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Bringing Hospital and Community Together: Interventions to Bridge the Transitional Care Gap

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Abstract

Problem

As healthcare spending continues to increase and overall quality lags in comparison to other developed countries, hospital readmission has been targeted to increase quality while decreasing cost. Components of the Affordable Care Act (ACA) have placed an emphasis on preventative and transitional care which has created programs aimed at reducing readmission, including the Community Health Access Programs (CHAP). One program in St. Louis, Missouri consisted of advanced practice paramedics and an occupational therapy assistant that performed discharge follow-up through in-home, in-office, and telephone visits. An in-depth program evaluation can create a foundation to build other programs in communities suffering similar care gaps.

Methods

A retrospective, program evaluation was performed. Data compilation revealed 22 patients who received services from the CHAP at Christian Hospital after a hospitalization. Age, race, gender, length of stay, number of secondary diagnoses. number of CHAP visits, and days to readmission from discharge were provided. A group of 22 patients not receiving CHAP services was then formed.

Results

The mean LOS for the CHAP group was 5.95 days and for the non-CHAP group was 5.36 days. There was no significant difference in the two groups for LOS. For days to readmission the average was 17.41 days for the CHAP group and 12.18 days for the non-CHAP group which approached statistical significance ($p = 0.056$). A linear

regression comparing number of CHAP visits found that the number of CHAP visits was associated with more days before the next admission.

Implications for Practice

Findings suggest the CHAP was able to improve readmission rates as the number of patient visits increased. This suggests patients need more connection with providers than is typically occurring in areas without a transitional care program in place. Further analysis is needed to determine implications across in other communities and across other diagnoses.

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Two sides of many components to the healthcare industry are acute care and chronic disease management. Acute care is a more specialized care that meets an immediate need while chronic care looks at managing a disease process over a longer period. These two components, however, often overlap with each other. Progression of a chronic disease can lead to an exacerbation, or acute condition of the illness. Focusing on the transition between a hospitalization and back to primary care is crucial to patient outcomes. Transitional care begins when a patient leaves the hospital and continues to the home with the goal of reducing readmission rates to the hospital after recent hospitalization (Verhaegh et al., 2014). Aside from patient outcomes, transitional care will also help to tackle healthcare spending, arguable one of the biggest systematic problems. The annual spending on healthcare in the United States far exceeds other countries and nearly doubles the amount spent on healthcare by Switzerland, the next closest country (Papanicolas, Woskie, & Jha, 2018). In this instance, increased spending doesn't equate to increased quality as the United States is lacking in many of the metrics used to assess quality such as mortality, chronic disease and obesity (Tikkanen & Abrams, 2020).

One of the chronic conditions accounting for the need to focus on improving transitional care is heart failure (HF). HF impacts close to six million people across the United States each year which accounts for more than $30 billion dollars in annual healthcare costs (Bergethon et al., 2016). Nearly 70% of these costs are attributed directly to hospital readmission rather than disease management (Bergethon et al., 2016).

Strategies have been created to help change this trend. Legislators and insurance companies have created new policies aimed at decreasing healthcare spending, one of the most notable is the Affordable Care Act (ACA). One of the articles within the ACA is the requirement of health insurance by everyone. Articles throughout the act required enrollment of individuals and instituted a tax penalty for those who fail to comply as well as extending coverage of children under parental plans through the age of 26 (Sommers et al., 2015). Prior to the ACA, the rate of patients returning to the hospital for a second stay due to HF was so high, the Get with the Guidelines Program (GWTG) was introduced by the American Heart Association (American Heart Association, 2020). The GWTG program took aim at reducing 30-day HF readmission rates by 20%. The progress seen in the first three years of the program was minimal as the overall reduction was reported to be 1% (Bergethon et al., 2016). The program then shifted reporting to individual interventions within the program that are collectively aimed at decreasing readmission rates and improving mortality. A more recent update showed that among hospitals participating in the GWTG quality measures increased over the first five years of participation. Thrombolytic medications were given an hour earlier, and thrombolytic prophylaxis was more likely initiated within 48 hours of admission. In addition, hospitals in the GWTG program were more likely to have discharge interventions in place including prescribing antithromobolytic and antihyperlipidemia medication along with smoking cessation (Ormseth et al., 2017). This supports the need for a deeper evaluation of transitional care to search for variables associated with suboptimal outcomes and methods to improve quality while decreasing cost.

Several components of the ACA aimed at making healthcare more accessible and creating a culture shift, focusing less on emergent care and more on preventive care. This includes interventions for early detection and routine physician follow-up such as a colonoscopy, mammogram, routine office visits, or other measures preventing hospitalization (Agarwal, Mazurenko, & Menachemi, 2017). This shift in focus is important. Transitional care requires health insurance to cover the costs of chronic disease management such as routine outpatient testing, medications and scheduled physician follow-up. Obtaining this type of care has been associated with decreased overall healthcare costs even in plans with more out-of-pocket expense for the individual (Agarwal et al., 2017). In Massachusetts, where a statewide health plan was put in place like the ACA, mortality rates were also decreased with additional access to preventive care services (Sommers, Long, & Baicker, 2014).

