Comprehensive Heart Failure Transition Program

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A DNP Research Project Submitted to Clarion and Edinboro Universities

In Partial Fulfillment of the Requirements for the Doctor of Nursing Practice Degree

November, 2020

Author Note

Grant funding was provided by Hamot Health Foundation, 302 French Street, Erie, PA, 16507

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Abstract

During the COVID-19 crisis in the spring of 2020, the nursing department responsible for facility-wide cardiac education and interdisciplinary communication was disbanded and redirected to other hospital needs. With that change and the subsequent lack of cohesive educational efforts, the hospital readmission rate climbed to 29.85%. This hospital system has consistently had readmission rates greater than the Centers for Medicare & Medicaid Services (CMS) national benchmark of 21.9% (Medicare, measures, and current data collection periods), which is both detrimental to our patients and causes us to incur readmission penalties yearly. Before this program began there was no process to transition care from inpatient to outpatient for the heart failure (HF) population; key members that touched HF patients operated in silos. Based on consistently high readmission rates and need for improved outcomes, a comprehensive HF discharge program was designed and implemented house-wide. Transitional care coordination includes providing education, scheduling post-discharge follow-up appointments, and providing HF toolkits. There was a retrospective analysis of data three months after the implementation of QI initiatives. Our facility's all-cause 30-day readmission rate has progressively declined by 7.63% since the HF transitional program's implementation (Study period 25.37% down to 17.74%). Readmission average rate for 2019 was 24.9% (n=241) (July 6-September 30, 2019) and compared to after implementation in 2020 was 22.56% (n=195) (July 6-September 30, 2020). Overall, we have found having an advanced practice provider (APP) lead a multi-disciplinary program to be the best practice for the HF population while improving outcomes and the ability for self-care while decreasing 30-day readmission.

Keywords: heart failure, transitional care, readmission, and navigator

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Comprehensive Heart Failure Transition Program

Congestive heart failure affects more than five million patients in the United States. By 2030, over eight million people in the United States (1 in every 33) will be diagnosed with HF. This disease process is associated with a high level of disability, healthcare costs, and mortality. HF is one of the main causes of hospital readmission and is the primary cause of readmission in many medical facilities. It remains the most common cause of hospitalization in persons older than 65 years. It is identified that HF patients who are readmitted often have multiple gaps in care. These include decreased health literacy, lack of follow-up with medical professionals, deficiency of resources, and inability to adhere to medication and dietary regimens after discharge.

Regular communication with HF patients improves the chances of strictly following the treatment plan, medication adherence, and physical activity recommendations (Lee, 2016). Researchers note that the inadequacy of communication and post-discharge follow-ups increases the chance of readmission. Since HF patients are susceptible to readmissions due to the disconnection of their care, medication regimen and appropriate interventions should be implemented across the continuum. Medication adherence is one of the most impactful areas of inadequate medical treatment. On average, 50 to 60% of patients discharged from the hospital have medication discrepancies. To decrease this patient safety risk, the Joint Commission National Patient Safety Goals recommend medication reconciliation at all transitions of care because post-discharge medication discrepancies are related to a high risk of readmission.

When readmission rates for HF patients are higher than the benchmark, it may signify insufficient discharge planning. Government and commercial payers have defined a 30-day readmission rate as a quality measure for hospitals and providers. The Hospital Readmissions

Reduction Program (HRRP) is a Medicare value-based purchasing program that reduces payments to hospitals with excessive readmissions. The HRRP applies a 30-day cutoff after which readmissions are no longer penalized. Using the standard time set by Medicare this program evaluation will use a regression discontinuity design and will no longer follow the patients after the 30 days ("Readmissions-Reduction-Program", 2019).

The objective of the HF program evaluation is to determine whether transitional care interventions will result in improved patient safety outcomes, decreased readmissions, and improved revenue streams/loss prevention. Before the implementation of this Comprehensive Heart Failure Transition Program, there was not a process for transitional care from inpatient to outpatient for the HF population. In addition, the department responsible for facility-wide cardiac education and interdisciplinary communication had been disbanded due to reduced resources impacted by the COVID-19 crisis, which further increased gaps in HF transitional care. Even before this change, our facility has consistently had readmission rates higher than the CMS national benchmark of 21.9%, suggesting poorer outcomes for our patients.

We also anecdotally noted that many of our patients stated they did not have the physical tools or understanding necessary to appropriately self-manage their care, such as scales and blood pressure (BP) cuffs. Over the three-month program evaluation, 55% of the patients admitted to the hospital did not have scales and 62% did not have BP cuffs. There was a total of 195 patients that met HF diagnosis criteria and 115 patients received a component of the kit (58.97%). Our patients also are often unable to access timely outpatient follow-up care per CMS guidelines. In comparison to data from the previous year, the average patients that had a seven-day follow-up appointment were 48.7%, with the comprehensive discharge plan, the seven-day follow-up improved to 66.8%.

Available Knowledge

Many HF studies have been completed since the recent health care reform with the fundamental goals of more efficient coordinated care leading to higher-quality outcomes for all patients and increased cost savings for patients and facilities. The literature review focused on the improvement of quality of life and decreased hospital readmission for the HF population. Disjointed points of patient care during transitions are common occurrences and noted to be detrimental to patient safety. HF interventions shown to overcome these safety problems include enhanced medication reconciliation, improvement of self-care, and increased health literacy. According to Cajita (2016), "Adequate health literacy was consistently correlated with higher HF knowledge".

One such study concludes that home visits by nurses with structured telephone support and supportive HF clinics decreased all-cause mortality after hospitalization for HF (Van Spall, 2017). A further literature search by Garcia (2017) found evidence that a multicomponent transitional care program should include an advanced practice nurse (APN), structured telephone support, and home visiting programs delivered through in-person (face-to-face) communication. Five studies highlighted the use of an APN as the manager and leader of the HF program which, combined with other interventions, demonstrated positive effects in reducing hospital readmissions through at least 30 days after discharge. HF nurse practitioners and APNs have developed a prominent role in HF care and are a prime focus for developing strategies to reduce HF readmissions on a single-facility level (Goldgrab, 2019).

Before this transitional program, the medical center had a fully operational outpatient advanced practice providers (APP) (nurse practitioners and physician assistants) led HF clinic for over 15 years. Takeda reported, "Case management studies probably slightly reduce

readmissions to hospital for any cause. As for HF readmissions, evidence was strongest for those interventions delivered by a specialist nurse. Clinic-based intervention models appeared to have little to no effect on the risk of readmission for any cause, whereas multidisciplinary programs may slightly reduce the risk of all-cause readmission" (2019).

