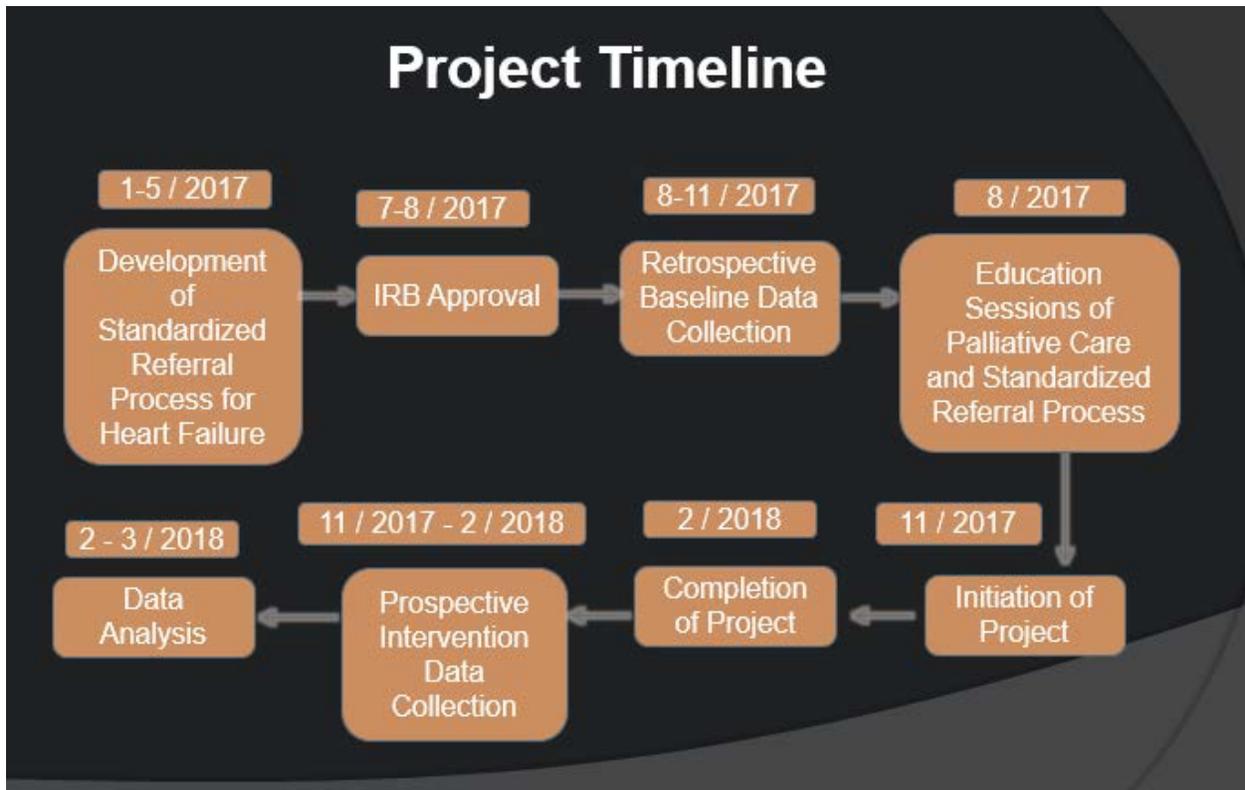
Appendix F

Standardized Palliative Care Referral for Heart Failure Project Intervention Flow Diagram



Appendix G

Standardized Palliative Care Referral for Heart Failure Project Timeline Flow Graphic



Appendix H

Standardized Palliative Care Referral for Heart Failure Project Logic Model

Student: Nikki Harvey

PICOT Question: Among (F) cardiology providers caring for advanced heart failure patients, does (I) palliative care education and a standardized palliative care referral process based on patient triggers as compared to (C) no education/no standardized referral process (O) increase the number of heart failure related palliative care referrals (T) within six months (S) in an ambulatory heart failure cardiology clinic?

Inputs	Intervention(s)		Outcomes – Impact		
	Activities	Outputs Participation	Short	Medium	Long
<p>Evidence, sub-topics</p> <ol style="list-style-type: none"> Palliative care (PC), heart failure (HF), and quality of care Referral patterns Barriers to referrals PC referrals in ambulatory setting <ul style="list-style-type: none"> Ambulatory setting Referring providers Improving provider knowledge on PC and referrals Standardized PC Referral Process <p>Major Facilitators or Contributors</p> <ul style="list-style-type: none"> DNP Advisor Preceptor PC team Cardiology providers <p>Major Barriers or Challenges</p> <p>Providers:</p> <ol style="list-style-type: none"> Inability to predict HF trajectory Lack of knowledge related to PC Discomfort in discussion of PC Desire to do everything Not attending in-services Decision not to refer <p>Patients:</p> <ol style="list-style-type: none"> Lack of knowledge 	<p>EBP intervention which is supported by evidence in input column</p> <p>Education on PC to cardiology providers for HF</p> <p>Establish standardized referral process for PC through triggers (alert prompting HF-related PC referral patients)</p> <ol style="list-style-type: none"> Stage D HF 2 or more HF hospitalization in last 12 months Inotrope dependence Have required HF infusion clinic Patient/provider recognize persistent troublesome HF symptom burden Lives in nursing home <p>Major steps of the intervention</p> <ol style="list-style-type: none"> Obtain IRB approval Development of standardized process in EMR Obtain baseline data from 90 days Provide education on PC, guidelines for HF and PC, standardized referral process 	<p>The participants</p> <p>Cardiology providers (MD, NP)</p> <p>Site</p> <p>Ambulatory HF Cardiology Clinic</p> <p>Time Frame</p> <p>180 days</p> <p>Consent Needed or other</p> <p>Not required IRB approved as quality assurance project</p> <p>Person(s) collecting data</p> <p>Student Investigator</p> <p>Others directly involved</p> <p>NA</p>	<p>(Completed as Student Investigator)</p> <p>Outcome(s) to be measured with reliable measurement tool(s)</p> <p>Primary: Numbers of PC referrals for HF patients</p> <p>Secondary: Patient characteristics</p> <p>Secondary: Readmission rate, # of office visits, and mortality post intervention</p> <p>Measurement tool(s): Chart review</p> <p>Statistical analysis to be used. Descriptive statistics including means, ranges, and standard deviation; paired t-test, and chi-square statistics</p>	<p>Outcomes to be measured (past DNP student time)</p> <p>Expand education and standardized referral process across the health system (general cardiology, family medicine, and internal medicine)</p>	<p>Outcomes that are potentials (past DNP student)</p> <p>Improved health system provider knowledge and utilization of PC</p>

Rev. 7/09, 1/2015 http://www.uconn.edu/cei/incoourse/interface/coop_M1_Coverstory.htm
 Logic-Model Worksheets content revisions by Lyle Lyle@uconn.edu. Applied to DNP EBP Project. Not to be placed on web for public use. For UMKC DNP coursework only

Appendix I

Recruitment Email



Dear Heart Failure Clinic Providers,

As a part of my Doctor of Nursing Practice at The University of Missouri-Kansas City I am conducting a quality improvement project in the Heart Failure Clinic. The project will focus on a standardized palliative care referral process for heart failure patients.

