Called to C.A.R.E.:

A Post-Discharge AMI Patient Care Initiative to Reduce Readmissions

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Abstract

Hospital readmissions after an acute myocardial infarction (AMI) are costly and avoidable with a thorough inpatient assessment and follow-up by a health care provider post-discharge. Prior studies indicate patient social support has a strong correlation to continued medication management and reduction of readmissions. The purpose of this Quality Initiative (QI) project was to measure the effect of the Called to C.A.R.E initiative, which was a series of four scripted follow-up phone calls focused on medication management, and its effect on reducing readmission rates in recently discharged AMI patients within 30 days following discharge. A second aim was to analyze the financial impact of conducting this initiative. The calls were conducted by a Cardiology Nurse Practitioner (NP) at specific time points, to all eligible AMI patients admitted to the practice site. The first call occurred at 48 hours and every seven days thereafter for a period of 30 days. Data were collected between July 2020 to October 2020, and compared to prior year data for the same time period. The AHRQ post-discharge follow-up phone call script was modified and utilized for this initiative. Results: Eighty nine patients were eligible to receive the Called to C.A.R.E initiative and 66 actually received between one to four of the follow up calls. The 2019 and 2020 comparison groups were demographically similar, as both were predominantly male, Caucasian, married, and had a mean age of 68-69.1 years. An average of 10 calls occurred per day, seven days a week, with the majority of the calls occurring in the afternoon between 12-3pm. There was a statistically significant difference in readmission rate (4.607; p=.032) between 2020 and 2019. In the 2020 group, readmission rates were reduced by 14.4% when compared to prior year data. The cost projections indicated that this reduction in readmissions could yield annual direct cost savings of $124,800. Targeting a specific support person and the use of the Called to C.A.R.E. initiative had an impact on readmission reduction in

the AMI patient population. The findings warrant further implementation to assess the impact of continued use of an Advanced Practice Registered Nurse (APRN) with prescribing privileges on readmission reduction.

Key words: readmissions, rehospitalization, acute myocardial infarction, heart attack, antiplatelet education, medication management, and follow-up phone calls

Combined key words “medication management AND myocardial infarction AND readmissions”

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A Post-Discharge AMI Patient Care Initiative to Reduce Readmissions

Hospital readmissions after acute myocardial infarction (AMI) have been costly, have occurred frequently, and are avoidable. According to Nguyen et al. (2018), nearly 1 in 6 patients diagnosed with an AMI had an unplanned readmission within 30 days of discharge, accounting for over $1 billion of annual healthcare cost. The Hospital Readmissions Reduction Program (HRRP) was established under the Affordable Care Act (ACA) in 2010 and required the Centers for Medicare & Medicaid Services (CMS) to impose financial penalties on hospitals across the nation with higher-than-expected 30-day readmission rates for patients with heart failure (HF), AMI, and pneumonia (PNA) beginning in 2012 (Wadera et al., 2018). Through the Medicare Value Based Purchasing Program (VBP), incentives were awarded to hospitals and health systems with lower than expected readmission rates (Robinson, 2016). The underlying causes of hospital readmission have been diverse. Studies have identified age, race, care by a regular provider, medical comorbidities, length of hospital stay, previous admissions in the last year, failure to transfer important information to the outpatient setting, discharging patients too soon, the number of medications at discharge, and many other risk factors for hospital readmission within 30 days (Robinson, 2016).

Background and Significance

Persons living with chronic disease, such as heart disease (HD), in the United States have had a high and increasing prevalence, with over half of all persons diagnosed with a chronic disease (Phelps & Sutton, 2018). Chronic disease management has created an immense economic burden for the nation. Healthcare costs were 2.5 times higher for patients with at least one chronic disease compared to patients without a chronic disease (Phelps & Sutton, 2018). Many

patients readmitted to hospitals have lived with one or more chronic conditions, which have required long-term medication therapy and regular follow-up care with providers. The Center for Disease Control and Prevention (CDC) reported 48.4% of the U.S. population used at least one prescription drug within the past 30 days, and 73.9% of physician office visits involved drug therapy with over 2.9 billion drugs ordered or provided (CDC, 2017).

Heart disease has been the leading cause of death for men, women, and people of most racial and ethnic groups in the United States. This has included the cost of health care services, medicines, and lost productivity due to death. Coronary heart disease (CHD) has been the most common type of HD, killing 365,914 people in 2017. Between 2014-2015, HD cost the United States about $219 billion. The CDC reported that about 805,000 Americans had an AMI annually and of these, 605,000 were a first AMI (CDC, 2019).

Per national guidelines, patients who suffer an AMI are prescribed specific medications upon discharge from the hospital. This includes a high intensity statin and an appropriate dual antiplatelet therapy (DAPT) regimen, consisting of aspirin and one P2Y12 receptor inhibitor (clopidogrel, ticagrelor, or prasugrel), to prevent thrombosis and ischemic events after stenting (Jneid et al., 2017). P2Y12 receptor inhibitors block the adenosine diphosphate (ADP) receptor P2Y12 on platelets in order to reduce platelet activation and aggregation (Wright & Antoniou, 2013). On average, a patient leaves the hospital with a minimum of two new prescriptions after suffering an AMI. Some of those patients already had prior medications prescribed, now changed to different dosages, intervals, or discontinued at discharge.

Medication management (MM) has been a factor in more than a quarter of readmissions, including medication errors during or after index admission and inadequate patient and caregiver understanding of MM (Uitvlugt et al., 2020). The existing literature on medication-related

readmissions showed that a median of 21% of readmissions were due to medication and a median 69% of those readmissions were deemed preventable (Uitylugt et al., 2020). The patient is the only constant factor in the care continuum, during the transition from hospital to home, patients are vulnerable to discontinuities in care that can negatively affect their medication regimens (Shull et al., 2018). A focused post-discharge intervention specifically addressing medication management could help to reduce medication related readmissions.

The Agency for Healthcare Research and Quality (AHRQ) developed an evidence-based tool called the IDEAL discharge planning tool in order to engage patients and their family members in preparing for the discharge home. The acronym stands for include, discuss, educate, assess, and listen. All portions of the tool are relevant; however, a key element is the inclusion of the patient and the identified support person as full partners in the planning for discharge home (AHRQ, 2017). By identifying a specific support person prior to patient discharge, an improvement in quality and a reduction in hospital readmissions is possible. This is because despite percutaneous coronary intervention (PCI) to treat AMI being more effective in restoring coronary blood flow compared with other interventions and now being conducted more safely than ever before, postoperative delirium after PCI is a reality (Ma et al., 2020). Delirium is an acute onset of a fluctuating disturbance in the following cognitive functions: attention; environmental awareness; and cognition and/or perception, and may be most readily identified in patients with sleep/wake cycle disturbances, emotional lability, hallucinations or delusions (Ma et al., 2020). Delirium has been reported as a rare complication after PCI, the early literature dating back to de Bono (1993) reported the incidence is 0.06%, but in patients older than 80 years old, after PCI, the reported incidence is 29.8% (Ma et al., 2020). A high stress level has also been an educational barrier prohibiting learning and decreased knowledge retention in the

hospitalized patient (Lee & Bokovoy, 2005). Both findings support the need to identify a support person for patients prior to discharge to aide in the discharging process.

Risk Assessment Tools and Targeted Interventions

Because of the Value Based Purchasing (VBP) initiative, hospitals developed risk assessment tools (RAT) and targeted interventions to help reduce readmissions. RAT's have aided hospital staff in identifying the characteristics associated with readmissions and have assisted providers in optimizing patient management following discharge (Spitzer et al., 2017). At the initiative site, a gap analysis was conducted to identify areas where targeted interventions were necessary to reduce readmissions for AMI patients. These areas included: transitions in care to other facilities or to home, completion of advanced care planning during the patient's admission, providing direct teaching of diagnosis and medication, and conducting a follow-up phone call within 48 hours of discharge. Implementation of a scripted follow-up phone call within 48 hours of discharge have been effective in other patient populations, such as HF (Ruggiri, Milner, & Buonocore, 2019). Studies have reported the use of the scripted call to evaluate patient understanding of the illness as well as health maintenance and medication reconciliation, with review of how and when to take medications (Phelps & Sutton, 2018).

Nursing staff, NP's, and Case Manager's (CM's) have been vital in the timely communication with patients and families, and medications have consistently been an integral aspect of the transition to home. A key responsibility of the transitional care nurse (TCN) and the patient care team is communicating the importance of optimal medication management (Hall, Meaux, & Reed, 2018). The hallmarks of TCN's are the focus on highly vulnerable, chronically ill patients throughout critical transitions in health and health care, the time-limited nature of services, and the emphasis on educating patients and family caregivers to address root causes of

poor outcomes and avoid preventable rehospitalizations (Naylor et al., 2011). Nurses, CM's, and NP's, have been well suited for reviewing the plan of care, reassessing and revising the plan of care with the team, and educating the patient and family about MM to reduce the risk of readmission. A clinician-initiated discharge telephone call was a simple and cost-effective method of connecting with the patient after hospital discharge to address medication issues that could've led to adverse outcomes (Ryan, Bierle, & Vuckovic, 2019).

At the doctoral student's practice site, the administrative leadership issued a directive to decrease readmissions in five key patient populations: AMI, HF, total hip/total knee (THTK), PNA, and chronic obstructive pulmonary disease (COPD). This mandate became an important component of the institutional assessment to support this project. The practice site developed a Readmission Reduction Strategy Team (Team) to identify strategies and standardize processes to mitigate readmissions and maximize performance-based reimbursement through analysis of clinical operational data. The Team was also tasked with developing and implementing interventions for system improvements through the continuum of patient care. Based on the Centers for Medicare and Medicaid Services (CMS) Hospital Readmission Reduction Program (RRP) data projections for payment for fiscal years 2021 to 2023, the projected RRP penalty for fiscal year 2021 (ended on June 30, 2019) was $974,527. Specifically, for the AMI patient population at the practice site from the period of 7/1/2016-6/30/2019 there were 63 readmissions and 493 discharges with a readmission index of 0.9870. The readmission penalty line was set at1.0, therefore, the facility was able to avoid federal penalty.

CMS defines a hospital readmission as an admission to an acute care hospital within 30 days of discharge from the same or another acute care hospital (CMS, 2017). It uses an all-cause definition, meaning that the cause of the readmission does not need to be related to the cause of

the initial hospitalization (CMS, 2017). The projected payment for fiscal year (FY) 2022 at the practice site ended on June 30, 2020 and included data from 7/1/2017-12/27/2019. The AMI population at the practice site had 420 discharges with 55 readmissions, holding the readmission index at 0.9879. For FY 2023 which will end on June 30, 2021, the AMI expected readmissions is 33 of 246 discharges, and the practice site is currently at a readmission index of 0.89. The estimated RRP penalty for FY 2022 across the market is $2,714,475 for all cause readmissions (Chavis, 2019).

In the HF patient population, the practice site has reduced the readmission index to 0.7253, which is the lowest readmission index of the five performance-based patient populations. An effective strategy for readmission reduction is a 48-hour follow-up phone call. Timely clinical point of contact, such as a telephone calls, has been included as a core recommendation of many large-scale efforts to reduce readmissions (Johnson, Laderman, & Coleman, 2013). In an analysis of claims data, Harrison et al. (2011) found that "members who do not receive a call within 14 days after discharge are 1.3 times more likely to be readmitted to the hospital within 30 days of discharge than those who do receive calls" (p. 29). In another study, patients who received an outreach call after discharge had a higher rate of attendance at the scheduled follow-up office visit and had fewer undesirable post-discharge outcomes (Johnson, Laderman, & Coleman, 2013).

Purpose

The purpose of this Quality Initiative (QI) project was to measure the effect of the Called to C.A.R.E. initiative, which was a series of four scripted follow-up phone calls focused on medication management, and its effect on reducing readmission rates in recently discharged AMI patients within 30 days following discharge. The series of calls were conducted at specific time

points. The C.A.R.E. acronym stands for clarify, assesses, reinforce, and engage patients and/or designated support person in their post-discharge medication management. The calls served to reinforce pre-discharge medication education and provided an additional opportunity for teach-back rather than to introduce new information concerning the patient's medication management.

Two specific aims were addressed in this project:

1. Did the Called to C.A.R.E. initiative reduce AMI 30 day readmissions within the three month intervention time-period when compared to 30 day readmissions in a comparable three month period?

2. What was the financial impact of this intervention?

Review of the Literature

The purpose of the evidenced based review of the literature was to answer the nursing practice question: For adult patients who have undergone a hospitalization for an AMI and are discharged on new, dose adjusted, or continued medications, does the initiation of a scripted follow-up phone call to specifically address medication management within 48 hours of discharge and once every seven days for 30 days decrease the risk of 30 day readmission when compared to those who receive no follow-up calls when tracked for three months? Operationalized key words were: readmissions, rehospitalization, acute myocardial infarction, heart attack, antiplatelet education, medication management, and follow-up phone calls. The key concept was to identify relevant literature to support the utilization of post-discharge follow-up phone calls to address medication management as an essential intervention to decrease readmission rates in the AMI patient population.

Evidence Search Methods

A systematic literature review was conducted to investigate the effects of a scripted follow-up phone call within 48 hours of discharge to specifically address medication

management on 30-day readmission rates for those patient's diagnosed with an (AMI). Four databases were searched to identify the relevant literature: PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Cochrane Library, and the Joanna Briggs Institute EBP Database (JBI). The searches were not restricted by year of publication. Only peer-reviewed academic journal articles were selected.

The Boolean search phrase, *medication management* AND *myocardial infarction* AND *readmissions* was used with Cochrane Library (54 results), PubMed (28 results), and the JBI (6 results) databases. In the CINAHL database, *readmissions* (9,913), *acute myocardial infarction* (30,994), and *medication management* (2,717) were searched with the "Suggested Subject Terms" applied. The search results from readmissions, acute myocardial infarction, and medication management were further merged using the term AND (5 results).

The total number of articles retrieved from the four databases was 93. After removing all the duplicate articles (4), there were 89 articles remaining. Exclusion criteria included non-adult populations (10) journal articles, and 79 articles remained after this filter was applied. The titles and abstracts were reviewed, based on the relevance to the PICOT question, and the articles which contained transitional care interventions, follow-up or community interventions, technological interventions, or pharmacy interventions were retained, resulting in 38 remaining articles. After a full text review, one more article was excluded because it addressed prehospital delay in acute cardiac ischemia. A total of 37 articles were retained for further screening. Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) worksheets were completed on the remaining 37 sources to further refine the best available evidence on the impact of performing medication reconciliation, follow-up phone calls, and focused transitions of care on reducing hospital readmissions for AMI patients. There were 20 additional sources eliminated after the

worksheet review due to being case reports, small study populations, or not having significant reported findings. A review of the reference lists on the retained articles were analyzed and an additional 11 sources were retained for analysis. Thus, a total of 28 sources were retained for a complete analysis. Figure 2 displays the search process, using a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.

Summary of Data and Analysis Method

The objective of this review was to identify and synthesize the best available evidence based on the themes of transitional care programs, medication reconciliation practices, and follow-up phone calls on adult patients discharged from hospital settings after experiencing an AMI. This review considered studies that included adults age18 and over who were admitted to a hospital and had a cardiac diagnosis. Both quantitative and qualitative studies were considered that evaluated the outcomes of transitional care programs and pre/post-discharge interventions aimed to help reduce readmissions to hospitals. This review considered studies that included the following primary outcomes: hospital readmissions, all-cause mortality, death, medication adherence, depression, and physical function post-discharge. Both experimental and non-experimental study designs were considered including randomized controlled trials, non-randomized controlled trials, quasi-experimental studies, before and after studies, prospective and retrospective cohort studies, case-control studies and analytical cross-sectional studies as appropriate for inclusion. This review also considered qualitative study designs including case series and descriptive cross-sectional studies for inclusion.

Analysis and Synthesis of Evidence

The method utilized to synthesize the body of evidence was a thematic analysis to pinpoint, examine, and record the themes found within the literature. A familiarization was

established with the literature by searching for themes within the data, reviewing the themes, defining the themes, and producing a final report of the most common themes. The literature supported three specific focus areas which have reduced readmissions in other studies and patient populations. Those three themes were implementation of transitional care programs, medication reconciliation practices, and follow-up phone calls. The term medication reconciliation is defined by The Joint Commission (JC) as a clinician's comparison of the prescribed medications a patient is actually using against the new medications ordered for the patient during an encounter, resolving any discrepancies, and updating the medical record to reflect them (The Joint Commission [JC], 2020). This is conducted on the inpatient setting as a JC required National Patient Safety Goal (NPSG). Medication management incorporates medication reconciliation in addition to conducting a more thorough assessment aimed to improve outcomes by providing education on the disease state and medications used to treat the disease state, ensuring that medicines are taken correctly, looking for any side effects, and providing education on how to manage any side effects (Uitvlugt et al., 2020). Because of the broader scope more suited to the home setting, the term medication management was intentionally used in this initiative rather than medication reconciliation.

Transitional Care Program

The first of the three themes identified throughout the literature was the use of transitional care programs (TCP). TCP's were implemented to aide in the coordination and continuity of health care for a patient during a movement from one healthcare setting to another (Lee et al., 2014). This transition could be to another healthcare facility, nursing home, rehabilitation program, hospice, or back to the patients' own home. The focus of these programs is to ensure the patient care needs are met during the course of a chronic or acute illness. This

theme was evidenced by the development of the nurse-coordinated Cardiac Care Bridge transitional care program (CCB program) aiming to reduce unplanned hospital readmission and mortality in the first six months for elderly adults ("Cardiac Care Bridge Trial", 2019). The CCB program had three essential phases: clinical phase, discharge phase, and the post-clinical phase. This coordinated care program had an arranged nurse home visit within two days of patient discharge, and the results showed a 25% mortality reduction in the older adults ("Cardiac Care Bridge Trial", 2019).

Du et al. (2016) designed a case control study to evaluate the coordinated care of cardiologist with intensive follow-up on patients who underwent PCI. This TCP markedly decreased cardiovascular risk factors, reduced medical costs, promoted medication adherence and improved the long-term prognosis of patients after PCI in the Chinese population while reducing readmissions (Du et al., 2016). Interestingly, a coordinated stress monitoring and management program instituted for patients after experiencing an AMI showed a 50% reduction in cardiac deaths up to seven year post initial cardiac event (Frasure-Smith & Prince, 1989). This study was limited to only adult males, but it had a study sample of 461 and was able to display how controlling stress can have a positive impact on long term survival after cardiac event. Gabriel et al. (2017) conducted a randomized control trial (RCT) to assess if the implementation of a discharge check-list upon patient admission would aid in the transition of care planning. Time difference between medically ready for discharge and actual discharge averaged 1.5 hours less in the intervention group, with no statistical differences found ($p>0.05$) (Gabriel et al., 2017). They did see an increase in patient satisfaction, which indicates perhaps the patient had a better understanding of their care (Gabriel et al., 2017).

House et al., (2016) reviewed medical records of patients discharged from an intermediate cardiac care unit who had a diagnosis of AMI or HF. They implemented an evidence-based QI through implementation of system-level bundled interventions, increased Home Health (HH) referrals, and enhanced collaboration which reduced 30-day readmissions for AMI and HF patients in a large academic medical center (House et al., 2016). Koski (2014) provided expert opinion regarding barriers to transitions of care for patients who were insured versus those who are uninsured. The study revealed that typically, limited English proficient patients lack insurance and that further evaluation needs to be conducted by nursing staff to assess their post-hospital needs (Koski, 2014). Thus supporting the need for an interdisciplinary collaboration approach and continued outpatient assessment to help reduce readmissions.

Lee et al. (2014) took transitions of care a step further and implemented the use of a situational awareness tool (SSA) to assess older patients who may benefit from physical therapy post discharge. This is especially important for post-AMI patients because physical activity is essential to long-term cardiovascular health. SSA intervention was associated with a lower occurrence of disability and fewer transitions to Skilled Nursing Facilities (SNF's), but was not associated with a decreased 30-day readmission rate (Lee et al., 2014). Clear and comprehensive provider–patient communication was key to achieving optimal transition of care (Mansukhani et al., 2015).

The Martin et al. (2018) study results suggested that the sample population of patients readmitted after AMI had longer lengths of stay on index admission and higher comorbidity indices when compared with the other AMI patient populations. Both of these factors have previously been defined to be associated with increased readmission rates. Martin et al. (2018) showed that improved access to cardiology care in the emergency department (ED) reduced

unnecessary readmissions for low-risk chest discomfort after PCI. This study also supported that medically managed patients should know to expect angina in the outpatient setting and should be connected to palliative care colleagues if appropriate. Meisinger et al. (2013) was another study which utilized a nurse-based intervention to provide follow-up to patients for one-year post-discharge. Nurse-based management among elderly patients with AMI had no significant influence on the rate of first unplanned readmissions or death during a one-year follow-up, which indicates there could be other essential variables involved in the readmission risk for elderly patients that need to be explored (Meisinger et al., 2013).

Peters & Keely (2017) conducted a study to test the Patient Activation Measure (PAM) to evaluate the level of engagement by patients after experiencing an AMI, based on the thoughts that the more engaged or "activated" patients are, the higher the score, and the more likely they were to adhere to medical therapy and make healthy lifestyle choices. An association was found between lower PAM scores and subsequent adverse clinical outcomes, including unplanned readmissions (Peters & Keely, 2017). Singh et al. (2020) compare the clinical characteristics, management, and long-term all cause and cardiovascular mortality among young adults who experienced a first type 1 MI, type 2 MI, or myocardial injury at age 50 years or younger. This study was beneficial to support the need for increased resources for younger patients who have experienced a type 2 MI. Many of these patients are younger, but lack social support to help them manage their care post-discharge to prevent recurrent admissions (Singh et al., 2020).

In Teixeira et al. (2010), the objective was to characterize ACS patients with a CABG and to compare their in-hospital and post discharge transitional outcomes with those of patients without a CABG. In the ACS patients, the presence of a CABG had no significant influence on short-or medium-term transitional outcomes, such as all-cause mortality and adverse cardiac

events requiring readmissions. Wadhera et al. (2018) conducted a retrospective cohort study that included approximately eight million Medicare beneficiary fee-for-service hospitalizations from 2005 to 2015, who implemented the HRRP. The HRRP was associated with a significant increase in trends in 30-day post discharge mortality among beneficiaries hospitalized for HF and PNA, but not for AMI (Wadhera et al., 2018). This implies a HRRP program may have benefits for elderly adults who suffer from an AMI. Weeks et al. (2018) identified and synthesized the best available evidence on the impact of TCP's on various forms of health services utilization in community dwelling older adults. The study showed that transitional care interventions of one month or less appear to be as effective as longer interventions in reducing hospital usage (Weeks et al., 2018). Each of these studies support the need for appropriate TCP's for adult patients. This theme relates to the PICOT question because the discharge location directly impacts the management of their medications and recovery from illness.

Medication Reconciliation Practices

The second theme identified was medication reconciliation practices, which had multiple pieces of literature to support its importance in mitigating readmissions. This theme was evidenced in the study by Anderegg et al. (2014) who instituted a review of 3,316 patients who participated in a restructured pharmacy practice model to help reduce 30-day readmissions. The study found the most significant impact was for patients in the high-risk subgroup, with a readmission rate dropping from 17.8% to 12.3% ($p = 0.042$) (Anderegg et al., 2014). Conliffe et al., (2019) conducted an observational chart review of patients who had participated in an inpatient "Med2Bed" program. This program involved a pharmacist educating and providing medications to inpatients prior to discharge in efforts to reduce ED visits and potential readmissions. The results showed rates of 30-day ED visits were non-significantly reduced in

cases (22 [11.9%] vs 33 [18.1%]; odds ratio = 0.62, p=.11), but they occurred significantly later (11 vs 7 days, p=.03) (Conliffe et al., 2019).

Goyal et al. (2015) evaluated a number of patients to assess their enrollment in Medicare part D benefits. The results showed that only half of Medicare-insured patients with AMI were enrolled in Part D by hospital discharge, and their 30-day and one year adjusted outcomes did not differ substantially from non-enrollees (Goyal et al., 2015). This result suggested enrollment in government medication benefits may not have a substantial impact on patient outcomes over time. Heaton et al. (2019) implemented a pharmacist-provided medication therapy management program to determine the impact of the intervention on primary and secondary medication nonadherence, and to measure patient satisfaction with the intervention. Overall, there was not a significant difference in 30-day readmission rates between intervention and control groups (11.3% vs. 10.7%; P = 0.49) because a large portion of patients randomized to the intervention did not attend their appointment (Heaton et al., 2019). In a per protocol analysis, which included the 62 intervention patients who attended their appointment and the 187 patients in the control group, there was a significant difference in 30-day readmission rates (1.6% vs. 10.7%; P = 0.02) (Heaton et al., 2019). The transmission of patient information from the inpatient setting to the community pharmacy setting is key to transitioning patients successfully, but the follow-up appointment seems to be an additional intervention needed for the success of the pharmacist post-discharge intervention.

Patton et al., (2003) utilized community pharmacists to intervene at 72 hours post discharge, again at seven days post discharge, and one final time at the 30-day mark for patients discharged after an AMI and other diagnoses. None of the patients who received regular follow-up by the pharmacist were readmitted within the 30-day time frame. A study published by Poh et

al., (2018) showed that patients managed by pharmacists had better overall blood pressure and warfarin management than those in the physician managed group. This study supported close pharmacy involvement in medication management beyond the hospital setting.