Within two years of enacting the ACA there was a decrease in uninsured individuals and an increase in preventive care measures (Sommers et al., 2015). As time continued, preventive measures only proved to be more beneficial at decreasing costs by leading to less emergency room visits and more screening (Agarwal et al., 2017). Having insurance is a great start but more is needed. Hospitals have started this process by implementing different community outreach programs that aim to keep patients in contact with providers while transitioning from acute back to primary care. Community Health Access Program (CHAP) has become a broad term for programs aimed at helping with the transitional process. Kaiser Permanente (2020) labels the CHAP as providing health insurance coverage. In Milwaukee, individuals can simply visit the program to find out how provisions of the ACA can provide insurance (Mental Health America of Wisconsin,

2020). Health Net of West Michigan (2020) aims the program at providing resources to reduce healthcare costs and address socioeconomic issues that prevent access to healthcare. In the state of Washington, resources are provided by navigating to other programs that will overcome these barriers as well (King County, 2020). Many of these programs rely on phone conversations to offer resources to patients. The CHAP located in St. Louis, Missouri, offers a unique experience that combines attributes of all of these through home and office visits in addition to phone calls (Christian Hospital, 2020).

The purpose of this project is to evaluate the efficacy of a post discharge program at reducing hospital readmissions for patients who have been recently admitted with heart failure. The evaluation was conducted using the Framework for Program Evaluation presented by the Centers for Disease Control and Prevention (CDC) (CDC, 2017). The aim of the project is to compare the readmission rates of adults aged 18 or older who have been hospitalized for heart failure between those who participated in CHAP services and those who did not. The primary outcome measure for this aim is the rate of HF readmission. Outcome measures were conducted by comparing days to readmission for HF patients 18 years of age and older discharged under care of the CHAP and those without.

Literature Review

A literature search was performed through the Cochrane Library, PubMed Central (PMC), PubMed@UMSL and Google Scholar. Each search began using the term “heart failure readmission rates” which revealed a vast amount of results ranging from 1,000 to more than 100,00 from each source. The search was then refined using the Boolean operator AND then adding “interventions” to narrow the results even further. Additional

search criteria included articles in English, research performed in the United States, free or open access to full text and published in a journal. In addition, only articles that suppled data along with the intervention were used. Sources were excluded for failing to meet inclusion criteria either through access, language, location of the research, or not printed in an established journal. This resulted in articles for review including meta-analyses, systemic reviews, randomized control trials, editorials, protocols, and clinical answers. Using the search criteria described above, reviewing abstracts and using only those that supplied evidence to show intervention efficacy led to 14 articles being used for the literature review (appendix A).

Much of the literature available focused on the geriatric population covered by Medicare rather than any adult patient with any type of coverage. Angraal et al. (2018), reviewed systemic evidence on heart failure readmission since the inception of the ACA. The study focused on people 65-years of age or older and looks at all Medicare, Medicaid and private insurance data specifically after initiation of the ACA. The data was compiled using five-year sample of readmission data across the entire country and separating it into Medicare, Medicaid and private insurance providers. The Hospital Readmissions Reduction Program (HRRP) was introduced in conjunction with ACA goals and showed some progress toward decreasing admissions (Angraal et al., 2018). While the study only reviews a five-year period, the inclusion of all patients across the nation over the age of 18 combined with the data reported is useful for foundational evidence. Gupta et al. (2018), evaluated the HRRP and GTWG programs to assess readmission trends. The interrupted time series study showed these programs were

reporting at around a 1% decrease in readmission rates and mortality up to one-year after discharge (Gupta et al., 2018).

Vivo et al. (2014), expands further by looking at differences in readmission rates and mortality among various ethnic groups. While the study can be considered slightly dated, comparing Caucasian, African American and Hispanic patients over a longer period than most studies provides a unique perspective. African American and Hispanic patients often have more readmissions and a lower mortality (Vivo et al., 2014). Although the evidence is reported as statistically significant, the sample size consisted of primarily Caucasian participants which can skew validity. This is likely why the statistical significance is not found in a more generalized study (Vader et al., 2016). Vader et al. (2016), attempted to define causes for readmission in HF patients and looked at a wide variety of factors including lab values, medication regimen and discharge programs. The extensiveness of the study helps to present a general overview of many different factors but outside of a link to renal insufficiency, little statistical evidence was found. In addition, the study simply lacked statistical evidence to support race as a risk factor with a lack of ethnic groups seen in reporting (Vader et al., 2016).

This issue has generated theories and frameworks to make identifying the risk of returning to the hospital after heart failure easier and more fluid across the continuum of care. Ryan, Bierle, and Vuckovic (2019) present a framework to prevent readmissions of HF patients focusing on reviewing, reassessing and reeducating patients. The foundation of the framework originates from the idea that there is no single variable attributed to increase or decrease readmission rates. This leads to the idea that multiple interventions are necessary. According to the framework, nurses are responsible for prevention

measures by evaluating the current plan of care in place, evaluating the acute exacerbation of the illness leading to hospitalization, then frequently educating the patient regarding changes to care regimens (Ryan et al., 2019). This not only gives the nurse the responsibility to assess the situation but advocate for necessary changes. A multifaceted approach was presented even earlier in an editorial by Desai (2012). The three-phase terrain framework focuses on post-discharge, plateau and palliative care. This approach found 70% of readmissions occur within 2 months after discharge or 2 months prior to death (Desai, 2012).

These frameworks have created a need to focus on the multitude of causes and interventions associated with hospital readmission in patients discharged from an acute stay with HF. This has led to the creation of tools to be used by hospitals to assess the risk of rehospitalization with more continuity. Using a combination of initiatives including the HRRP, ACA, and Centers for Medicare and Medicaid Services (CMS), Chamberlain et al. (2018), created the Readmission After Heart Failure (RAHF) scale. Using a tool such as this can help create a more consistent assessment of individual patient needs. The RAHF scale considers various demographic factors to create a numerical score is then linked to the probability of hospital readmission. The score indicates a low, moderate, or high risk and was shown to be accurate 95% of the time (Chamberlain et al., 2018).