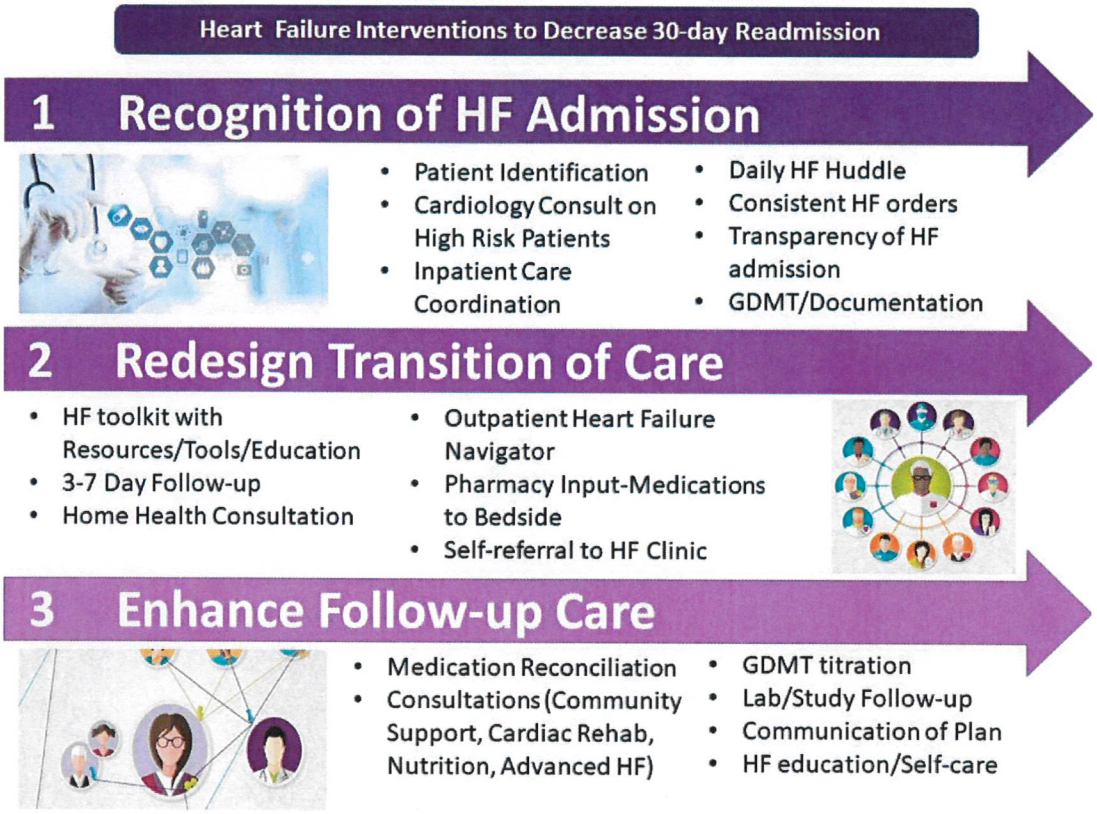
Our literature review consistently demonstrated that a comprehensive discharge plan reduced readmission rates. Research is relatively consistent that nurse-driven education, follow-up, and multidisciplinary interventions can reduce readmissions and decrease mortality. When there is a systematic approach to bridging patient care from inpatient to outpatient, the noted studies listed have shown a decrease in readmission rates and improvement in patient outcomes, including patient satisfaction, a better quality of life, and improved adherence to the medical regimen.

Rationale

Multiple randomized studies of post-discharge interventions after hospitalization for HF have reported mixed results, with two meta-analyses suggesting possible benefit with various types of interventions, including home visits, clinic visits, and telephone calls (Lee, 2016). We instituted multiple interventions shown to be effective in reducing HF readmissions (Figure 1). These interventions include a self-care toolkit (large bathroom scale, BP cuff, educational binder, weight log, measuring cup, symptom magnet, and medication box), transitional three to seven-day follow-up appointment made before discharge (with primary care provider (PCP), APP-led HF clinic, APP-led cardiology Transitional Care Clinic (TCC), advanced HF specialist, or primary cardiologist). Interventions also include the self-referral process to HF clinic, discharge checklist with daily HF team huddle, home health referral, enhanced medication and HF

education with videos and teach-back, post-discharge automated phone call by CipherHealth Inc., and new medication delivered to the bedside by the pharmacy.

Figure 1



Specific Aims

The purpose of this project was to improve HF population health and decrease the average 30-day All-Cause readmission rates to below the CMS average of 21.9%. All interventions listed are implemented and ordered for all patients discharged with a HF diagnosis. Patients may refuse all or parts of this holistic plan, such as not following up in three to seven-days or declining home health care. Using this data, multi-disciplinary teams can examine the root cause of readmissions and implement evidence-based post-discharge transition intervention plans. With statistical analysis, we can assess the influence of these interventions on 30-day readmission rates and quality measures. The goal of this process improvement program is to

supply HF patients with the holistic services and attention they need to optimize and sustain their health and prevent readmission. By focusing on research data and interventions, these readmission reduction plans will continue to progress into a positive program focused on quality and improved clinical outcomes while achieving anticipated cost savings and increased quality of life.

A fellow professional/academic peer partnered with this QI initiative program and serves as a secondary aim to decrease the readmission penalty and financial health care burden of HF readmission. This QI program intends to be financially sustainable with a reduction of our 30-day readmission rate.

Context

Our northwestern Pennsylvania hospital is a 423-bed medical center with level II trauma and multiple units ranging from observation to several intensive care units divided by diagnoses. This hospital offers full inpatient and outpatient services and serves as a tri-state regional referral hub from Western New York through Eastern Ohio, encompassing a 120-mile radius. During the COVID-19 crisis in the spring of 2020, the nursing department responsible for HF education was redirected to other hospital bed-side needs. With that change and the subsequent lack of cohesive educational efforts, the hospital readmission rate climbed to 29.85%. This hospital system has consistently had readmission rates greater than the CMS national benchmark of 21.9% (Medicare, measures, and current data collection periods), which is both detrimental to our patients and causes us to incur a readmission penalty yearly. Before this program began there was no process to transition care from inpatient to outpatient for the HF population; key providers and medical personnel that touched HF patients operated in silos.

The poorest zip code in America for both median and mean income is 16501, which is in the area where our facility is located (Wallace & Irma Wallace, 2019). Socioeconomic status is known to impact HF outcomes and rehospitalization. Low income was associated with a higher risk of all-cause and non-HF readmission within 1 to 12 months after HF diagnosis and HF readmission within 3 to 12 months among patients with incident HF with reduced ejection fraction (HFrEF). Low-income patients also had a higher number of hospital bed days and a higher rate of mortality during follow-up (Schjødt, 2019). Patients often stated they do not have the physical tools and knowledge to help them manage their care. They have problems understanding the complexity of care and many are at high risk for low health literacy. These factors, coupled with a high occurrence of medication errors when transitioning from hospital to home, validate why an early three to seven-day follow-up and an effective post-discharge appointment have become a deliberate intervention decreasing readmission rates. HF management requires a partnership with patients and their understanding of how to appropriately self-manage their care, such as a healthy diet, medication regimen, weight, and BP logs with the use of scales and BP cuffs.