Segal et al., (2020) conducted a retrospective cohort study that reviewed the benefits of a bedside medication delivery program to improve patient medication adherence. They found that although it did not decrease 30-day readmission rates, it did improve patient satisfaction and improve the financial income for the hospital. Warraich et al. (2018) conducted a longitudinal study to assess the long-term ramifications of unemployment after a patient experiences an AMI. Patients who experienced an adverse employment change were unable to afford needed medications and would require close medication follow-up for assistance needs. In this situation, a pharmacist could be instrumental in providing known resource information to the patients before they decompensate to a state where they need to return to the hospital after months of medication nonadherence.

Follow-up Phone Calls

The third theme identified in the review of literature was the implementation of follow-up phone calls within 24 to 48 hours of patient discharge. This theme was evidenced by Budiman et al., (2016) who conducted a prospective study to determine if medication education during hospitalization and post-discharge with follow-up phone calls would decrease readmissions. The pharmacists made a follow-up phone call within 72 hours of discharge to reinforce medication education started in the inpatient setting. All-cause readmission at 30 days was lower, but did not reach statistical significance (13% to 5%, p=.18). Out of 95 patients in the control group, 12 were readmitted, whereas two out of 40 patients in the intervention group were readmitted (Budiman et al., 2016). All patients in the intervention group picked up their discharge prescriptions within

three days after being discharged and patient medication adherence and literary scores (MedAL) were significantly improved from a baseline of 4.5 to eight at 30 days post-discharge (P = 0.0005) (Budiman et al., 2016).

Kavradim et al. (2019) implemented a focused telephone follow-up intervention utilizing the Roy Adaptation model to improve AMI patients' self-efficacy, quality of life, and lifestyle modifications necessary for improved health. They conducted a series of three follow-up phone calls with significant results at 12 weeks in regards to an assessed adapted coping process to improve overall health for the patients. Patel et al. (2017) developed and implemented a pharmacy-driven, post discharge follow-up telephone call program to assess medication adherence, provide education, and address medication-related concerns. By providing these services, patients received continuity of care and positively decreased ED visitation rates and hospital readmission rates (Patel et al., 2017).

Technology has been utilized in institutions to aid in providing follow-up reminders aimed at readmission reduction. Volpp et al. (2017) incorporated electronic reminders and a follow-up phone calls program to help improve patient disease management. Although there were no statistically significant differences between study arms in time to first rehospitalization for a vascular event or death, this led to the thought that perhaps developing a compound intervention integrating wireless pill bottles, lottery-based incentives, and social support to improve readmission outcomes for AMI survivors could be beneficial (Volpp et al., 2017). The SupportMe Trial (2019) measured the feasibility of embedding a text messaging program into routine clinical practice to improve cardiovascular risk factors among patients with coronary artery disease (CAD). This particular study saw an improvement in patient systolic blood

pressure and other hemodynamic markers at six months, simply with the implementation of follow-up text reminders that provided basic education and medication management information.

To address the possibility of publication bias, a search of the grey literature was performed by searching key search terms in the internet search engine and looking at the first 20 results. There was no evidence of a publication bias based on the grey literature, and findings were not consistent with findings in the systematic review. Several themes in the gray literature were counseling patients on MI recovery, unplanned 30-day readmissions, and medication adherence and readmission in Medicare myocardial infarction.

Evaluation and Recommendation

The purpose of this systematic review was to identify published evidence to support practices, programs, and interventions to aid in patient transitions from the hospital and the evidenced based question: For adult patients who have undergone a hospitalization for an AMI and are discharged on new, dose adjusted, or continued medications, does the initiation of a scripted follow-up phone call within 48 hours of discharge and once every seven days for 30 days to specifically address medication management decrease the risk of 30 day readmission when compared to those who receive no follow-up calls when tracked for three months? The results of this review can help to guide clinical practice in several ways. Evidence showing that TCP's can reduce rehospitalization at 30 days was moderate in quality. This finding indicated that TCP's are promising approaches to reducing expensive health care services, and in particular hospital readmissions. TCP's show high potential for empowering patients to partner in their care and enhance their understanding of long-term disease management. The results of some of the studies indicated that older adults (aged 70 or older) with very high levels of acuity at baseline may not have a reduction in health system usage due to other variables. The greatest impact of

readmission reduction was in adults age 18-65 who have adequate social support. This finding supports the implementation of screening processes to determine eligibility for at home follow-up in the adult population age 18-65. Some examples of transitional care support which have shown to be effective include: HH visits, pharmacist involvement in the care continuum, and follow-up phone calls with targeted interventions. Results from a moderate number of high-quality studies indicated that focused medication reconciliation practices and follow-up phone calls did have a significant effect on the use of primary prevention and outpatient care facilities instead of ED visits and inpatient admissions to acute care for repeat cardiac issues. Thus, the evidence supported the benefit of identifying a social support person for each patient and the use of follow-up phone calls as a low cost strategy to reduce readmissions in transitions of care.

A limitation of this systematic review was the focus was on AMI patients only. Health care institutions, internationally, have implemented multiple intervention strategies to help reduce readmissions in other patient populations and there is often overlap in many patient conditions. Limiting the intervention to a focus on medication management may over-simplify the multiple factors that correlate to readmission risk, thereby, limiting other variables, such as depression, quality of life, or social support that may impact readmission risk.

Theoretical Framework

The analysis of the current literature supported a quality improvement (QI) project as the most effective approach to meet the standard of care set forth by the federal government to reduce readmissions. The theoretical model utilized for this QI project was the Donabedian Model with utilization of the SQUIRE guidelines framework to guide the procedures of the project, and the Plan Do Study Act (PDSA) implementation framework to implement rapid cycle change at the practice site. The Donabedian model was utilized to examine services and

evaluated the quality of the health care facility's readmission reduction practices with a focus on improving the quality, safety, and value, with the implementation of the intervention being linked back to the observed outcomes. The theoretical framework was a direct and systematic framework, using the triad of structure, process, and outcome to evaluate the quality of the readmission reduction practices (Donabedian, 1988) (See Figure 1). The structure portion involved defining the structural and organizational characteristics where the healthcare occurs, the process portion focused on the care delivered to the patients, and the outcomes of care focused on the effects of health care on the status of patients and populations (AHRQ, n.d.).

Current Structure

At the doctoral student's practice site, the Readmission Reduction Strategy Team (Team) included an interdisciplinary team of healthcare professionals tasked with the role of examining current utilized practices to reduce readmissions. An identified opportunity was to expand the use of scripted follow-up phone calls to the AMI patient population post-discharge. This practice was utilized in other patient populations and has been effective in reducing readmission rates. During the patient's admission, per health system policy, members of the interdisciplinary care team are expected to complete medication reconciliation for every patient at admission and discharge. This practice is often rushed, incomplete, or missed on some patients. The responsibility typically defaults to the bedside caregiver, but no real ownership of the structure is currently or universally exercised at the practice site. The goal of this project was to enculturate a practice to ensure medication management was comprehensive and complete to help avoid readmissions.

Compliance with the American College of Cardiology (ACC) and American Heart Association (AHA) 2019 guidelines for primary prevention of cardiovascular disease were

monitored and tracked internally at the practice site, and patients were prescribed the recommended P2Y12 inhibitor, aspirin, statin, beta blocker, and ace inhibitor as clinical presentation indicated (American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines, 2019). Beyond prescribing at discharge, there was a current structure in place during the first 48 hours of discharge where a TOC nurse would contact the Medicare Shared Savings Program (MSSP) and Medicaid coverage patients for a single follow-up call and medication reconciliation was completed during this interaction. Beyond the 48 hour time frame, or for patients who were self-pay or do not fall in these coverage categories, there was no 48 hour follow-up intervention. Subsequent follow-up calls to reassess patient understanding, or ability to receive and administer the prescribed medications were not formally conducted. The CMS requires a 48 hour follow-up appointment to be scheduled for the patient post-discharge, but internal hospital policy varied in implementation at the practice site.

Current Process

The percentage of patient's receiving a follow-up phone call within 48 hours of discharge or subsequent calls from a cardiology specialist at this practice site was zero percent. Many of the AMI patients seen by an inpatient cardiology specialist typically received a follow-up appointment at one week post-discharge, but some were not seen until one month post-discharge. Some patients had an appointment prior to leaving the hospital and others were instructed to call the practice post-discharge. During the patient's inpatient admission the NP, CM, and RN often assessed the patient's ability to afford their medications, and offered assistance when needed. None of the patients received a follow-up phone call for every week up to 30 days post-discharge. Assessment of support person or determining who managed patient medications was not routinely conducted at the practice site.

Current Outcomes

The percentage of AMI patients who took their medications exactly as prescribed post-discharge is unknown. However, the percentage of patients readmitted within 30 days post-AMI is known for the practice site. In the most recent February 2020 QPSR data, the number of AMI readmissions for the practice site was at 0.97, with a target of 0.90, therefore for that three month quarter the site was above target (Chavis, 2019). For FY 2023 which ends June 30, 2021, the data is reflective of the period that began from 7/1/2018-12/27/2019, the AMI expected readmissions was set at 33 of 246 discharges, and the practice site was at a readmission index of 0.89 (Charvis, 2019). In reviewing payor 30-day readmissions by the specific day from day 1-30, the practice site has the highest overall readmission rates at days 7-8 and again at days 13-14 (.02c MRMC QPSR).

Quality Initiative Design and Implementation

Design and Setting

This project used a QI design and implementation framework to test the impact of the Called to C.A.R.E. initiative. The organization is one of the nation's 20 largest healthcare systems, serving over seven states. The setting for this project was in the south east and urban market, which consisted of four acute care non-profit community hospitals. AMI patients were admitted to any of the four hospitals within the system.

The setting for the QI project was the practice site of the doctoral student, a community hospital of 225 beds. It was implemented with full support and collaboration of all cardiology providers, administration, and hospital staff. Because the doctoral student is employed as a Cardiology NP at the practice site, for the remainder of the paper the doctoral student will be referred as the Cardiology NP. The project site had a fully equipped cardiac catheterization lab,

where patients underwent PCI and stenting or were medically managed. The patients were admitted primarily to the Intravascular Care Unit (IVCU), which was a 15-bed intermediate care unit that had rapid patient turn-over, or to a telemetry unit and then transferred to the IVCU. Often, patients were discharged from the IVCU in less than 24 hours post-intervention for an AMI. Most of the patients were discharged on no less than two new medications, with one of those medications often a high-risk anti-platelet medication.

Eligibility Criteria

Participants in this study included all adult patients age 18 and older with a primary diagnosis of AMI discharged to home from the practice site, whether they received a PCI or were medically managed without invasive intervention. A PCI intervention is defined as a non-surgical procedure that used a catheter to place a small structure called a stent or a balloon to open up blood vessels in the heart that have been narrowed by plaque buildup (United States Department of Health and Human Services [USDHHS], 2011). Project enrollment was automatic for eligible patients as part of the QI process. Inclusion criteria were respective to the location to which the patient was discharged. Patients discharged to nursing homes, SNF's, long-term care facilities, or hospice were tracked, but since medical professionals handled their medication management, these patients were excluded from the Called to C.A.R.E. initiative. Both English and Spanish speaking persons were included in this care initiative. Persons aged 17 or younger and those who lacked a telephone in their residence or discharge location were excluded.

Structure

The purpose of this project was to measure the effect of the Called to C.A.R.E. initiative on readmission rates in recently discharged AMI patients. The calls were conducted at specific time points. The C.A.R.E. acronym means clarify, assesses, reinforce, and engage patients and/or

designated support person in their post-discharge medication management. The calls served to reinforce pre-discharge medication education and as an additional opportunity for teach-back rather than to introduce new information concerning the patient's medication management. Two specific aims were addressed in this project: 1. Did the Called to C.A.R.E. initiative reduce AMI 30 day readmissions within the three month intervention time-period? and 2. What was the financial impact of this intervention?

The Team developed a team charter (See Appendix A) to establish boundaries and a clear direction for the quality group. A series of interdisciplinary team meetings with the Team were held throughout this project. Four meetings had been held prior to the national Covid-19 pandemic which reduced the momentum of the team meetings for a period of two months though meetings resumed in July 2020 and continue to meet monthly. The Team consisted of quality improvement specialist, CM's, department directors, physicians, pharmacists, and a Cardiology NP. In those initial January and February meetings of 2020, the charter was developed and a gap analysis was conducted to identify the primary areas of opportunity. The primary areas of opportunity identified were: staff development, content of discharge education, medication management; which included medication reconciliation, internal and external hand-off processes, care coordination, and a process to have patients questions answered post-discharge.

Process

Process as defined by Donabedian, indicates what a provider does to maintain or improve health, either for healthy people or for those diagnosed with a health care condition (AHRQ, 2017). The process elements of this QI intervention included: team meetings, patient and family inpatient medication reconciliation and education, CM and RN involvement with introduction of the initiative, the Cardiology NP verifying the support person by patient interview prior to

discharge, and the Cardiology NP implementation of the Called to C.A.R.E. initiative. The Called to C.A.R.E. phone calls were implemented at the 48-hour time frame and every seven days thereafter up to 30 days. If the patient or support person was not reached at the 48 hour time point, the call was attempted again at 72 hours. Each patient received a minimum of four phone call attempts, and a maximum of five attempts over a 30 day period from discharge date. If contact was made with the patient or support person at 48 hours, the subsequent call was seven days from that date to the same individual. If the initial contact was at 72 hours, the subsequent calls were made every seven days thereafter to the same individual, up to 30 days post-discharge date. After the initial contact was made, the patient or support person was to be asked a preferred time for the subsequent calls, which could potentially enhance compliance. However, through PSDA cycle assessment, it was not feasible to incorporate patient preference because of practice demands and workflow at the Cardiology NP's practice site.

Inpatient Procedures

The Internal Review Board (IRB) of the Cardiology NP's practice site determined that this project was QI and did not require IRB oversight. At the Team meeting in June 2020, permission was obtained to conduct the QI project. The staff were informed of the initiative by the Nursing Directors and the CM lead at the practice site through staff meetings and e-mail communication. After the initial staff communication, the Cardiology NP reinforced the project with the staff the week prior to implementation and continued weekly check-in's throughout implementation. The hospital Cardiologists were also notified the week prior to implementation of the QI initiative and given an opportunity for questions. Flyers were placed on all inpatient nursing units as a reference for the staff. To identify eligible patients, the Cardiology NP obtained access to a report in the electronic health record (EHR) for any patient with a primary

diagnosis of AMI (including ST-elevation MI and Non-ST-elevation MI). This list was run daily from the EHR by the Cardiology NP at 7 am, 7 days a week. The list was closely reviewed to identify patients who met eligibility criteria and eliminated those who did not meet criteria. Patients who did not meet eligibility criteria were removed from the list. This list was generated by the NP for a period of 7 weeks.

This was a QI initiative; therefore, all eligible patients were offered the Called to C.A.R.E. initiative. To determine the primary contact for the Called to C.A.R.E. initiative, a pre-hospital assessment was conducted. The Cardiology NP conducted this assessment daily during the 7 week period. Patients were asked these questions: 1. Do you manage your medications at home independently or rely on a support person for assistance? If the latter, the name and phone number were obtained, and 2. What is their relationship to you? If the patient was unable to identify a support person, the demographic face sheet in the EHR was utilized for an identified emergency contact. The Cardiology NP contacted the individual identified prior to patient discharge to assess if they were indeed going to be the support person for the patient. If the identified individual said they were unable to be the patients' support person, then the patient was asked to identify another individual. If they were unable to identify a willing or able support person, then the patient was the default contact. Patients were categorized into two groups thereafter: independently manages medications and medications assisted or managed by support person. This information was communicated by documentation on the patient white board by the Cardiology NP. The identified primary support person was also documented on the white board in the patient hospital room, with supporting contact information, as is already a standard of care at the practice site. The support person options were open to the patient discretion and were tracked and recorded.

The introduction of the Called to C.A.R.E. initiative occurred at two timepoints during the patient's admission. The Cardiology NP provided a script for the CM's and RN's to follow when introducing the project to the patient and their support person (See Figure 4). The CM or RN were the first touchpoint and the Cardiology NP was the second M-F 9-6pm. Due to limited scheduling, on weekend mornings, the RN was the first touchpoint, and the Cardiology NP conducted the second touchpoint. After 6pm on the weekdays, there was no CM or RN available to conduct the initial touchpoint, therefore patients admitted after 6pm were introduced to the project the following morning. All nursing units were provided with the laminated cards to administer to the patients and use for the project introduction during touchpoint one. This provided an opportunity for any pre-discharge questions to be answered and allowed time for clarification of the purpose of the calls, which was not to introduce new information or provide medical advice. The patient was told to expect the calls from the Cardiology NP between the hours of 9am-6pm at 48 hours and then every seven days thereafter. The laminated cards included the initiative description and the Cardiology NP's name and contact information (See Figure 4). This information was written based on The Centers for Disease Control and Prevention (CDC) (2016) "Everyday words for public health communication" guidelines. These guidelines recommended using active voice, short sentences, and using everyday words and pronouns. Patients discharged to a SNF, nursing home, hospice, long-term care, inpatient rehab, or were deceased prior to discharge, did not receive the intervention. Discharge disposition, date, and time were tracked on a spreadsheet by the Cardiology NP.

Post-Discharge Procedures

All adult patients age 18-105 with a diagnosis of AMI discharged from the practice site during the implementation time frame, were included as participants in this initiative. The

patients were initially identified by their MRN numbers for tracking purposes, then assigned a patient identification number by the Cardiology NP to maintain privacy. A scripted follow-up phone call tool (See Figure 3) was utilized for up to 30 days post-discharge on all eligible patients to discuss their medication management. The first scripted follow up phone call (C1) occurred at 48 hours post patient discharge from the hospital. A copy of the patients after visit summary (AVS) with the list of medications was utilized during each phone call for real time review and comparison. The Cardiology NP conducted these calls between the hours of 9am-6pm daily. The patient responses, time of day, and the length of each call were tracked by the Cardiology NP on a spreadsheet. If the patient or support person sought medical advice during the call, the Cardiology NP directed them to their provider. Any patient who contacted the Cardiology NP at any point in between calls was also tracked. If the patient or support person was not available or did not answer the phone on the first attempt at 48 hours, the Cardiology NP made a second attempt at 72 hours. If the patient or support person did not answer at the 72 hour time point, the calls were still attempted every seven days up to 30 days.

The Cardiology NP attempted a minimum of four phone calls and a maximum of five attempts over the 30 day period. The number of calls were tracked using the C1, C2, C3, C4, C5 timepoints. On the final phone call, the patient or support person were asked three questions to evaluate the intervention and could respond yes, no, or unsure to each question posed (See Figure 6). None of the patients requested to be excluded from any further phone calls at any point during the intervention, but this would have been respected, and tracked. No attempts were made to contact the patients beyond the 30 days post discharge date.

Outcomes

This proposed project used a QI framework to test if the new process of the Called to C.A.R.E. initiative would reduce readmissions in AMI patients recently discharged from the practice site. The two specific aims addressed in this project were: 1. Did the Called to C.A.R.E. initiative reduce AMI 30 day readmissions within the three month intervention time-period?, and 2. What was the financial impact of this intervention? The measures to answer the first aim were archived data provided by the data analyst for the market from the same time period one year prior to the intervention period for this project. This data was used to assess and compare if there was a reduction in readmissions after the initiative occurred. The patient's discharged to SNF, nursing home, long term care facilities, hospice, inpatient rehab, or became deceased, were tracked, but not included in the analysis. To measure the financial impact aim, the time spent on initiative was tracked. The salary of the NP, RN, and CM were calculated, and the cost of the inpatient procedures and materials to conduct the intervention were totaled for year one and year two (See Table 4). The Cardiology NP conducting the calls tracked the data for patients who did not answer the phone calls. The PDSA cycle was utilized and changes were made as indicated in regards to timing of the patient calls and introduction of the project to patient or their support person.

Statistical Analysis

To measure the effect of the Called to C.A.R.E. initiative, readmission rates pre and post intervention were compared. The readmission rates for a three month period in 2019 were compared to the same three months in 2020, after Called to C.A.R.E was completed. The post-intervention questionnaire was a simple three question Likert scale utilized to assess patient perception of the intervention (See Figures 6-8). In order to assess for variations in the data, timing of the phone calls, discharge location, and whether the patient or the support person received the intervention were tracked. Descriptive statistics collected included: age, gender,

race, education, location of discharge, length of stay, percentage of patients who handle their own medications, percentage of patients referred to other services, and the demographics of the support person. To answer project aim number one, readmission data was analyzed using Pearson chi-square. Through collaboration with the practice site quality data analyst, historical data were collected through the EHR. Data were analyzed using descriptive and inferential statistics.

IRB Review

The determination by the organization's internal IRB was this project could proceed as a QI process with no IRB oversight (See Appendix B). The Privacy Officer of the practice site reviewed the project procedures and aims, and provided consent for this project to be implemented. The policy for the organization will be followed when sharing proprietary data. Participants were informed that this QI is offered to all patients with the diagnosis of AMI for the purposes of ensuring they had follow-up post-discharge. All data was given an identification number and was anonymously processed. Regarding the use of the patient's telephone number to contact them, permission was obtained from the patient and/or support person. All of the Health Insurance Portability and Accountability Act (HIPAA) Protected Health Information (PHI) identifiers were removed from the data obtained during implementation of the project. This information was not stored on any external hard drive and were only used for the purposes of this QI. Data collected is property of the health care organization and was presented to the Team for future analysis. The patient contact information was only kept during the duration of the intervention, then discarded in a locked shred bin at the hospital. There were no conflicts of interest, nor personal financial gains as a result of conducting this initiative.

Results

Characteristics of the Eligible Patients

Eighty-nine AMI patients were eligible, but 66 received the Called to C.A.R.E initiative. Of these 89 patients, nine patients were deceased prior to discharge, two patients were discharged to SNF's, three patients were discharged to inpatient rehabilitation facilities, two patients were discharged to long term care facilities, and two patients were discharged to hospice, therefore, those eighteen patients did not receive the intervention. There was one patient who was readmitted within three hours of discharge, and an additional four patients did not answer any of the follow-up calls. Thus, a total of 66 patients received the Called to C.A.R.E. initiative. Any readmitted patient was not re-enrolled because they were already defined by CMS as an all cause readmission.

The 89 eligible patients showed the following demographics. The mean age was 68 years with a range of 38-95 years. The sample was predominantly Caucasian (72%), male (55.1%), married (42.7%) or widowed or divorced (39.3%) and all patients were English speaking. The educational level ranged from fifth grade to graduate studies, with (68.5%) completing high school or partial high school. The majority of the patients reported living with someone, whether an adult child, spouse, or friend (75.3%). (See Table 5).

The majority of the 89 eligible patients were discharged to home or to a family members home (78.7%), nine patients (10.1%) died prior to discharge, and 10 patients (11.2%) were discharged to hospice or a facility. The average length of stay (LOS) for the non-readmitted group was 4.38 days with a range of 1-46 days. Due to this outlier, the median was calculated as a measure of central tendency and was three days, with the interquartile range (IQR=2-5). The majority of these patients (75.3%) received Medicare or Medicaid benefits (See Table 5).

Among the readmitted patients, (n=10), the mean age was 69.9 years, predominantly Caucasian (80%), male (60%), married (20%), with (80%) widowed, divorced, single, or separated. Educational level among this group was 70% competed high school or above, and the remaining 30% had a 5th-8th grade education. Forty percent of the patients reported living alone, with the remaining (60%) stating they lived with someone. There was an average LOS of 5.2 days within the readmitted population.

In the entire group of 89, there was a broad range in number of prescribed medications at discharge from 0-28, with the average of 12 medications. Among the readmitted patients, the range was 5-28 medications, with an average of 16 medications per patient. The non-readmitted patients had a range from 0-24 medications, with an average of 10 medications at discharge (See Table 6). This displays that on average the readmitted group of patients was prescribed six more medications than those who were not readmitted.

Demographics of the Support Person

The Called to C.A.R.E initiative was given to the patient or support person based on the patient's response while hospitalized. Of the total eligible sample (N=89), 58 or (65.2%) stated they managed their own medications and 31 or (34.8%) stated that a support person managed their medications. Twenty-five or (28.1%) of those who managed the medications for the patient were identified as a family member. There were only six or (6.7%) who had facility personnel or paid caregivers to manage their medications.

Eighty six or (96.6%) of eligible patients identified a support person and only three patients, (3.4%) did not. Spouses or significant others were most prevalent support, 43 (50%), with other family members at 10 (11.7%). The majority of the support persons, 30 (69.8%), identified themselves as wives to the patient, with adult children following closely at 28 (32.5%).

Support persons were predominantly female (61.6%) (See Table 7). When those who were readmitted were extrapolated from the overall eligible population, only two (20%) of the 10 readmitted patients stated they did not have social support available and five (50%) of them handled their own medications. Three (30%) had a wife or daughter to assist with their medications, and two (20%) were dependent on facility nurses.

Readmission Reduction

Of the 89 patients eligible for the intervention, there were 66 who met the inclusion criteria to receive the intervention. The 23 patients who did not receive the intervention were either discharged to a facility or hospice, deceased prior to discharge, or there were no answers for any of the calls (n=4). There were a total of 10 readmissions in the 2020 time period, and 12 readmissions in the 2019 time period. Of the 10 readmitted patients in 2020, two were readmitted from a facility, one patient was readmitted the same day of discharge, and another patient did not answer any calls prior to being readmitted, thereby none of these patients participated in the Called to C.A.R.E. initiative. Therefore, these patients were eliminated from the data analysis.