Education on palliative care and the new referral process will be provided soon. The project will start mid-November.

Please contact me if you have any questions.

Nikki Harvey DNP Student, MSN, RN
nharvey@kumc.edu



Appendix J

Intervention Flyer

Standardized Palliative Care Referral for Heart Failure

- Starting mid-November there will be a new palliative care referral process in O2 for heart failure patients in the Heart Failure Clinic
- Providers will see a BPA asking them to consider palliative care if:
 - Stage D heart failure
 - 2 or more heart failure admissions in the last 12 months
 - Inotrope dependence
 - Have required heart failure infusion clinic
 - Patient/provider recognition of persistent, troublesome symptom burden
 - Lives in a nursing home
- There will be an option to acknowledge the BPA (no further action) or automatically launch into the palliative care order
- This is a part of the Doctorate of Nursing Project conducted by Nikki Harvey, please **contact her** for any questions (nharvey@kumc.edu)



Appendix K

Readability for Recruitment Flyer and Intervention Email

Heart Failure / Palliative Care Flyer

Text To Score

Text Save Load History Help Measure Readability

Starting mid-November there will be a new palliative care referral process in 02 for heart failure patients in the Heart Failure Clinic

Providers will see a BPA asking them to consider palliative care if:

- Stage D heart failure
- 2 or more heart failure admissions in the last 12 months
- Inotrope dependence
- Have required heart failure infusion clinic
- Patient/provider recognition of persistent, troublesome symptom burden
- Lives in a nursing home

There will be an option to acknowledge the BPA (no further action) or automatically launch into the palliative care order

Readability Rating

RATING: **A**

You are using too many long words. Try replacing some of them with shorter alternatives.

Readability Grade Levels

Readability Formula	Grade
Flesch-Kincaid Grade Level	8
Gunning Fog Index	11.1
Coleman-Liau Index	12
SMOG Index	11.1
Automated Readability Index	8.2
Average Grade Level	10.1

<https://readable.io/text/>

Heart Failure / Palliative Care Email

Text To Score

Text Save Load History Help Measure Readability

Dear Heart Failure Clinic Providers,

As a part of my Doctor of Nursing Practice at The University of Missouri-Kansas City I am conducting a quality improvement project in the Heart Failure Clinic. The project will focus on a standardized palliative care referral process for heart failure patients.

Education on palliative care and the new referral process will be provided soon. The project will start mid-November.

Please contact me if you have any questions.

Nikki Harvey DNP Student, MSN, RN
nharvey@kumc.edu

Readability Rating

RATING: **B**

You are using too many long words. Try replacing some of them with shorter alternatives.

Download Results: PDF CSV

Readability Grade Levels

Readability Formula	Grade
Flesch-Kincaid Grade Level	9.7
Gunning Fog Index	10.4
Coleman-Liau Index	11.4
SMOG Index	12.2
Automated Readability Index	9.1
Average Grade Level	10.5

<https://readable.io/text/>

Appendix L

RedCap – Provider Data

HF related PC referrals - Provider data

Page 1 of 2

Record ID

Provider ID

- Provider 1
- Provider 2
- Provider 3
- Provider 4
- Provider 5
- Provider 6
- Provider 7
- Provider 8
- Provider 9
- Provider 10
- Provider 11
- Provider 12

Provider Degree

- NP
- MD
- DO
- PA

Provider Age

- 20-25
- 26-30
- 31-35
- 36-40
- 41-45
- 46-50
- 51-55
- 56-60
- Unable to determine

Provider Years of Practice

- 0-5
- 5-10
- 11-15
- 16-20
- 21-25
- 26-30
- 31 - 35
- 35+
- Unable to determine

HF PC Education Attendance

- Yes
- No

Number of Palliative Care Order Placed Via BPA

- 0
- 1
- 2
- 3
- 4

0002/0018/30/11/20

www.projectredcap.org



Confidential

Page 2 of 2

PC Referrals Pre

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25
- 26
- 27
- 28
- 29
- 30
- 31
- 32
- 33
- 34
- 35
- 36
- 37
- 38
- 39
- 40
- 41
- 42
- 43
- 44
- 45
- 46
- 47
- 48
- 49
- 50
- 51
- 52
- 53
- 54
- 55
- 56
- 57
- 58
- 59
- 60
- 61
- 62
- 63
- 64
- 65
- 66
- 67
- 68
- 69
- 70
- 71
- 72
- 73
- 74
- 75
- 76
- 77
- 78
- 79
- 80
- 81
- 82
- 83
- 84
- 85
- 86
- 87
- 88
- 89
- 90
- 91
- 92
- 93
- 94
- 95
- 96
- 97
- 98
- 99
- 100

PC Referrals Post

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25
- 26
- 27
- 28
- 29
- 30
- 31
- 32
- 33
- 34
- 35
- 36
- 37
- 38
- 39
- 40
- 41
- 42
- 43
- 44
- 45
- 46
- 47
- 48
- 49
- 50
- 51
- 52
- 53
- 54
- 55
- 56
- 57
- 58
- 59
- 60
- 61
- 62
- 63
- 64
- 65
- 66
- 67
- 68
- 69
- 70
- 71
- 72
- 73
- 74
- 75
- 76
- 77
- 78
- 79
- 80
- 81
- 82
- 83
- 84
- 85
- 86
- 87
- 88
- 89
- 90
- 91
- 92
- 93
- 94
- 95
- 96
- 97
- 98
- 99
- 100

Appendix L (continued)

RedCap – Pre Intervention

HF PC - Pt Preintervention

Page 1 of 4

Record ID	_____
Patient ID	_____
Month	<input type="radio"/> 1. September <input type="radio"/> 2. October <input type="radio"/> 3. November <input type="radio"/> 4. December <input type="radio"/> 5. August
Patient Age	<input type="radio"/> 20-25 <input type="radio"/> 26-30 <input type="radio"/> 31-35 <input type="radio"/> 36-40 <input type="radio"/> 41-45 <input type="radio"/> 46-50 <input type="radio"/> 51-55 <input type="radio"/> 56-60 <input type="radio"/> 61-65 <input type="radio"/> 66-70 <input type="radio"/> 71-75 <input type="radio"/> 76-80 <input type="radio"/> 81-85 <input type="radio"/> 86-89 <input type="radio"/> >89
Patient Race	<input type="radio"/> Caucasian <input type="radio"/> African American <input type="radio"/> Hispanic <input type="radio"/> Asian <input type="radio"/> Indian <input type="radio"/> Middle Eastern <input type="radio"/> Other
Patient Gender	<input type="radio"/> Male <input type="radio"/> Female
Patient Living Condition	<input type="radio"/> Independent living <input type="radio"/> Nursing home/Rehab <input type="radio"/> Assisted living
Marital Status (married)	<input type="radio"/> Yes <input type="radio"/> No
Zip Code	_____
Payor Source	<input type="radio"/> Private insurance <input type="radio"/> Medicare <input type="radio"/> Medicare + secondary <input type="radio"/> Self-pay <input type="radio"/> Medicaid