Inadequate health literacy is associated with an increased risk of death and hospitalizations. The goal of HF patient education and literacy is to support patients and their caregiver(s). This may include new disease management knowledge, problem-solving skills, strategies, and motivation necessary for adherence to the medical plan and active participation in self-care.

Close monitoring with post-discharge appointments is shown to decrease readmission rates. Measures can be made through clinical assessment, medication reconciliation and titration, and other guideline-directed medical therapies (GDMT) for HF. The medication reconciliation

procedural standard contains a review of appropriate medications, recognizing discrepancies, revising them according to the intended plan of regimen, and distributing a confirmed list to the patient. Research has shown a decrease in HF hospitalizations and mortality following medication interventions focused on medication optimization of GDMT, medication education, and reconciliation. Notably, before this program implemented the transitional process, patients frequently fell outside the CMS recommended window of seven days for receiving post-discharge follow-up care which may have contributed to increased readmission rates.

Interventions

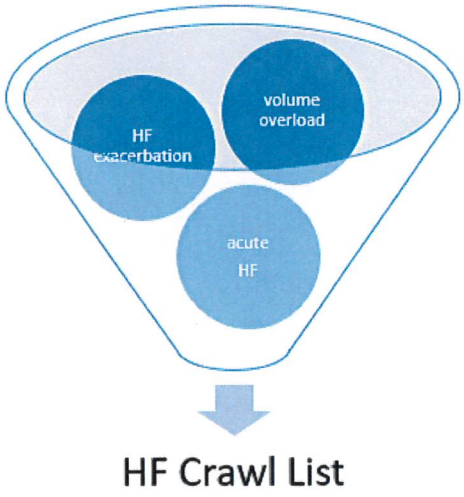
There was a retrospective analysis of data three months after the implementation of QI initiatives. The HF coordination team includes a part-time HF nurse coordinator, physician assistant, and nurse practitioners who identified current inpatients with a primary diagnosis of HF using an accurate real-time report called the "crawl list." This list was created for this QI program with informatics to search in-house HF symptom documentation "crawling" through electronic health records (EHR) text (ED notes, progress notes, diagnostic studies, history and physical, etc.) looking for key HF coding terms such as acute on chronic HF (systolic, diastolic, reduced ejection fraction, preserved ejection fraction HF), acute pulmonary edema, and ejection fraction <40% (Figure 2). The diagnosis of HF is, first and foremost, a clinical one, based on the New York Heart Association heart failure functional classification. Coding in our facility was not real-time, therefore, evaluation of the concurrent documentation was necessary.

Figure 2

Search engine scans cardiac catheterization and echocardiogram reports, emergency department, history and physical, operate, progress and radiology notes to include them in the HF Crawl List.

Included patients with the following phrases:

- fluid/volume overload
- acute/decompensated chronic heart failure/CHF/HF
- CHF/HF/HFrEF exacerbation
- exacerbation heart failure



Excluded patients with the following phrases:

- grade 1
- no vascular congestion seen/identified
- cardiothoracic surgery post-operative progress note
- not/no/suspect/possible/questionable/potential exacerbation

The HF coordination team, including the original outpatient HF clinic, provides care coordination and transitional care. The Quality Manager provides statistics and factual reports using de-identified EHR information. The Director analyzes clinical and financial reports to determine the impact of QI interventions. For overall transparency, a HF readmissions dashboard enables the healthcare provider to track trends, understand performance, and better manage readmission rates for their patient population. In a study that looked at an institution with a quality improvement program already in place to reduce 30-day readmission rates for HF, an electronic medical record (EMR) based approach further significantly reduced 30-day index hospital readmission rates (Banerjee, 2017).

The implemented transitional process consists of:

- A real-time HF "crawl" list auto-generated daily showing all patients who met specific criteria that identified them as an acute HF patient admission.
- This information is emailed daily to the unit nursing directors, case management, pharmacy, and outpatient HF clinic to facilitate transitional care.
- The list is communicated to the HF care coordination team, which includes the HF navigator and HF providers.
- Identified patients are approached by a member of the team to ensure that the comprehensive discharge plans are initiated, and transitional care efforts are started (such as home health, referrals, and follow-up on lab work and studies).
- The patients are given HF discharge survival toolkits (including scale, BP cuff, measuring cup and tape, medication organizer, weight logs, educational binder, symptom magnet (Figure 3), and 30 days' worth of newly prescribed medications).
- Patients are educated using teach-back as an interactive teaching method that uses basic language focusing on crucial facts and asks patients to verbally recall health information just discussed regarding HF and self-care. Education includes recognition of escalating HF symptoms, plan for response to symptoms, activity/exercise tolerance recommendations, daily weight monitoring, medication adherence, promotion of self-care, specific dietary recommendations including sodium restriction and fluid intake, and the importance of routine and timely follow-up care. Patients may also view one to two-minute videos on an electronic tablet on relatable cardiology topics if additional education is needed.

- Guideline-directed post-discharge appointments are made based on the patients' needs and preferences and relayed before discharge.
- Medications are reconciled by a designated pharmacist before discharge to ensure accuracy and the patients' ability to obtain and afford the prescribed medications. The on-site pharmacist provides new medication education with verbal and written education.

Figure 3

Heart Failure Refrigerator Magnet

Every Day!

- Weigh yourself first thing every morning after you urinate.
- Take your medicines as directed.
- Check for swelling or shortness of breath.
- No more than 2000 mg of sodium and 6 to 8 cups of liquid per day.

Warning! Call the cardiology office if:

- Weight is up 3 pounds in a day or 5 pounds in a week.
- Increased shortness of breath or cough.
- Swelling or bloating.
- Mild chest pains.
- Trouble sleeping.

STOP! Go to the ER or call 911 if you:

- Are struggling to breathe.
- Have new or severe chest pains.
- Have confusion, dizziness, or fainting.

Cardiology Office:_____

Phone #: _____

Our cardiology TCC was created as a dedicated transitional intervention clinic for people with chronic diseases such as HF. The TCC clinic was designed as an option to offer provider visits geared toward readmission avoidance after recent hospital discharge; we found this to be an imperative resource for patients with chronic diseases such as HF. This clinic does not substitute required regular PCP or cardiology visits; it is a bridge from the hospital admission until the patient stabilizes in the home-based setting.

Many factors contribute to unsuccessful transitions of patient care, including:

- Communication breakdowns: Providers do not effectively communicate significant information among the care team, to the patient, family, or those taking care of the patient at home.
- Patient education breakdowns: Patients or family/caregivers often receive inconsistent recommendations, confusing instructions about follow-up care, and unclear medication regimens.
- Accountability breakdowns: PCPs are occasionally not identified by name during discharge planning. Often, there is no clinical entity that takes accountability to ensure that the patient's health care is coordinated across several settings and among different providers.
- Medication reconciliation breakdowns: Completing a precise medication reconciliation is imperative to ensure safe, compliant, and effective medication use. Having an accurate medication list allows the care team to differentiate it with the patient's current and newly prescribed medications to identify discrepancies and minimize potential adverse drug events. Executing strategies can promote safe and smooth transitions from one level of care to the next.