The impact of the Called to C.A.R.E initiative was measured by comparing the rate of readmissions during the intervention period in 2020 to readmissions in patients admitted to this facility during the same months in 2019. The readmission rate of 6/66 (9.1%) seen in the patients who received the Called to C.A.R.E was compared to a readmission rate of 12/51 (23.5%) in the number of cases reviewed in 2019. There was a statistically significant difference in readmission rate (4.607; p=.032) between 2020 and 2019. This result provided support that the readmission rate of patients who received the Called to C.A.R.E. initiative was lower when compared to the readmission rate for the prior year, during the same time period, at the same practice site (See Table 8). The only demographics available for the 2019 group from the data analytics

department of the practice site was age, gender, race, and marital status. Of note, there is no available demographic data specific to the 12 readmitted patients, only for the entire 2019 group. In this 2019 group of 51 patients, the age ranged from 40-88 years, with a mean age of 69.1. The majority were male 30 (58.8%), Caucasian 33 (64.7%), married 26 (51%) or widowed or divorced 14 (27.4%). The percentage of readmissions in 2020 at the same practice site was 14.4% lower than in the preceding year (See Table 8). The Phi value was .198, which is a low effect size (See Table 8). This indicates the statistically significant variation in the readmission reduction could be associated with other variables than the Called to C.A.R.E initiative.

Among the 10 readmitted patients, the number of days home prior to readmission ranged from 1 to 28 days, with a mean of 15.8 days. Four of the patients made it greater than 20 days post-discharge before being readmitted to the hospital (See Figure 10). Three of the readmitted patients had a chief complaint of chest pain; one was treated medically and the other two were taken to the cardiac catheterization lab and re-examined for new coronary blockages. One of the three patients needed stenting to another coronary vessel. Three patients were readmitted with atrial fibrillation with rapid ventricular response. Two patients were readmitted from facilities, one for treatment of septic shock and the other for progressive gangrene of a below the knee amputation. One patient was readmitted within three hours for seizures and the final patient was readmitted for acute diastolic heart failure. As the focus of the QI project was not on reasons for readmission, no data was collected to measure if medication management correlated with reasons for the readmissions. All readmitted patients who received the Called to C.A.R.E. initiative reported medication compliance during the calls with the Cardiology NP. However, many of the patients reported side effects, such as dizziness, syncope, overall malaise, and lethargy.

Of the 66 patients who received all or most of the Called to C.A.R.E. initiative, 17 patients needed referrals to other services. The Cardiology NP contacted the outpatient CM department lead to help two patients find a primary care physician (PCP), referred four patients to their cardiologist with concerns about dizziness, depression, and other adverse effects they reported, and one patient needed assistance finding a location to obtain Covid-19 testing. There were 10 patients who needed prescription refills, had insurance questions, or other health care related questions, which were referred to their PCP. Overall, most patients shared some additional information or had additional questions outside medication management, to which the Cardiology NP could not provide an answer due to the limitations of the project focus.

Call Data

There were a total of 283 call attempts made throughout the Called to C.A.R.E. initiative, totaling 3,016 minutes or 50.3 hours (See Figure 6). There was no time limit to the calls so the patient or their support person would feel unhurried to discuss their medications in a calm manner. Many of the names of medications were difficult for the patients to pronounce or remember. A total of 58 (20.5%) calls were unanswered with 225 (79.5%) of the call attempts connecting with a patient, support person, or both. The average number of unanswered calls for each time point was 11.6, with the majority of "no answers" occurring at C1 overall. Among the 66 patients, 42 (47.2%) answered all four calls, 13 (14.6%) answered three calls, seven patients (7.9%) answered two calls, and four (4.5%) answered one call.

Of the 66 who received the Called to C.A.R.E. initiative , 46 were the patient, 15 were a support person, and five were both the patient and a support person. Among the 46 patients who responded to the Called to C.A.R.E, 38 answered three to four calls of the series, six answered two calls, and two answered one call. Of the five who had both participants on the calls, four

answered all four calls, and only one pair answered one of two call attempts, and were readmitted by the third attempt. The 15 support persons who participated were, a son, a granddaughter, seven wives, four daughters, a husband, and a mom. All but one support person answered three to four calls of the series, there was one wife who answered only two of the four calls. All 66 patients reported a support person available to them. There was a high response rate among all three groups, but the support group rate was highest at 93.3% (14/15), the patient group 82.6% (38/46), and 80% (4/5) for the combined patient/support group. The clinical significance of this finding reinforces the literature, which shows patients with support manage better than those without support available (Turan, Aksoy, & Ciftci, 2019).

The time of day of the calls and the day of the week were tracked. The majority of calls, 148, occurred in the afternoon (12pm-3pm), 80 in the evening (3pm-6pm), and 55 in the morning between 9am-12pm. A Pearson chi-square test was used to determine if the time of day the calls were made impacted the patient answering the calls, resulting in a chi-square equal to 5.244 ($p = .073$). This is not a statistically or clinically significant result (See Figure 11). The day of the week the calls were made was also examined to determine if this would impact the patient participation in the call series. The majority of calls occurred on Friday (12 calls) and the least amount of calls occurred on Tuesday (8 calls), with an average of 10 calls per day. A Pearson chi-square test was used to determine if the day of the week the calls were made impacted the patient answering the calls, resulting in a chi-square equal to 6.119 ($p = .410$). This is not a statistically or clinically significant result (See Figure 12).

Though the number was small for readmissions among the patients who received the Called to C.A.R.E. initiative, of the six readmitted patients, they answered a minimum of one call and a maximum of three calls of the series. For those patients who were not readmitted and

received the Called to C.A.R.E. initiative (n=60), the patients answered a minimum of one call (n=2) and a maximum of the entire four call series (n=42). There were 38 missed calls in total for the non-readmitted Called to C.A.R.E. group, with the majority of missed calls occurring at C1 (12 no answered calls) and C3 (13 no answered calls). The average number of calls answered by the non-readmitted Called to C.A.R.E. group was 3.57 as compared to an average of 1.83 in the readmitted group. This is a favorable trend which associates a higher number of calls answered to the non-readmitted group.

Patient Perspective

On the final call of the series, the patients were asked three questions to determine their perception of the Called to C.A.R.E. initiative: 1. Do you think this Called to C.A.R.E. initiative helped you to stay out of the hospital?, 2. Do you feel there were too many calls made to you?, 3. Do you feel the length of time on the calls was too long?. A total of 58 patients answered the last call. In regards to question one, 51 of the 58 respondents responded “yes” they felt the initiative kept them out of the hospital and seven were unsure. In response to questions two and three, all 58 patients responded no. There were 31 patients who did not participate in the questionnaire because they were excluded, readmitted, or didn’t answer the call (See Figure 8). There were 43 patients who provided feedback, which was documented (See Figure 9). The common themes were they felt a sense of caring, it kept them on track, and it provided clarity.

Financial Analysis

A financial analysis was conducted to evaluate the cost and cost savings of the Called to C.A.R.E. initiative for year one and year two at a single practice site. The materials required to complete this initiative were the laminated cards, the unit flyers, the laptop for remote access, and a telephone with service to conduct the calls. The laptop with windows and the telephone

were devices issued to the Cardiology NP which were of no additional cost to conduct the initiative, therefore the initial cost for materials was $697.70. The personnel involved in the initiative were a single Cardiology NP and a CM or RN to assist with introduction of the initiative on the inpatient setting. Based on the calculated hours to conduct this initial project, there was only a need for a 0.1 Full Time Equivalent (FTE) CM or RN and a 0.4 FTE NP. This totals to $51,516 in annual personnel expenses. The intervention was conducted solely by the NP and included time to review the patient record prior to conducting calls, running the daily report, checking on the patient discharges, and the actual time spent discussing medications with the patient or support person. In dollars this equates to $4,644.08, therefore the total projected cost for year one was 57,871.24 (See Figure 4).

The projected cost for year two was $25,140.28, with a total projected cost for year one and two at $83,011.52. The cost avoidance as a result of the Called to C.A.R.E. initiative was seen in the reduction of readmission, from 12 patients in 2019 to six patients in 2020. The cost of each AMI readmission is approximately $20,800 (CMS, 2017), therefore the projected cost savings was $124,800. If this reduction rate is repeated for year two, the site would see an additional savings of $62,400 with a net savings of $163,329.33 for years one and two (See Figure 4).

Discussion

Summary and Interpretation

The purpose of this Quality Initiative (QI) project was to measure the effect of the Called to C.A.R.E. initiative on reducing readmission rates in recently discharged AMI patients within 30 days following discharge.

Two specific aims were addressed in this project:

1. Did the Called to C.A.R.E. initiative reduce AMI 30 day readmissions within the three month intervention time-period when compared to 30 day readmissions in a comparable three month period?

2. What was the financial impact of this intervention?

The readmission rate in the 66 patients who received the Called to C.A.R.E. initiative was 9.1%, a 14.4% reduction when compared to the readmission rate of 23.5% in the 2019 group. There was a high response rate of 79.5% among the patients or support persons participating in the Called to C.A.R.E initiative. The initiative posed a low financial burden to the organization to implement, and the 14.4% reduction rate totaled approximately $124,800 in cost reduction for AMI readmissions at this one practice site (CMS, 2017). Though the readmitted group was small, there were some notable differences between the readmitted and non-readmitted groups. The readmitted group had a longer LOS, were discharged on more medications, and fewer were married suggesting less social support. These differences are worthy of further investigation.

The Cardiology NP will present a report of the Called to C.A.R.E initiative to the administration at the practice site. Because of the reduction in readmission rates and the favorable financial bottom line, the initiative is sustainable and, thus, the NP will recommend that Called to C.A.R.E. initiative be continued. Revisions to consider are: 1. Inclusion of patients discharged to a post-discharge facility; 2. Provide the follow up calls at time of day preferred by the patient to improve patient satisfaction; 3. Include the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) analysis; 4. Add documentation of the initiative in the patient chart for communication to the TOC team; 5. Expand the AHRQ tool used to incorporate activity, daily monitoring, and diet recommendations. Finally, the strong recommendation will be made that an APRN with prescriptive privileges provide the follow up

phone calls, as the cornerstone of Called to C.A.R.E. initiative, in order to diagnose and adjust medications in real time and as needed by the patient report.

Key elements to the success of the Called to C.A.R.E initiative included the introduction of the initiative to the patient prior to discharge, identification of a support person, continuity of care by the Cardiology NP, and the high level of support identified as available to the patients. The findings of this QI project were consistent with several recent studies that examined readmission risk in cardiac patients. Howie-Esquivel & Spicer (2012) found that HF patients without partners were more at risk for readmission, irrespective of age. In another study that looked at the effects of perceived social support on the effects of medication adherence in hypertensive patients, drug adherence of patients with hypertension was found to have a strong correlation with perceived social support (Turan, Aksoy, & Ciftci, 2019). In this Called to C.A.R.E. initiative, 42.7% of the patients were married and 75.3% stated that they lived with someone. This level of post-discharge support after a health care crisis, such as an AMI, may explain the reduction in the readmission rate. This finding is consistent with the findings in Turan et al. (2019), which showed married patients perceived more emotional support than single patients. In a study conducted by Chan et al., (2019), those patients with high social support had half the odds of readmission or death within 30 days post-discharge than those with low social support. Assessing patients' social support may aid targeting of transitional care resources and intervention design and help to mitigate readmission risks in various patient populations, not simply in AMI patients.

The CM and RN's involved at the practice site provided only positive feedback concerning the initiative. The CM in particular would touch base with the Cardiology NP daily and discuss the eligible patients. As part of their daily workflow, the CM incorporated the

introduction of Called to C.A.R.E. initiative during their initial assessment of the AMI patients. The RN's involved utilized the same practice. Neither perceived the initiative as a high increase in time to their daily work-flow.

The Called to C.A.R.E. initiative provided a positive perception to the patient and/or their support person(s) towards the organization (See Figure 9). Inpatient practices associated with this project aided in the identification of a support person, and also placed the NP in a position to meet the patient personally prior to discharge. This helped in the establishment of a relationship prior to the implementation of Called to C.A.R.E. initiative after patient discharge. It created a standardized process by which AMI patients were identified, assessed, and followed-up on, which facilitated consistency, resulting in fewer readmissions.

There were differences between the patients who were readmitted to those who were not that may explain the difference in readmission rates. Eight of the readmitted patients were single, separated, widowed, or divorced and two patients stated they lacked social support. Eight of the readmitted patients visited the ED prior to their readmission date, ranging from 1-6 visits. The ED visits varied from a chief complaint of leg pain, vertigo, headache, dehydration, seizures, chest pain, and a hematoma. One of the readmitted patients had no outpatient cardiologist, so he sought emergency room and inpatient acute care for cardiac management.

A study published by Fabbietti et al. (2018), found the association between polypharmacy and three month readmission is substantially independent of potentially inappropriate medications, but should always be considered as a clue for readmission cause. Polypharmacy is an issue and concern among our elderly population and should be addressed at every opportunity possible to reduce the burden of medications. The average of six more medications prescribed to the readmitted group has meaning and is worth further study. This finding is consistent with the

literature findings that support higher number of medications are associated with higher rates of readmissions (Heaton et al., 2019).

Strengths and Limitations

The most significant strengths of this QI were the use of evidence based literature, the student was embedded in the practice site, and external data (the ROL) and internal data (institutional assessment) were used as a basis for the design. Additionally, a modified, validated tool created by the Agency for Healthcare Research and Quality (AHRQ) was used to guide the Called to C.A.R.E. initiative. The tool required minimal resources, but could result in a feasible, inexpensive, sustainable intervention. Additionally, 100% of the patients meeting the inclusion criteria were targeted for this quality initiative, rather than a small sample size, therefore these results were reflective of the patient population at this site. On the IVCU where the majority of the AMI patients were admitted, there was a designated CM four days a week, which was beneficial for continuity and consistency of the project. The interdisciplinary collaboration and communication were strengths throughout this initiative.

Though recommendations exist for a thorough completion of medication reconciliation practices, there are currently a lack of consistent resources available to conduct a thorough assessment. This task typically defaults to the bedside RN during the admission process, without thorough assessment post-discharge. Patient medications change in dosage and frequency; some are discontinued, and some are added without much discussion. An individual with medical experience and prescribing authority who conducts a thorough medication assessment is beneficial to assist with patient transitions to home and beyond. Patients reported having multiple medications at home they were no longer prescribed with no knowledge of places to dispose of them, nor a thorough understanding of their need.

This QI was conducted at a single practice site at a rural community hospital. The data was reviewed and analyzed in one-sub population and the findings cannot be generalized to other AMI patient populations or to other hospitals. Implementation and sustainment rely heavily on administrative support and interdisciplinary team collaboration, which ultimately leads to improved patient outcomes. For consistency throughout the intervention, none of the eligible patients were asked a preferred time to receive the calls, which could have affected their ability to respond to the calls.

The current Covid-19 pandemic affected patient access to elective procedures and diagnostic testing in the spring during the height of the pandemic. This could have potentially delayed patient ability to seek care for chronic illness management or acute exacerbations of underlying health conditions. The limitations on visitors and visitation hours to the hospital could have affected the patient support person presence during their admission or at time of discharge. Staff illness and turnover posed a limitation because the new staff needed introduction to the project aims and purpose, it consumed additional time, and occurred weekly.

Implications for Practice

Implementation of the Called to C.A.R.E. initiative has a significant impact on the establishment and maintenance of a patient/provider relationship throughout the care continuum. The primary aim of the initiative served to reduce readmissions in the AMI patient population by providing medication management support post-discharge by an APRN with prescribing privileges. In creating a standardized process of establishing a relationship with not only the patient, but a designated support person prior to discharge, the APRN was able to utilize that relationship to gain a 79.5% response rate for participation in the post-discharge initiative. This high response rate allowed multiple opportunities for medication questions to be answered at

specific timepoints by the APRN, thereby likely aiding in the reduction of readmissions. The coordinated follow-up phone calls to the patient or their support person allowed the APRN an opportunity to build on information shared throughout a 30 day time span. The APRN with prescribing privileges was a constant resource to the patient, which likely led to the development of a more trusting relationship with the provider and the organization. By identifying a designated support person prior to discharge, medication management for patients will likely be greatly improved, as it has been proven that an established support person aides in the reduction of readmissions for patients (Howie-Esquivel & Spicer, 2012). Future implementation of this initiative at other facilities in the market by an APRN with prescribing privileges may aide in real time adjustment of medications and potentially avoid serious side effects to the patient. Partnering with patients and their families concerning their medication management may be especially impactful to avoid ED visits and continue to reduce readmissions because 81.1% of hospital ED visits involve drug therapy (CDC, 2017).

Sustainability

Implementing long-term quality initiative practices to a practice site can pose a challenge. The Donabedian Framework (Donabedian, 1988) uses an algorithm which outlines a simple three step process for identifying an issue with current structure, practice, and outcomes in a health care organization. This standard is essential for effective functioning in a quality improvement project and there could be multiple processes in place simultaneously to achieve a single outcome, such as decreasing readmissions. Individual organizational dynamics and practices can heavily influence procedures and adoption of these practice changes.

The findings of the Called to C.A.R.E. initiative support its continued sustainability in the AMI patient population and expansion to other patient populations in need of readmission

reduction. The overall cost of implementation is less than the potential net benefit in readmission reduction and increased patient satisfaction ratings. The inpatient stay is inundated with procedures, new information, and multiple members of the interdisciplinary team interacting with the patient; therefore an outpatient resource would provide continued support. Patients want to feel supported beyond the inpatient setting and this was expressed by the majority of those who received the Called to C.A.R.E. initiative (See Figure 9). Medication reconciliation is a laborious, and often rushed process in the inpatient setting. This factor and that patients are in a state of stress can lead to incomplete understanding of their medication regimen at home. Calls at set time points by an APRN in the 30 days post admission were shown to be effective in preventing readmission.

In order to better serve the patients and allow the APRN to practice to their full scope, this initiative should expand to allow the APRN to provide medical advice to the patients. The script used for the calls would need to be revised to include the additional health information to be collected from the patient or support person. The APRN with prescribing privileges is also capable of calling in, changing, discontinuing, or modifying patient medications based on the clinical data presented at the time of the calls. This timely ability to respond to patient care needs could lead to improved patient outcomes. The timing of the calls every seven days was an adequate amount of time for the patient to continue to feel supported, yet not overwhelmed by the provider check-ins (See Figure 9). There was an opportunity for the patient and APRN to develop and sustain a trusting relationship through the multiple interactions over the 30 day time period. The subsequent calls also addressed prior medication issues to ensure resolution, especially if the patient was referred to a PCP or Cardiologist with medical concerns.

Disseminate Results

Program information, project findings, and financial analysis information will be presented to the practice site during the readmission reduction committee meeting in December 2020, and the data and tools will remain at the organization for further analysis and potential expansion of the program. A full manuscript of the project will be submitted to the University of Virginia School of Nursing as part of the requirements for completion of the Doctorate of Nursing Practice program, as well as submitted to Libra, the University's scholarly institutional repository. A manuscript will be submitted to the *Journal of Cardiovascular Nursing (JCN)* for publication based on journal guidelines for submission. An abstract has been submitted to the Virginia Council of Nurse Practitioners (VCNP) for their review and approval to present a poster at their annual conference in March 2021, notification of acceptance will be determined in late December 2020.

Conclusions

Acute myocardial infarction is a significant problem affecting men and women of various cultures and races across the age span. One in six AMI patients are readmitted in the first 30 days at the annual cost of $1 billion dollars to the US healthcare system (CMS, 2017). Thus, innovative interventions aimed at reducing the emotional and financial burden of readmissions are of value. This paper reported on the effect of the Called to C.A.R.E. initiative, a series of four, scripted follow up phone calls by a Cardiology NP focusing on medication management in a group of 66 patients discharged from a rural, community hospital in 2020. The intervention was effective in reducing the readmission rate by 14.4% and supported findings in the literature that the presence of a support person is important in managing medication regimens and avoiding readmission. The net benefits in reduction of financial losses from AMI readmissions and the

potential improvement in patient outcomes and satisfaction outweighed the cost to implement this intervention. APRN's with prescribing privileges are uniquely poised with the medical knowledge, established patient rapport, and with the familiarity of available resources in the community to reduce readmissions and assist patients and their support persons with managing complex medication regimens after discharge for an AMI.

References

American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. (2019). 2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease. *Journal of The American College of Cardiology, 74*(10), e177-e232. https://doi: 10.1016/j.jacc.2019.03.010.

Anderegg, S. V., Wilkinson, S. T., Couldry, R. J., Grauer, D. W., & Howser, E. (2014). Effects of a hospital wide pharmacy practice model change on readmission and return to emergency department rates. *American Journal of Health System Pharmacy, 71*(17), 1469-1479. https://doi: 10.2146/ajhp130686.

Agency for Healthcare Research and Quality. (n.d.). *Types of Quality Measures*. Retrieved from https://www.ahrq.gov/professionals/quality-patientsafety/talkingquality/create/types.html

Agency for Healthcare Research and Quality. (2017, December). *Strategy 4: Transitions from Hospital to Home: IDEAL Discharge Planning.* https://www.ahrq.gov/professionals/systems/hospital/engagingfamilies/strategy4/index.html

Agency for Healthcare Research and Quality. (2011, August). *Sample Script for Follow-Up Phone Call.* https://archive.ahrq.gov/professionals/systems/hospital/red/callscript.html.

Budiman, T., Snodgrass, K., & Komatsu, C. A. (2016). Evaluation of pharmacist medication education and post-discharge follow-up in reducing readmissions in patients with ST-segment elevation myocardial infarction (STEMI). *Annual Pharmacotherapy, 50*(2), 118-124. https://doi: 10.1177/1060028015620425.

Cardiac care bridge trial. (2019, March 31). ICTRP. Retrieved February 26, 2020, from http://www.who.int.proxy01.its.virginia.edu/trialsearch/Trial2.aspx?TrialID=NTR6 316, 2017

Centers for Disease Control and Prevention. (2019). *Heart Disease Facts.* https://www.cdc.gov/heartdisease/facts.htm

Centers for Disease Control and Prevention. (2017). *FastStats: Therapeutic Drug Use.* https://www.cdc.gov/nchs/fastats/drug-use-therapeutic.htm

Centers for Disease Control and Prevention. (2016, May). Everyday Words for Public Health Communication. https://www.cdc.gov/Other/PlainWriting.html.

Centers for Medicare and Medicaid Services. (2017). *Measure Information Form.* https://www.cms.gov/Medicare/Medicare-Fee-for-Service Payment/PhysicianFeedbackProgram/Downloads/2015-ACR-MIF.pdf

Chan, B. , Goldman, L. E., Sarkar, U., Guzman, D., Critchfield, J., Saha, S., & Kushel, M. (2019). High perceived social support and hospital readmissions in an older multi-ethnic, limited English proficiency, safety-net population. *BMC Health Services Research, 19*(334), 1-9. https://doi.org/10.1186/s12913-019-4162-6.

Chavis, K. (2019). *CMS Hospital readmissions reduction program (RRP) projections for payment FY 2021 through 2023.* Bon Secours Mercy Health.

Conliffe, B., VanOpdorp1, J., Weant, K., VanArsdale, V., Wiedmar, J., & Morgan, J. (2019). Impact of an advanced pharmacy practice experience student-run “Meds 2 Beds” and discharge counseling program on quality of care. *Hospital Pharmacy, 54*(5), 314-322. https://doi.org/10.1177/0018578718791519

de Bono, D. (1993). Complications of diagnostic cardiac catheterisation: results from 34,041 patients in the United Kingdom confidential enquiry into cardiac catheter complications. The Joint Audit Committee of the British Cardiac Society and Royal College of Physicians of London. *British Heart Journal, 70*(3), 297-300.

Donabedian, A. (1988). The quality of care: how can it be assessed? *JAMA, 260*(12), 1743–1748.

Du, L., Dong, P., Jia, J., Li, Z., Lai, L., Yang, X., Wang, S., Yang, X., Li, Z., Shang, X., & Fan, X. (2016). Impacts of intensive follow-up on the long-term prognosis of percutaneous coronary intervention in acute coronary syndrome patients - a single center prospective randomized controlled study in a Chinese population. *European Journal of Preventive Cardiology, 23*(10), 1077-1085.

Fabbietti, P., Di Stefano, G., Moresi, R., Cassetta, L., Di Rosa, M., Fimognari, F., Bambara, V., Ruotolo, G., Castagna, A., Ruberto, C., Lattanzio, F., Corsonello, A. (2018). Impact of potentially inappropriate medications and polypharmacy on 3-month readmission among older patients discharged from acute care hospital: a prospective study. Aginig Clinical Experiment Research, 30, 977-984. DOI 10.1007/s40520-017-0856-y

Frasure-Smith, N. & Prince, R. (1989). Long-term follow-up of the ischemic heart disease life stress monitoring program. *Psychosomatic Medicine, 51*(5), 485-513.

Gabriel, S., Gaddis, J., Mariga, N. N., Obanor, F., Okafor, O.T., Thornton, A., & Molasky, W. (2017). Use of a daily discharge goals checklist for timely discharge and patient satisfaction. *Medical Surgical Nursing*, *26*(4), 236-241.

Goyal, A., de Lemos, J. A., Peng, S. A., Thomas, L., Amsterdam. E. A., Hockenberry, J. M., Peterson, E. D., Wang, T.Y. (2015). Association of patient enrollment in Medicare part D with outcomes after acute myocardial infarction. *Circulation Cardiovascular Quality Outcomes, 8*(6), 567-75. https://doi: 10.1161/CIRCOUTCOMES.115.001650.