While the RAHF is a good assessment tool, failing to look at the reasons behind individual patients in further depth provides limitations. Evaluating data from the provider perspective is a start but taking the patient and caregiver perspective into consideration is also important. One study assessed patients and caregivers after

discharge in an open-ended interview format to gain that perspective (Sevilla-Cazes et al., 2018). Despite the limited sample size useful insight was presented to the cause of data reported in other studies. Patients and caregivers went beyond comorbidities and reported uncertainty at understanding and following instructions, socioeconomic issues and even emotions as leading to lack of adherence to the medical regiments. In the study, patients reported that a feeling of despair and testing the limitations of medical recommendations combined with other socioeconomic factors that led to patients and caregivers struggling with adjusting to life after a recent hospitalization (Sevilla-Cazes et al., 2018).

This information makes it reasonable to determine that HF readmission is a problem and something needs to be done. A national study surveyed hospitals across the country who participate in the quality improvement program, titled Hospital to Home. Almost 90% of hospitals reported having a written objective in place to reduce HF readmission but still there was more needing to be done (Bradley et al., 2012). While most hospitals had personnel focusing on quality improvement in this area, less than half had a partnership with community providers to achieve continuity of care. Hospitals went on to report medication and discharge instructions were only sent to the primary physician about a quarter of the time and while most hospitals used a few of the 10 interventions recommended, less than 3% used all of them (Bradley et al., 2012).

The identification of multiple variables has led to the development and initiation of different types of interventions. The efficacy of the results, however, can vary as much as the interventions. Feltner et al. (2014), performed a systematic review of interventions aimed at reducing HF readmission. Assessing 47 studies with programs to

provide home visits, support via telephone, outpatient visits to specialized clinics and educational interventions measured readmission and mortality rates with varying degrees of success (Feltner et al., 2014). Interventions were evaluated on a scale of low, medium and high intensity. Programs providing home visits and offering telephone support ranged from low to high, while telemonitoring and clinic visits seemed to lack support or fail to reach a high degree of benefit (Feltner et al., 2014). Another article supported the telehealth claim finding little evidence to support the intervention alone is enough to make significant changes in HF readmission (Flodgren et al., 2015). Technology is also an area met with apprehension at times as users attempt to learn how to interface and keep up with changes made to optimize performance. This leaves the possibility of difficulty using the intervention and noncompliance. A study by Rosen, McCall, and Primack (2017) showed a telehealth intervention was successful at decreasing readmission rates and improving mortality. This could likely be due to most of the patients adhering to the intervention (Rosen et al., 2017).

Another interesting approach looked at nutritional interventions as a strategy for reducing HF readmissions (Abshire et al., 2015). Looking at different nutrients and nutritional interventions across various countries, including the United States, shed at least some light into the importance of nutrition. While the multiple components left room for more investigation, dietary education proved to be useful for decreasing dietary sodium intake, readmission rates and disease progression (Abshire et al., 2015). Considering nutrition further implicates the need for a multifaceted approach. This is further supported by Jackevicius et al. (2015), in a review of a multidisciplinary approach. While the study consisted of less than 300 patients, a CHAP and non-CHAP

group were established. Participants who received the intervention were seen in an outpatient clinic providing many different services. This allowed for individualized follow-up with patients who were recently discharged from an acute hospitalization. The clinic was staffed with various providers including pharmacist, cardiologist, case manager and physician assistant to follow-up with the patient during visits. This allowed for the program to offer an array of resources to help identify and overcome patient specific socioeconomic barriers along with routine disease management from the provider. Six visits over the course of 12 weeks with these various staff members reduced readmissions from 23.3% to 7.6%, showing statistical significance along with a declining death rate (Jackevicius et al., 2015).

Framework

Extensive evidence is available to support the need to create systemic changes for transitional care, particularly in adults with HF who have recently been admitted to the hospital. Interventions including telemedicine, phone calls, educational programs, clinics and more have shown mixed results. Data consistently reports multiple interventions focusing on various areas of care are the most effective. Despite all of this, little evidence exists to support hospital-based program such as the CHAP. Building evidence and gaining the support from providers and hospital administrators will be the key to success in effectively replicating the CHAP program throughout other communities. Hospital based programs that follow patients after being discharged are still novel which means translating evidence from intervention such as the CHAP into practice requires evaluation of efficacy. The Framework for Program Evaluation presented by the CDC (2017) is one method to guide that evaluation. Evaluating program efficacy allows for

further discussion of areas of strengths and area where changes may need to be considered in the use of the CHAP model, allowing for a shift in transitional care to improve quality while decreasing costly readmissions.

Literature supports that systemic change is needed. While various programs attempt to create change, evaluating efficacy is key. This project evaluates program efficacy using the Framework for Program Evaluation from the CDC (CDC, 2017). The framework from the CDC summarizes elements for effective program evaluation through a series of standards and steps. The first step is to identify stakeholders from all aspects of the program. Next, is to the describe the program in detail. Third, is to focus on the evaluation design to identify areas of greatest concern while making efficient use of resources. Gathering evidence is next and crucial to the ability to evaluate the program and make recommendations. The fifth step is to take the information to draw and justify conclusion. Finally, it is important to share the information learned from the evaluation. Founding on the standards of utility, feasibility, propriety and accuracy, the framework repeats to continue assessing for program efficiency as changes are realized and initiated (CDC, 2017).