Our outpatient transitional care team consists of nurse practitioners, physician assistants, nurses, and medical assistants. Consultations can be made to additional operating units such as HF clinic, advance HF clinic, electrophysiology clinic, structural heart clinic, home health/home telemonitoring, medical nutrition, outpatient infusion center (outpatient diuretics), pharmacy (daily medication scheduled packets and home delivery), cardiopulmonary rehabilitation, palliative care, and other consultants/departments/studies.

The strategies of effective transitional care services are central to improving outcomes-based patient care delivery and safety, reducing hospital readmissions, and reducing overall expenses to the health care system. Clear, concise, and comprehensive patient-provider communication is the key to attain optimum transition of care.

Step by step TCC procedure:

1. Confirm of appointment with a pre-visit phone call
2. Medication reconciliation
3. Documentation of admission and discharge date with a summary of hospitalization
4. Nursing and provider assessment and plan
5. Screenings (tobacco cessation, sleep apnea, depression, and falls)
6. Consultations can be ordered
7. Order follow-up lab work/studies if needed
8. Routine follow-up with PCP, cardiology, or HF clinic planned
9. Letter sent to PCP via mail or EMR and a phone call to the care team if needed
10. Post-visit follow-up phone call made to the patient (if ordered)

Study of the Interventions

The goal is to implement this intervention for every acute HF patient admission to decrease HF readmission rates. In this case, group assignment has already taken place as described by participation in interventions for transitional care. As a result, every HF patient discharged from the facility is offered a comprehensive discharge plan intervention. However, because randomization will not be used, one validity threat to quasi-experimental studies is selection bias. It may be that there is something different about the patients who choose to participate in the program (e.g. they are more motivated or have a higher socioeconomics level) that makes them more likely to succeed by decreasing their hospital readmission.

The quantitative, retrospective, quasi-experimental method was appropriate because the intent was to examine the effect of a multifactorial discharge plan using an intervention group and a control group. Although the treatment intervention has already taken place, the method for measuring the variables was controlled to produce quantifiable data for both levels of interventions. Statistical analyses were performed on this data regarding the existence of any possible link between comprehensive discharge plan and HF outcomes to evaluate and study the impact.

Measures

Total HF patients and 30-day readmissions are continuously monitored within our facility's heart and vascular institute and on a system-level health catalyst reporting within our northwestern Pennsylvania medical center. This data is both measurable and observable. It is imperative to track performance metrics, establish readmission baselines, and distribute information to multi-disciplinary teams involved to reduce readmissions. The data consists of a diagnosis of HF, frequency of rehospitalization episodes, total inpatient days, cardiology

consultation, home health consultation, pharmacy intervention, HF self-care kit, and follow-up episodes for patients who receive the comprehensive discharge plan and those who did not. These were compared against the previous calendar year before transitional care interventions were initiated. Exclusion criteria based on HRRP criteria included the pediatric population, discharge to another facility or hospice, a patient left against medical advice, or death. Our data does include planned readmissions since our system catalyst data does not exclude them.

Analysis

The direct capturing of data ensures high credibility, dependability, confirmability, and transferability regarding this quantitative data collection and analysis. The data compared readmission rates of patients with HF one year before implementation (July-September 2019) and then compared it to the HF readmission rates of people discharged after implementation of our HF program. The evaluation was done on the impact of HF intervention pre and post-implementation of the program. The data and subsequent analysis tracked the interventions' impact on readmission rates and balance measures. By looking at a similar time frame for the pre and post-program evaluation, we expected to decrease variability in the data. Since the planning of this evaluation, the COVID-19 pandemic has occurred and continued to possibly account for some variation in the results. In response to the COVID-19 crisis, a much higher volume of patient visits has taken place via virtual encounters, with a subcategory of patients clinically identified as needing further in-person clinic assessment.

Ethical Considerations

This program evaluation used a quasi-experimental approach. These methods offered hands-on options for conducting impact program evaluations in real-life hospital situations. Utilizing pre-existing patient groups such as a preprogram group of HF patients and then a

similar group who had already participated in this HF program, we were able to avoid the ethical concerns associated with a random assignment such as experimental methodologies. For example, the withholding or delaying of a potentially effective treatment or the provision of a less effective treatment for one group of study participants (White, 2014). This program was planned to remedy the high readmission rate before the program evaluation was considered and then evaluate the results to see if the program was effective.

Results

For effective execution of the HF interventions, stakeholders needed clear and concise evidence-based communication of the plan. The inpatient and outpatient team members played a major role; they included a registered nurse navigator, APPs, cardiologists, pharmacists, nurse clinicians, hospital executives, case managers, home health, quality manager, and the outpatient HF clinic.

Evaluating the problem, reviewing available knowledge and the development of the transitional HF interventions took four weeks. The first phase of the implementation was to establish the most appropriate strategies to decrease 30-day readmission for patients with HF and determine the anticipated outcomes. The second phase involved reviewing the evidence acquired from literature and systematic reviews on its appropriateness and determining whether it follows the best practices in addressing the issue of readmissions. The third phase promoted the engagement of the stakeholders. It involved meeting with colleagues and developing a protocol for implementing the intervention within the organization. The last phase evaluated the effectiveness of the intervention in addressing the problem of reducing readmissions for exacerbation of symptoms within 30 days of discharge from the medical center.

The HF population was evaluated for the quantity of unplanned HF readmissions occurring within 30 days, with day zero defined as the discharge date for the HF diagnosis index hospitalization. Unplanned readmission was well-defined by CMS as readmissions that are not part of a patient's plan of care, within 30 days of discharge from the medical center, as defined previously through exclusion criteria. Unlike CMS, our medical center's health catalyst reporting system includes all age groups, planned readmissions, and all insurance payors. Historically, our system catalyst readmission data is higher than the HRRP data.

The final program evaluation population included 195 patients admitted from July 6, 2020, to September 30, 2020. We identified six factors that were associated with the relative change in 30-day risk-adjusted readmission rates.

The expectation that a holistic discharge plan to reduce readmissions among patients with HF is that implementing a general transition of care would result in significant reductions in readmission. As noted, there is a large number of studies indicating that systematic implementation of quality improvement initiatives results in enhancements of readmission 30-day rates, our program evaluation for the first 3 months of assessment was in line with our literature review.

Summary

We introduced a real-time principal diagnosis recognition process called the "crawl list" after identifying the difficulty of accurately recognizing patients during their hospitalization who would go on to be coded as HF. This quality improvement initiative empowered us to assist a larger number of eligible patients, even if not with the full HF interventions such as follow-up appointments or home health. The evidence of this initial program evaluation advocates that HF

interventions are effective in reducing 30-day readmissions if they consist of components listed in Figure 1, and which are provided and coordinated by an APP-lead care coordination team.