Appendix L (continued)

RedCap – Pre Intervention

- | | |
|-------------------------|---|
| Referral Source | <input type="radio"/> Provider 1
<input type="radio"/> Provider 2
<input type="radio"/> Provider 3
<input type="radio"/> Provider 4
<input type="radio"/> Provider 5
<input type="radio"/> Provider 6
<input type="radio"/> Provider 7
<input type="radio"/> Provider 8
<input type="radio"/> Provider 9
<input type="radio"/> Provider 10
<input type="radio"/> Provider 11
<input type="radio"/> Provider U
<input type="radio"/> Provider 12
<input type="radio"/> Provider O |
| Heart Failure Diagnosis | <input type="radio"/> I11.0 Hypertensive heart disease with heart failure
<input type="radio"/> I13.0 Hypertensive heart and chronic kidney disease with heart failure and stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease
<input type="radio"/> I13.2 Hypertensive heart and chronic kidney disease with heart failure and with stage 5 chronic kidney disease, or end stage renal disease
<input type="radio"/> I50 Heart failure
<input type="radio"/> I50.1 Left ventricular failure
<input type="radio"/> I50.2 Systolic (congestive) heart failure
<input type="radio"/> I50.20 Unspecified systolic (congestive) heart failure
<input type="radio"/> I50.21 Acute systolic (congestive) heart failure
<input type="radio"/> I50.22 Chronic systolic (congestive) heart failure
<input type="radio"/> I50.23 Acute on chronic systolic (congestive) heart failure
<input type="radio"/> I50.3 Diastolic (congestive) heart failure
<input type="radio"/> I50.30 Unspecified diastolic (congestive) heart failure
<input type="radio"/> I50.31 Acute diastolic (congestive) heart failure
<input type="radio"/> I50.32 Chronic diastolic (congestive) heart failure
<input type="radio"/> I50.33 Acute on chronic diastolic (congestive) heart failure
<input type="radio"/> I50.4 Combined systolic (congestive) and diastolic (congestive) heart failure
<input type="radio"/> I50.40 Unspecified combined systolic (congestive) and diastolic (congestive) heart failure
<input type="radio"/> I50.41 Acute combined systolic (congestive) and diastolic (congestive) heart failure
<input type="radio"/> I50.42 Chronic combined systolic (congestive) and diastolic (congestive) heart failure
<input type="radio"/> I50.43 Acute on chronic combined systolic (congestive) and diastolic (congestive) heart failure
<input type="radio"/> I50.9 Heart failure, unspecified |

Appendix L (continued)

RedCap – Pre Intervention

LVEF	<input type="radio"/> 1. 5% <input type="radio"/> 2. 10% <input type="radio"/> 3. 15% <input type="radio"/> 4. 20% <input type="radio"/> 5. 25% <input type="radio"/> 6. 30% <input type="radio"/> 7. 35% <input type="radio"/> 8. 40% <input type="radio"/> 9. 45% <input type="radio"/> 10. 50% <input type="radio"/> 11. 55% <input type="radio"/> 12. > 55%
NYHA Score	<input type="radio"/> NYHA 1 <input type="radio"/> NYHA 2 <input type="radio"/> NYHA 3 <input type="radio"/> NYHA 4 <input type="radio"/> Unable to determine
Co-morbidities	<input type="checkbox"/> DM <input type="checkbox"/> CAD <input type="checkbox"/> HTN <input type="checkbox"/> CKD Stage 1 (GFR >90) <input type="checkbox"/> CKD Stage 2 (GFR 60-89) <input type="checkbox"/> CKD Stage 3 (GFR 30-59) <input type="checkbox"/> CKD Stage 4 (GFR 15-29) <input type="checkbox"/> CKD Stage 5 (GFR < 15) <input type="checkbox"/> PAD <input type="checkbox"/> None
Mortality Post Referral	<input type="radio"/> Yes <input type="radio"/> No
Readmission Post Referral	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4+ <input type="radio"/> NA
Office Visit Post Referral	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11+ <input type="radio"/> NA
Office Visit Post Referral with PC	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11+ <input type="radio"/> NA
ER Visit Post Referral	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4+ <input type="radio"/> NA

Appendix L (continued)
RedCap – Post Intervention

HF related PC referrals - Patient Post Intervention
Page 1 of 4

HF PC - Pt Postintervention

Record ID	_____
Patient ID	_____
Month	<input type="radio"/> 1. November <input type="radio"/> 2. December <input type="radio"/> 3. January <input type="radio"/> 4. February
Patient Age	<input type="radio"/> 20-25 <input type="radio"/> 26-30 <input type="radio"/> 31-35 <input type="radio"/> 36-40 <input type="radio"/> 41-45 <input type="radio"/> 46-50 <input type="radio"/> 51-55 <input type="radio"/> 56-60 <input type="radio"/> 61-65 <input type="radio"/> 66-70 <input type="radio"/> 71-75 <input type="radio"/> 76-80 <input type="radio"/> 81-85 <input type="radio"/> 86-89 <input type="radio"/> >89
Patient Race	<input type="radio"/> Caucasian <input type="radio"/> African American <input type="radio"/> Hispanic <input type="radio"/> Asian <input type="radio"/> Indian <input type="radio"/> Middle Eastern <input type="radio"/> Other
Patient Gender	<input type="radio"/> Male <input type="radio"/> Female
Patient Living Condition	<input type="radio"/> Independent living <input type="radio"/> Nursing home <input type="radio"/> Assisted living
Marital Status (married)	<input type="radio"/> Yes <input type="radio"/> No
Zip Code	_____
Payor Source	<input type="radio"/> Private insurance <input type="radio"/> Medicare <input type="radio"/> Medicare + secondary <input type="radio"/> Self-pay <input type="radio"/> Medicaid

Appendix L (continued)