Engaging Stakeholders

Several of the key administrators that are over the program have been asked to be involved in the project. This has created administrative interest due to the ability to showcase the results of the program. The director of emergency medical services (EMS) has agreed to be the project mentor. The director of care coordination, who oversees the program, has been enthusiastic about presenting data to quantify the impact of the program. In reaching out to the director of quality and analytics, she responded with

excitement that someone was going to be able to evaluate the data of the CHAP. The manager and employees of the program have also been involved in the formulation of the project offering background information and have also expressed excitement to have others have a better understanding of the program and positive impact on the community.

Program

The structure of the CHAP in the setting facility is unique from other community outreach programs. The program was formed after an analysis by the facility determined that nearly half of emergency department visits and 40% of EMS calls were non-emergent situations (Christian Hospital, 2020). Interviews with those that helped create and manage the program share an historical evolution. The foundation of the program was possible due to the facility operating an ambulance service that served the community. Owning and operating the ambulance service made it possible to create an ambulance staffed with advanced practice paramedics able to intercept emergency calls that could be considered non-emergent. Advanced practice paramedics can carry out tasks above that of a traditionally licensed paramedic and have an expanded setting that includes the home (Global Emergency Medical Registry, 2020). This was a key component as advanced practice paramedics could now perform minor treatments in the home under medical direction and prevent an emergency room visit.

This model prevented enough emergency room visits for non-emergent situations that the program was then placed in the emergency room with the addition of a certified occupational therapy assistant (COTA). The model transitioned to identifying social determinants of health that led to excess emergency room visits without regard to diagnosis. This allowed for every patient to be screened and referred if needed, without

being excluded due to primary diagnosis. With the addition of a COTA to the advanced practice paramedics, the program was now able to assess for existing social determinants of health that led to increased admission and provide patient-specific resources to help prevent hospitalization. This included obtaining health insurance, finding a primary care physician, seeking out drug and alcohol abuse programs and even finding employment. The success of the new model led to the program branching out to serve all patients discharged. This adapted to the current model as any patient, emergency room or in-patient, can be referred to the program by a nurse that suspects these aspects could contribute to decreased health outcomes if not addressed. The paramedics and occupational therapy assistant would then follow-up with the patient to perform an assessment and determine need using mobile integrated health units. These mobile units allowed the first encounter to be face-to-face, often in the patient's home after discharge. This led to a more thorough, personal explanation of discharge instructions and patient-specific assessment. Staff would ask about physicians the patient may see, how medications and food are obtained, mobility of the patient and ability to provide self-care. While performing a more accurate, in-depth assessment of patient needs staff could provide treatments such as checking vital signs and performing dressing changes. The facility reports that the program has led to the prevention of rehospitalization and is credited with helping more than 1,500 patients being placed in the appropriate medical setting at discharge and provided resources to manage care for over 9,000 patients (Christian Hospital, 2020). The design and evidence will be described in the methods and results sections. Conclusions and disseminating the results for further learning are discussed in the discussion and conclusion sections.

Method

Design

This project uses the program evaluation model based on the framework presented by the CDC. Identifying the design of the study is the third step in the framework. In this project, a retrospective evaluation was conducted to evaluate readmission rates among patients discharged with the CHAP compared with those discharged with traditional interventions after a recent hospitalization for heart failure.

Setting

The study is conducted in a community hospital located in North County, St. Louis, Missouri. The United States Census Bureau provides vital data for communities. The CHAP in North County, St. Louis, Missouri is unique in that the hospital that provides the program also has and EMS ambulance service. The response area of the EMS and CHAP consists of Spanish Lake, North County Fire and Rescue, Black Jack, Metro North and Mid County fire protection districts, as well as Berkeley and Ferguson fire departments. According to the United States Census Bureau (2020), these communities are primarily African American. Financially, the average income falls well below the national level with poverty rates more than double in some areas (United States Census Bureau, 2020). Although the communities are densely populated, they still lack easy access to nutritious food options and healthcare services (Washington University, 2015). High crime rates and lack of education further add socioeconomic concerns (Federal Bureau of Investigation, 2020).

Sample

A convenience sample was used. The sample included patients 18 years of age and older who were discharged from the local community hospital after an admission from heart failure within the EMS response area. Participants consisted of those discharged with and without the CHAP between January 1st, 2019 and December 31st, 2019 after and admission for HF. A report from the electronic medical record (EMR) identified patients 18 years of age and older discharged between January 1st, 2019 and December 31st, 2019 with and without CHAP services. A cross-reference was then conducted among primary diagnosis of heart failure with those enrolled in the CHAP revealing six patients. The reports were then expanded to include HF as a secondary diagnosis and revealed a final total of 22 patients discharged with a primary or secondary diagnosis of HF and referral to the CHAP. Once the CHAP group was identified, another group of 22 patients discharged in the same time frame with a primary or secondary diagnosis of HF with demographic characteristics of similar age, gender, and race was identified who did not have a referral to the CHAP. Though this creates an accurate comparison by age, gender, race, and insurance, it does not account for any interventions that changed throughout the year.

Approval Processes

This project was reviewed and approved by the Christian Hospital Institutional Review Board (IRB) and the IRB at the University of Missouri-St. Louis.

Data Collection/Analysis

Evidence was gathered per step four in the framework for program evaluation. Patients with HF discharged with a referral to the CHAP had readmission rates compared

to those discharged under traditional measures. The electronic medical record (EMR) system at the facility was used by a quality improvement analyst to provide reports that included primary diagnosis, secondary diagnosis(es), days to readmission from discharge, age, gender, ethnicity, insurance, length of stay, if received services from the CHAP, number of CHAP visits, and emergency room visits prior to readmission. Any readmission reported on a visit prior to January 1st, 2019 or after December 31st, 2019 was excluded. See appendix B for the data collection tool used to identify variables.