Various strategies for engaging patients in their care have been researched including motivational interviewing, teaching to goal, and teach-back methods of initiation and engagement. Summary of this QI program interventions include a self-care HF toolkit (large bathroom scale, BP cuff, educational binder, weight log, measuring cup, symptom magnet, and medication box) and holistic transition of care. Providing patients with a survival kit not only provides them with the physical and educational tools needed for self-care but also encourages engagement and self-confidence. This kit also provides contact information available during the time of transition.

A scheduled three to seven-day follow-up appointment is established before discharge. Mechanisms for feedback loops for patients, family/caregivers, and providers offer course corrections to the patient's care plan which is critical for outpatient success. Multiple comorbidities such as chronic obstructive pulmonary disease (COPD), diabetes, and renal dysfunction are common for patients with HF and need coordination of care. The creation of the TCC clinic allows access to cardiology providers focused on communication, education, medication reconciliation, assessment, and plan focused on recent hospital discharge.

Interventions also include the self-referral process to HF clinic, HF team huddle with checklist coordinated inpatient rounds, enhanced HF education with videos and teach-back, post-discharge automated phone call for feedback, pharmacy support with medication education and delivery of new medications, and home health referral. For HF patients, home services such as social work, patient education, telemonitoring, physical therapy, occupational therapy, and medication instruction have been associated with reduced readmission rates.

Using this summary, the monthly HF process team meeting can examine the root cause of readmissions and implement evidence-based strategies for our population. HF data dashboard enables the team to track trends, data, and performance. The HF process meeting was designed to engage a wide group of stakeholders to observe the practical barriers and gaps in care and knowledge. The organized and systematic delivery of high-quality HF management both in-hospital and in the community also requires a dedicated HF multidisciplinary team, embracing expertise and working collegiately together to deliver an integrated service.

Although the available data is only the first three months of the evidence review, the planned interventions are in line with current research and the American Heart Association's (AHA) Get With the Guidelines-Heart Failure (GWTG-HF). HF discharge requires an integrated, consistent, and multidisciplinary program that includes pre- and post-discharge interventions.

Interpretation

From July 6, 2020, to September 30, 2020, 44 subjects met 30-day HF readmission criteria, final program evaluation population included 195 patients. Final sample (n=195) included 109 males (55.8%) and 86 females (44.2%). The sample ranged in age from 34-103 years (mean, 72.2 years). Overall, the three-month evaluation (July 6, 2020, to September 30, 2020) revealed a decrease in the 30-day readmission rate to 22.56%.

Diagnosis of HF (ICD-10 Coding)

HF with preserved ejection fraction (HFpEF) has less guideline-driven treatment options. These patients need close management of symptoms and comorbidities. There is no guidance on how to effectively manage the underlying cardiovascular issues associated with HFpEF. Despite high rates of readmission for these patients, there is no FDA-approved treatment for HFpEF.

Diagnosis HFpEF (I13.2, I13.0, I11.0, and I50.33) includes 98.9% of the patient readmitted at our facility during the study period (Table 1).

Table 1

Diagnosis of HF (ICD-10 Coding) 7/6/2020-9/30/2020				
Primary Discharge Diagnosis (ICD- 10 Coding)	**(n)**	**Total %**	**30 Day Readmission (n)**	**Readmission %**
I13.2 HYP HRT & CHR KDNY DIS W HRT FAIL AND W STG 5 CHR KDNY/ESRD	**35**	**17.90%**	**15**	**42.86%**
I13.0 HYP HRT & CHR KDNY DIS W HRT FAIL AND STG 1-4/UNSP CHR KDNY	**82**	**42.10%**	**20**	**24.39%**
I11.0 HYPERTENSIVE HEART DISEASE WITH HEART FAILURE	**72**	**36.90%**	**7**	**9.72%**
I50.21 ACUTE SYSTOLIC (CONGESTIVE) HEART FAILURE	**1**	**0.50%**	**0**	**0.00%**
I50.33 ACUTE ON CHRONIC DIASTOLIC (CONGESTIVE) HEART FAILURE	**3**	**1.50%**	**2**	**66.76%**
I50.43 ACUTE ON CHRONIC COMBINED SYSTOLIC AND DIASTOLIC HRT FAIL	**1**	**0.50%**	**0**	**0.00%**
I50.810 RIGHT HEART FAILURE, UNSPECIFIED	**1**	**0.50%**	**0**	**0.00%**
I50.1 LEFT VENTRICULAR FAILURE				
I50.20 UNSPECIFIED SYSTOLIC (CONGESTIVE) HEART FAILURE				
I50.22 CHRONIC SYSTOLIC (CONGESTIVE) HEART FAILURE				
I50.23 ACUTE ON CHRONIC SYSTOLIC (CONGESTIVE) HEART FAILURE				
I50.30 UNSPECIFIED DIASTOLIC (CONGESTIVE) HEART FAILURE				
I50.31 ACUTE DIASTOLIC (CONGESTIVE) HEART FAILURE				
I50.32 CHRONIC DIASTOLIC (CONGESTIVE) HEART FAILURE				
I50.40 UNSP COMBINED SYSTOLIC AND DIASTOLIC (CONGESTIVE) HRT FAIL				
I50.41 ACUTE COMBINED SYSTOLIC AND DIASTOLIC (CONGESTIVE) HRT FAIL				
I50.42 CHRONIC COMBINED SYSTOLIC AND DIASTOLIC HRT FAIL				
I50.811 ACUTE RIGHT HEART FAILURE				
I50.812 CHRONIC RIGHT HEART FAILURE				
I50.813 ACUTE ON CHRONIC RIGHT HEART FAILURE				
I50.814 RIGHT HEART FAILURE DUE TO LEFT HEART FAILURE				
I50.82 BIVENTRICULAR HEART FAILURE				
I50.83 HIGH OUTPUT HEART FAILURE				
I50.84 END STAGE HEART FAILURE				
I50.89 OTHER HEART FAILURE				
I50.9 HEART FAILURE, UNSPECIFIED				
Total	**195**	**100.00%**	**44**	**22.56%**

Frequency of Rehospitalization Episodes

Of the sample, nine (20%) had more than one readmission within 30 days. Days between discharge and readmission ranged from 0-30, (M 12.66, SD 8.29). Program evaluation revealed the most frequent days between discharge and readmission were 10 days. Descriptive statistics showed there was a higher insistence of readmission for those < 70 years of age (17 returns of n=88 patients were 19.3%) versus readmission for those ⩾ 70 years of age (27 returns of n=153 patients were 17.6%).