RedCap – Post Intervention

- Referral Source
- Provider 1
 - Provider 2
 - Provider 3
 - Provider 4
 - Provider 5
 - Provider 6
 - Provider 7
 - Provider 8
 - Provider 9
 - Provider 10
 - Provider 11
 - Provider 12
 - Provider O
 - Provider U
- Heart Failure Diagnosis
- I11.0 Hypertensive heart disease with heart failure
 - I13.0 Hypertensive heart and chronic kidney disease with heart failure and stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease
 - I13.2 Hypertensive heart and chronic kidney disease with heart failure and with stage 5 chronic kidney disease, or end stage renal disease
 - I50 Heart failure
 - I50.1 Left ventricular failure
 - I50.2 Systolic (congestive) heart failure
 - I50.20 Unspecified systolic (congestive) heart failure
 - I50.21 Acute systolic (congestive) heart failure
 - I50.22 Chronic systolic (congestive) heart failure
 - I50.23 Acute on chronic systolic (congestive) heart failure
 - I50.3 Diastolic (congestive) heart failure
 - I50.30 Unspecified diastolic (congestive) heart failure
 - I50.31 Acute diastolic (congestive) heart failure
 - I50.32 Chronic diastolic (congestive) heart failure
 - I50.33 Acute on chronic diastolic (congestive) heart failure
 - I50.4 Combined systolic (congestive) and diastolic (congestive) heart failure
 - I50.40 Unspecified combined systolic (congestive) and diastolic (congestive) heart failure
 - I50.41 Acute combined systolic (congestive) and diastolic (congestive) heart failure
 - I50.42 Chronic combined systolic (congestive) and diastolic (congestive) heart failure
 - I50.43 Acute on chronic combined systolic (congestive) and diastolic (congestive) heart failure
 - I50.9 Heart failure, unspecified

Appendix L (continued)

RedCap – Post Intervention

LVEF	<input type="radio"/> 1. 5% <input type="radio"/> 2. 10% <input type="radio"/> 3. 15% <input type="radio"/> 4. 20% <input type="radio"/> 5. 25% <input type="radio"/> 6. 30% <input type="radio"/> 7. 35% <input type="radio"/> 8. 40% <input type="radio"/> 9. 45% <input type="radio"/> 10. 50% <input type="radio"/> 11. 55% <input type="radio"/> 12. > 55%
NYHA Score	<input type="radio"/> NYHA 1 <input type="radio"/> NYHA 2 <input type="radio"/> NYHA 3 <input type="radio"/> NYHA 4 <input type="radio"/> Unable to determine
Co-morbidities	<input type="checkbox"/> DM <input type="checkbox"/> CAD <input type="checkbox"/> HTN <input type="checkbox"/> CKD Stage 1 (GFR >90) <input type="checkbox"/> CKD Stage 2 (GFR 60-89) <input type="checkbox"/> CKD Stage 3 (GFR 30-59) <input type="checkbox"/> CKD Stage 4 (GFR 15-29) <input type="checkbox"/> CKD Stage 5 (GFR < 15) <input type="checkbox"/> PAD <input type="checkbox"/> None
Mortality Post Referral	<input type="radio"/> Yes <input type="radio"/> No
Readmission Post Referral	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4+ <input type="radio"/> NA
ED Visits Post Referral	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4+ <input type="radio"/> NA
Office Visit Post Referral	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11+ <input type="radio"/> NA
Office Visit Post Referral with PC	<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11+ <input type="radio"/> NA
Order from BPA	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unable to determine

Appendix M

SPSS database

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	ProviderId	Numeric	8	2		{1.00, Provi...	None	8	Right	Nominal	Input
2	Degree	Numeric	8	2		{1.00, NP}...	None	8	Right	Nominal	Input
3	Age	Numeric	8	2		{1.00, 20-25...	None	8	Right	Scale	Input
4	Gender	Numeric	8	2		{1.00, Fema...	None	8	Right	Unknown	Input
5	YearsExp	Numeric	8	2		{1.00, 0-5}...	None	8	Right	Scale	Input
6	EdSession	Numeric	8	2		{1.00, Yes}...	None	9	Right	Nominal	Input

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	PatientId	Numeric	8	2		None	None	8	Right	Nominal	Input
2	PrePostGroup	Numeric	8	2		{1.00, Pre-in...	None	8	Right	Nominal	Input
3	Month	Numeric	8	2		{1.00, Septe...	None	8	Right	Nominal	Input
4	Age	Numeric	8	2		{1.00, 20-25...	None	8	Right	Nominal	Input
5	Race	Numeric	8	2		{1.00, Cauc...	None	8	Right	Nominal	Input
6	Gender	Numeric	8	2		{1.00, Fema...	None	8	Right	Nominal	Input
7	Living	Numeric	8	2		{1.00, Indep...	None	8	Right	Nominal	Input
8	Married	Numeric	8	2		{1.00, Yes}...	None	8	Right	Nominal	Input
9	Zipcode	Numeric	8	2		None	None	8	Right	Nominal	Input
10	Payor	Numeric	8	2		{1.00, Privat...	None	8	Right	Nominal	Input
11	RefSource	Numeric	8	2		{1.00, Provi...	None	8	Right	Nominal	Input
12	HFDx	Numeric	8	2		{1.00, I11.0...	None	8	Right	Nominal	Input
13	EF	Numeric	8	2		{1.00, 5%}...	None	8	Right	Ordinal	Input
14	NYHA	Numeric	8	2		{1.00, NYH...	None	8	Right	Nominal	Input
15	DM	Numeric	8	2		{1.00, Yes}...	None	8	Right	Nominal	Input
16	CAD	Numeric	8	2		{1.00, Yes}...	None	8	Right	Nominal	Input
17	HTN	Numeric	8	2		{1.00, Yes}...	None	8	Right	Nominal	Input
18	PAD	Numeric	8	2		{1.00, Yes}...	None	8	Right	Nominal	Input
19	CKD	Numeric	8	2		{1.00, CKD ...	None	8	Right	Nominal	Input
20	Mortality	Numeric	8	2		{1.00, Yes}...	None	8	Right	Nominal	Input
21	Readmit	Numeric	8	2		{1.00, 0}...	None	8	Right	Ordinal	Input
22	OfVisit	Numeric	8	2		{1.00, 0}...	None	8	Right	Ordinal	Input
23	OfVisitPC	Numeric	8	2		{1.00, 0}...	None	8	Right	Ordinal	Input
24	ERVisit	Numeric	8	2		{1.00, 0}...	None	8	Right	Ordinal	Input
25	BPA	Numeric	8	2		{1.00, Yes}...	None	8	Right	Nominal	Input
26	PCReferral	Numeric	8	2		{1.00, Yes}...	None	8	Right	Nominal	Input

Appendix N

Statistical Table Template(s)