Hall, L. C., Meaux, J. B., & Reed, C. C. (2018). Care-T: Reducing readmissions on a cardiology unit. *Medsurg Nursing, 27*(3), 173-176.

Harrison, P. L., Hara, P. A., Pope, J. E., Young, M. C., & Rula, E. Y. (2011). The impact of post-discharge telephonic follow-up on hospital readmissions. *Population Health Management, 4*(1), 27–32.

Heaton, P. C., Frede, S., Kordahi, A., Lowery, L., Moorhead, B., Kirby, J., Kunze, N., & Luder, H. (2019). Improving care transitions through medication therapy management: a community partnership to reduce readmissions in multiple health systems. *Journal of the American Pharmacist Association, 59*(3), 319-328. https://doi.org/10.1016/j.japh.2019.01.005

House, M., Stephens, K. P., Whiteman, K., Swanson-Biearman, B., & Printz M. (2016). Cardiac medicine 30-Day readmission reduction strategies: do improved discharge transitions decrease readmissions? *Medical Surgical Nursing, 25*(4), 251-254.

Howie-Esquivel, J. & Spicer, J. G. (2012). Association of partner status and disposition with rehospitalization in heart failure patients. *American Journal of Critical Care, 21*(3), e65-e73.

Jneid, H., Addison, D., Bhatt, D., Fonarow, G., Gokak, S., Grady, K., Green, L. A., Heidenreich, P. A., Ho, M. P., Jurgens, C. Y., King, M. L., Kumbhani, D. J., & Pancholy, S. (2017). 2017 AHA/ACC Clinical performance and quality measures for adults with ST-Elevation and Non-ST-Elevation myocardial infarction. *Journal of the American College of Cardiology, 70*(16), 2048-90. http://dx.doi.org/10.1016/j.jacc.2017.06.032

Johnson, M. B., Laderman, M., & Coleman E. A. (2013). Enhancing the effectiveness of follow-up phone calls to improve transitions in care: three decision points. *The Joint Commission Journal on Quality and Patient Safety, 39*(5), 221-227.

Kavradim, S. T. & Ozer, Z. C. (2019). The effect of education and telephone follow-up intervention based on the Roy Adaptation Model after myocardial infarction: randomised controlled trial. *Scandinavian Journal of Caring Sciences, 34*, 247-260. https://doi: 10.1111/scs.12793

Koski, H. (2014). Challenges providing discharge education for uninsured and underinsured patients. *ViewPoint Journal, 41*(4), 3-7.

Lee, T. L., & Bokovoy, J. (2005). Understanding discharge instructions after vascular surgery: an observational study. *Journal of Vascular Nursing, 23,* 25-29.

Lee, J., Kim, S., Nakagawa, S., & Yoo, J. W. (2014). The effects of shared situational awareness on functional and hospital outcomes of hospitalized older adults with heart failure. *Journal of Multidisciplinary Healthcare, 7,* 259-265. https://doi.org/10.2147/JMDH.S62269

Ma, J. R., Fan, M. M., & Wang Z. S. (2020). Age, preoperative higher serum cortisol levels, and lower serum acetylcholine levels predict delirium after percutaneous coronary intervention in acute coronary syndrome patients accompanied with renal dysfunction. *Indian Journal of Psychiatry*, *62*(12), 172-177.

Mansukhani, R. P., Bridgeman, M. B., Candelario, D., & Eckert, L. J. (2015). Exploring transitional care: evidence-based strategies for improving provider communication and reducing readmissions. *Pharmacy and Therapeutics, 40*(10), 690-694.

Martin, L. M., Januzzi, J. L., Thompson, R. W., Ferris, T. G., Singh, J. P., Bhambhani, V., & Wasfy, J. H. (2018). Clinical profile of acute myocardial infarction patients included in the hospital readmissions reduction program. *Journal of American Heart Association. 7*(16), 1-7. https://doi:10.1161/JAHA.118.009339

Meisinger, C., Stollenwerk, B., Kirchberger, I., Seidl, H., Wende, R., Kuch, B., & Holle, R. (2013). Effects of a nurse-based case management compared to usual care among aged patients with myocardial infarction: results from the randomized controlled KORINNA study. *BMC Geriatrics Journal, 13*(115), 1-9. https://doi: 10.1186/1471-2318-13-115.

Naylor, M. D., Aiken, L. H., Kurtzman, E. T., Olds, D. M., & Hirschman, K. B. (2011). The importance of transitional care in achieving Health Reform. *Health Affairs*, *30*(4), 746-754.

Nguyen, O. K., Makam, A. N., Clark, C., Zhang, S., Das, S. R., & Halm, E. A. (2018). Predicting 30-day hospital readmissions in acute myocardial infarction: The AMI "READMITS" (Renal function, elevated brain natriuretic peptide, age, diabetes mellitus, non-male sex, intervention with timely percutaneous coronary intervention, and low systolic blood pressure) score. *Journal of the American Heart Association, 7*(8), 1-10. https://doi:10.1161/JAHA.118.008882

Patel, S. D., Nguyen, P. A., Bachler, M., & Atkins, B. (2017). Implementation of post-discharge follow-up telephone calls at a comprehensive cancer center. *American Journal of Health-system Pharmacy, 74*(2), S42-S46. https://doi: 10.2146/ajhp160805f

Patton, A. P., Liu, Y., Hartwig, D. M., May, J. R., Moon, J., Stoner, S. C., & Guthrie K. D. (2003). Community pharmacy transition of care services and rural hospital readmissions: a case study. *Journal of American Pharmacist Association, 57*(3S), S252-S258. https://doi: 10.1016/j.japh.2017.02.019.

Peters, A. E. & Keeley, E. C. (2017). Patient engagement following acute myocardial infarction and its influence on outcomes. *American Journal of Cardiology, 120*(9), 1467-1471. https://doi: 10.1016/j.amjcard.2017.07.037.

Phelps, P., & Sutton K. (2018). Structured telephonic consultation to decrease heart failure readmissions. *Medsurg Nursing, 27*(3), 153-156.

Poh, E. W., McArthur, A., Stephenson, M., & Roughead, E. E. (2018). Effects of pharmacist prescribing on patient outcomes in the hospital setting: a systematic review. *JBI Database of Systematic Reviews & Implementation Reports, 16*(9), 1823-1873. https://doi:10.11124/JBISRIR-2017-003697

Richards, B. G., Hajduk, A. M., Perry, J., Krumholz, H. M., Khan, A. M., & Chaudhry S. I. (2019). Patient-Reported Quality of Hospital Discharge Transitions: Results from the SILVER-AMI Study. *Journal of General Internal Medicine, 35*(3), 808-814. DOI: 10.1007/s11606-019-05414-8.

Robinson, R. (2016). The HOSPITAL score as a predictor of 30-day readmission in a retrospective study at a university affiliated community hospital. *PeerJ, 4*, 1-9. https://doi:10.7717/peerj.2441

Ruggiri, J. C., Milner, K. A., & Buonocre, D. (2019). Implementing post-discharge 48 Hour scripted call for patients with heart failure: An evidence-based practice quality improvement project. *Medsurg Nursing, 28*(3), 183-187.

Ryan, C. J., Bierle, R., & 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:10.4037/ccn2019345

Segal, J. B., Apfel, A., Brotman, D. J., Shermock, K. M., & Clark, J. M. (2020). Evaluation of bedside delivery of medications before discharge: effect on 30-Day readmission. *Journal of Managed Care and Specialty Pharmacy, 26*(3), 296-304.

Shull, M. T., Braitman, L. E., Stites, S. D., DeLuca, A., & Hauser, D. (2018). Effects of a pharmacist-driven intervention program on hospital readmissions. *American Journal of Health-System Pharmacy, 75*(9), e221-e230. https://doi:10.2146/ajhp170287

Singh, A., Gupta, A., DeFilippis, E. M., Qamar, A, Biery, D. W., Almarzooq, Z., Collins, B., Fatima, A., Jackson, C., Galazka, P., Ramsis, M., Pipilas, D. C., Divakaran, S., Cawley, M., Hainer, J., Klein, J., Jarolim, P., Nasir, K., Januzzi, J. L., Di Carli, M. F., Bhatt, D. L., & Blankstein, R. (2020). Cardiovascular mortality after type 1 and type 2 myocardial infarction in young adults. *Journal of the American College of Cardiology, 75*(9), 1003-1013.

Spitzer, E., Frei, M., Zaugg, S., Hadorn, S., Kelbaek, H., Ostojic, M., Baumbach, A., Tuller, D., Roffi, M., Engstrom, T., Pedrazzini, G., Vukcevic, V., Magro, M., Kornowski, R., Luscher, T. F., von Birgelen, C., Heg, D., Windecker, S., & Raber, L. (2017). Rehospitalizations following primary percutaneous coronary intervention in patients with ST-elevation myocardial infarction: Results from a multi-center randomized trial. *Journal of the American Heart Association, 6*, 1-18. https://doi:10.1161/JAHA.117.005926

Squire 2.0. (2017). Squire Statement. Retrieved April 4, 2020, from http://squire-statement.org/index.cfm?fuseaction=Page.ViewPage&pageId=471

SupportMe: text messaging support for patients with chronic disease. (2019, March 31). CT.gov. Retrieved February 22, 2020, from http://www.who.int.proxy01.its.virginia.edu/trialsearch/Trial2.aspx?TrialID=ACTRN12616001689460, 2016

The Joint Commission. (2020, November). *Hospital: 2021 National Patient Safety Goals.* https://www.jointcommission.org/-/media/tjc/documents/standards/national-patient-safety-goals/2021/simplified-2021-hap-npsg-goals-final-11420.pdf

Teixeira, R., Lourenço, C., António, N., Jorge, E., Baptista, R., Saraiva, F., Mendes, P., Monteiro, S., Gonçalves, F., Monteiro, P., Freitas, M., & Providência, L. A. (2010). Can we improve outcomes in patients with previous coronary artery bypass surgery admitted for acute coronary syndrome? *Revista Española de Cardiología, 63*(5), 554-563.

Turan, G. B., Aksoy, M., & Ciftci, B. (2019). Effect of social support on the treatment adherence of hypertension patients. *Journal of Vascular Nursing, 37*(1), 46-51.

Uitvlugt, E. B., Janssen, M. J., Siegert, C. E., Leenders, A. J., Van den Bemt, B. J., Van den Bemt, P. M., & Karapinar-Çarkit, F. (2020). Patients' and providers' perspectives on medication relatedness and potential preventability of hospital readmissions within 30 days of discharge. *Health Expectations, 23*, 212-219. https://doi:10.1111/hex.12993

United States Department of Health and Human Services. (2011). *Percutaneous Coronary Intervention.* Retrieved from https://www.nhlbi.nih.gov/health-topics/percutaneous-coronary-intervention.

Volpp, K. G., Troxel, A. B., Mehta, S. J., Norton, L., Zhu, J., Lim, R., Wang, W., Marcus, N., Terwiesch, C., Caldarella, K., Levin, T., Relish, M., Negin, N., Smith-McLallen, A., Snyder, R., Spettell, C. M., Drachman, B., Kolansky, D., & Asch D. A. (2017). Effect of electronic reminders, financial incentives, and social support on outcomes after myocardial infarction: the heart strong randomized clinical trial. *JAMA Internal Medicine, 77*(8), 1093-1101.

Wadhera, R. K., Joynt Maddox, K. E., Wasfy, J. H., Haneuse, S., Shen, C., & Yeh, R. W. (2018). Association of the hospital readmissions reduction program with mortality among medicare beneficiaries hospitalized for heart failure, acute myocardial infarction, and pneumonia. *Journal of the American Medical Association, 320*(24), 2542-2552. https://doi:10.1001/jama.2018.19232

Warraich, H. J., Kaltenbach, L. A., Fonarow, G. C., Peterson, E. D., & Wang, T. Y. (2018). Adverse change in employment status after acute myocardial infarction: analysis from the TRANSLATE-ACS study. *Circ Cardiovascular Quality Outcomes, 11*(6), 1-20. https://doi:10.1161/CIRCOUTCOMES.117.004528

Weeks, L. E., Macdonald, M., Martin-Misener, R., Helwig, M., Bishop, A., Iduye, D. F., & Moody, E. (2018). The impact of transitional care programs on health services utilization in community-dwelling older adults: a systematic review. *JBI Database of Systematic Reviews & Implementation Reports,16*(2), 345-384. https://doi: 10.11124/JBISRIR-2017-003486

Wright, P., & Antoniou, S. (2013). Acute Coronary Syndrome: potent oral antiplatelets. *Nurse Prescribing, 11*(8), 397-400.

Table 1

Summary of Literature Review Theme 1: Transitions of Care

Study Reference (Author, Year)	Design	Subjects and Setting and Data Collection Period	Independent Variable	Dependent Variable	Study Outcomes	Level of Evidence and Quality Grade
Cardiac care bridge trial. (2019, March 31).	RCT	500 cardiac patients age 70 or older involved in a nurse-coordinated CCB transitional care program aiming to reduce unplanned hospital readmission and mortality in the first six months in comparison to usual care in older hospitalized cardiac patients at high risk of readmission and mortality. Data collected at 6 months post-discharge.	The CCB program has three phases of the care process: 1) clinical phase, 2) discharge phase from hospital to home and 3) post-clinical phase after hospital discharge. The intervention consists of three components: 1) case management, 2) disease management and 3) home-based cardiac rehabilitation. Medication management is part of all three components.	Primary outcome is the incidence of first all-cause unplanned readmission or mortality within 6 months post-randomization.	Led to a 25% reduction in mortality, HR 0.75; 95% CI 0.56–0.99. Studies on cardiac rehabilitation in the elderly found positive trends on patients' functional ability.	I;B
Lee, J., et. al (2014).	Prospective Interventional Study	948 community dwelling adults age 65 years or older with principal diagnosis of HF were examined to determine whether a SSA intervention may enhance the benefits of physical therapy for hospitalized older persons with HF and reduce 30 day readmissions.	SSA intervention over 30 days that involved daily multidisciplinary meetings.	Physical function using ADL stage at three different times (pre-admission, hospital admission, and hospital discharge) & Thirty-day hospital readmission rate was defined as hospital readmission for heart failure within 30 days since hospital discharge.	SSA intervention was associated with a lower occurrence of disability and fewer transitions to SNFs but was not associated with 30-day readmission rate.	II;A
Du, L., et. al (2016).	Case Control Study	A convenience sample of 964 Chinese patients from single institution randomly assigned to different post hospital intervention groups to investigate the impact of cardiologist-coordinated intensive follow-up on the long-term prognosis of PCI.	Cardiologist coordinated secondary prevention measures with intensive follow-up.	Reduced readmissions, improved medication adherence	There was not a significant difference in 30-day readmission rates between intervention and control groups (11.3% vs. 10.7%; P = 0.49).	II; B

Table 1 (Continued)

Summary of Literature Review Theme 1: Transitions of Care

Study Reference (Author, Year)	Design	Subjects and Setting and Data Collection Period	Independent Variable	Dependent Variable	Study Outcomes	Level of Evidence and Quality Grade
Frasure-Smith, N. & Prince, R. (1989).	Longitudinal Study	461 male patients were examined to review outcomes up to seven years after a one-year, post-AMI stress monitoring and management program.	Stress monitoring and management program	Stress score, 1-year cardiac death rates post MI, and readmissions	Stress scores lowered and reduced one-year cardiac deaths by almost 50%, but made no difference in readmission rates or durations.	III; B
Gabriel, S., et. al (2017).	RCT	65 medical inpatients were evaluated to determine if use of a daily discharge goals checklist during inter professional rounds decrease the time from medically ready for discharge and actual discharge and/or improves patient satisfaction with discharge education/ information	Daily discharge goals checklist during interdisciplinary rounds daily on patient admission.	Difference in time between medically ready for discharge and actual discharge, and patient satisfaction with discharge teaching	Time difference between medically ready for discharge and actual discharge averaged 3.9 ± 2.2 and 5.4 ± 6.9 hours between the intervention and usual care groups, respectively, with no statistical differences found ($p>0.05$).	II; B
House, M., et. al (2016).	Prospective Medical Record Review	22 records from magnet flagship hospital of 30 day readmissions from the cardiac intermediate unit from October- December 2012, April-June 2013 (25 records after implementation), and July-September 2013 (15 records after implementation). Patients had initial diagnosis of AMI or HF.	Increased HH referrals and implementation of system-level bundled interventions.	Reduce cardiac readmissions	It reduced 30-day readmissions for AMI and HF in a large academic medical center through implementation of system-level bundled interventions, increased HH referrals, and enhanced collaboration.	III; B

Table 1 (Continued)

Summary of Literature Review Theme 1: Transitions of Care

Study Reference (Author, Year)	Design	Subjects and Setting and Data Collection Period	Independent Variable	Dependent Variable	Study Outcomes	Level of Evidence and Quality Grade
Koski, H. (2014).	Expert Review, Case Study	A patient was evaluated from 30 days from the first admission from October-December 2012 to determine barriers and suggested solutions for providing discharge education and resources for uninsured and underinsured patients in the free clinic setting	During discharge, the nurse provides medication reconciliation and clear verbal and written discharge instructions with a trained interpreter to translate verbal instructions and any educational materials used should be provided in Spanish.	Limit readmissions and/or return doctor visits.	Caring for patients in a free clinic requires individualized approach to address multifaceted needs.	V; C
Mansukhani, R. P., et. al (2015).	Integrative Review; Opinion of experts	To discuss evidence-based strategies for improving provider communication and reducing readmissions	The communication tool utilized	Review of charts and prior studies	Suggested algorithms that have proven effective in improving communication	V; B
Martin, L. M., et. al (2018).	Non-experimental study, Chart reviews , Retrospective	197 patients considered 30-day readmissions after AMI from July 2012 to June 2015 197. There were physician-adjudicated chart reviews conducted to obtain granular understanding of the clinical characteristics and chief complaint of patients included in the actual penalty.	Readmitted AMI patients	Cause of readmission and hospital readmission recorded.	Penalties affect large proportions of patients who do not receive revascularization during the index hospitalization. In particular, many patients are deemed too high risk for intervention by clinicians or they themselves decline intervention.	V; B
Meisinger, C., et. al (2013).	Single-centre randomized two-arm parallel group trial (RCT)	Evaluate the effects of a nurse-based case management for 329 elderly patients 65 and older discharged after an AMI from a tertiary care hospital between September 2008 and May 2010.	Nurse-based follow-up for one year including home visits and calls.	Time to first readmission or death	Had no significant influence on the rate of first unplanned readmissions or death during a one-year follow-up.	II; B

Table 1 (Continued)

Summary of Literature Review Theme 1: Transitions of Care

Study Reference (Author, Year)	Design	Subjects and Setting and Data Collection Period	Independent Variable	Dependent Variable	Study Outcomes	Level of Evidence and Quality Grade
Peters, A. E. & Keeley, E. C. (2017).	Qualitative, surveys	From March 2016 to December 2016, 93 surveys administered to patients after AMI at the time of a clinic visit scheduled within 10 days of hospital discharge to evaluate how engaged patients are in their own health care based on the thoughts that the more engaged or "activated" patients	Patient Activation Measure assessment tool that evaluates how engaged patients are in their own health care.	Composite end point of major medication errors, emergency department visits, and/or unplanned readmission. Also continued tobacco use after discharge.	Scores ranged from 40.9 to 100 (median 62.6, interquartile range 56.0 to 72.1). Patients with lower scores also were more likely to continue to use tobacco after discharge.	III; B
Singh, A., et. al (2020).	Retrospective Cohort Study	3,829 patients who experienced AMI at 50 years or younger who presented to 2 large academic medical centers.	All cases of type 2 AMI or myocardial injury were reviewed by a team of study physicians to determine the primary etiology of the demand/supply mismatch whether coronary (e.g., spasm, embolism, dissection) or non-coronary (e.g., hypertensive emergency, sepsis, respiratory failure and/or hypoxia).	In-hospital mortality, all-cause mortality, and cardiovascular mortality	Death during hospitalization (median: 4 days; interquartile range: 2 to 8 days) was significantly higher in patients with myocardial injury and type 2 MI compared with patients with type 1 MI.	I; A
Wadhera, R., et. al (2018).	Retrospective Cohort Study	Included approximately 8 million Medicare beneficiary fee-for-service hospitalizations from 2005 to 2015 of adults 65 or older. Compared with past trends, was the announcement or implementation of the HRRP associated with a change in mortality within 30 days of discharge following hospitalization for HF, AMI, or pneumonia?	Hospital Readmissions Reduction Program (HRRP)	Change in patient mortality	The HRRP was associated with a significant increase in trends in 30-day post discharge mortality among beneficiaries hospitalized for HF and pneumonia, but not for AMI.	III; B

Table 1 (Continued)

Summary of Literature Review Theme 1: Transitions of Care

Study Reference (Author, Year)	Design	Subjects and Setting and Data Collection Period	Independent Variable	Dependent Variable	Study Outcomes	Level of Evidence and Quality Grade
Teixeira, R., et. al (2010).	Prospective Observational Study	1,495 patients followed for 19 months to characterize the patients with coronary artery bypass grafts and to compare their in-hospital and post discharge outcomes with those of patients without a coronary artery bypass graft.	Adult acute coronary syndrome patients admitted to acute care	Readmissions or mortality increase.	In our acute coronary patients, the presence of bypass grafting had no significant influence on short- or medium-term outcomes, such as all-cause mortality and adverse cardiac events	I; A
Weeks, L. E., et. al (2018).	Systematic Review	23 articles were reviewed of community dwelling adults aged 60 and over with at least one medical diagnosis to help identify and synthesize the best available evidence on the impact of transitional care programs on various forms of health services utilization in community dwelling older adults.	Utilization of transitional care program	Primary outcomes: hospital admissions, hospital readmissions, emergency department visits, and nursing home admissions.	Transitional care reduces hospital readmissions over time, with largest effects seen at 30 days. Transitional care may increase utilization of primary care services and thus have a favorable impact on preventative care.	II; A

Note. SSA = shared situational awareness; HF = heart failure; CCB = Cardiac Care Bridge; AMI = acute myocardial infarction; PCI = percutaneous coronary intervention RCT = randomized clinical trial

Table 2

Summary of Literature Review Theme 2: Medication Reconciliation Practices

Study Reference (Author, Year)	Design	Subjects and Setting and Data Collection Period	Independent Variable	Dependent Variable	Study Outcomes	Level of Evidence and Quality Grade
Anderegg, S. V., et. al (2014).	Quasi-experimental, Observational, Pre–Post study	3316 patients 18 yrs. or older discharged from UKH between July and December 2012; discharged from internal medicine, family medicine, cardiology, or orthopedic surgery medical services.	A restructured pharmacy practice model including (1) medication reconciliation at transitions of care for every patient and discharge education for a high-risk subgroup, (2) new or expanded services in the paranesthesia testing clinic and ED, (3) a medication reconciliation technician team, and (4) reduced pharmacist-to- patient ratios.	Composite rate of 30-day readmission and return to ED visits between the pre-implementation and post implementation groups.	In the high-risk subgroup, there was a significant reduction in the 30-day rate of hospital readmissions; cost projections indicated that this reduction in readmissions could yield annual direct cost savings of more than $780,000. Implementation of a team-based pharmacy practice model resulted in a significant decrease in the rate of 30-day readmissions for high-risk patients.	II; A
Conliffe, B., et. al (2019).	Observational Chart Review	370 adult patients were evaluated by utilizing a medication dispensing program in hospitals.	Med 2 Bed program	30-day hospital readmissions	Rates of 30-day ED visits were not significantly reduced in cases (22 [11.9%] vs 33 [18.1%]; and occurred significantly later (11 vs 7 days, P = .03).	III; B
Goyal, A., et. al (2015).	Longitudinal Study	59,149 Medicare beneficiaries age 65 or older discharged after an AMI between Jan. 2007 and Dec. 2010 aiming at determining whether enrollment versus non-enrollment in Medicare's prescription drug plan (Part D) is associated with better outcomes after acute myocardial infarction (AMI).	Medicare Part D Enrollment	30 day and 1-year trends in all-causes deaths, all cause readmissions, and major adverse cardiovascular events	Only half of Medicare-insured patients with AMI were enrolled in Part D by hospital discharge, and their 30-day and 1-year adjusted outcomes did not differ substantially from non- enrollees	V; B

Table 2 (Continued)

Summary of Literature Review Theme 2: Medication Reconciliation Practices

Study Reference (Author, Year)	Design	Subjects and Setting and Data Collection Period	Independent Variable	Dependent Variable	Study Outcomes	Level of Evidence and Quality Grade
Heaton, P. C., et. al (2019).	RCT	Four hundred patients discharged from a participating hospital with AMI diagnosis. The primary objective was to measure the impact of a pharmacist-provided medication therapy management program on 30-day post discharge readmission rates and to determine the impact of the intervention on primary and secondary medication nonadherence, and to measure patient satisfaction with the intervention.	Pharmacist-provided medication therapy management program	Primary outcome measure was 30-day readmission rate. Secondary outcomes were pharmacist interventions, primary and secondary medication nonadherence, and patient satisfaction	There was not a significant difference in 30-day readmission rates between intervention and control groups. In the PP analysis, controlling for baseline differences, patients in the intervention group were likely to fill prescriptions.	I; A
Patton, A. P., et. al (2003).	Case Control Study	9 Patients admitted with 1 of the 5 qualifying conditions and identifying the participating pharmacy to explore community pharmacist involvement in the TOC process for patients discharged with AMI, HF, pneumonia, COPD, or elective total hip or knee arthroplasty.	Spoke to community pharmacist within 72 hours of discharge to complete a comprehensive medication review. A follow-up telephone call occurred 7 days after the encounter to evaluate for drug-related problems, adherence, and key information recalled from the previous visit. A final telephone call occurred on the 30th day after discharge to assess for hospital readmissions ED visits	Number of patients readmitted or visiting the ED within 30 days after discharge	Of the 9 patients completing the study, none were readmitted or visited the ED within 30 days after discharge. All of the participants were satisfied with the care and education provided by pharmacists.	V; C