Days between discharge and completed follow-up visits ranged from 0-10 days, (M 7, SD 2.02). The median between discharge and follow up visit was 6.5 days. The relationship between days to follow-up and days to readmission showed that nine (29%) were readmitted before the follow-up visit and 12 (27.3%) were readmitted after the follow-up visit. Lost to follow-up, no-show, cancellation, or rescheduling of appointment was noted in 12 (27.3%) patients. Lack of total follow-up was correlated with 30-day readmission in 21 patients (47.72%). Historically, our HF clinic appointments have had a late cancellation (canceled within 48 hours) and no-show rate of 23.7%. The HF patient population has had a higher incidence of non-compliance with follow-up appointments. There is a strong correlation between lack of follow-up appointments and readmission rates within 30-days of discharge.

Cardiology Consultation

Reviewing data advocates that cardiology consultation reduces 30-day readmission rates for HF exacerbation. Patients were inclined to have shorter days to follow-up and increased rates of follow-up in the cardiology office (including HF clinic and TCC clinic). Patients receiving mutual inpatient cardiology consultation and outpatient cardiology-driven follow-up had a lower readmission rate of 19.6% compared to 22.3% without consultation. Seven-day follow-up with

cardiology as attending was 87.5%, with consultation only was 72.3%, and without cardiology attending/consultation was 66.0% (Table 2). Although no causation can be recognized by this QI evaluation, our data suggest that increased cardiology consultations can reduce HF readmission rates.

Table 2

Cardiology Consultation		
	Cardiology Consult	No Cardiology Consult
Readmission Rate	19.60%	22.30%
Cardiology 7- day Follow-up	72.30%	66%

Home Health Consultation

Using QI methodology, it was found that home health care was an important component of HF transitional care and improved access to care. Home health referrals were provided to HF patients through nursing, telehealth monitoring, and interdisciplinary communication to improve care delivery. Of these 195 patients admitted, 88 patients met the criteria and accepted home health services. Of those 88 patients, 23 (26.1%) were readmitted within 30 days of discharge. This does not take into account this population's severity index. Patients that met our system catalyst's moderate to high return risk criteria (return risk is based on 118 variables including age, sex, overall hospital stays, emergency room visits in the past year, chief complaint, medications, insurance, lab work, and comorbidities) included 85 out of the 88 patients.

In the 2019 comparison group, 27.8% of patients received home health services (Table 3). This service increased to 45.1% in the 2020 controlled group which again noted an overall decrease in 30-day readmissions (Table 4). This data is in line with the research which supports home health interventions and our referral protocol process.

Table 3

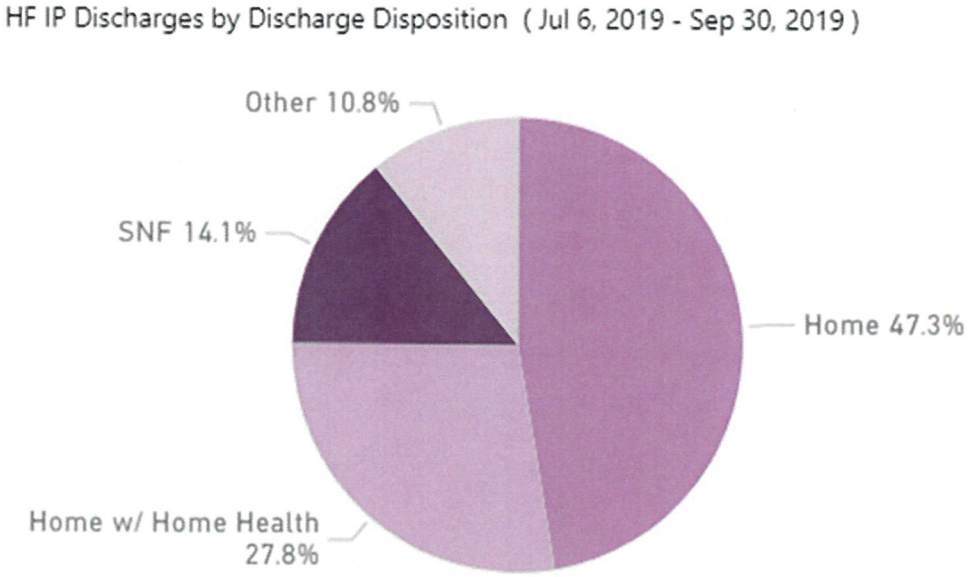
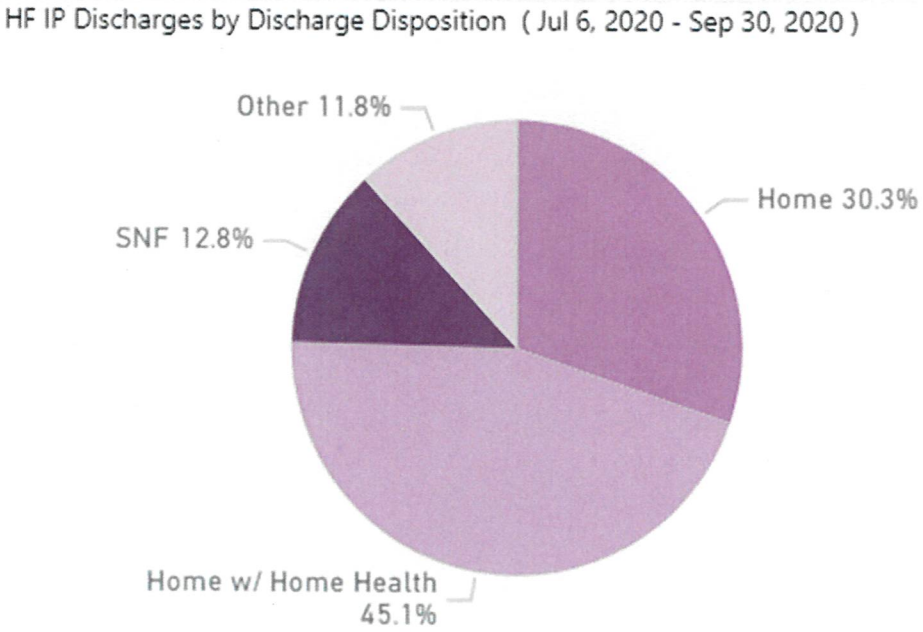


Table 4



Pharmacy Intervention

Of the 195 patients admitted with acute HF, pharmacy intervention with medication delivered to beside included 32 patients. Of these 32 patients, 18.75% of the patients were readmitted within 30-days. Antidotally, this is a very small number of patients and would warrant further investigation.

HF Self-Care Kit with Enhanced HF Education with Teach-back

Of the 195 patients admitted with HF, we gave 121 patients (62%) components of the kit with enhanced HF education with teach-back. Of the 35 unique patients with 30-day readmission (44 total return visits), 27 patients received a component of the kit which is 77%. The process excluded patients admitted to the intensive care units, patients transferred to another facility, discharged to long-term facilities or rehabilitation centers, death, and missed opportunities such as patients discharged before evaluation (weekends). HF nurse navigator interventions described as a kit with education needs to be implemented for every acute HF patient admission. During this implementation, the QI program only had the availability of a part-time nurse resource. The program evaluation did find that the navigator had multiple missed opportunities to evaluate or navigate the patient due to the high number of admissions and the lack of time.