Patient	Total (n)	Control (n)	Intervention (n)	Significance
Referrals #, mean (SD)				
Age, mean				
Age, %				
- 40-49				
- 50-59				
- 60-69				
- 70-79				
- 80-89				
- >89				
Race, %				
- Caucasian				
- African American				
- Hispanic				
- Asian				
- Indian				
- Middle Eastern				
Gender, % Male				
Gender, % Female				
Living Condition (baseline), %				
- Independent living				
- Nursing home				
- Assisted living				
Married, %				
Payor Source, %				
- Private insurance				
- Medicare				
- Medicare + secondary				
- Self-pay				
- Medicaid				
Heart failure dx (ICD10), %				
- I11.0 Hypertensive heart disease with heart failure (HCC)				
- I13.0 Hypertensive heart and chronic kidney disease with heart failure and stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease (HCC)				
- I13.2 Hypertensive heart and chronic kidney disease with				

<p>heart failure and with stage 5 chronic kidney disease, or end stage renal disease (HCC)</p> <ul style="list-style-type: none"> - I50.1 Left ventricular failure (HCC) - I50.20 Unspecified systolic (congestive) heart failure (HCC) - I50.21 Acute systolic (congestive) heart failure (HCC) - I50.22 Chronic systolic (congestive) heart failure (HCC) - I50.23 Acute on chronic systolic (congestive) heart failure (HCC) - I50.30 Unspecified diastolic (congestive) heart failure (HCC) - I50.31 Acute diastolic (congestive) heart failure (HCC) - I50.32 Chronic diastolic (congestive) heart failure (HCC) - I50.33 Acute on chronic diastolic (congestive) heart failure (HCC) - I50.40 Unspecified combined systolic (congestive) and diastolic (congestive) heart failure (HCC) - I50.41 Acute combined systolic (congestive) and diastolic (congestive) heart failure (HCC) - I50.42 Chronic combined systolic (congestive) and diastolic (congestive) heart failure (HCC) - I50.43 Acute on chronic combined systolic (congestive) and diastolic (congestive) heart failure (HCC) - I50.9 Heart failure, unspecified (HCC) 				
<p>EF %, %</p> <ul style="list-style-type: none"> - 0-15 - 16-20 - 21-25 - 26-30 - 31-35 - 36-40 				

- 41-45				
- 46-50				
- 51-55				
- >55				
NYHA, %				
- 1				
- 2				
- 3				
- 4				
Comorbidities, %				
- DM				
- CAD				
- HTN				
- Renal Failure				
- PAD				
Mortality post referral, %				
Readmission #, %				
ED visits #, %				
Provider office visit #, %				
PC office visit #, %				

Appendix N (continued)

Statistical Table Template(s)

Provider	Total (n)	Control (n)	Intervention (n)	Significance
Provider				
Provider degree , % - MD - NP - PA				
Provider age, mean				
Provider age, % - 20-25 - 26-30 - 31-35 - 36-40 - 41-45 - 46-50				
Provider gender, % Male				
Provider gender, % Female				
Provider years of practice, % - 0-5 - 6-10 - 11-15 - 16-20 - 21-25 - 26-30 - 31-35 - >35				
Provider attending education, %				
Provider # of PC referrals				

Appendix O

Characteristics of Providers

Characteristics	Providers
Degree – MD, n (%)	3 (25)
Degree – APP, n (%)	9 (75)
Age, range (mean)	33-61 (41-45) years
Gender – Male, n (%)	3 (25)
Gender – Female, n (%)	8 (75)
Years' Experience, range (mean)	1-20 (5-10) years

APP = Advanced Practice Providers

Appendix P

Comparison of Palliative Care Referral Patients Pre and Post Intervention

Characteristics	Pre Intervention (N=54)	Post Intervention (N=47)
Age, range (mean)	46-89+ (66-70) years	31-89+ (76-80) years
Race		
Caucasian, n (%)	37 (69%)	34 (72%)
African American, n (%)	15 (28%)	13 (28%)
Hispanic, n (%)	2 (3%)	0 (0%)
Gender		
Male, n (%)	30 (56%)	19 (40%)
Female, n (%)	24 (44%)	28 (60%)
Living Condition		
Independent, n (%)	49 (91%)	44 (94%)
Nursing Home, n (%)	4 (7%)	2 (4%)
Assisted Living, n (%)	1 (2%)	1 (2%)
Married, n (%)	30 (56%)	23 (49%)
Payor Source		
Private Insurance, n (%)	18 (33%)	11 (23%)
Medicare, n (%)	30 (56%)	28 (60%)
Medicare + Secondary, n (%)	0 (0%)	5 (11%)
Self-Pay, n (%)	2 (4%)	1 (2%)
Medicaid, n (%)	4 (7%)	2 (4%)
HF Diagnosis		
150.21, n (%)	1 (2%)	0 (0%)
150.22, n (%)	6 (11%)	11 (23%)
150.23, n (%)	2 (4%)	1 (2%)
150.3, n (%)	1 (2%)	1 (2%)
150.30, n (%)	5 (9%)	0 (0%)
150.32, n (%)	13 (24%)	19 (40%)
150.33, n (%)	4 (7%)	3 (6%)

150.4, n (%)	0 (0%)	5 (11%)
150.42, n (%)	15 (28%)	4 (9%)
150.43, n (%)	6 (11%)	3 (6%)
150.9, n (%)	1 (2%)	0 (0%)
Ejection Fraction		
10%, n (%)	1 (2%)	3 (6%)
15%, n (%)	3 (6%)	2 (4%)
20%, n (%)	8 (15%)	7 (15%)
25%, n (%)	4 (7%)	4 (9%)
30%, n (%)	4 (7%)	1 (2%)
35%, n (%)	2 (2%)	3 (6%)
40%, n (%)	2 (2%)	3 (6%)
45%, n (%)	3 (6%)	1 (2%)
50%, n (%)	5 (9%)	4 (9%)
55%, n (%)	6 (11%)	5 (11%)
>55%, n (%)	18 (33%)	14 (30%)
NYHA		
2, n (%)	7 (13%)	10 (21%)
3, n (%)	39 (72%)	26 (55%)
4, n (%)	3 (6%)	3 (6%)
Unable to Determine	5 (9%)	8 (17%)
Co-Morbidities		
Diabetes, n (%)	26 (48%)	17 (36%)
Coronary Artery Disease, n (%)	34 (63%)	25 (53%)
Hypertension, n (%)	48 (89%)	40 (85%)
Chronic Kidney Disease, n (%)	29 (55%)	33 (70%)
Peripheral Artery Disease, n(%)	1 (2%)	3 (6%)
Mortality, n (%)	2 (4%)	3 (6%)
Readmission		
0, n (%)	41 (76%)	39 (83%)
1, n (%)	11 (20%)	7 (15%)