Table 2 (Continued)

Summary of Literature Review Theme 2: Medication Reconciliation Practices

Study Reference (Author, Year)	Design	Subjects and Setting and Data Collection Period	Independent Variable	Dependent Variable	Study Outcomes	Level of Evidence and Quality Grade
Poh, E. W., et. al (2018).	Retrospective Review	15 studies were included from January 2017 in eight major databases from database inception. Only studies in English were included.	Pharmacy prescribing practices	Therapeutic failure or benefit, adverse effects, and morbidity or mortality. Secondary outcomes included error rates in prescriptions, medication omissions on the medication chart.	In four studies that measured clinical outcomes, there was no difference in blood pressure management between pharmacists and doctors while patients of pharmacist prescribers had better cholesterol levels. In two studies, pharmacists were better at adhering to warfarin dosing nomograms than doctors (average of 100% versus 62% compliance). In six studies, when prescribing warfarin according to dosing nomograms, equivalent numbers or more patients were maintained in therapeutic range by pharmacist prescribers compared to doctors.	III; B
Segal, J. B., et. al (2020).	Retrospective Cohort Study	6,167 received medications and 28,546 did not. An evaluation program where patients received medications at their bedside before discharge with the goal of reducing the risk of primary nonadherence to prescribed medications.	Patient received medications at bedside prior to discharge	Reduced risk of 30 day admission	In this study, the isolated intervention of bedside medication delivery did not reduce 30-day readmission risks. Favorable outcomes on other metrics such as primary nonadherence.	II; A

Table 2 (Continued)

Summary of Literature Review Theme 2: Medication Reconciliation Practices

Study Reference (Author, Year)	Design	Subjects and Setting and Data Collection Period	Independent Variable	Dependent Variable	Study Outcomes	Level of Evidence and Quality Grade
Warraich, H. J., et. al (2018).	Longitudinal Study	9,319 adult patients who had AMI at 233 US hospitals were assessed for prevalence of and outcomes associated with adverse change in employment after AMI	Employment status of the AMI patients.	Patient-reported depression, health status, and financial hardship affording medications	Patients who experienced an adverse change in employment after AMI reported lower quality of life, increased depression, and more difficulty affording medications.	III; B

Note. AMI = acute myocardial infarction; TOC = transitions of care; COPD = chronic obstructive pulmonary disease; HF = heart failure; ED = Emergency Department

Table 3

Summary of Literature Review Theme 3: Follow-up Phone Calls

Study Reference (Author, Year)	Design	Subjects and Setting and Data Collection Period	Independent Variable	Dependent Variable	Study Outcomes	Level of Evidence and Quality Grade
Budiman, T., et. al (2016).	Prospective, Non-randomized, non-blinded	136 adult patients 18 or older admitted to the hospital with a diagnosis of STEMI who received cardiac stents between January 2015 and April 2015.	Pharmacist-managed STEMI medication education, discharge instruction, and post-discharge phone calls	30-day hospital readmission rates, medication adherence, time to first prescription fill, and change in literacy scores (improvement in MedAL score)	All-cause readmission at 30 days was lower but not statistically significant (13% to 5%, P = 0.18); of 95 patients in the control group, 12 readmitted; 2 of 40 patients in the intervention group were readmitted. All patients in the intervention group picked up their discharge prescriptions within 3 days after discharge. Patients' MedAL score were significantly improved from 4.5 to 8 at 30 days post-discharge (P = 0.0005). The time requirement for the 2 telephone follow-up calls was on average 22.2 ± 12.3 minutes.	II;A
Kavradim, S. T. & Ozer, Z. C. (2019).	RCT	66 patients from the cardiac intermediate unit were evaluated at baseline and then 12 weeks to determine the effect of education and telephone follow-up for improving AMI patients' self-efficacy, QOL and lifestyle adaptation.	Follow-up phone call intervention using a check-list, pre-discharge education, and three follow-up phone calls.	QOL, coping adaptation process, self-efficacy, and lifestyle changes.	This study demonstrated that education and telephone follow-up intervention based on Roy Adaptation Model was had positive and significant results after 12 weeks compared with usual care.	II;B
Patel, S. D., et. al (2017).	3 phases; Retrospective cohort, Prospective cohort, Quality assurance cohort	206 calls to adults between July-September 2013 and the development of a pharmacy-driven, post discharge follow-up telephone call program to assess medication adherence, provide education, and address medication-related concerns.	Post-discharge transitions of care follow-up phone call by pharmacist	Medication adherence	Pharmacy is well positioned to complete an accurate medication review and conduct post discharge telephone calls to address medication-related issues. By providing these services, patients will receive continuity of care and positively impact emergency room visitation rates and hospital readmission rates.	II;B

Table 3 (Continued)

Summary of Literature Review Theme 3: Follow-up Phone Calls

Study Reference (Author, Year)	Design	Subjects and Setting and Data Collection Period	Independent Variable	Dependent Variable	Study Outcomes	Level of Evidence and Quality Grade
SupportMe: text messaging support for patients with chronic disease. (2019, March 31).	RCT	At an Australian facility 1000 patients 18 years or older with CAD or DM II were enrolled in text reminder program to determine if this improves cardiovascular risk factor and diabetes control among patients with CAD or DM II.	SupportMe Text app	Outcomes include body mass index, waist circumference, low-density lipoprotein, physical activity levels, dietary intake, QOL, mood, and smoking cessation.	SupportMe will develop new evidence as to whether a single text messaging support programme will improve clinical parameters for people with different chronic diseases, namely CAD and DM II, and whether this can be successfully implemented into a wider chronic disease programme.	II;B
Volpp, K. G., et. al (2017).	RCT	1,509 adult AMI survivors enrolled in 12-month intervention conducted from 2013 through 2016 to determine if a system of medication reminders using financial incentives and social support delays subsequent vascular events in patients following AMI compared with usual care.	Random assignment to treatment group who received electronic pill bottles combined with lottery incentives and social support for medication adherence, or to usual care	Time to first vascular rehospitalization or death.	There were no statistically significant differences between study arms in time to first rehospitalization for a vascular event or death. A compound intervention integrating wireless pill bottles, lottery-based incentives, and social support did not significantly improve medication adherence or vascular readmission outcomes for AMI survivors.	II;B

Note. MedAL = medication adherence and literacy scores; RCT = randomized control trial; AMI = acute myocardial infarction; QOL = quality of life; CAD = coronary artery disease; DM II = diabetes mellitus type II

Table 4

Financial Analysis Summary

FINANCIAL ANALYSIS

IMPLEMENTATION OF THE CALLED TO C.A.R.E. QUALITY INITIATIVE: A POST-DISCHARGE AMI PATIENT CARE INITIATIVE TO REDUCE READMISSIONS

NOVEMBER 20, 2020

PROPOSAL MANAGER: LARISSA LASO RODRIGUEZ, MSN, AGACNP-BC, CCRN-CSC

INITIATIVE COSTS- YEAR 1	NOTES	UNIT COSTS	TOTAL UNITS	TOTAL
Materials and Supplies				
Laminated Called to C.A.R.E. cards	These were distributed to the patients prior to discharge to describe the quality initiative.	$ 0.75	176	$132.00
Unit Flyers	Placed on the inpatient nursing units to summarize and describe the project	$ 2.57	10	$25.70
Lenova ThinkPad T470 Laptop	For remote access to records (already provided by employer)	$ 844.00	0	$0.00
Microsoft Office Download	For documentation of patient data (already provided yb employer)	$ 39.97	0	$0.00
Telephone Device	iPhone 7; personal device	$ 229.99	0	$0.00
Telephone Device Service	Per month (12 month period)	$ 45.00	12	$540.00
Personnel Expenses				
Acute Care Nurse Practitioner	0.4 FTE (national average) 832 hrs annually x 52.90	$ 44,012.80	1	$44,012.80
Case Manager	0.1 FTE (national average) 116.48 hrs annually x 34.26	$ 3,990.60	1	$3,990.60
Registered Nurse	0.1 FTE (national average) 91.52 hrs annually x 38.39	$ 3,513.40	1	$3,513.40
Inpatient Rounding Time				
Case Manager	Timepoint 1; 50 patients x 5 min each (56% of timepoints)	$ 34.26	4.16	$142.52
Registered Nurse	Timepoint 1; 39 patients x 5 min each (44% of timepoints)	$ 38.39	3.25	$124.77
Acute Care Nurse Practitioner	Timepoint 2; 22.25 hours over 7 weeks	$ 52.90	22.25	$1,177.03
Called to C.A.R.E. Intervention Time to complete				
Time Spent Running Daily AMI Report	Patient list run daily at 0700 (10 mins each day * 7 days a week * 7 weeks)	$ 52.90	8.16	$431.66
Time Spent Reviewing patient p/t calls	Reviewed D/C instructions, medications, and follow-up's prior to calling each patient (15 mins each patient * 66 patient called)	$ 52.90	16.5	$872.85
Time Spent Reviewing patient discharges daily	Enrolled patients to determine day of discharge (5 mins * 7 days * 8 weeks)	$ 52.90	4.67	$247.04
Time Spent on all Calls	Total time spent on all calls made to patient or identified support person and documentation of responses (50.3 hr. for 283 total calls made)	$ 52.90	50.3	$2,660.87
PROJECTED COSTS-YEAR 1				$57,871.24
PROGRAM COSTS YEAR 2				
Materials and Supplies				
Laminated Called to C.A.R.E. Cards	General projection 420 AMI discharges	$ 0.75	500	$375.00
Unit Flyers	All inpatient nursing units	$ 2.57	10	$25.70
Telephone Device Service	Covered by hospital monthly stipend	$ 45.00	12	$540.00
Inpatient Rounding Personnel Expenses				
RN/CM Timepoint 1	0.1 FTE (national average) 420/2=210 * 5 min	$ 34.26	17.5	$599.55
RN/CM Timepoint 1	0.1 FTE (national average) 420/2=210 * 5 min	$ 38.39	17.5	$671.83
NP Timepoint 2	0.4 FTE (national average) 420/2=420* 15 min	$ 52.90	105	$5,554.50
Outpatient Called to C.A.R.E. Intervention				
NP Calls Made to Patients	Mean Average hourly rate for NP in Virginia for 420 patients annually equates to 1680 calls approx. 12 minutes each call.	$ 52.90	336	$17,774.40
PROJECTED COSTS - YEAR 2				$25,140.28
PROJECTED COSTS YEAR 1 & YEAR 2				$83,011.52
COST SAVINGS/ AVOIDANCE				
Year 1 Cost-avoidance due to decreased AMI readmissions	The average cost of an AMI readmission is 64 percent the cost of an initial AMI admission, which is $20,800 on average. Saw a 14.4 % decrease in readmissions Average rate is 16.3% median observed all cause readmission rate for AMI nationally. (12*20,800=249,600)/(6*20,800=124,800)	$ 20,800.00	6	$124,800.00
Year 2 Cost-avoidance due to decreased AMI readmissions	If continue on trajectory and decrease by another 50% reduction (3*20,800=62,400)	$ 20,800.00	3	$62,400.00
COST AVOIDANCE FOR AMI READMISSIONS				$187,200.00
Cost of orientation of Acute Care Nurse Practitioner	Hourly Rate (52.90) *# orientation hours (24)	$ 1,269.60	1	$1,269.60
TOTAL COST SAVINGS & AVOIDANCE FOR YEARS 1 & 2				$188,469.60
			Net Savings	$163,329.33

Table 5

Characteristics of Patients Eligible for Called to C.A.R.E. Initiative (N=89)

	n	%	Range	Mean(*SD)*
Age (years) Readmitted Patients	10		60-86	69.9(7.6)
Age (years) Non-readmitted Patients	79		38-95	67.9(12.9)
Length of stay (days)	89		1-46	4.38(5.9)
Race				
Non-Hispanic White	64	72		
Non-Hispanic Black	25	28		
Gender				
Male	49	55.1		
Female	40	44.9		
Education				
5th-some HS	31	34.8		
Graduated HS	30	33.7		
Some College or Training	20	22.5		
Bachelors or Master’s Degree	8	9		
Location at Discharge				
Home or Family Member's Home	70	78.7		
Deceased	9	10.1		
Facility	10	11.2		

Table 5

Characteristics of Patients Eligible for Called to C.A.R.E. Initiative (N=89)

	n	%	Range	Mean(*SD)*
Marital Status				
Divorced or Legally Separated	16	18		
Widowed or Single	35	39.3		
Married	38	42.7		
Employment				
Retired	46	51.8		
Disability	5	5.6		
Unemployed or Furloughed	13	14.6		
Employed	25	28		
Living Alone				
Yes	22	24.7		
No	67	75.3		
Insurance				
Medicare	56	62.9		
Medicaid	11	12.4		
Private Insurance	16	18		
Self-pay	6	6.7		

Note: This is the demographic information related to the group of 89 patients. HS = high school

Table 6

Medication Data for Called to C.A.R.E. Patients (N=89)

	n	%	Range	Mean(*SD)*
Number Medications at Discharge for Readmitted	10		5-28	16.2(6.6)
Number Medications at Discharge for Non-readmitted	79		0-24	9.6(5.6)
Patients Manages Their Own Medications				
Yes	58	65.2		
No	31	34.8		
Who Manages the Patient Medications				
Self	58	65.2		
Husband	2	2.3		
Wife	14	15.7		
Adult Child	8	9		
Mother	1	1.1		
Facility/Hospice	6	6.7		

Table 7

Characteristics of Support Person Identified by Patient (N=86)

	n	%
Gender		
Male	20	23.2
Female	53	61.6
Did not specify	13	15.2
Relationship to Patient		
Spouse	43	50
Adult Child	28	32.5
Other Family Member	10	11.7
Friend(s)	5	5.8
Adult Child		
Male	8	28.6
Female	20	71.4
Spouse		
Male	13	30.2
Female	30	69.8

Table 8

Comparison of AMI Readmission Data at the Practice Site in 2019 as Compared to 2020

	2019		2020				
	Frequency	%	Frequency	%	χ^2	*p*	Phi
Readmitted	12	23.5	6	9.1	4.607	.032	.198
Not Readmitted	39	76.5	60	90.9			

Note. The above data reflects the number of patients for the same time period one year apart at the same practice site. The 2019 data report for patient enrollment ran from July 27, 2019- September 13th, 2019 and the 2020 data was also from July 27th-September 13th. Readmissions who did not receive the intervention were eliminated from the 2020 analysis.

Figure 1. Donabedian's conceptual framework to evaluate quality of medical care. A. Donabedian. (1966). *Journal of Nursing Law, 12(3), 116.* DOI: 10.1891/1073-7472.12.3.115. Reprinted with permission.

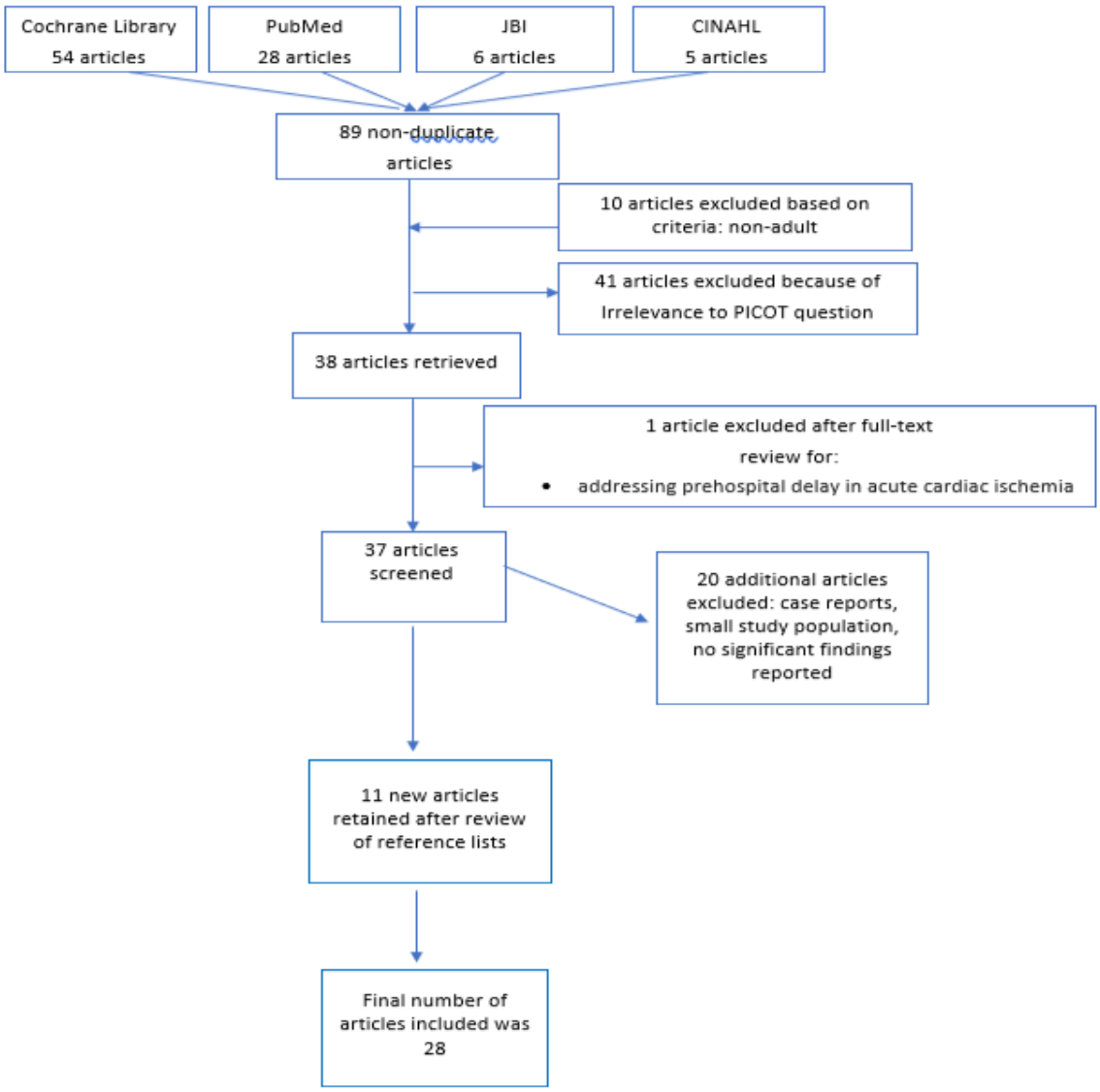

Figure 2. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram for the systematic literature search process. CINAHL = Cumulative Index to Nursing and Allied Health Literature; JBI = Joanna Briggs Institute EBP Database.

Called to C.A.R.E Script for Follow-Up Phone Calls
Adopted and Modified from the AHRQ Sample Script for Follow-up Phone Call
Patient #____ Call #: 1, 2, 3, 4, 5

1. Hello Mr./Ms. . I am [caller's name], a [type of clinician] from [name of hospital]. You may remember that before you left [name of hospital], we mentioned you'd receive a series of calls checking in on your or [significant other/parent/spouse] medication management. I am calling to talk to you about your [patient name] medications. It will probably take about 10 to 20 minutes, depending on the number of medicines you [patient name] are taking. I will not be providing any medical advice during this call, if you are experiencing medical concerns please call your provider.

2. Were you able to get your prescriptions filled? Y/N

3. Can you bring all of the medicines to the phone, please? We will review them during this call. Please have the medication list we provided you before you left the hospital in front of you.

4. Do you have all of your medicines in front of you now? Y/N. How many medications are you taking?
We will go through your medicines one by one. Make sure they are the right ones, then we'll discuss how often you've been able to take them and any problems or questions you might have about any of them.

5. Choose one of your medicines to start with.
What is the name of this medicine?
At what times during the day do you take this medicine?
How much do you take each time?
What is the strength of the medicine?
How do you take this medicine?
What do you take this medicine for?

6. Have you had any concerns or problems taking this medicine? Y/N
Has anything gotten in the way of your being able to take it? Y/N
Have you ever missed taking this medicine when you were supposed to? Y/N Why?

7. Do you think you are experiencing any side effects from the medicine? Y/N
If yes, Could you please describe these side effects?

8. After patient has described all medicines, ask: Are you taking any additional medicines that you haven't already told me about, including other prescription medicines, OTC medicine, or herbal medicines, vitamins, or supplements?

9. If patient has been prescribed medicines that the patient hasn't mentioned, ask whether he or she is taking that medicine.
If yes, go through the list of medicine questions.
If not, probe as to why not.
If patient is unaware of the medicine this will be documented.

10. Have you been to the hospital or ER since I spoke to you last? Y/N Did you get readmitted? Y/N

Do you use a pill box? Y/N

What questions do you have today regarding your medicines?

Thank you for speaking with me today. I will be calling again in 7 days, or if it is the last call I say, thank you for participating so I can ensure you are understanding your medications, and ask the 3 post-intervention questions.

Figure 3. Patient Call Script.

Laminated Card for Patient

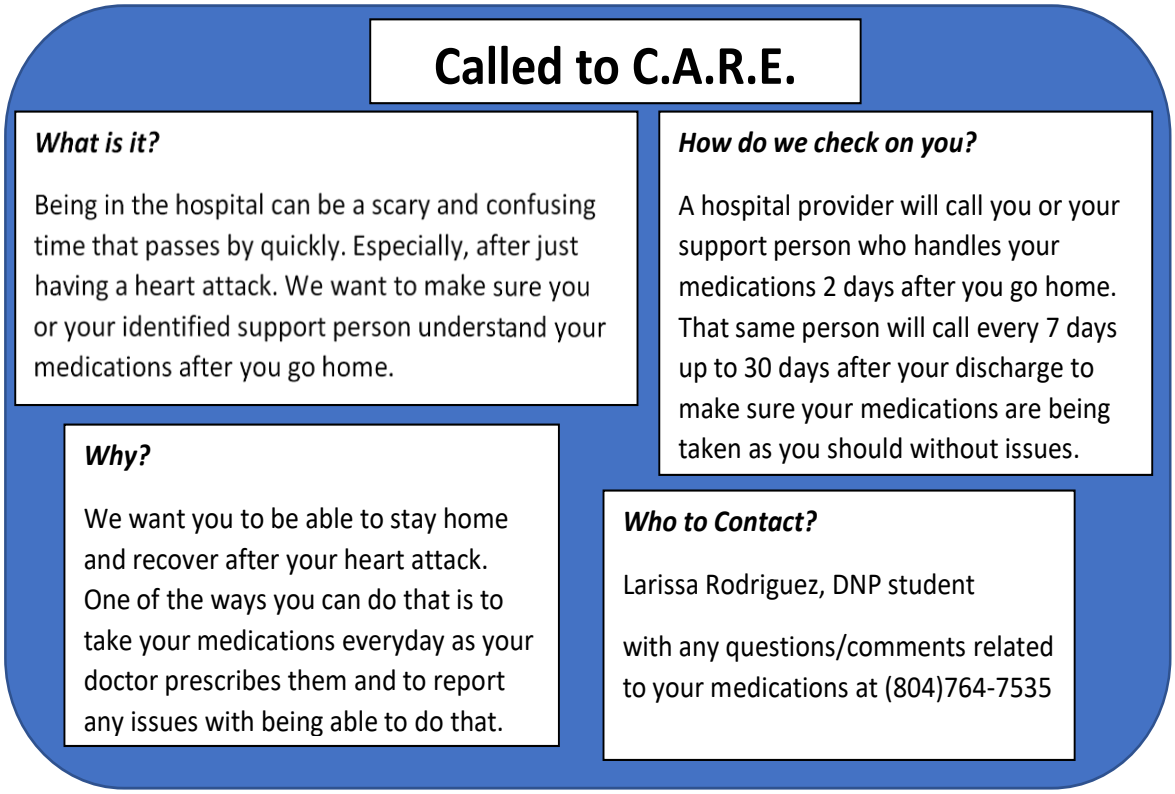

Figure 4. Laminated Cards Distributed to Patients enrolled in the Initiative.

Called to **C.A.R.E.**

HOW CAN YOU HELP?

- TELL THE PATIENT ABOUT THE INITIATIVE
  Hand out the laminated Called to C.A.R.E explanation cards to all AMI patients. Cards are available on the nursing units.
- IDENTIFY THE PATIENT SUPPORT PERSON
  This is the person who manages the patient's medications. Whether it's the spouse, significant other, adult child, adult friend, or patient themselves.
- COMMUNICATE THE SUPPORT PERSON TO OTHER MEMBERS ON THE CARE TEAM
  Document the identified support person and their preferred contact number on the white board in the room and on Kardex in patient chart.
- PROJECT REMINDER PRIOR TO DISCHARGE
  Remind the patient they will receive a visit by the nurse practitioner prior to discharge to explain the intervention.

A POST-DISCHARGE AMI PATIENT CARE INITIATIVE TO REDUCE READMISSIONS .