Data was then analyzed using a t-test for age, length of stay, number of emergency room visits, number of secondary diagnoses, and days to readmission. Due to sample size, a Mann-Whitney was then performed for analysis. A linear regression was also performed to evaluate number of CHAP visits and days to readmission. Data analysis was performed through Intellectus Statistics.

Procedures

Upon attaining IRB approval, the data query was conducted. The facility ran reports through the EMR system then removed identifying information. These de-identified reports were sent to the investigator to be used for data analysis as determined by the standards set in step five of the framework for program evaluation.

Results

It was determined that a Mann-Whitney was most appropriate due to sample size and distribution. The average age of the CHAP participants was 73.2 and the non-CHAP participants was 71.55. The result of the two-tailed Mann-Whitney U test was not significant based on an alpha value of 0.05, $U = 266.5$, $p = .565$. The result of the two-tailed Mann-Whitney U test for emergency room visits was not significant based on an

alpha value of 0.05, U = 253, p = .684 with a mean of 0.18 for CHAP participants and 0.14 for non-CHAP participants. The CHAP participants averaged 26.73 secondary diagnoses per patient while the non-CHAP group averaged 28.5. The number of secondary diagnoses between the two groups was not statistically significant with a two-tailed Mann-Whitney U test result of an alpha value of 0.05, U = 213.5, p = .503. Each group were comprised of the same sex with five (23%) males and 17 (77%) females. Four participants (18%) in each group were white and 18 (82%) were black. Each group also consisted of six individuals (23%) that were treated with a primary diagnosis of heart failure and 16 (77%) with a secondary diagnoses of heart failure. The majority if the entire sample were enrolled in Medicare except for four that were enrolled in either private insurance, Medicaid, or considered to not have insurance.

The mean length of stay was 5.95 days for CHAP participants and 5.36 days for non-CHAP participants. The result of the two-tailed Mann-Whitney U test for length of stay was not significant based on an alpha value of 0.05, U = 275.5, p = .428. Days to readmission was then analyzed. The mean days to readmission was 17.41 days for CHAP participants and 12.18 days for non-CHAP participants. A Mann-Whitney U test was not significant based on an alpha value of 0.05, U = 319.5, p = .069.

With days to readmission approaching statistical significance, a linear regression test was then completed to evaluate number CHAP visits and days to readmission. Statistical significance was noted in the number of CHAP visits to the days to readmission. In table 1 below, the number of CHAP visits compared to days to readmission revealed a p = .023 showing that as CHAP visits increased, so did the number of days until the next readmission.

Table 1

Results for Linear Regression with CHAP_Visits predicting Days_to_Readmission

Variable	*B*	*SE*	95% CI	β	*t*	*p*
(Intercept)	12.87	1.54	[9.77, 15.98]	0.00	8.38	< .001
CHAP_Visits	1.26	0.53	[0.18, 2.34]	0.34	2.36	.023

Note. Results: $F(1,42) = 5.59$, $p = .023$, $R^2 = 0.12$
Unstandardized Regression Equation: Days_to_Readmission = 12.87 + 1.26*CHAP_Visits

Discussion

The primary focus of this project was to determine the efficacy of the CHAP that includes home visits to decrease hospital readmission rates for patients with heart failure. Determining the definition of readmission is the first step toward an answer. In the realm of this study, each patient, whether in the CHAP or non-CHAP group, had a hospital readmission. Thus, the definition of readmission in this instance became the number of days it took until the readmission occurred. While simply participating in the CHAP and receiving a visit showed a longer time to readmission, the results were just shy of statistical significance. There was, however, statistical support to show a relationship between frequency of CHAP visits and a longer time to readmission.

Finding statistical significance of extending the time to readmission supports the usefulness of the CHAP intervention in impacting the timing of readmissions which can address quality penalties that are placed on healthcare facilities. The demographics of the CHAP and non-CHAP groups were designed to be close enough in comparison to minimize those factors influencing readmission. This means that the statistical findings are likely due to the intervention of the CHAP rather than additional demographic characteristics.

The implications of this study for practice can be significant pending further intervention and study. In facilities that have at-risk populations with frequent

admissions, implementation of a similar program that puts providers in contact with patients after discharge can reduce time to readmission and perhaps overall readmission rates. The ratio of reduction versus resources will likely be the determining factor in implementation of other programs. For example, a hospital with higher readmission rates may find more benefit to spending the required resources to decrease readmissions than a hospital that has few readmissions. If implementation of the program costs more than the savings caused by the program, obtaining facility buy-in will become difficult. Increased funding to facilities from outside sources, such as grants or insurance coverage, for the implementation of other programs could also incentivize further program development and study.

Despite these significant clinical implications, the study has some limitations and further work that needs to be assessed. First, the sample consisted primarily of black females. A larger and more diverse group of participants would help determine efficacy across different groups and communities. This program was also tailored by the facility directly to the community it serves. Further implementation should be created based on needs of the unique community that is being served. A more thorough chart review would be suggested to capture all of the patients that were seen by the CHAP in 2019. The data given for all CHAP patients contained nearly 150 different patients. Of those, only six were found when using heart failure as a primary diagnosis.

Aside from sample size, the study was conducted at a time when in-person visits were taking place. Due to a shift in resources and care practices, as well as COVID-19. the program is now more virtual consisting of telehealth visits from a nurse practitioner and phone calls from a social worker or community health worker. An updated study to

compare readmissions of those in the previous format versus the current format will help to determine if the results were due to the program structure or simply having the program in place.