2, n (%)	2 (4%)	0 (0%)
ER Visit Post Referral		
0, n (%)	51 (96%)	44 (94%)
1, n (%)	1 (2%)	2, (4%)
2, n (%)	1 (2%)	0 (0%)
Provider Office Visit Post Referral		
0, n (%)	20 (37%)	18 (38%)
1, n (%)	17 (32%)	16 (34%)
2, n (%)	7 (13%)	7 (15%)
3, n (%)	3 (6%)	5 (11%)
5, n (%)	1 (2%)	0 (0%)
6, n (%)	2 (4%)	0 (0%)
7, n (%)	1 (2%)	0 (0%)
9, n (%)	1 (2%)	0 (0%)
10, n (%)	1 (2%)	0 (0%)
PC Office Visit Post Referral		
0, n (%)	37 (70%)	34 (72%)
1, n (%)	9 (17%)	9 (19%)
2, n (%)	5 (9%)	3 (6%)
3, n (%)	1 (2%)	0 (0%)
6, n (%)	1 (2%)	0 (0%)

Appendix Q

Provider Referral Pattern

	Pre Intervention (N=54)	Post Intervention (N=47)
Provider 1, n (%)	6 (11%)	4 (9%)
Provider 2, n (%)	6 (11%)	4 (9%)
Provider 3, n (%)	1 (2%)	1 (2%)
Provider 4, n (%)	4 (4%)	5 (11%)
Provider 5, n (%)	5 (9%)	5 (11%)
Provider 6, n (%)	2 (4%)	0 (0%)
Provider 7, n (%)	6 (11%)	11 (23%)
Provider 8, n (%)	6 (11%)	5 (11%)
Provider 9, n (%)	3 (6%)	1 (2%)
Provider 10, n (%)	4 (7%)	4 (9%)
Provider 11, n (%)	7 (13%)	2 (4%)
Provider 12, n (%)	1 (2%)	0 (0%)
Other, n (%)	3 (6%)	5 (11%)

Other – unknown or referred by another provider

Appendix R

Impact of Education on Palliative Care Referrals

	Pre-Intervention PC Referrals	Post Intervention PC Referrals
Attended Education	27 (28.87) [0.12]	27 (25.13) [0.14]
Did Not Attend Education	22 (19.78) [0.25]	15 (17.22) [0.29]
Chi-square statistic 0.8432 <i>p</i>-value .655988 (not significant (<i>p</i> <.05))		

Appendix S

Impact of Education on Palliative Care CPT Documentation

	PC CPT Codes	CV Provider Encounters
Pre Intervention	176 (182.39) [0.22]	1367 (1360.61) [0.03]
Post Intervention	174 (167.61)[0.24]	1244 (1250.39) [0.03]

Chi square statistic 0.5298 p – value .466703 (not significant p < .05)

Appendix T

Impact of Palliative Care Referrals

		Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2- tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Readmit	Equal variances assumed	1.601	.209	.828	99	.410	.20764	.25071	-.28981	.70510
	Equal variances not assumed			.863	81.199	.391	.20764	.24064	-.27114	.68642
OffVisit	Equal variances assumed	8.361	.005	1.422	99	.158	.52876	.37177	-.20892	1.26644
	Equal variances not assumed			1.484	79.980	.142	.52876	.35640	-.18050	1.23802
OffVisitPC	Equal variances assumed	1.940	.167	.772	99	.442	.16706	.21643	-.26238	.59650
	Equal variances not assumed			.788	96.581	.433	.16706	.21203	-.25378	.58790
ERVisit	Equal variances assumed	.000	.994	-.005	99	.996	-.00079	.14838	-.29521	.29363
	Equal variances not assumed			-.005	96.562	.996	-.00079	.14857	-.29568	.29411

Appendix U

IRB Approval



KUMC HUMAN SUBJECTS COMMITTEE

**REQUEST FOR
QUALITY IMPROVEMENT/QUALITY ASSURANCE DETERMINATION**

THIS FORM MUST BE TYPED

Project Leader: Andrew Sauer, MD	
Department: Cardiology	
Email: asauer@kumc.edu	Phone: 8-9600
Alternate Contact Person (e.g., Project Coordinator): Nikki Harvey, MSN, RN, DNP student	
Email: nharvey@kumc.edu	Phone: 8-7824

Project Title:

Increasing Heart Failure-Related Palliative Care Referrals through Education and Standardized Referral

Project Number, Version and/or Date:**1. Briefly state the purpose of the proposed project. (Attach project plan if available.)**

Determine if educating cardiology providers on the benefits of heart failure palliative care and the development of a standardized referral process will increase the number of heart failure related palliative care referrals at an ambulatory heart failure cardiology clinic.

2. Describe the research that has already demonstrated the effectiveness of your intervention. (Cite research and/or attach documentation about the national program or standard you are implementing)

The annual cost of heart failure in the United States is \$31 billion with much of that occurring towards the end of life. Providers struggle with predicting the trajectory of the condition, leaving many patients without resources to make informed decisions and an overall decrease in quality of life. Patients with palliative care have demonstrated improved symptom burden and quality of life as well as decreased cost associated to end of life care.

Leading institutions such as the American Heart Association, American College of Cardiology, and Institute of Medicine have issued guidelines and statements supporting

Revised 10/4/16

FOR OFFICE USE ONLY

Quality Improvement Determination Acknowledged. IRB review is not required.

HRPP Director
HRPP Official

Karen Blackwell
Signature

7/14/17
Date

Appendix V

Iowa Model Permission

[External] Permission to Use and/or Reproduce The Iowa Model (2015)

Kimberly Jordan - University of Iowa Hospitals and Clinics [noreply@qualtrics-survey.com]    Actions -

To:  Nikki Harvey

Personal Monday, April 24, 2017 4:29 PM

Retention Policy: UKH Default Folder 3 Year Delete (3 Years) Expires: 4/23/2020

The University of Kansas Health System

You have permission, as requested today, to review/use *The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care (Iowa Model)*. Click the link below to open.

Copyright will be retained by The University of Iowa Hospitals and Clinics.

Permission is not granted for placing the Iowa Model on the internet.

[The Iowa Model - 2015](#)

Citation: The Iowa Model Collaborative. (In press). *The Iowa Model Revised: Development and validation. Worldviews on Evidence-Based Nursing.*

In written material, please add the following statement:

- *Used/Reprinted with permission from the University of Iowa Hospitals and Clinics. Copyright 2015. For permission to use or reproduce, please contact the University of Iowa Hospitals and Clinics at (319)384-9098.*

If you have questions, please contact Kimberly Jordan at 319-384-9098 or kimberly-jordan@uiowa.edu.