As a part of the healthcare ministry, Called to C.A.R.E. is an initiative for our patients which consists of a series of 4 scripted follow-up phone calls at specific time-points focused on patient medication management after they go home.

C.A.R.E. stands for:

C: Clarify-the accurate medication list with the identified support person

A: Assess- their understanding of the medications

R: Reinforce- the need for the medications and the subsequent calls

E: Engage- the patient or support person to continue medications as prescribed.

All adult patients age 18 or older who have a diagnosis of AMI (NSTEMI or STEMI with or without PCI) and are discharged to home will be included. Both Spanish and English speaking patients will also be included in this initiative.

Patients discharged to SNF, Nursing Home, or discharged against medical advice will not be included. Patients age 17 or younger and patients with no telephone service will also be excluded.

Any questions please contact Larissa Rodriguez, NP

Enrollment July 27th, 2020-September 24th, 2020

8260 Atlee Road, Mechanicsville, Virginia 23116 Tel 804.764.7535

LLR4DZ@VIRGINIA.EDU

Figure 5. Called to C.A.R.E. Inpatient Flyer Distributed to Inpatient Nurses at Practice Site.

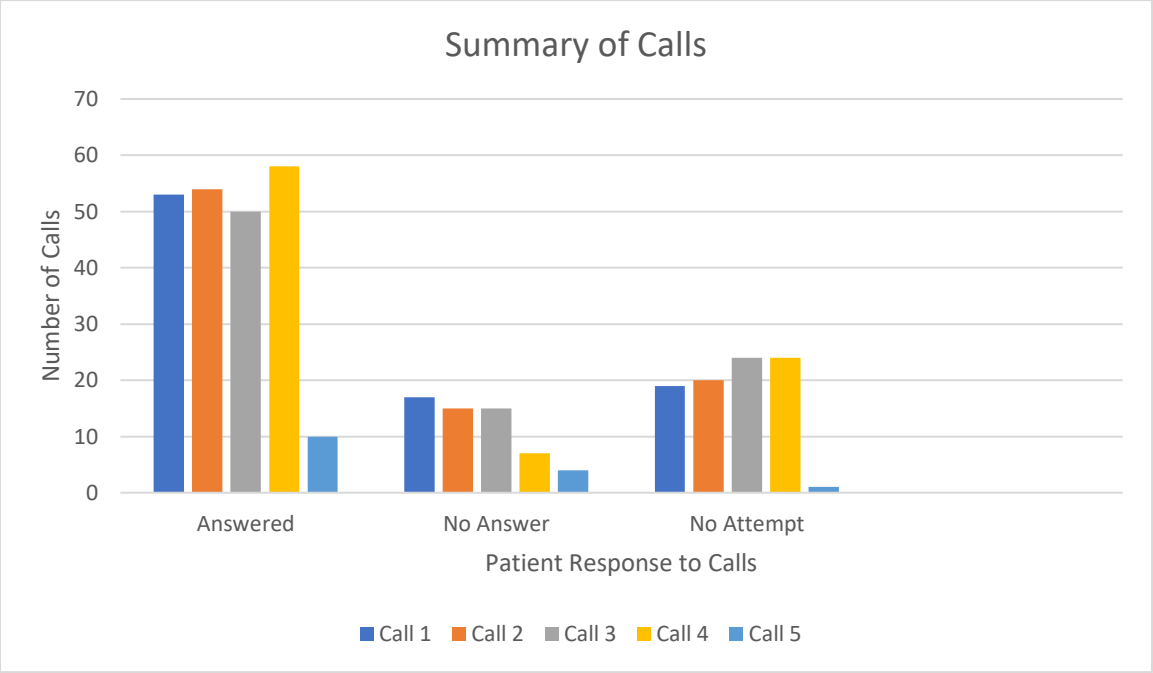

Figure 6. Summary of all call made during the Called to C.A.R.E. initiative.

Patient Post Intervention Questionnaire

Likert Scale *To be completed after the last call in the Called to C.A.R.E. series is completed.*	Yes	No	Unsure
Do you think this Called to C.A.R.E. helped you to stay out of the hospital?			
Do you feel there were too many calls made to you?			
Did you feel the length of time on the calls was too long?			

To be utilized after the final call of the intervention is made to the patient.

Figure 7. Post-intervention Questionnaire to Assess Patient Perspective.

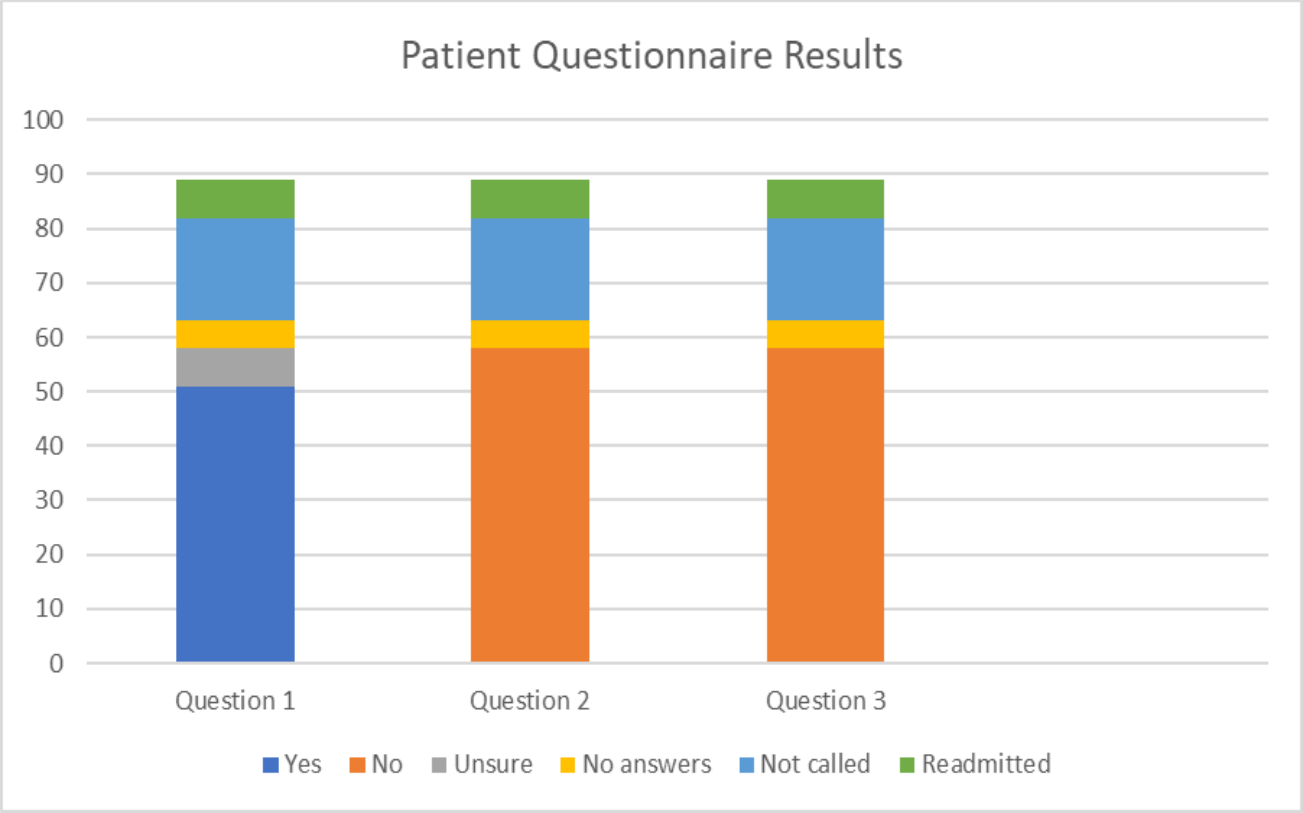

Figure 8. Patient Questionnaire Results from Called to C.A.R.E. series.

" In fact I am glad you call." "You **keep me up** on what I should be doing." "I think it makes him feel better that you call to check on him." "You know when people get older, they get a little childish and want more attention."

"It has just been wonderful to have you call, I wish there were more." "I'm just sad that it's over." "The calls were not too long, it's **just nice to hear that someone cares."**

"I **got the opportunity to ask questions** I need to know the answers to."

"I feel the calls helped, oh yes I did!" "I enjoyed them, I feel **this kept me on track.**"

"**Anytime there is a follow-up made by a healthcare worker, there is a feeling of care**." "Actually, this was very calming and I appreciate being able to discuss things with you." "A healthcare worker calling and showing concern is very important now a days." "Feel free to include me if you need any further feedback or follow-up from a patient, I will be happy to participate."

"The calls were great, I enjoyed telling someone how I am doing." "I **enjoyed having someone to ask questions** to." "I looked forward to having someone to talk to every week to check on me."

"Your calls **keep my spirits up if nothing else**."

"I **enjoyed talking to you**, I'm sad there are no more calls." "Please keep an eye on us still, keep us in your prayers."

"The calls were not too long at all." "**At first I thought it was going to be a pain, but it actually helped me**." "It's good to explain to people what's going on with their meds." "That other stuff was killing me, **I would've quit taking all of my medications because I didn't know which one it was causing me to feel bad if you didn't explain the side effects to me**." "You were encouraging, you didn't beat me down."

"**Feels good** to have this many people from the **organization checking on you**."

"All of the calls **showed me you care**, was nice to have someone check on me and **keep me on track**."

"Yes **it was very helpful to have these medications discussed and explained because they are all new to me now**." "The calls were long enough to answer my questions, I never felt like you were rushed or hurried."

"It was helpful, it was **nice to have someone check on me**."

"I kind of looked forward to the calls." "**It's nice to talk it out**."

"Was so **nice to have someone check on me**."

"It was **nice to have someone check on me especially early on after my heart attack**."

"I don't mind you calling, at least I can communicate with someone." "I really don't know what they said at his appointment, I wrote down questions for him to take with him and they sent no responses, he was frustrated after his appointment and said he wasted a trip to Richmond." "**At least you try to take time to explain things and check on us."**

"**It's nice to know what my medications are for**."

"I'm **always glad to talk to you folks**, I like to tell people when they done good, I'm an old fashioned boy."

"It's been a **very nice experience to have such attentive follow-up**." "You're really attentive, seem to really listen, and take your time answering my questions."

"It was very, very good thank you." "**Last week when you spoke to us it made us feel 1000 times better**." "It's scary coming home after something like this happens." "In fact last weekend when we were scared and couldn't get a hold of someone you made my wife feel better."

"I think because of the situation I'm in and the unknown it's **good to know someone is calling and checking on me and my medications**."

"It was a **pleasure having someone to speak to**."

"It's **great to have someone check on us, answer questions, and encourage us**." "Very hard to get a hold of the doctor sometimes."

"Thank you, **you have been very helpful and caring**."

"I appreciate your taking the time to explain things to me, it made me more at ease." "**I am grateful you could direct me about my medications."**

"It's **nice to know that people care**."

"It was **very nice to have someone checking on us** to see how we were doing."

"Very **nice of you to check on us so much, I've been handling his medicines for a long time now, nice to know someone cares**."

"Yes, **you really helped the first week getting his medications straight**." "The nursing home is taking care of his medications now."

"I **appreciate your time and concern for my mom**."

"I **appreciate someone checking on me, listening, and clarifying my medications with me**."

"Thank you for checking on me." "**It makes me feel like I am being looked after until I can help myself**."

"**You were an absolute help**!" "You cleared my head up" "I can't believe how confused I was" "Dang doctors had me worried I would have another heart attack and die before I could even get a hold of one." "**I got a better understanding of what I am taking and why**". "You cleared up a lot" " I had so much new stuff going on with my heart, kidneys, diabetes, so much it was overwhelming."

"I **appreciated your calls so much**."

"Well **call me back again sometime**."

"I didn't consider you a bother at all. **I felt it is a significant and important job for you to check in because it meant a lot to me as a family member." "I know you're going to call and I get my list of questions together to be prepared." "It's especially nice because you have medical knowledge."**

Figure 9. Patient comments to final questionnaire at completion of Called to C.A.R.E. initiative.

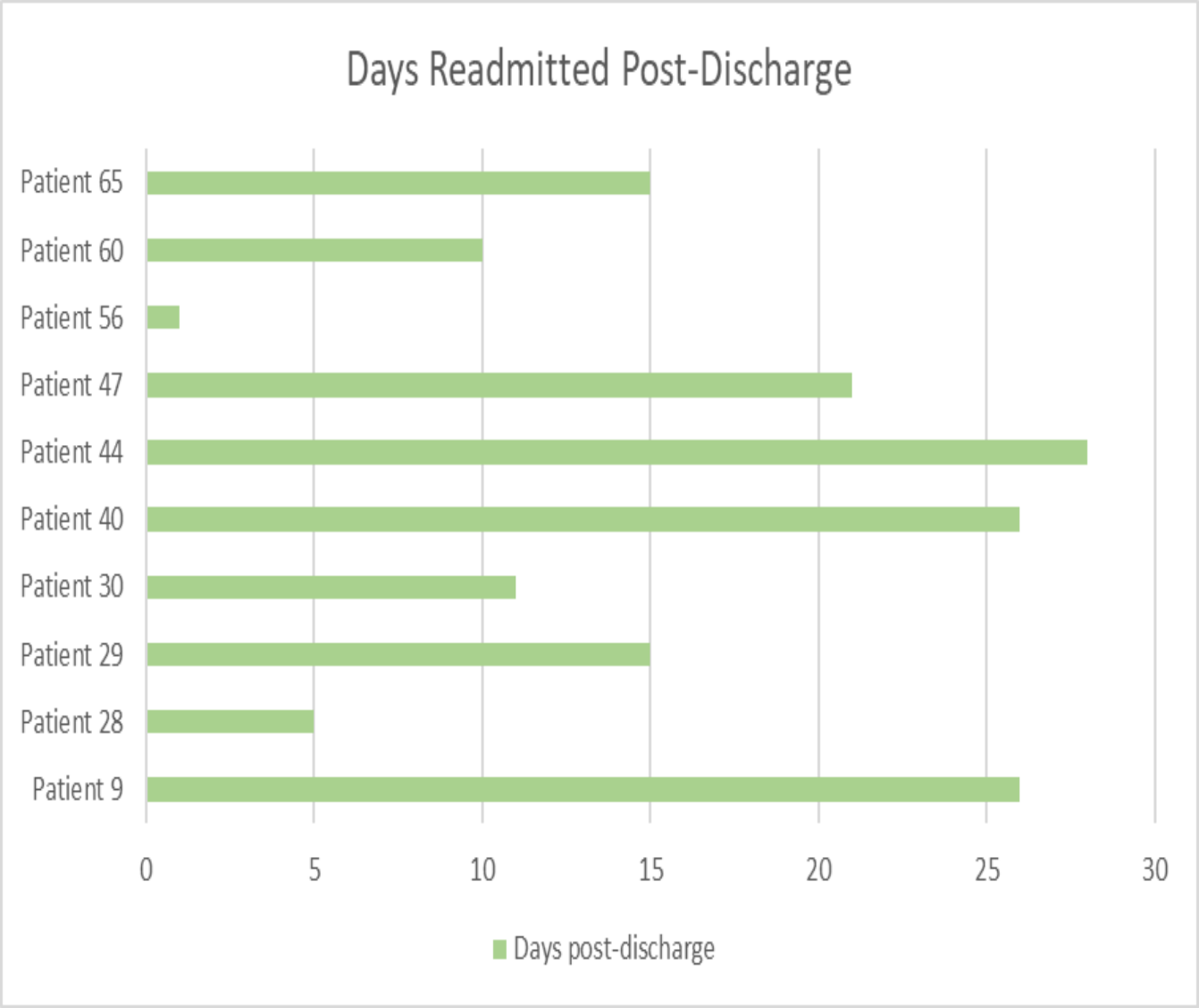

Figure 10. Readmitted Patients vs. Days Post-Discharge.

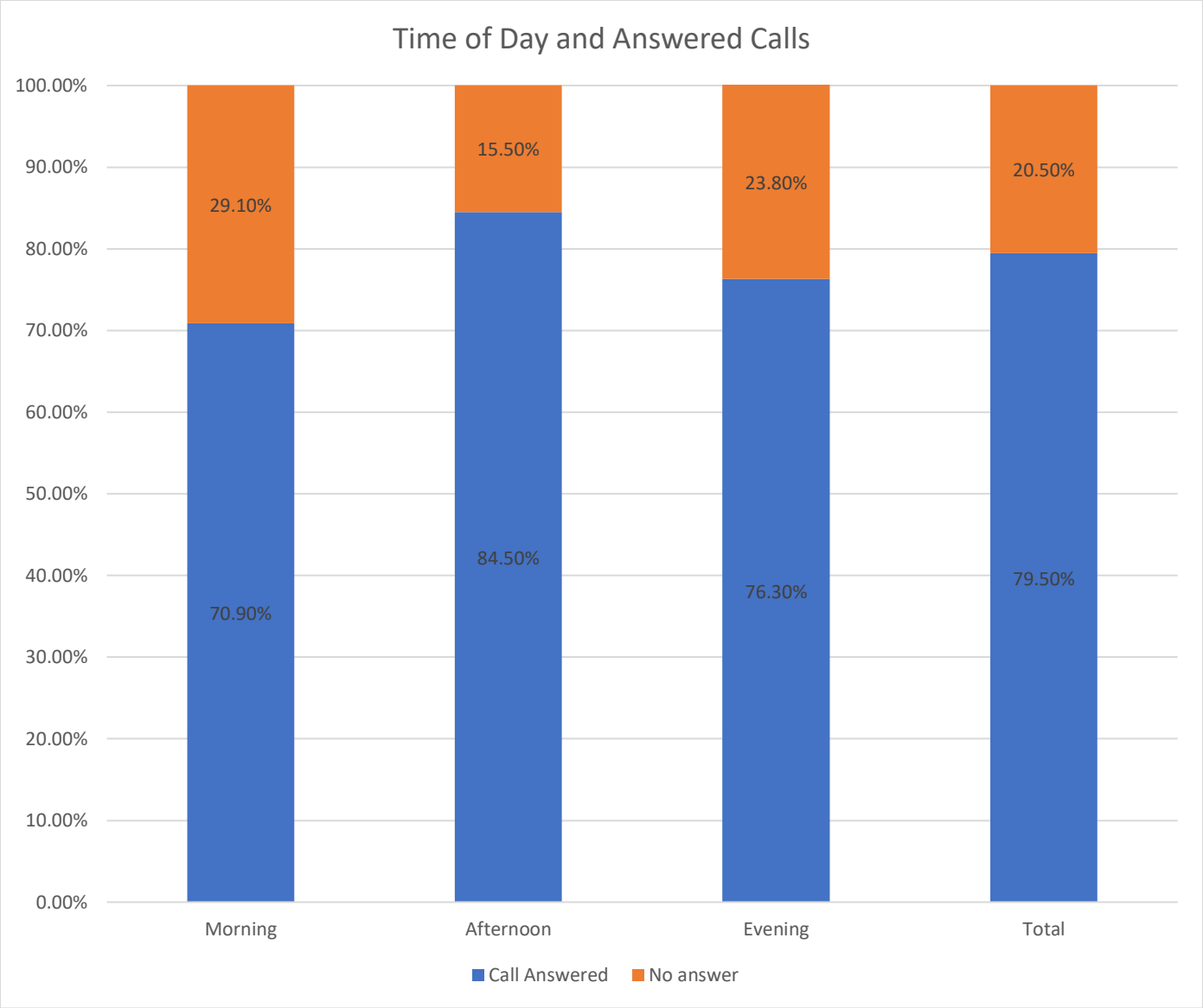

Figure 11. Time of day and percentage of answered calls. *Note:* Morning is defined as 9am-12pm, Afternoon is defined as 12pm-3pm, and Evening is defined as 3pm-6pm.

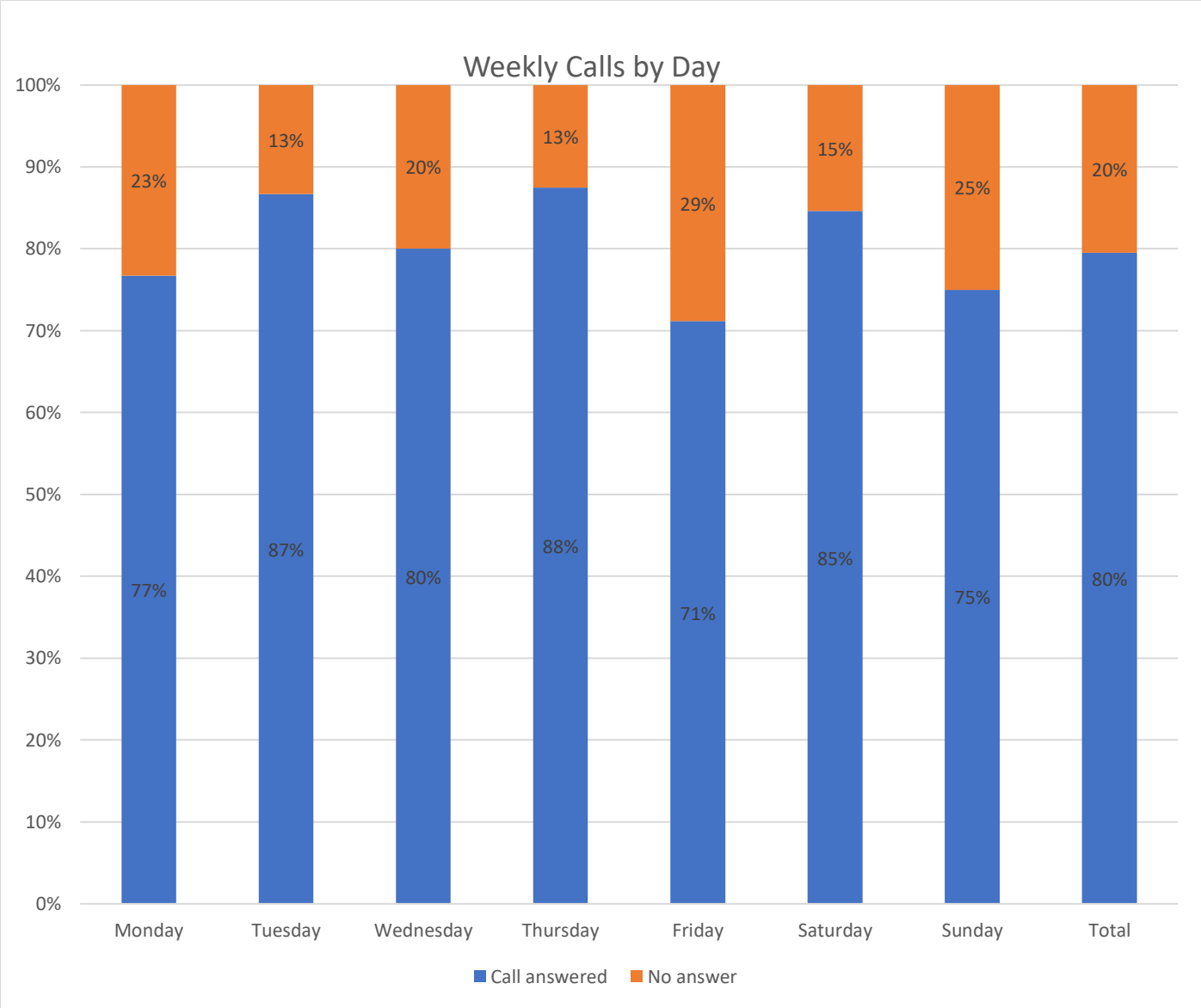

Figure 12. Daily summary percentage of calls answered vs. not answered and day of week.

Appendix A

Team Charter

Readmission Reduction Strategy Team Charter:

The Bon Secours Richmond Readmission (BSR) Reduction Strategy Team is chartered as an interdisciplinary team to identify strategies and standardize processes to mitigate readmissions and maximize performance based reimbursement through analysis of clinical and operational data.

The overall goal of the BSR Readmission Reduction Strategy Team is to develop and implement interventions and system improvements through the continuum of care and standardize processes across the market.

To achieve this goal and purpose, the objectives and strategies of the BSR Readmissions Strategy Team includes, but are not limited to the following:

- Standardizing facility readmission review process
- Reviewing readmission data from defined populations describing and comparing performance with peer and/or benchmark institutions including data from the Quality and Patient Safety Report (QSPR) and Readmission Reduction Program (RRP), and financial data.
- Analyzing current data and practice to identify specific opportunities, processes, and actions for performance improvement.
- Development and maintenance of evidence-based practices with the incorporation of evidence-based national clinical guidelines specific to AMI, HF, CABG, CVA, COPD, PN, Hip/Knee, and Sepsis.
- Communication of outcomes relative to the effectiveness of care and system processes, i.e. quarterly reporting to Quality Council.
- Annual review/revision of flow processes, order sets, and policies and procedures.

Co-Leaders: Ellen Calhoun, Administrative Director, Senior Services; Interim Administrative Director, Inpatient Care Management, Bon Secours Richmond

Barbara Ferguson, Director of Quality, St. Mary’s Hospital

Appendix B

IRB Approval Letter

BON SECOURS MERCY HEALTH

8580 Magellan Pkwy
Richmond, VA 23227
804-627-5155

DATE: May 26, 2020

TO: Larissa L. Rodriguez MSN, RN, AGACNP-BC, CCRN-CSC
Bon Secours Mercy Health – Memorial Regional Medical Center
8260 Atlee Rd.
Mechanicsville, VA 23116

FROM: Sue Henderson, CCRC
Senior Research Participant Protections Analyst
Research Participant Protections Program (RP^3)

RE: Reducing Adult AMI Readmissions: Implementation of Follow-up Phone-calls to Address Medication Management

Thank you for providing all the documents and background information regarding your project: "Reducing Adult AMI Readmissions: Implementation of Follow-up Phone-calls to Address Medication Management."