Overall, data in the literature review suggests change is needed. Policy changes have attempted to force changes that focus on decreased cost and increased quality. This study showed that the more provider interaction a patient had after discharge from the hospital, the longer it took before a readmission occurred. While further study is recommended, a cost-benefit analysis should be conducted to determine if the cost of program operation supersedes the costs of readmissions. As more programs are implemented, obtaining more data becomes easier. Having multiple programs in place across various facilities could help sustain momentum for project implementation and create funding by decreasing overall healthcare costs due to lowered readmission rates. Funding through legislation, cost-benefit analysis, or even through other grants and donors will be a crucial driver to creating and sustaining this change. Reporting findings allowed for completion of the final step in the framework for program evaluation. The findings will be presentable to all stakeholders. This allows for all involved to learn from the strengths of the program and find areas for improvement.

Conclusion

Healthcare policies have been implemented over recent years to create changes by improving quality while decreasing costs. The foundation of these can be found by simply looking at the amount of money the United States spends on healthcare in comparison to other countries. Perhaps even more alarming is that the United States falls

well behind the lead when it comes to many of the quality metrics used to evaluate care. The data to support the need for change is overwhelmingly clear.

A literature review shows one area of concern is in readmission to the hospital after a hospitalization. Policies have created penalties for hospitals that have patients return for the same condition shortly after being sent home. The uniqueness of communities has created several different transitional care programs that include different formats and providers. The CHAP is one of these transitional care programs that has become popular recently due to being focused more simply on providing resources that focus on social determinants of health that are causing barriers at adhering to a prescribed treatment regimen. One format of this program includes in-home and in-person visits conducted by advanced practice paramedics and an occupational therapy assistant.

A program evaluation was conducted to show the efficacy the CHAP has on readmission rates. While the study began with robust intentions, the data resulted in a small sample size that compared 22 patients in the CHAP with 22 patients in a non-CHAP group. Data analysis revealed that there may be some benefit to being in the program. With more visits from CHAP providers being associated to more days until the next readmission. This supports the need for a more in-depth evaluation while simultaneously showing that more of these programs are needed. A cost-benefit analysis of program cost versus incurring readmission penalties will help implement more programs.

The next step is to disseminate the data among all stakeholders. Allowing the community, policy makers, and other healthcare facilities to see the results can create momentum for changes. Facilities can use the data to begin performing a cost-benefit

analysis for those that have high readmissions. The community can use the results to understand how social issues can impact health outcomes. Policy makers can use the data to create funding for implementation of other programs in at-risk communities. Allowing all stakeholders to see the information will build a foundation to create and sustain necessary change that has been sought for years.

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Appendix A

Reference Matrix

Legend:

Level of evidence (LOE): I – systematic review, II – randomized control trials, III – Nonrandomized controlled studies, IV – Controlled Cohort studies, V – Uncontrolled cohort studies, VI – Case studies, qualitative and descriptive studies, evidenced-based practice implementation, quality improvement projects, VII – expert opinion

Grade: A – strong recommendation (level I, II, III, IV), B – recommendation (level II, III, IV), C – optional (level II, III, IV) with flexible decision making required, D – optional (level V, VI, VII) should consider along with support from other sources

CITATION Author(s), Date, Title, Journal Information, doi	**PURPOSE / BACKGROUND** Purpose & Outcome Measures or Goals (Aims)	**PARTICIPANTS / SETTING** Sample & Setting	**METHODS / DESIGN** Study Design & Interventions	**RESULTS / LIMITATIONS / RECOMMENDATIONS** Results, Strengths/Weaknesses, Limitations, & Recommendations
Abshire, M., Xu, J., Baptiste, D., Almansa, J. R., Xu, J., Cummings, A., Andrews, M. J., & Dennison Himmelfarb, C. (2015). Nutritional interventions in heart failure: a systematic review of the literature. Journal of cardiac failure, 21(12), 989–999. https://doi.org/10.1016/j.cardfail.2015.10.004	To evaluate components of nutritional interventions and create evidence for future practice	17 random control trials found through CINAHL, PUBMED, and EMBASE	Systemic review	LOE: I Strengths: missed studies, occur across multiple countries, interventions pose little opposition to implement Limitations: studies from multiple countries, inconsistent reporting across studies makes comparison difficult, most studies focus on macronutrients

				Risks: minimal patient risk for program implementation Feasibility: would require teaching and f/I from RN and dietitian Grade: A Conclusion: recommend based on strengths necessitate consideration for use
Angraal, S., Khera, R., Zhou, S., Wang, Y., Lin, Z., Dharmarajan, K., Desai, N. R., Bernheim, S. M., Drye, E. E., Nasir, K., Horwitz, L. I., & Krumholz, H. M. (2018). Trends in 30-day readmission rates for Medicare and non-Medicare patients in the era of the Affordable Care Act. The American journal of medicine, 131(11), 1324–1331.e14. https://doi.org/10.1016/j.amjmed.2018.06.013	Assess the impact of the Hospital Readmission Reduction Program (HRRP) on heart failure (HF) readmissions among all payers	A yearly review of 18-27 states between 2010-2015 that totaled 2,128,140 patients with HF	Meta-analysis of the Nationwide Readmissions Database	LOE: I Strengths: evaluation of three payer systems, risk adjusted ratio with 95% CI, sample size included anyone over 18 Limitations: only uses the HRRP Risks: minimal risk for program implementation Feasibility: program recommended as a national standard Grade: A Conclusion: recommend due to strengths create a broad use for the study