Appendix W

Educational Material

Standardized Palliative Care Referral for Heart Failure

Heart Failure Palliative Care Best Practice Advisory (BPA)

Important (Advisory) (1)

This patient has a diagnosis of Heart Failure (HF), consider a referral to palliative care if one of the following criteria is met: Stage D HF; 2 or more HF hospitalizations in the last year; Inotrope dependence; has required HF infusion clinic; patient/provider recognition of persistent, troublesome symptom burden; lives in nursing home.

Order Do Not Order Palliative Care Referral

Acknowledge Reason
Acknowledge (No referral @ this time)

Providers can order HF palliative care referral directly from BPA or acknowledge and exit BPA

BPA will trigger monthly during office visit encounter for HF patients who have not been referred to Palliative Care

Accept

Ambulatory Heart Failure Palliative Care Order

AMB REFERRAL PALLIATIVE CARE

Priority: Routine Routine STAT

Client: KU Referral KU Referral KU Referral / Print External Referral / Print / Renew

Indication: Heart Failure / VAD/Heart Transplant / Other (See comment in Scheduling Instructions)

When: Next Office Visit / As Soon As Possible / Other (See comment in Scheduling Instructions)

Referral: To provider: To pres spec: To dept: To inst dept: Cardiology To inst dept: By provider: To location:

RefType: Consult, Test

Referral Reason: Specialty Services Required Second Opinion Patient Preference

Referral Priority: Routine Urgent Elective

Quantity: 1

Comments (FC):

Indication and timing of the palliative care appointment

Cardiology

Other indications and scheduling instructions as needed

Accept Cancel Remove

Advanced Care Planning Reimbursement

CMS reimbursement for MD/APP for advance care planning

- **99497 is for the first 30 minutes (at least 16 min)**
- **99498 is an add-on code, for each additional 30 min**

CPT code 99497 - Advance care planning including explanation and discussion of advance directives such as standard forms (with completion of such forms, when performed), by physician or other qualified health professional; first 30 min, face-to-face with patient, family member(s) and/or surrogate

CPT code 99498 - Advance care planning including explanation and discussion of advance directives such as standard forms (with completion of such forms, when performed), by physician or other qualified health professional; each additional 30 min (list separately in addition to code for primary procedure)

- ♦ Per CPT, there are no limits on number of times ACP can be reported for a given beneficiary in a given time period; CMS has not established any frequency limits
- ♦ When service is billed multiple times for a given beneficiary, would expect to see a documented change in beneficiary's health status and/or wishes regarding his or her end-of-life care



**UMKC Doctor of Nursing Practice
EBP Project Scholarly Paper, Guidelines
Final DNP Project**

Sections **Description of Content** (proposal content with additional final project content shaded, 25 to 30 pages in body of paper. 100 points)

<p>Title (2 points)*</p> <p><i>Word count per APA</i></p>	<p>Indicates the population, EBP quality improvement intervention, and measured outcome.</p>	<p>Included: Y, N, NA, comment</p> <p>Y</p>
<p>Abstract (5)</p> <p>Key Terms</p> <p><i>2/3 page, 250-word maximum</i></p>	<p>Summarizes the key project components sequentially: introduction of topic indicating significance, purpose, study design, population with number with setting, EBP intervention, outcome(s) measured, results, and implications to nursing or healthcare or impact to society.</p>	<p>Y (8 items)</p>
<p>title heading on 1st page (1)</p> <p>Significance (Economic, Policy,</p>	<p>(The support for the reason to do this project.)</p> <p>Introduces the specific problem or system dysfunction.</p> <p>Provides the current information and evidence about the problem. (economic, policy, and/or</p>	<p>Y</p> <p>Y</p>

<p>Health System) (1)</p> <p>Local Issue (1)</p> <p>Diversity Considerations (1)</p> <p><i>2 pages for this section</i></p>	<p>health system).</p> <p>Describes the nature and severity of the problem or system dysfunction within the local project setting.</p> <p>Presents diversity content associated with the population and/or local project setting.</p>	<p>Y</p> <p>Y</p>
<p>Problem, Purpose</p> <p>Problem Statement (1)</p> <p>Intended Improvement with Purpose (1)</p> <p>Facilitators & Barriers</p>	<p>(The clearly defined problem, purpose of the EBP intervention, and factors for success)</p> <p>States concisely the primary current problem and any secondary problems.</p> <p>Identifies the current trigger for the change and why the change is important now.</p> <p>Concludes with primary and any secondary purpose statement(s).</p> <p>Identifies the project facilitators (support</p>	<p>Y</p> <p>Y</p> <p>Y</p>

<p>(2)</p> <p><i>1 page for this section</i></p>	<p>systems, stakeholders or shareholders, champions) and the potential barriers to the change.</p> <p>Discusses the project economic component as a facilitator or barrier.</p> <p>Discusses potential for sustainability of the intervention during and after the project.</p>	<p>Y</p> <p>Y</p> <p>Y</p>
<p>Review of the Evidence</p> <p>PICOTS (1)</p> <p>Search Strategies (1)</p> <p>Evidence, Sub-Topics</p>	<p>(The existing evidence for this DNP project)</p> <p>States precisely the primary PICOTS and any secondary PICOTS question.</p> <p>Identifies the literature search strategies (broad to focused with direct application to project) including (a) databases, (b) search terms and criteria, and (c) results of search by study design and by level of evidence [Melnyk] with numbers</p> <p>Presents the synthesis and integration of the evidence (studies and guidelines) that support</p>	<p>Y</p> <p>Y (all items)</p> <p>Y</p>

<p>or Themes (6)</p> <p><i>3-4 pages for this section</i></p>	<p>the problem, intervention, and outcome measurement. At least 3 sub-topics or themes with a total of 15 – 20 studies including evidence based guidelines</p>	
<p>Theory (2)</p> <p><i>½ page</i></p>	<p>Discusses the theory with concepts and addresses application to the project and intervention.</p> <p>Discusses application of the theory in studies similar to the project.</p>	<p>Y</p> <p>Y</p>
<p>Methods</p> <p>IRB Approval, Site Approval, Ethical Issues, Funding (2)</p> <p><i>½ page</i></p>	<p>(The components of the project. Provides information for others to replicate the evidence based change)</p> <p>States specific IRB approval and site agreement.</p> <p>Discusses ethical considerations of privacy, protection including research vulnerable population, and author conflicts of interest.</p> <p>Addresses management of the ethical concerns.</p>	<p>Y</p> <p>Y</p> <p>_____</p>