Based on your project's details and overall objectives, the Office of Research has determined that it does not fall within the "human subjects research" definition as that term is currently defined in the federal regulations. Therefore, it does not fall within the purview of Bon Secours IRB review, approval, and oversight responsibilities. Further, since there is no identifiable Bon Secours patient data being utilized and transmitted outside Bon Secours, the project does not need BSHSI Regulatory & Compliance Committee review.

Since this is project is not human subjects research, the only approval you will need is from your department's leadership and/or administration. Please verify if any further departmental approvals are required. Our office just makes the determination of whether a project is human subjects research or not, and proceeds accordingly through our IRB process if it meets that criteria.

Congratulations on your project and best wishes for its successful implementation!

Thank you,

Sue Henderson

Sue Henderson, CCRC
Senior Research Participant Protections Analyst
Research Participant Protection Program (RP^3) | Bon Secours Mercy Health
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W: 804-264-7394 | F: 804-627-5160 | Sue_Henderson@bshsi.org
BON SECOURS MERCY HEALTH

Appendix C

Manuscript

Called to C.A.R.E.:

A Post-Discharge AMI Patient Care Initiative to Reduce Readmissions

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A Scholarly Practice Project presented to the Graduate Faculty of The University of Virginia in Candidacy for the Degree of Doctor of Nursing Practice
There are no conflicts of Interest

Words: 4485
Tables and Figures: 9

Abstract

Background: Hospital readmissions after an acute myocardial infarction (AMI) are costly and avoidable with a thorough inpatient assessment and follow-up by a health care provider post-discharge. Prior studies indicate patient social support has a strong correlation to continued medication management and readmission reduction.

Purpose: The purpose of this Quality Initiative (QI) project was to measure the effect of the Called to C.A.R.E initiative, which was a series of four scripted follow-up phone calls conducted by an Advanced Practice Registered Nurse (APRN), and its effect on reducing readmission rates in recently discharged AMI patients within 30 days following discharge. A second aim was to analyze the financial impact of conducting this initiative.

Conclusions: Sixty-six patients received the Called to C.A.R.E initiative in 2020. When compared to the 2019 group, there was a statistically significant difference in readmission rates (4.607; p=.032). 79.5% of the patients or their designated support person engaged in the initiative and 96.6% of the eligible patients identified a support person available to assist with their medication management. In the 2020 group, readmission rates were reduced by 14.4% when compared to prior year data. The cost projections indicated that this reduction in readmissions could yield annual direct cost savings of $124,800.

Clinical Implications: Targeting a specific support person and the use of the Called to C.A.R.E. initiative had an impact on readmission reduction in the AMI patient population. The findings warrant further implementation to assess the impact of continued use of an APRN with prescribing privileges on readmission reduction.

Key words: readmissions, rehospitalization, acute myocardial infarction, medication management, and follow-up phone calls

Introduction

Hospital readmissions after acute myocardial infarction (AMI) have been costly and are avoidable. Nearly 1 in 6 patients diagnosed with an AMI had an unplanned readmission within 30 days of discharge, accounting for over $1 billion of annual healthcare cost[15]. The Hospital Readmissions Reduction Program (HRRP) was established under the Affordable Care Act (ACA) in 2010 and required the Centers for Medicare & Medicaid Services (CMS) to impose financial penalties on hospitals across the nation with higher-than-expected 30-day readmission rates for patients with AMI, Heart Failure (HF), and Pneumonia (PNA) beginning in 2012[23]. Through the Medicare Value Based Purchasing Program (VBP), incentives were awarded to hospitals and health systems with lower than expected readmission rates[19].

Background and Significance

Persons living with chronic disease, such as heart disease (HD), in the United States have had a high and increasing prevalence, with over half of all persons diagnosed with a chronic disease[18]. Chronic disease management has created an immense economic burden for the nation. Healthcare costs were 2.5 times higher for patients with at least one chronic disease compared to patients without a chronic disease[18]. Many patients readmitted to hospitals have lived with one or more chronic conditions, which have required long-term medication therapy and regular follow-up care with providers. The Center for Disease Control and Prevention (CDC) reported 48.4% of the U.S. population used at least one prescription drug within the past 30 days, and 73.9% of physician office visits involved drug therapy with over 2.9 billion drugs ordered or provided[4].

Medication management (MM) has been a factor in more than a quarter of readmissions, including inadequate patient and caregiver understanding of MM[22]. This is because postoperative delirium after percutaneous coronary intervention (PCI) to treat an AMI is a very possible reality

for patients during their inpatient stay[14]. Delirium is an acute onset of a fluctuating disturbance in the following cognitive functions: attention; environmental awareness; and cognition and/or perception, and may be most readily identified in patients with sleep/wake cycle disturbances, emotional lability, hallucinations or delusions[14]. Delirium has been reported as a rare complication after PCI, the early literature reported the incidence is 0.06%[8], but in patients older than 80 years old, after PCI, the reported incidence is 29.8%[14].

The administrative leadership issued a directive to decrease readmissions in the AMI patient population. This mandate became an important component of the institutional assessment to support this project. The practice site developed a Readmission Reduction Strategy Team (Team) to identify strategies and standardize processes to mitigate readmissions and maximize performance-based reimbursement through analysis of clinical operational data. CMS defines a hospital readmission as an admission to an acute care hospital within 30 days of discharge from the same or another acute care hospital[6]. It uses an all-cause definition, meaning that the cause of the readmission does not need to be related to the cause of the initial hospitalization[6].

Purpose

The purpose of this Quality Initiative (QI) project was to measure the effect of the Called to C.A.R.E. initiative, which was a series of four scripted follow-up phone calls focused on medication management, and its effect on reducing readmission rates in recently discharged AMI patients within 30 days following discharge. The series of calls were conducted at specific time points. The C.A.R.E. acronym stands for clarify, assesses, reinforce, and engage patients and/or designated support person in their post-discharge medication management. The calls served to reinforce pre-discharge medication education and provided an additional opportunity for teach-back rather than to introduce new information concerning the patient's medication management.

Two specific aims were addressed in this project:

1. Did the Called to C.A.R.E. initiative reduce AMI 30 day readmissions within the three month intervention time-period when compared to 30 day readmissions in a comparable three month period?

2. What was the financial impact of this intervention?

Evidence Search Methods

A systematic literature review was conducted to investigate the effects of a scripted follow-up phone call within 48 hours of discharge to specifically address medication management on 30-day readmission rates for those patient's diagnosed with an (AMI). Four databases were searched to identify the relevant literature: PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Cochrane Library, and the Joanna Briggs Institute EBP Database (JBI). The searches were not restricted by year of publication. Only peer-reviewed academic journal articles were selected.

The Boolean search phrase, *medication management* AND *myocardial infarction* AND *readmissions* was used with Cochrane Library (54 results), PubMed (28 results), and the JBI (6 results) databases. In the CINAHL database, *readmissions* (9,913), *acute myocardial infarction* (30,994), and *medication management* (2,717) were searched with the "Suggested Subject Terms" applied. The search results from readmissions, acute myocardial infarction, and medication management were further merged using the term AND (5 results).

The total number of articles retrieved from the four databases was 93. After removing all the duplicate articles (4), there were 89 articles remaining. Exclusion criteria included non-adult populations (10) journal articles, and 79 articles remained after this filter was applied. The titles and abstracts were reviewed, based on the relevance to the PICOT question, and the articles which contained transitional care interventions, follow-up or community interventions,

technological interventions, or pharmacy interventions were retained, resulting in 38 remaining articles. After a full text review, one more article was excluded because it addressed prehospital delay in acute cardiac ischemia. A total of 37 articles were retained for further screening. Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) worksheets were completed on the remaining 37 sources to further refine the best available evidence on the impact of performing medication reconciliation, follow-up phone calls, and focused transitions of care on reducing hospital readmissions for AMI patients. There were 20 additional sources eliminated after the worksheet review due to being case reports, small study populations, or not having significant reported findings. A review of the reference lists on the retained articles were analyzed and an additional 11 sources were retained for analysis. Thus, a total of 28 sources were retained for a complete analysis. Figure 1 displays the search process, using a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.

Analysis and Synthesis of Evidence

The method utilized to synthesize the body of evidence was a thematic analysis to pinpoint, examine, and record the themes found within the literature. A familiarization was established with the literature by searching for themes within the data, reviewing the themes, defining the themes, and producing a final report of the most common themes. The literature supported three specific focus areas which have reduced readmissions in other studies and patient populations: 1. implementation of transitional care programs; 2. medication reconciliation practices; and 3. follow-up phone calls. The term medication reconciliation is defined by The Joint Commission (JC) as a clinician's comparison of the prescribed medications a patient is actually using against the new medications ordered for the patient during an encounter, resolving any discrepancies, and updating the medical record to reflect them[20]. This is conducted on the

inpatient setting as a JC required National Patient Safety Goal (NPSG). Medication management incorporates medication reconciliation in addition to conducting a more thorough assessment aimed to improve outcomes by providing education on the disease state and medications used to treat the disease state, ensuring that medicines are taken correctly, looking for any side effects, and providing education on how to manage any side effects[22]. Because of the broader scope more suited to the home setting, the term medication management was intentionally used in this initiative rather than medication reconciliation.

Transitional Care Program

TCP's were implemented to aide in the coordination and continuity of health care for a patient during a movement from one healthcare setting to another[13]. This transition could be to another healthcare facility, nursing home, rehabilitation program, hospice, or back to the patients' own home. The focus of these programs is to ensure the patient care needs are met during the course of a chronic or acute illness. A randomized control trial (RCT) was conducted to assess if the implementation of a discharge check-list upon patient admission would aid in the transition of care planning[10]. Time difference between medically ready for discharge and actual discharge averaged 1.5 hours less in the intervention group[10]. In another study, they reviewed medical records of AMI patients discharged from an intermediate cardiac care unit[11]. They implemented an evidence-based QI through implementation of system-level bundled interventions, increased Home Health (HH) referrals, and enhanced collaboration which reduced 30-day readmissions for AMI patients in a large academic medical center[11].

Medication Reconciliation Practices

Medication reconciliation practices theme was evidenced in a study which instituted a review of 3,316 patients who participated in a restructured pharmacy practice model to help

reduce 30-day readmissions[1]. The study found the most significant impact was for patients in the high-risk subgroup, with a readmission rate dropping from 17.8% to 12.3% ($p = 0.042$)[1]. In another study, they utilized community pharmacists to intervene at 72 hours post discharge to discuss medications, again at seven days post discharge, and one final time at the 30-days for patients discharged after an AMI[17]. None of the patients who received regular follow-up by the pharmacist were readmitted within the 30-day time frame.

Follow-up Phone Calls

This theme was evidenced by a prospective study which sought to determine if medication education during hospitalization and post-discharge with follow-up phone calls would decrease readmissions[3]. The pharmacists made a follow-up phone call within 72 hours of discharge to reinforce medication education started in the inpatient setting. All-cause readmission at 30 days was lower, but did not reach statistical significance (13% to 5%, $p= 0.18$)[3]. All patients in the intervention group picked up their prescriptions within three days after discharge and patient medication adherence and literary scores (MedAL) were improved from a baseline of 4.5 to 8 at 30 days post-discharge ($p= 0.0005$)[3].

Another study implemented a focused telephone follow-up intervention utilizing the Roy Adaptation model to improve AMI patients' self-efficacy, quality of life, and lifestyle modifications necessary for improved health[12]. They conducted a series of three follow-up phone calls with 96.77% patients in the intervention group continuing medication use. In yet another study, the researchers developed and implemented a pharmacy-driven, post discharge follow-up telephone call program to assess medication adherence, provide education, and address medication-related concerns[16]. By providing these services, 58% of the patients avoided a medication discrepancy[16].

Theoretical Framework

The theoretical model utilized for this QI project was the Donabedian Model with utilization of the Plan Do Study Act (PDSA) implementation framework to implement rapid cycle change at the practice site. The theoretical framework was a direct and systematic framework, using the triad of structure, process, and outcome to evaluate the quality of the readmission reduction practices[9]. The structure portion involved defining the structural and organizational characteristics where the healthcare occurs, the process portion focused on the care delivered to the patients, and the outcomes of care focused on the effects of health care on the status of patients and populations[2].

Design and Setting

This project used a QI design and implementation framework to test the impact of the Called to C.A.R.E. initiative. The determination by the organization's internal IRB was this project could proceed as a QI process with no IRB oversight. The organization is one of the nation's 20 largest healthcare systems, serving over seven states. The market for this project was in the south east and urban area, which consisted of four acute care non-profit community hospitals. AMI patients were admitted to any of the four hospitals within the system. The setting for the QI project was a community hospital of 225 beds. It was implemented with full support and collaboration of all cardiology providers, administration, and hospital staff. The project site had a fully equipped cardiac catheterization lab, where patients underwent PCI and stenting or were medically managed. The patients were admitted primarily to the Intravascular Care Unit (IVCU), which was a 15-bed intermediate care unit that had rapid patient turn-over, or to a telemetry unit and then transferred to the IVCU.

Eligibility Criteria

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Participants in this study included all adult patients age 18 and older with a primary diagnosis of AMI discharged to home from the practice site. Project enrollment was automatic for eligible patients as part of the QI process. Inclusion criteria were respective to the location to which the patient was discharged. Patients discharged to nursing homes, SNF's, long-term care facilities, or hospice were tracked, but since medical professionals handled their medication management, these patients were excluded from the Called to C.A.R.E. initiative. Both English and Spanish speaking persons were included in this care initiative. Persons aged 17 or younger and those who lacked a telephone in their residence or discharge location were excluded.

Structure

The Team developed a charter to establish boundaries and a clear direction for the quality group. A series of interdisciplinary meetings with the Team were held throughout this project. Four meetings had been held prior to the national Covid-19 pandemic. Meetings resumed in July 2020 and continue to meet monthly. The Team consisted of quality improvement specialist, CM's, department directors, physicians, pharmacists, and a Cardiology NP. In those initial January and February meetings of 2020, the charter was developed and a gap analysis was conducted to identify the primary areas of opportunity. The primary areas of opportunity identified were: staff development, content of discharge education, medication management; which included medication reconciliation, internal and external hand-off processes, care coordination, and a process to have patients questions answered post-discharge.

Process

The introduction of the Called to C.A.R.E. initiative occurred at two timepoints during the patient's admission. The Cardiology NP provided a script for the CM's and RN's to follow when introducing the project to the patient and their support person. The CM or RN were the

first touchpoint and the Cardiology NP was the second M-F 9-6pm. Due to limited scheduling, on weekend mornings, the RN was the first touchpoint, and the Cardiology NP conducted the second touchpoint. All nursing units were provided with the laminated cards to administer to the patients and flyers were placed on the nursing units explaining the initiative. The laminated cards included the initiative description and the Cardiology NP's name and contact information. This information was written based on The Centers for Disease Control and Prevention (CDC) "Everyday words for public health communication" guidelines[4]. These guidelines recommended using active voice, short sentences, and using everyday words and pronouns. Discharge disposition, date, and time were tracked on a spreadsheet by the Cardiology NP.

Post-Discharge Procedures

The Called to C.A.R.E. phone calls were implemented at the 48-hour time frame and every seven days thereafter up to 30 days. The tool utilized was a modified version of the AHRQ post-discharge phone follow-up tool (See Figure 2). If the patient or support person was not reached at 48 hours, the call was attempted again at 72 hours. If contact was made at 48 hours, the subsequent call was seven days from that date to the same individual. If the initial contact was at 72 hours, the subsequent calls were made every seven days, up to 30 days post-discharge. A copy of the patients after visit summary (AVS) with the list of medications was utilized during each phone call for real time review and comparison. The Cardiology NP conducted these calls between the hours of 9am-6pm daily. The patient responses, time of day, and the length of each call were tracked by the Cardiology NP on a spreadsheet. If the patient or support person sought medical advice during the call, the Cardiology NP directed them to their provider. The number of calls were tracked using the C1, C2, C3, C4, C5 timepoints. On the final phone call, the patient or support person were asked three questions to evaluate the intervention and could respond yes,

no, or unsure to each question posed. The participants could also provide additional comments if they so desired and these were recorded (See Figure 4). None of the patients requested to be excluded from any further phone calls at any point during the intervention, but this would have been respected, and tracked. No attempts were made to contact the patients beyond the 30 days.

Outcomes

In order to assess for variations in the data, timing of the phone calls, discharge location, and whether the patient or the support person received the intervention were tracked. Descriptive statistics collected included: age, gender, race, education, location of discharge, length of stay, percentage of patients who handle their own medications, percentage of patients referred to other services, and the demographics of the support person. To answer project aim number one, readmission data was analyzed using Pearson chi-square. Through collaboration with the practice site quality data analyst, historical data were collected through the EHR. Data were analyzed using descriptive and inferential statistics.

Results

Characteristics of the Eligible Patients

Eighty-nine AMI patients were eligible, but 66 received the Called to C.A.R.E initiative. Of these 89 patients, nine were deceased prior to discharge, two went to SNF's, three to inpatient rehabilitation, two to long term care facilities, and two to hospice, therefore, those eighteen patients were excluded. There was one patient readmitted within three hours of discharge, and an additional four patients did not answer any calls. Any readmitted patient was not re-enrolled because they were already defined by CMS as an all cause readmission.

The 89 eligible patients showed the following demographics. The mean age was 68 years with a range of 38-95 years. The sample was predominantly Caucasian (72%), male (55.1%),

married (42.7%) or widowed or divorced (39.3%) and all patients were English speaking. The educational level ranged from fifth grade to graduate studies, with (68.5%) completing high school or partial high school. The majority of the patients reported living with someone, whether an adult child, spouse, or friend (75.3%). (See Table 2).

The majority of the 89 eligible patients were discharged to home or to a family members home (78.7%), nine patients (10.1%) died prior to discharge, and 10 patients (11.2%) were discharged to hospice or a facility. The average length of stay (LOS) for the non-readmitted group was 4.38 days with a range of 1-46 days. Due to this outlier, the median was calculated as a measure of central tendency and was three days, with the interquartile range (IQR=2-5). The majority of these patients (75.3%) received Medicare or Medicaid benefits (See Table 2).

Among the readmitted patients, (n=10), the mean age was 69.9 years, predominantly Caucasian (80%), male (60%), married (20%), with (80%) widowed, divorced, single, or separated. Educational level among this group was 70% competed high school or above, and the remaining 30% had a 5th-8th grade education. Forty percent of the patients reported living alone, with the remaining (60%) stating they lived with someone. There was an average LOS of 5.2 days within the readmitted population.

In the entire group of 89, there was a broad range in number of prescribed medications at discharge from 0-28, with the average of 12 medications. Among the readmitted patients, the range was 5-28 medications, with an average of 16 medications per patient. The non-readmitted patients had a range from 0-24 medications, with an average of 10 medications at discharge (See Table 3). This displays that on average the readmitted group of patients was prescribed six more medications than those who were not readmitted.

Demographics of the Support Person

Eighty six or (96.6%) of eligible patients identified a support person and only three patients, (3.4%) did not. Spouses or significant others were most prevalent support, 43 (50%), with other family members at 10 (11.7%). The majority of the support persons, 30 (69.8%), identified themselves as wives to the patient, with adult children following closely at 28 (32.5%). Support persons were predominantly female (61.6%) (See Table 4). When those who were readmitted were extrapolated from the overall eligible population, only two (20%) of the 10 readmitted patients stated they did not have social support available and five (50%) of them handled their own medications. Three (30%) had a wife or daughter to assist with their medications, and two (20%) were dependent on facility nurses.

Readmission Reduction

The impact of the Called to C.A.R.E initiative was measured by comparing the rate of readmissions during the intervention period in 2020 to readmissions in patients admitted to this facility during the same months in 2019. The readmission rate of 6/66 (9.1%) seen in the patients who received the Called to C.A.R.E was compared to a readmission rate of 12/51 (23.5%) in the number of cases reviewed in 2019. There was a statistically significant difference in readmission rate (4.607; p=.032) between 2020 and 2019. This result provided support that the readmission rate of patients who received the Called to C.A.R.E. initiative was lower when compared to the readmission rate for the prior year, during the same time period, at the same practice site (See Table 8). The percentage of readmissions in 2020 at the same practice site was 14.4% lower than in the preceding year (See Table 5). The Phi value was .198, which is a low effect size (See Table 8). This indicates the statistically significant variation in the readmission reduction could be associated with other variables than the Called to C.A.R.E initiative.

Call Data

There were a total of 283 call attempts made throughout the Called to C.A.R.E. initiative, totaling 3,016 minutes or 50.3 hours (See Figure 3). A total of 58 (20.5%) calls were unanswered with 225 (79.5%) of the call attempts connecting with a patient, support person, or both. Of the 66 who received the Called to C.A.R.E. initiative, 46 were the patient, 15 were a support person, and five were both the patient and a support person. Among the 46 patients who participated, 38 answered three to four calls of the series. Of the five who had both participants on the calls, four answered all four calls. All but one support person answered three to four calls of the series. There was a high response rate among all three groups, but the support group rate was highest at 93.3% (14/15), the patient group 82.6% (38/46), and 80% (4/5) for the combined patient/support group. All patients (n=66) reported a support person available to them. The clinical significance of this finding reinforces the literature, which shows patients with support manage better than those without support available[21].

Though the number was small for readmissions among the patients who received the Called to C.A.R.E. initiative, of the six readmitted patients, they answered a minimum of one call and a maximum of three calls of the series. For those patients who were not readmitted and received the Called to C.A.R.E. initiative (n=60), the patients answered a minimum of one call (n=2) and a maximum of the entire four call series (n=42). There were 38 missed calls in total for the non-readmitted Called to C.A.R.E. group, with the majority of missed calls occurring at C1 (12 no answered calls) and C3 (13 no answered calls). The average number of calls answered by the non-readmitted Called to C.A.R.E. group was 3.57 as compared to an average of 1.83 in the readmitted group. This is a favorable trend which associates a higher number of calls answered to the non-readmitted group.

Discussion

The readmission rate in the 66 patients who received the Called to C.A.R.E. initiative was 9.1%, a 14.4% reduction when compared to the readmission rate of 23.5% in the 2019 group. There was a high response rate of 79.5% among the patients or support persons participating in the Called to C.A.R.E initiative. The initiative posed a low financial burden to the organization to implement, and the 14.4% reduction rate totaled approximately $124,800 in cost reduction (See Table 1) for AMI readmissions at this one practice site[6]. Though the readmitted group was small, there were some notable differences between the readmitted and non-readmitted groups. The readmitted group had a longer LOS, were discharged on more medications, and fewer were married suggesting less social support. These differences are worthy of further investigation.

The Cardiology NP will present a report of the Called to C.A.R.E initiative to the administration at the practice site. Because of the reduction in readmission rates and the favorable financial bottom line, the initiative is sustainable and, thus, the NP will recommend that Called to C.A.R.E. initiative be continued. Revisions to consider are: 1. Inclusion of patients discharged to a post-discharge facility; 2. Provide the follow up calls at time of day preferred by the patient to improve patient satisfaction; 3. Include the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) analysis; 4. Add documentation of the initiative in the patient chart for communication to the TOC team; 5. Expand the AHRQ tool used to incorporate activity, daily monitoring, and diet recommendations. Finally, the strong recommendation will be made that an APRN with prescriptive privileges provide the follow up phone calls, as the cornerstone of Called to C.A.R.E. initiative, in order to diagnose and adjust medications in real time and as needed by the patient report.

Key elements of the Called to C.A.R.E initiative included the introduction of the initiative prior to patient discharge, identification of a support person, continuity of care by the

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Cardiology NP, and the high level of identified support. The findings of this QI project were consistent with recent studies that examined readmission risk in cardiac patients. In a study that looked at the effects of perceived social support on the effects of medication adherence in hypertensive patients, drug adherence of patients was found to have a strong correlation with perceived social support[21]. In this Called to C.A.R.E. initiative, 42.7% of the patients were married and 75.3% stated that they lived with someone. This level of post-discharge support after an AMI, may explain the reduction in the readmission rate. This finding is consistent with the findings in a study, which showed married patients perceived more emotional support than single patients[21]. In another study, patients with high social support had half the odds of readmission within 30 days post-discharge than those with low social support[7].

Conclusions

Innovative interventions aimed at reducing the emotional and financial burden of readmissions are of value. This paper reported on the effect of the Called to C.A.R.E. initiative, a series of four, scripted follow up phone calls by a Cardiology NP focusing on medication management in a group of 66 patients discharged from a rural, community hospital in 2020. The reduction of readmissions by 14.4% supported findings in the literature that the presence of a support person is important in managing medication regimens and avoiding readmission. The net benefits in reduction of financial losses from AMI readmissions and the potential improvement in patient outcomes and satisfaction outweighed the cost to implement this intervention. APRN's with prescribing privileges are uniquely poised with the medical knowledge, established patient rapport, and with the familiarity of available resources in the community to reduce readmissions and assist patients and their support persons with managing complex medication regimens after discharge for an AMI.