Bradley, E., Curry, L., Horwitz, L., Sipsma, H., Thompson, J., & Elma, M. et al. (2012). Contemporary evidence about hospital strategies for reducing 30-day readmissions. Journal Of The American College Of Cardiology, 60(7), 607-614. doi: 10.1016/j.jacc.2012.03.067	Determine the range and prevalence of practices currently in place to reduce HF and myocardial infarction readmissions	537 hospitals	Cross-sectional study conducted via web-based survey	LOE: VI Strengths: data was gathered by direct hospital reporting rather than from databases, response rate was more than 90%, sample size was more than 500 hospitals Limitations: the study relied on hospital self-reporting, the sample size was limited to only hospitals in the home health program Risks: patient emotional vulnerability Feasibility: requires someone to hold sessions and record data Grade: D Conclusion: recommend with patient preference due to good response rate and perspective directly from the hospital
Chamberlain, R. S., Sond, J., Mahendraraj, K., Lau, C. S., & Siracuse, B. L. (2018). Determining 30-day readmission risk for heart failure patients: the Readmission After Heart Failure scale. International journal of general medicine, 11, 127–141.	Develop a scale that predicts readmission rates for patients with heart failure	State Inpatient Database resulting in 642,448 patients from New York and California and 365,359 from Washington and Florida	Systemic review	LOE: I Strengths: proposes a new risk scale, reviewed more than 1 million patients, accounted for multiple risk factors Limitations: only conducted in four states

https://doi.org/10.2147/IJGM.S150676				Risks: minimal risk for implementation, risk occurs in lack of accuracy if present Feasibility: requires assessment by a provider Grade: A Conclusion: recommend based on proposition of new scale, sample size
Desai, A. (2012). The three-phase terrain of heart failure readmissions. Circulation: Heart Failure, 5(4), 398-400. doi: 10.1161/circheartfailure.112.968735	Clearly define the landscape of readmissions beyond 30 days to design future strategies	8,543 newly discharged Canadian patients with heart failure	Longitudinal cohort	LOE: IV Strengths: presents a 3-phase approach to readmissions for HF, presents multiple interventions for various factors Limitations: performed on Canadian patients Risks: minimal patient risk for implementation, risk falls in lack of accuracy if present Feasibility: requires a provider to assess Grade: C Conclusion: recommend due to provision of new approach to view

				HF readmission, presents multiple ideas to reduce readmission
Feltner, C., Jones, C., Cené, C., Zheng, Z., Sueta, C., & Coker-Schwimmer, E. et al. (2014). Transitional care interventions to prevent readmissions for persons with heart failure. Annals Of Internal Medicine, 160(11), 774. doi: 10.7326/m14-0083	Assess the ability of transitional care interventions to reduce readmission and mortality rates for heart failure	47 random controlled trials	Systemic review and meta-analysis	LOE: I Strengths: evaluates multiple interventions Limitations: some interventions lack reporting data, some interventions require extensive resources for implementation Risks: breach of privacy, access to home care needs Feasibility: requires personnel and/or program to create in-home care after d/c Grade: A Conclusion: recommend due to evaluation of multiple interventions
Flodgren G, Rachas A, Farmer AJ, Inzitari M, Shepperd S. Interactive telemedicine: effects on professional practice and health care outcomes. Cochrane Database of Systematic Reviews 2015, Issue 9. Art. No.: CD002098. DOI: 10.1002/14651858.CD002098.pub2.	Assess the effectiveness/ acceptability/ costs of telemedicine (TM)	93 trials that evaluated effectiveness of interactive telemedicine in addition to, as an alternative, or partly substituted for usual care	Meta-analysis randomized control trials (RCT's)	LOE: I Strengths: large sample size, specific to HF, showed improved quality of life Limitations: showed little correlation, implementation poses several barriers

				Risks: lack of significant correlation poses little benefit Feasibility: requires technology, providers, technological resources (devices, connection, someone to troubleshoot) Grade: D Conclusion: not recommended due to lack of correlation and potential barriers making broad use difficult
Gupta, A., Allen, L. A., Bhatt, D. L., Cox, M., DeVore, A. D., Heidenreich, P. A., Hernandez, A. F., Peterson, E. D., Matsouaka, R. A., Yancy, C. W., & Fonarow, G. C. (2018). Association of the hospital readmissions reduction program implementation with readmission and mortality outcomes in heart failure. JAMA cardiology, 3(1), 44–53. https://doi.org/10.1001/jamacardio.2017.4265	Examine the association of the HRRP with readmission and mortality	115,245 Medicare patients across 416 US hospitals	Interrupted time series and survival analysis index	LOE: V Strengths: gender representation, follows AHA “Get with The Guidelines” (GWTG) program, patients with advanced disease process were excluded (presence of ventricular assistive device or hospital stay > 30 days) Limitation: specific to elderly (average age 80.5), limited to Medicare patients, lacks ethnic representation Risks: minimal risk as if follows current guidelines

				Feasibility: nationally recognized program, requires staff to educate and monitor Grade: D Conclusion: recommend due to following GWTG guidelines, excludes high risk patients, shows difference between male and female
Jackevicius, C., de Leon, N., Lu, L., Chang, D., Warner, A., & Mody, F. (2015). Impact of a multidisciplinary heart failure post-hospitalization program on heart failure readmission rates. Annals Of Pharmacotherapy, 49(11), 1189-1196. doi: 10.1177/1060028015599637	Evaluate the effect of a multi-disciplinary team on HF readmissions	277 patients	Retrospective cohort study	LOE: IV Strengths: considers many disciplines Limitations: examines a program already in existence, multiple resources would be needed to create the clinic, rural areas may not have access to a central clinic, small sample size, relies on ability for patients to visit clinic Risks: communication is more difficult when more people are involved Feasibility: requires involvement from multiple staff members, requires post d/c f/u Grade: C