<p>Setting & Participants (1) <i>1/2 page</i></p>	<p>Addresses funding.</p> <p>Describes the setting, specifics of the participants with inclusion and exclusion criteria, sampling method, and expected number.</p>	<p>Y</p> <p>Y</p>
<p>EBP Intervention (2) <i>2 pages</i></p>	<p>States the EBP intervention.</p> <p>Details the intervention steps (recruitment, intervention sequence including time and participant involvement and who conducts) so others can replicate.</p>	<p>Y</p> <p>Y</p>
<p>Change Process, EBP (2) <i>1/2 page</i></p>	<p>Discusses the change theory with processes to promote change and EBP model or framework to support the project.</p> <p>Discusses likelihood of sustainability after project completion.</p>	<p>Y (change)</p> <p>Y (EBP)</p> <p>Y</p>
<p>Study Design (1) <i>1/3 page</i></p>	<p>Identifies the study design for measuring impact of the EBP intervention on primary outcome and</p>	<p>Y</p>

	any secondary outcomes.	
Validity (1) <i>1/2 page</i>	Describes aspects of the project that address internal validity (integrity of the data) and external validity (transferability)	Y
Outcomes (1) <i>1/4 page</i>	States the primary outcome and any secondary outcome of the EBP intervention which includes anticipated degree and direction of impact of the EBP intervention on the outcome.	Y
Measurement	Identifies and discusses the instrument to	Y
Instrument(s) (2) <i>1/2 - 1 page</i>	measure each outcome of the EBP intervention including tool validity and reliability.	Y
	Addresses procedures associated with participant completion of the instrument.	Y
	Discusses permission for use of the instrument.	Y
Quality of Data (1) <i>1/2 page</i>	Explains methods to promote quality of data including a) power analysis of number of participants, b) baseline data and post data with	

<p>Analysis Plan (Statistical) (2) <i>1/2 page</i></p>	<p>time length of data collection, and c) comparison to published benchmark data.</p> <p>Provides statistical methods to draw inferences from the data which includes pre-post data and demographics, if later applies.</p>	<p>Y</p>
Results		
<p>Setting & Participants (5) <i>1/2 page</i></p>	<p>Reports the time frame, setting, and participants involved.</p> <p>Describes participant data.</p>	<p>Y</p> <p>Y</p>
<p>Intervention Course, Actual (5) <i>1/2-1 page</i></p>	<p>Reports the major components of the intervention and the associated time periods.</p> <p>Addresses the number of participants at key points.</p>	<p>Y</p> <p>Y</p>
<p>Outcome Data by Sub-Topic (10) <i>1 page</i></p>	<p>Presents the data with statistical analysis for each measured outcome.</p>	<p>Y</p>

	Includes summary of missing data.	Y
Discussion		
Successes, Most Important (4) <i>1/2 page</i>	States and describes the most important successes in the study outcomes.	Y
Study Strengths (2) <i>1/2-1 page</i>	Describes elements of the setting (for example, geography, resources, organizational culture, staff, and leadership) that provided support and context for the intervention.	Y
	Discusses degree of success in implementing the intervention components.	Y
Results Compared to Evidence in the Literature (2) <i>1 page</i>	Compares and contrasts the study results with relevant findings from specific published studies.	Y
Limitations		
Internal Validity	Discusses possible sources of confounding	Y

Effects (1)	factors, bias, and imprecision in EBP intervention processes and collection of data that could affect the study outcomes.	
External Validity	Address factors (participant characteristics, setting characteristics) that could affect generalizability	Y
Effects (2)		Y
Sustainability of Effects and Plans to Maintain Effects (1)	Addresses potential for observed gains to weaken over time and plans for maintaining improvement.	
Efforts to Minimize the Study Limitations (1)	Reviews the efforts to minimize limitation impact on application of results.	Y
<i>2-3 pages this section</i>	Assesses the effect of limitations on interpretation and application of findings.	Y
Interpretation		
Expected & Actual Outcomes (2)	Addresses expected results, unexpected results, problems, and failures.	Y

	<p>Explores possible reasons for differences between observed and expected outcomes.</p>	<p>Y</p>
<p>Intervention Effectiveness (inferences) (2)</p>	<p>Draws inferences consistent with the strength of the study data about causal mechanisms (components of the intervention, support context factors, type of setting) that assisted with the intervention's effectiveness.</p>	<p>Y</p>
	<p>Addresses the types of settings in which the study intervention is most likely to be effective.</p>	<p>Y</p>
<p>Intervention Revision (1)</p>	<p>Suggests intervention modifications that might improve attainment of the outcomes.</p>	<p>Y</p>
<p>Expected and Actual Impact to Health System, Costs, and Policy (2)</p>	<p>Highlights the expected impact and the actual impact of the EBP intervention on health system, policy, and cost.</p>	<p>Y</p>
	<p>Reviews study estimated costs and actual cost of the intervention and study.</p>	<p>Y</p>

<p>Opportunities, other</p> <p><i>2 pages for this section</i></p>	<p>Discusses the potential for the economic sustainability of the intervention.</p> <p>Discusses current funding sources for the study.</p> <p>As applies, optional.</p>	<p>Y</p> <p>Y</p>
<p>Conclusions</p> <p>Practical Usefulness of Intervention (2)</p> <p>Further Study of Intervention (1)</p> <p>Dissemination (1)</p> <p><i>1 page for this section</i></p>	<p>Discusses overall practical usefulness of the EBP intervention.</p> <p>Addresses further implementation and outcome studies of the EBP intervention.</p> <p>Presents dissemination.</p>	<p>Y</p> <p>Y</p> <p>Y</p>
<p>References (4)</p>	<p>Presents a minimum of 20 research studies including evidence based guidelines. All cited within body of paper. May have additional</p>	<p>Y</p>

	<p>references: e.g., grey literature, professional organization guidelines which may not be derived from high evidence level research, other.</p> <p>Excludes general references such as textbooks.</p> <p>Use primary sources.</p>	
<p>Appendices (all cited within body of paper, sequence of appendices as introduced in paper)</p> <p>Cost Table for Project (1)</p> <p>Definition of Terms (1)</p> <p>Synthesis of Evidence Table (specific to project) (1)</p> <p>Theory to Application Diagram (1)</p>		<p>Y(cost)</p> <p>Y (terms)</p> <p>Y(table)</p> <p>Y (theory)</p>

Logic Model (1)		Y(Logic)
Project Timeline Flow Graphic (1)		Y (timeline)
Intervention Flow Diagram (1)		Y(intervention)
Intervention Materials (example-education program)		Y (materials)
IRB Approval Letter(s), if applies **		Y (IRB)
IRB Approved Consent or Informational Letter, if applies		NA (consent)
Measurement Tool(s), if applies		Y (tools)

<p>Permission(s) for Tool(s), if applies</p> <p>Data Collection Template (1)</p> <p>Statistical Analysis Results Table(s) (4)</p> <p>Other Tables</p> <p>This checklist completed by student</p>		<p>_____</p> <p>(permission)</p> <p>Y (collection)</p> <p>Y (results, analysis)</p>
--	--	---

*total points = 100 points

** if applies, then must be present to receive paper grade