There is a need to have seven-day a week coverage by a navigator in our medical center to ensure the identification and services unique to each HF patient can be addressed. These interventions can ensure the patient has a smooth transition of care from hospital to home, resulting in better-quality care, improved self-care, and decreased readmission risk.

Overall 30-day Readmission Rate

Readmission rates started declining after the initiation of the QI program in July 2020 (Table 5). Between July 6, 2020, and September 30, 2020, 195 patients met the criteria for acute HF admission based on ICD-10 coding. Overall QI program evaluation found an 7.63% decline in 30-day readmissions over the 3-month study period (25.37% down to 17.74%). Readmission average rate for 2019 was 24.9% (n=241) (July 6-September 30, 2019) and compared to after implementation in 2020 was 22.56% (n=195) (July 6-September 30, 2020) (Table 6).

Table 5

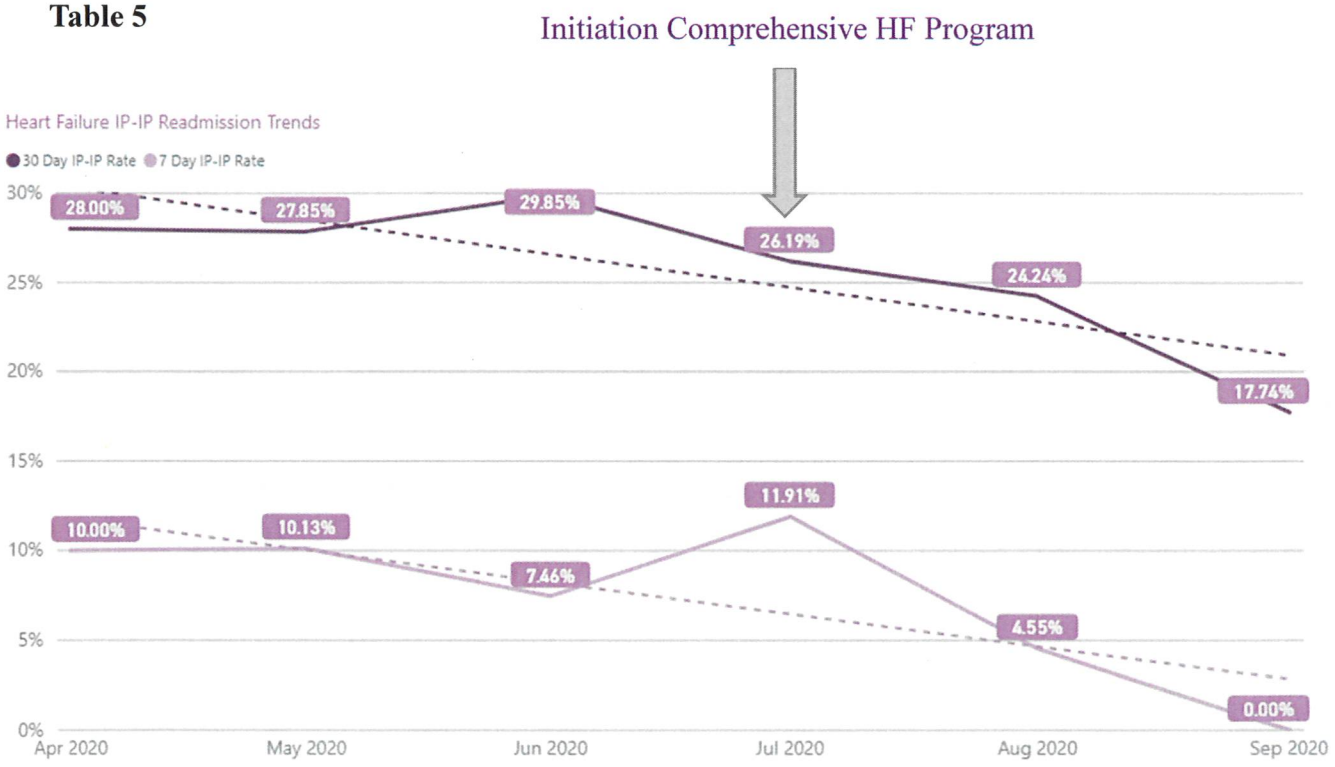
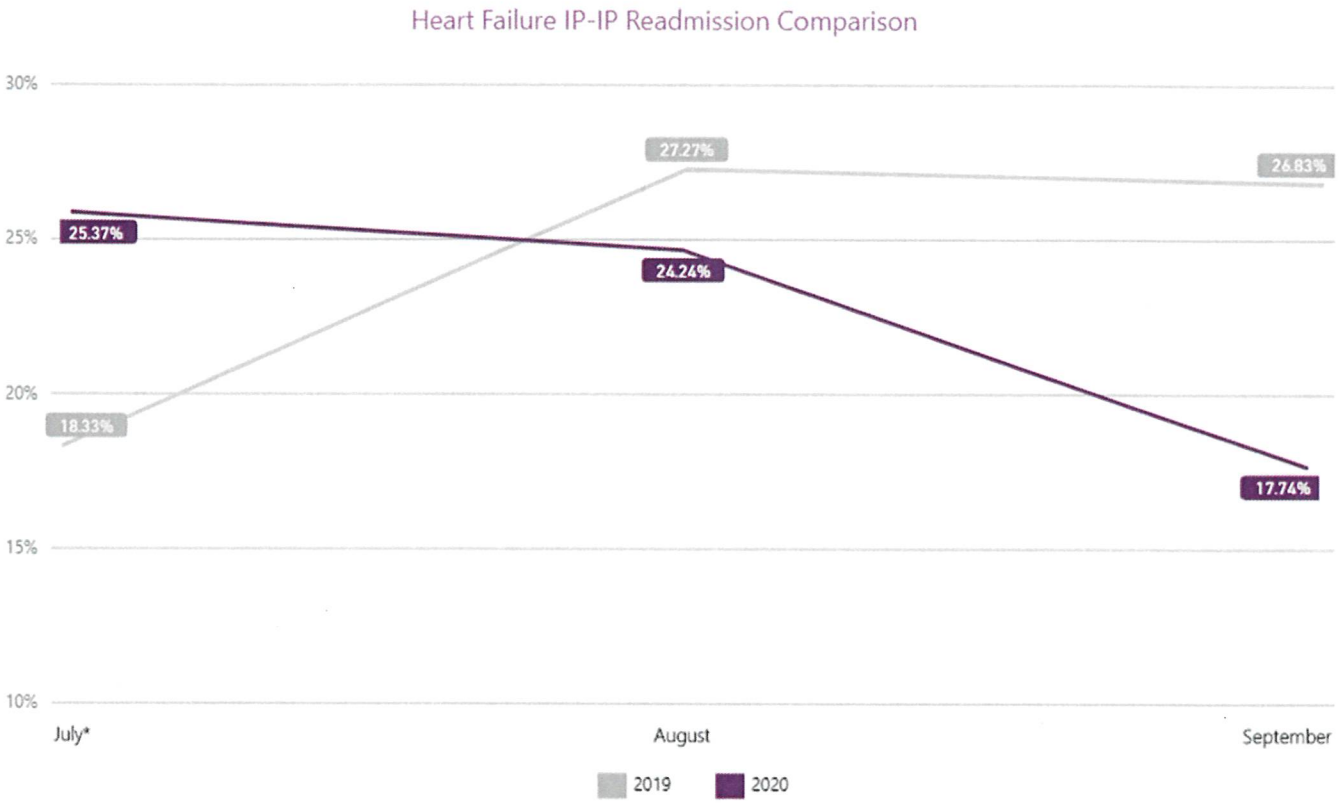