References

1. Anderegg SV, Wilkinson ST, Couldry RJ, Grauer DW, Howser E. Effects of a Hospital Wide Pharmacy Practice Model Change on Readmission and Return to Emergency Department Rates. AJHP. 2014;1(17). doi:10.2146/ajhp130686.
2. Agency for Healthcare Research and Quality. Types of Quality Measures. https://www.ahrq.gov/professionals/quality-patientsafety/talkingquality/create/types.html. N.d. Accessed November 20, 2020.
3. Budiman T, Snodgrass K, Komatsu CA. Evaluation of Pharmacist Medication Education and Post-Discharge Follow-up in Reducing Readmissions in Patients with ST- segment Elevation Myocardial Infarction (STEMI). AOP. 2016;50(2). doi: 10.1177/1060028015620425.
4. Centers for Disease Control and Prevention. FastStats: Therapeutic Drug Use. https://www.cdc.gov/nchs/fastats/drug-use-therapeutic.htm. Published 2017. Accessed November 20,2020.
5. Centers for Disease Control and Prevention. Everyday Words for Public Health Communication. https://www.cdc.gov/Other/PlainWriting.html. Published May 2016. Accessed August 23, 2020.
6. Centers for Medicare and Medicaid Services. Measure Information Form. https://www.cms.gov/Medicare/Medicare-Fee-for-Service Payment/PhysicianFeedbackProgram/Downloads/2015-ACR-MIF.pdf. Published 2017. Accessed August 27, 2020.
7. Chan B, Goldman LE, Sarkar U, Guzman D, Critchfield J, Saha S, Kushel M. High Perceived Social Support and Hospital Readmissions in an Older Multi-Ethnic,

Limited English Proficiency, Safety-net Population. BMC. 2019;19(334). doi.org/10.1186/s12913-019-4162-6.

8. de Bono D. Complications of Diagnostic Cardiac Catheterisation: Results from 34,041 Patients in the United Kingdom Confidential Enquiry into Cardiac Catheter Complications. The Joint Audit Committee of the British Cardiac Society and Royal College of Physicians of London. BHJ.1993;70(3).
9. Donabedian A. The Quality of Care: How Can it be Assessed? JAMA. 1988;260(12).
10. Gabriel S, Gaddis J, Mariga NN, Obanor F, Okafor OT, Thornton A, Molasky W. Use of a Daily Discharge Goals Checklist for Timely Discharge and Patient Satisfaction. MSN. 2017;26(4).
11. House M, Stephens KP, Whiteman K, Swanson-Biearman B, Printz M. Cardiac Medicine 30-Day Readmission Reduction Strategies: Do Improved Discharge Transitions Decrease Readmissions? MSN. 2016;25(4).
12. Kavradim ST, Ozer ZC. The Effect of Education and Telephone Follow-up Intervention Based on the Roy Adaptation Model after Myocardial Infarction: Randomised Controlled Trial. SJCS. 2019;34. doi:10.1111/scs.12793
13. Lee J, Kim S, Nakagawa S, Yoo JW. The Effects of Shared Situational Awareness on Functional and Hospital Outcomes of Hospitalized Older Adults with Heart Failure. JMH. 2019;7. doi.org/10.2147/JMDH.S62269.
14. Ma JR, Fan MM, Wang ZS. Age, Preoperative Higher Serum Cortisol Levels, and Lower Serum Acetylcholine Levels Predict Delirium After Percutaneous Coronary Intervention in Acute Coronary Syndrome Patients Accompanied with Renal Dysfunction. IJP. 2020;62(12).

15. Nguyen OK, Makam AN, Clark C, Zhang S, Das SR, Halm EA. Predicting 30-Day Hospital Readmissions in Acute Myocardial Infarction: The AMI "READMITS" (Renal Function, Elevated Brain Natriuretic Peptide, Age, Diabetes Mellitus , Nonmale Sex , Intervention with Timely Percutaneous Coronary Intervention, and Low Systolic Blood Pressure) Score. JAHA. 2018;7(8). doi:10.1161/JAHA.118.008882

16. Patel SD, Nguyen PA, Bachler M, Atkins B. Implementation of Post-Discharge Follow-up Telephone Calls at a Comprehensive Cancer Center. AJHP. 2017;74(2). doi: 10.2146/ajhp160805f

17. Patton AP, Liu Y, Hartwig DM, May JR, Moon J, Stoner SC, Guthrie KD. Community Pharmacy Transition of Care Services and Rural Hospital Readmissions: A Case Study. JAPA.2003;57(3S). doi: 10.1016/j.japh.2017.02.019.

18. Phelps P, Sutton K. Structured Telephonic Consultation to Decrease Heart Failure Readmissions. 2018;27(3):6.

19. Robinson R. The HOSPITAL score as a predictor of 30 day readmission in a retrospective study at a university affiliated community hospital. PeerJ. 2016;4:e2441. doi:10.7717/peerj.2441

20. The Joint Commission. Hospital: 2021 National Patient Safety Goals. https://www.jointcommission.org/-/media/tjc/documents/standards/national-patient-safety-goals/2021/simplified-2021-hap-npsg-goals-final-11420.pdf. Published November 2020. Accessed November 13, 2020.

21. Turan GB, Aksoy M, Ciftci B. Effect of Social Support on the Treatment Adherence of Hypertension Patients. JVN. 2019;37(1).

22. Uitvlugt EB, Janssen MJA, Siegert CEH, et al. Patients' and providers' perspectives on medication relatedness and potential preventability of hospital readmissions within 30 days of discharge. *Health Expect*. 2020;23(1):212-219. doi:10.1111/hex.12993

23. Wadhera RK, Joynt Maddox KE, Wasfy JH, Haneuse S, Shen C, Yeh RW. Association of the Hospital Readmissions Reduction Program with Mortality among Medicare Beneficiaries Hospitalized for Heart Failure, Acute Myocardial Infarction, and Pneumonia. JAMA. 2018;320(24). doi:10.1001/jama.2018.19232

What's New

- The primary aim of this initiative served to reduce readmissions in the AMI patient population, and the readmission rate in the 66 patients who received the Called to C.A.R.E. initiative was 9.1%, a 14.4% reduction when compared to the readmission rate of 23.5% in the 2019 group.
- In creating a standardized process of establishing a relationship with not only the patient, but a designated support person prior to discharge, the APRN was able to obtain a 79.5% response rate for participation in the post-discharge initiative.
- The initiative posed a low financial burden to the organization to implement, and the 14.4% reduction rate totaled approximately $124,800 in cost reduction for AMI readmissions at this one practice site.

Table 1

Financial Analysis Summary

FINANCIAL ANALYSIS

IMPLEMENTATION OF THE CALLED TO C.A.R.E. QUALITY INITIATIVE: A POST-DISCHARGE AMI PATIENT CARE INITIATIVE TO REDUCE READMISSIONS

NOVEMBER 20, 2020

PROPOSAL MANAGER: LARISSA LABO RODRIGUEZ, MSN, AGACNP-BC, CCRN-CSC

INITIATIVE COSTS- YEAR 1	NOTES	UNIT COSTS	TOTAL UNITS	TOTAL
Materials and Supplies				
Laminated Called to C.A.R.E. cards	These were distributed to the patients prior to discharge to describe the quality initiative.	$ 0.75	176	$132.00
Unit Flyers	Placed on the inpatient nursing units to summarize and describe the project	$ 2.57	10	$25.70
Lenova Think Pad T470 Laptop	For remote access to records (already provided by employer)	$ 844.00	0	$0.00
Microsoft Office Download	For documentation of patient data (already provided yb employer)	$ 99.97	0	$0.00
Telephone Device	iPhone 7; personal device	$ 229.99	0	$0.00
Telephone Device Service	Per month (12 month period)	$ 45.00	12	$540.00
Personnel Expenses				
Acute Care Nurse Practitioner	0.4 FTE (national average) 832 hrs annually x 52.90	$ 44,012.80	1	$44,012.80
Case Manager	0.1 FTE (national average) 116.48 hrs annually x 34.26	$ 3,990.60	1	$3,990.60
Registered Nurse	0.1 FTE (national average) 91.52 hrs annually x 38.39	$ 3,513.40	1	$3,513.40
Inpatient Rounding Time				
Case Manager	Timepoint 1: 50 patients x 5 min each (56% of timepoints)	$ 34.26	4.16	$142.52
Registered Nurse	Timepoint 1: 39 patients x 5 min each (44% of timepoints)	$ 38.39	3.25	$124.77
Acute Care Nurse Practitioner	Timepoint 2: 22.25 hours over 7 weeks	$ 52.90	22.25	$1,177.03
Called to C.A.R.E. Intervention Time to complete				
Time Spent Running Daily AMI Report	Patient list ran daily at 0700 (10 mins each day * 7 days a week * 7 weeks)	$ 52.90	8.16	$431.66
Time Spent Reviewing patient p/t calls	Reviewed D/C instructions, medications, and follow-up's prior to calling each patient (15 mins each patient * 66 patient called)	$ 52.90	16.5	$872.85
Time Spent Reviewing patient discharges daily	Enrolled patients to determine day of discharge (5 mins * 7 days * 8 weeks)	$ 52.90	4.67	$247.04
Time Spent on all Calls	Total time spent on all calls made to patient or identified support person and documentation of responses (50.3 hr. for 288 total calls made)	$ 52.90	50.3	$2,660.87
PROJECTED COSTS/YEAR 1				$57,871.24
PROGRAM COSTS YEAR 2				
Materials and Supplies				
Laminated Called to C.A.R.E. Cards	General projection 420 AMI discharges	$ 0.75	500	$375.00
Unit Flyers	All inpatient nursing units	$ 2.57	10	$25.70
Telephone Device Service	Covered by hospital monthly stipend	$ 45.00	12	$540.00
Inpatient Rounding Personnel Expenses				
RN/CM Timepoint 1	0.1 FTE (national average) 420/2=210 * 5 min	$ 34.26	17.5	$599.55
RN/CM Timepoint 1	0.1 FTE (national average) 420/2=210 * 5 min	$ 38.39	17.5	$671.83
NP Timepoint 2	0.4 FTE (national average) 420/2=420* 15 min	$ 52.90	105	$5,554.50
Outpatient Called to C.A.R.E. Intervention				
NP Calls Made to Patients	Mean Average hourly rate for NP in Virginia for 420 patients annually equates to 1680 calls approx. 12 minutes each call.	$ 52.90	336	$17,774.40
PROJECTED COSTS- YEAR 2				$25,140.28
PROJECTED COSTS YEAR 1 & YEAR 2				**$83,011.52**
COST SAVINGS/ AVOIDANCE				
Year 1 Cost-avoidance due to decreased AMI readmissions	The average cost of an AMI readmission is 64 percent the cost of an initial AMI admission, which is $20,800 on average. Saw a 14.4 % decrease in readmissions. Average rate is 16.3% median observed all cause readmission rate for AMI nationally. (12*20,800=249,600)/(6*20,800=124,800)	$ 20,800.00	6	$124,800.00
Year 2 Cost-avoidance due to decreased AMI readmissions	If continue on trajectory and decrease by another 50% reduction (3*20,800=62,400)	$ 20,800.00	3	$62,400.00
COST AVOIDANCE FOR AMI READMISSIONS				$187,200.00
Cost of orientation of Acute Care Nurse Practitioner	Hourly Rate ($52.90) *8 orientation hours (24)	$ 1,269.60	1	$1,269.60
TOTAL COST SAVINGS & AVOIDANCE FOR YEARS 1 & 2				**$188,469.60**
			Net Savings	**$105,329.33**

Table 2

Characteristics of Patients Eligible for Called to C.A.R.E. Initiative (N=89)

	n	%	Range	Mean(*SD*)
Age (years) Readmitted Patients	10		60-86	69.9(7.6)
Age (years) Non-readmitted Patients	79		38-95	67.9(12.9)
Length of stay (days)	89		1-46	4.38(5.9)
Race				
Non-Hispanic White	64	72		
Non-Hispanic Black	25	28		
Gender				
Male	49	55.1		
Female	40	44.9		
Education				
5th-some HS	31	34.8		
Graduated HS	30	33.7		
Some College or Training	20	22.5		
Bachelors or Master's Degree	8	9		
Location at Discharge				
Home or Family Member's Home	70	78.7		
Deceased	9	10.1		
Facility	10	11.2		

Table 2

Characteristics of Patients Eligible for Called to C.A.R.E. Initiative (N=89)

	n	%	Range	Mean(*SD*)
Marital Status				
Divorced or Legally Separated	16	18		
Widowed or Single	35	39.3		
Married	38	42.7		
Employment				
Retired	46	51.8		
Disability	5	5.6		
Unemployed or Furloughed	13	14.6		
Employed	25	28		
Living Alone				
Yes	22	24.7		
No	67	75.3		
Insurance				
Medicare	56	62.9		
Medicaid	11	12.4		
Private Insurance	16	18		
Self-pay	6	6.7		

Note: This is the demographic information related to the group of 89 patients. HS = high school

Table 3

Medication Data for Called to C.A.R.E. Patients (N=89)

	n	%	Range	Mean(*SD*)
Number Medications at Discharge for Readmitted	10		5-28	16.2(6.6)
Number Medications at Discharge for Non-readmitted	79		0-24	9.6(5.6)
Patients Manages Their Own Medications				
Yes	58	65.2		
No	31	34.8		
Who Manages the Patient Medications				
Self	58	65.2		
Husband	2	2.3		
Wife	14	15.7		
Adult Child	8	9		
Mother	1	1.1		
Facility/Hospice	6	6.7		

Table 4

Characteristics of Support Person Identified by Patient (N=86)

	n	%
Gender		
Male	20	23.2
Female	53	61.6
Did not specify	13	15.2
Relationship to Patient		
Spouse	43	50
Adult Child	28	32.5
Other Family Member	10	11.7
Friend(s)	5	5.8
Adult Child		
Male	8	28.6
Female	20	71.4
Spouse		
Male	13	30.2
Female	30	69.8

Table 5

Comparison of AMI Readmission Data at the Practice Site in 2019 as Compared to 2020

	2019		2020				
	Frequency	%	Frequency	%	χ^2	*p*	Phi
Readmitted	12	23.5	6	9.1	4.607	.032	.198
Not Readmitted	39	76.5	60	90.9			

Note. The above data reflects the number of patients for the same time period one year apart at the same practice site. The 2019 data report for patient enrollment ran from July 27, 2019- September 13th, 2019 and the 2020 data was also from July 27th-September 13th. Readmissions who did not receive the intervention were eliminated from the 2020 analysis.

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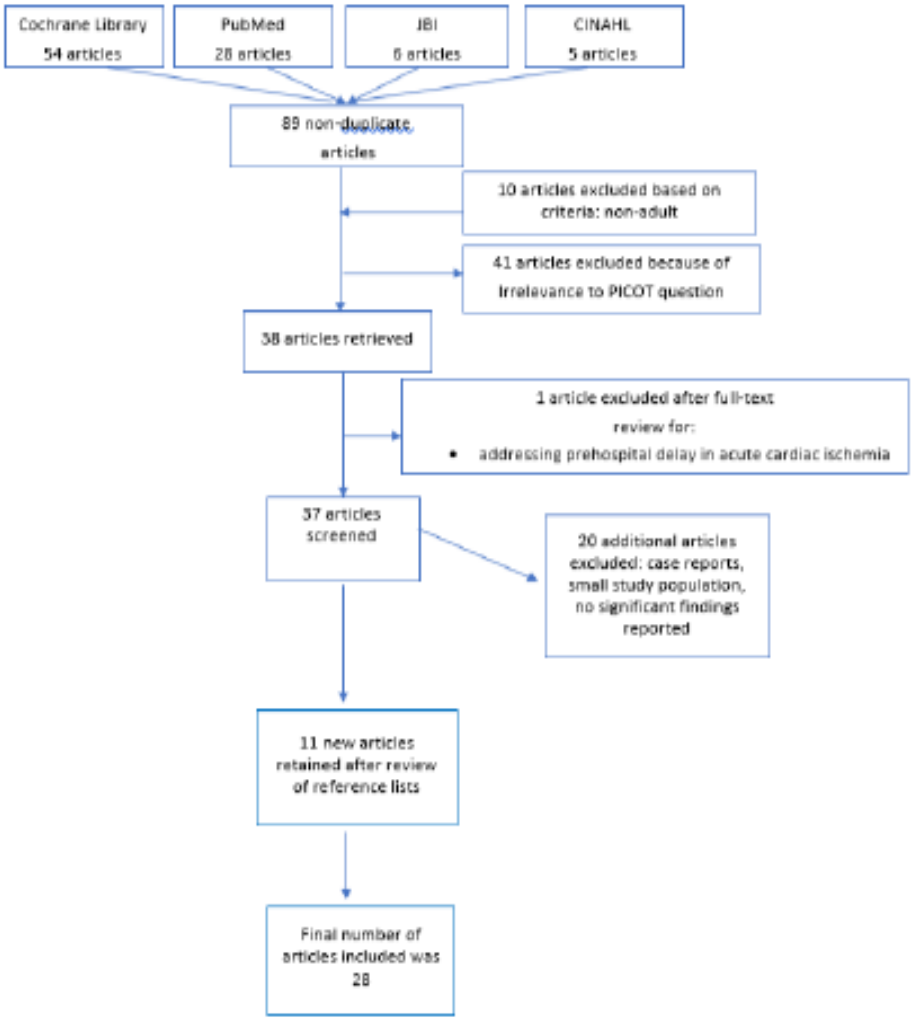

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram for the systematic literature search process. CINAHL = Cumulative Index to Nursing and Allied Health Literature; JBI = Joanna Briggs Institute EBP Database.

Called to C.A.R.E Script for Follow-Up Phone Calls
Adopted and Modified from the AHRQ Sample Script for Follow-up Phone Call
Patient #____ Call #: 1, 2, 3, 4, 5

1. Hello Mr./Ms. . I am [caller's name], a [type of clinician] from [name of hospital]. You may remember that before you left [name of hospital], we mentioned you'd receive a series of calls checking in on your or [significant other/parent/spouse] medication management. I am calling to talk to you about your [patient name] medications. It will probably take about 10 to 20 minutes, depending on the number of medicines you [patient name] are taking. I will not be providing any medical advice during this call, if you are experiencing medical concerns please call your provider.

2. Were you able to get your prescriptions filled? Y/N

3. Can you bring all of the medicines to the phone, please? We will review them during this call. Please have the medication list we provided you before you left the hospital in front of you.

4. Do you have all of your medicines in front of you now? Y/N. How many medications are you taking?
We will go through your medicines one by one. Make sure they are the right ones, then we'll discuss how often you've been able to take them and any problems or questions you might have about any of them.

5. Choose one of your medicines to start with.
What is the name of this medicine?
At what times during the day do you take this medicine?
How much do you take each time?
What is the strength of the medicine?
How do you take this medicine?
What do you take this medicine for?

6. Have you had any concerns or problems taking this medicine? Y/N
Has anything gotten in the way of your being able to take it? Y/N
Have you ever missed taking this medicine when you were supposed to? Y/N Why?

7. Do you think you are experiencing any side effects from the medicine? Y/N
If yes, Could you please describe these side effects?

8. After patient has described all medicines, ask: Are you taking any additional medicines that you haven't already told me about, including other prescription medicines, OTC medicine, or herbal medicines, vitamins, or supplements?

9. If patient has been prescribed medicines that the patient hasn't mentioned, ask whether he or she is taking that medicine.
If yes, go through the list of medicine questions.
If not, probe as to why not.
If patient is unaware of the medicine this will be documented.

10. Have you been to the hospital or ER since I spoke to you last? Y/N Did you get readmitted? Y/N

Do you use a pill box? Y/N

What questions do you have today regarding your medicines?

Thank you for speaking with me today. I will be calling again in 7 days, or if it is the last call I say, thank you for participating so I can ensure you are understanding your medications, and ask the 3 post-intervention questions.

Figure 2. Patient Call Script

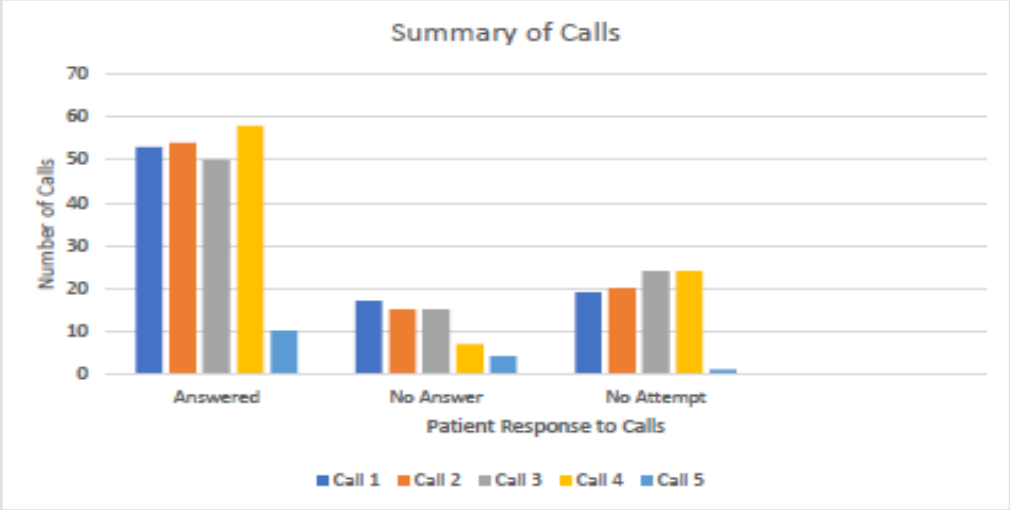

Figure 3. Summary of all call made during the Called to C.A.R.E. initiative.

" In fact I am glad you call." "You keep me up on what I should be doing." "I think it makes him feel better that you call to check on him." "You know when people get older, they get a little childish and want more attention."

"It has just been wonderful to have you call, I wish there were more." "I'm just sad that it's over." "The calls were not too long, it's just nice to hear that someone cares."

"I got the opportunity to ask questions I need to know the answers to."

"I feel the calls helped, oh yes I did!" "I enjoyed them, I feel this kept me on track."

"Anytime there is a follow-up made by a healthcare worker, there is a feeling of care." "Actually, this was very calming and I appreciate being able to discuss things with you." "A healthcare worker calling and showing concern is very important now a days." "Feel free to include me if you need any further feedback or follow-up from a patient, I will be happy to participate."

"The calls were great, I enjoyed telling someone how I am doing." "I enjoyed having someone to ask questions to." "I looked forward to having someone to talk to every week to check on me."

"Your calls keep my spirits up if nothing else."

"I enjoyed talking to you, I'm sad there are no more calls." "Please keep an eye on us still, keep us in your prayers."

"The calls were not too long at all." "At first I thought it was going to be a pain, but it actually helped me." "It's good to explain to people what's going on with their meds." "That other stuff was killing me, I would've quit taking all of my medications because I didn't know which one it was causing me to feel bad if you didn't explain the side effects to me." "You were encouraging, you didn't beat me down."

"Feels good to have this many people from the organization checking on you."

"All of the calls showed me you care, was nice to have someone check on me and keep me on track."

"Yes it was very helpful to have these medications discussed and explained because they are all new to me now." "The calls were long enough to answer my questions, I never felt like you were rushed or hurried."

"It was helpful, it was nice to have someone check on me."

"I kind of looked forward to the calls." "It's nice to talk it out."

"Was so nice to have someone check on me."

"It was nice to have someone check on me especially early on after my heart attack."

"I don't mind you calling, at least I can communicate with someone." "I really don't know what they said at his appointment, I wrote down questions for him to take with him and they sent no responses, he was frustrated after his appointment and said he wasted a trip to Richmond." "At least you try to take time to explain things and check on us."

"It's nice to know what my medications are for."

"I'm always glad to talk to you folks, I like to tell people when they done good, I'm an old fashioned boy."

"It's been a very nice experience to have such attentive follow-up." "You're really attentive, seem to really listen, and take your time answering my questions."

"It was very, very good thank you." "Last week when you spoke to us it made us feel 1000 times better." "It's scary coming home after something like this happens." "In fact last weekend when we were scared and couldn't get a hold of someone you made my wife feel better."

"I think because of the situation I'm in and the unknown it's good to know someone is calling and checking on me and my medications."

"It was a pleasure having someone to speak to."

"It's great to have someone check on us, answer questions, and encourage us." "Very hard to get a hold of the doctor sometimes."

"Thank you, you have been very helpful and caring."

"I appreciate your taking the time to explain things to me, it made me more at ease." "I am grateful you could direct me about my medications."

"It's nice to know that people care."

"It was very nice to have someone checking on us to see how we were doing."

"Very nice of you to check on us so much, I've been handling his medicines for a long time now, nice to know someone cares."

"Yes, you really helped the first week getting his medications straight." "The nursing home is taking care of his medications now."

"I appreciate your time and concern for my mom."

"I appreciate someone checking on me, listening, and clarifying my medications with me."

"Thank you for checking on me." "It makes me feel like I am being looked after until I can help myself."

"You were an absolute help!" "You cleared my head up" "I can't believe how confused I was" "Dang doctors had me worried I would have another heart attack and die before I could even get a hold of one." "I got a better understanding of what I am taking and why". "You cleared up a lot" " I had so much new stuff going on with my heart, kidneys, diabetes, so much it was overwhelming."

"I appreciated your calls so much."

"Well call me back again sometime."

"I didn't consider you a bother at all. I felt it is a significant and important job for you to check in because it meant a lot to me as a family member." "I know you're going to call and I get my list of questions together to be prepared." "It's especially nice because you have medical knowledge."

Figure 4. Patient comments to final questionnaire at completion of Called to C.A.R.E. initiative.