				Conclusion: recommend as it shows importance of a multidisciplinary approach
Rosen, D., McCall, J. D., & Primack, B. A. (2017). Telehealth protocol to prevent readmission among high-risk patients with congestive heart failure. The American journal of medicine, 130(11), 1326–1330. https://doi.org/10.1016/j.amjmed.2017.07.007	Assess adherence and effectiveness of a TM program	Random sample of 50 patients with congestive heart failure	RCT	LOE: II Strengths: p value is statistically relevant for overall decrease in readmissions good adherence at 120 days Limitation: small sample size, does not consider demographic data, implementation poses barriers Risks: minimal risk as program is already included in national guidelines Feasibility: requires staff to educate, implement, monitor Grade: B Conclusion: recommend as data showed statistically relevant
Ryan, C. J., Bierle, R. S., & Vuckovic, K. M. (2019). The three rs for preventing heart failure readmission: review, reassess, and reeducate. Critical care nurse, 39(2), 85–93. https://doi.org/10.4037/ccn2019345	Evaluate treatment strategies that reduce readmissions	Review of readmission data from registries, databases, and Medicare claims	Systemic review	LOE: I Strengths: comprehensive review, assesses multiple factors, evaluates various sources, presents new model

				Limitations: lacks statistical data, proposes the use of multiple simultaneous interventions Risks: not all patients will be receptive to palliative care, breach of privacy in the home setting, missed categorization of patient Feasibility: requires hospital and home staff, education on categorization of patients Grade: A Conclusion: recommend as it evaluates multiple factors, presents new model
Sevilla-Cazes, J., Ahmad, F. S., Bowles, K. H., Jaskowiak, A., Gallagher, T., Goldberg, L. R., Kangovi, S., Alexander, M., Riegel, B., Barg, F. K., & Kimmel, S. E. (2018). Heart failure Home management challenges and reasons for readmission: a qualitative study to understand the patient's perspective. Journal of general internal medicine, 33(10), 1700–1707. https://doi.org/10.1007/s11606-018-4542-3	Understand patient and caregiver challenges managing HF at home	31 patients from two hospitals	Observation qualitative study	LOE: VI Strengths: interviews comprised of open-ended questions, presents patient and caregiver views, identified two cycles to readmissions Limitations: small sample size, comprised of comments rather than statistical data Risks: none noted Feasibility: staff needed to improve d/c f/u

				Grade: D Conclusion: recommend as it provides perspective from the patient and caregivers, identifies two cycles to readmission
Vader, J. M., LaRue, S. J., Stevens, S. R., Mentz, R. J., DeVore, A. D., Lala, A., Groarke, J. D., AbouEzzeddine, O. F., Dunlay, S. M., Grodin, J. L., Dávila-Román, V. G., & de Las Fuentes, L. (2016). Timing and causes of readmission after acute heart failure hospitalization-insights from the heart failure network trials. Journal of cardiac failure, 22(11), 875–883. https://doi.org/10.1016/j.cardfail.2016.04.014	Study factors causing readmission in younger population of HF patients	835 participants across three studies	Post-hoc retrospective analysis	LOE: I Strengths: focus on HF, participation not limited to elderly, identified multiple factors Limitations: focuses on three studies, small sample size, some participants occurred in more than one study, data was not statistically relevant in most studies Risks: data does not support significant improvement with implementation Feasibility: staff required to monitor multiple factors does not outweigh the result Grade: D Conclusion: not recommended due to lack of statistically relevant data, small sample size

Vivo, R. P., Krim, S. R., Liang, L., Neely, M., Hernandez, A. F., Eapen, Z. J., Peterson, E. D., Bhatt, D. L., Heidenreich, P. A., Yancy, C. W., & Fonarow, G. C. (2014). Short- and long-term rehospitalization and mortality for heart failure in 4 racial/ethnic populations. Journal of the American Heart Association, 3(5), e001134. https://doi.org/10.1161/JAHA.114.001134	Compare 30-day and 1-year readmission rates among four ethnic groups	47,145 patients across 213 hospitals in the US 83.2% white 10.5% black 5% Hispanic 1.4% Asian/ pacific islander	Meta-analysis from the GWTG registry	LOE: I Strengths: evaluated different ethnic groups, good gender representation Limitations: only Medicare recipients, population is primarily, ethnic representation is primarily white Risks: focus on ethnicity can lead to stereotyping, bias, unequal treatment plans Feasibility: staff required to f/u post d/c with high risk populations Grade: A Conclusion: recommend as it presents ethnic considerations

Appendix B

Data Collection Tool

Assigned Numerical Value									
Outcome Measures		1	2	3	4	5	6	7	8
	Heart Failure Primary Versus Secondary Diagnosis	Primary	Secondary						
	Gender	Male	Female	Transgendered	Not answered				
	Ethnicity	White	Black or African American	Hispanic or Latino	Asian	American Indian or Alaskan Native	Native Hawaiian or Pacific Islander	Other	Not answered
	Insurance	Medicare	Medicaid	Private	None				
	Variable(s) Assigned Direct Numeric Value Based on Result								
	Days to Readmission								
	Age								
	Length of Stay								
	Numbe of CHAP visits								
	Number of Emergency Room Visits								