Table 6

July 6*-September 30, 2019 Comparison to July 6*-September 30, 2020



Limitations

Several limitations were present. The COVID-19 crisis has impacted the accessibility of home health, long-term facilities and rehabilitation centers, cardiology services, and family/community support. It has also obstructed the chronic management of cardiac conditions such as HF. Elective procedures, cardiac imaging, and routine outpatient appointments have been postponed across the United States due to the risk of virus transmission and the need for reallocation of resources needed to treat a growing number of COVID-19 patients. The impact on patients with HF and other comorbidities during these times can be detrimental. Our transitional

care program has implemented procedures to ensure ongoing monitoring and care of patients virtually.

The HF transitional care process was delivered as a QI program. The analysis relied on retrospective methods to define if interventions were significant. The interventions were delivered as a bundle (kit), retrospectively it was difficult to define which component was most impactful for readmissions.

Conclusions

Our facility's all-cause 30-day readmission rate has progressively declined since the HF transitional program's implementation. This transitional care coordination has become a fundamental part of the medical center's 30-day readmission reduction program. Numerous contributing interventions and significant lessons learned are attributed to the continued achievement of our patients.

This cardiac transitional care process is planned to expand its efforts to include additional chronic cardiovascular disease patient populations at risk for 30-day readmission. Overall, we have found having an APP lead a multi-disciplinary program to be a best practice method to care for the HF population while improving outcomes and the ability for self-care while decreasing 30-day readmission.

The implementation of HRRP was associated with improved processes and a reduction in readmissions within 30 days of discharge for HF. Concerns exist that pressures to decrease readmissions have led to the development of care patterns that may have unintentional adverse consequences through reducing access to care. Therefore, HRRP may discourage appropriate hospital admission and increase the risk of mortality (Wadhera, 2018). The primary goal of this QI program was to initiate transitions of care to improve our patient's health status and quality of

life rather than avoid readmissions. Our in-hospital mortality rate refers to the percentage of patients who died while in the hospital; over the previous year comparison, our facility increased by 1.3%. There were no significant differences between the 30-day mortality rate between the two groups of patients from 2020 and 2019 (6.4% in 2020 and 6.57% in 2019).

Patients Discharged with Primary Diagnosis of HF between 7/6/2020 and 9/30/2020:

- In-Hospital Mortality Rate = 7.8%
- 30 Day Mortality Rate = 6.4% (Eligible Patients Only)

Patients Discharged with Primary Diagnosis of HF between 7/6/2019 and 9/30/2019:

- In-Hospital Mortality Rate = 6.5%
- 30 Day Mortality Rate = 6.57% (Eligible Patients Only)

Recent publications highlight the opposing shift toward increased HF mortality even as readmissions have been decreasing, which has powered assumptions that HRRP programs may be concentrating on avoiding readmissions at the expense of quality care. Psotka states "Proponents argue that it has reduced national readmission rates, in part by raising awareness and investment in mechanisms to better assist patients during discharge and transitions; opponents contend that it unfairly penalizes hospitals for issues beyond their control, has unintended negative consequences due to incentivizing readmission over survival, that it encourages "gaming" the system, was not tested before implementation, and that it does not specify how hospitals can improve their performance" (2020). Additional studies are needed to further clarify this negative association. This QI program focused on best practices for the transition of care and to supply resources to the HF population. Our facility decreased 30-day HF readmission and did not see a negative impact on 30-day mortality.

Funding

Patients' deficiencies with adherence to the plan of care are often due to a lack of the understanding or resources necessary to comply. Better self-care behavior was found to be a predictor of treatment adherence. Seid concluded having a "good level of heart failure knowledge was positively associated with adherence to self-care recommendations. It is therefore strategic to plan improving heart failure patients' knowledge about heart failure signs, symptoms, and management approaches, to improve the patients' adherence level" (2019). To address these gaps in care and positively impact outcomes, a grant totaling $37,000 from a charity heart foundation was awarded to provide kits for one year. The purpose of the heart grant program is to positively impact the health of people who live in the communities we serve, therefore, the foundation's mission aligns well with our goal.

The foundation's grant allowed us to assemble and distribute components of a comprehensive discharge plan to our HF patients in need. This HF survival kit focuses on self-management, wellness and prevention, and direct health care services. Patients were given components of the kit depending on their needs such as scales and BP cuffs (Figure 4).

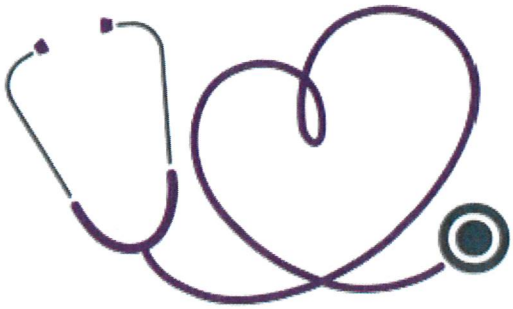
Although grant guarantees differ, program sustainability is important to continue monetary resources for this population. Confidences of these positive QI program outcomes will engage the sustainability of the HF kits to be continually supplied.

A full HF Survival Kit averaged approximately $60.00 per kit:

- Large Platform Digital Scale (up to 440lb) with Measuring Tape
- Blood Pressure Cuff
- Weekly Pill Box with Logo/Contact Phone Number (24 hours and seven days a week on-call coverage)
- Measuring Cup (Ounces)
- Educational Binder (Interactive HF Workbook) with multiple informative resources including Weight and Blood Pressure Log
- Drawstring Backpack

- Notebook with Pen
- Heart Failure Symptom Refrigerator Magnet with Contact Phone Number

Figure 4



SELF-CARE KIT
FOR HEART FAILURE MANAGEMENT

In this binder, you will find a variety of educational materials to help you manage your condition and care for your heart. You also should have received a scale and a blood pressure cuff in your kit.

If you have any questions about anything you have received or the materials in your kit, please call

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