Reducing Readmissions for the MI Patient with

Early Access to Multidisciplinary Team Care

Kathryn Ward, MSN, PHCNS-BC
Charlottesville, Virginia

BSN, University of Virginia, 1987
MSN, University of Virginia, 2001

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Regina DeGennaro, DNP, RN, Chair _____

Catherine F. Kane, PhD, RN _____

Ellen C. Keeley, MD, MS _____

Abstract

Background An acute myocardial infarction (MI) or heart attack occurs in approximately 735,000 Americans each year accounting for 1 in 4 deaths of all heart-related events. Hospital readmissions within the first 30 days of discharge occur in 11% of patients resulting in a mean cost of $22,000 per admission. While there is vulnerability among this population for readmission to the hospital there was no evidence that programs with timely access to care exist. This scholarly project addresses the question of outcomes of an early post-discharge multidisciplinary intervention to reduce readmission in this post MI population at an academic health center.

Purpose The purpose of this study was to examine whether early access to a multidisciplinary MI clinic (MDMI) following discharge for an acute myocardial infarction reduces readmission rates within 30 days following discharge.

Design The design was a retrospective descriptive comparative study of patients who were discharged with the diagnosis of acute myocardial infarction. Study data was obtained from patient chart review.

Methods The data for this study was drawn from the electronic medical records (EMR) of patients discharged with a documented primary or secondary diagnosis of an acute myocardial infarction to any setting from January 1, 2016 through May 31, 2016.

Results Of the 307 patients discharged with an acute MI within the six month time frame, 88 (29%) attended the MDMI clinic with a readmission rate of 5.7% as compared to the treatment as usual group of 219 (71%) that had a readmission rate of 14.6%.

Conclusions The decreased readmission rate in the patients seen in the MDMI clinic suggests there is evidence that the readmission of patients seen in clinic differed from the readmission rate

from those not seen. This was, however, unrelated to age. The mean age of those readmitted was less than the mean age of those not readmitted.

Key words: readmission, heart disease, acute myocardial infarction, pharma, telemedicine, diet, literacy, and exercise.

Combined key words “myocardial infarction and patient readmission” and “health belief model” AND (“cardiac OR “heart disease” OR “myocardial infarction”) were also searched.

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Patient safety and quality care must always be the goal of any treatment. While readmission rates are often proposed as markers for poor quality of care, a consistent link between readmission and quality of care has not been established (Fischer et al., 2014). Nonetheless, hospital readmissions negatively impact the quality of life. Patients who have been hospitalized for an acute myocardial infarction (MI) are at high risk for readmission within 30 days of discharge (Ben-Assa E et al., 2014). One strategy for reducing readmissions for acute MI patients is to improve access to care for prompt outpatient follow-up post hospitalization. This goal is aligned with Healthy People 2020 Access to Health Services for improving access to quality health care in order to receive the best outcomes and ensure an ongoing source of care for the patient (U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion, 2015). Strategies to avoid readmission post MI are being developed and evaluated to identify the interventions with the highest effectiveness.

Health Problem Significance

Cardiovascular disease remains the primary cause of death in the United States. Acute MI affects 7.1 million people or 3.5% of the population (Coons & Fera, 2007). The number of Americans who have an acute myocardial infarction each year is staggering. According to the American Heart Association, each year approximately 735,000 Americans have a heart attack or MI one every 34 seconds (Centers for Disease Control and Prevention (CDC), March 05, 2015). While hospital readmission rates within 30 days of discharge differ by age, gender, and socio-economic factors, they were at an alarming rate of 17.1% in 2009 with an associated cost of greater than $13,000 based on Medicare claims data during that same time (Stranges, Barrett,

Wier, & Andrews, 2012). Not only is prompt access to care important but long-term outcomes are directly related to an expectation of life-long behavior changes in patients (Redfern, 2011).

Organizing Framework and Health Belief Model

The Health Belief Model (HBM) is one of the most studied and used theoretical frameworks in all of Public Health (Jones et al., 2015). This model presumes that anyone who has a perceived or real threat to their health and is susceptible to serious consequences will change their behaviors if they also believe in benefit from the actions recommended. Most adults have the ability to control their behavior if they are appropriately motivated and believe there is a connection between conduct and consequences (Schwarzer, 2008). Based on the Health Belief Model's six constructs of perceived susceptibility, severity, benefits, barriers, a cue to action, and the belief they will successfully be able to perform the action (U.S. Department of Health and Human Services, National Cancer Institute., 2005), it is conceivable that providing patients with resources regarding lifestyle changes will benefit them and prevent future adverse events. Self-efficacy is integral to the success of any behavior change and contingent on what and how the person believes in their success if outcomes are made clear (Bandura, 1977). MI patients are faced with a life changing event. Changes in behaviors related to medication, diet, and exercise is necessary and must be changed from the pre-event. Their success is based on their perceived ability to manage and sustain changes. Early access to care following an MI is important to capture the perishable time while the patient is in early recovery so that complications can be avoided and healthy impressions made.

Literature Search

In order to find relevant studies aimed at access to care and early follow-up for discharged MI patients to prevent readmissions, a nursing and healthcare literature electronic search was

conducted, using the following search terms: readmission, heart disease, acute myocardial infraction, pharma, telemedicine, diet, literacy, exercise and the combined key words "myocardial infarction and patient readmission" and "health belief model" AND ("cardiac OR "heart disease" OR "myocardial infarction"). The databases searched were MEDLINE, CINAHL, and Web of Science. The search was limited to articles in English with no timeframe. The inclusion criteria were a diagnosis of acute myocardial infarction after discharge, concentrating on people living predominately in the United States. Supplemental to searching national databases, relevant government reports were examined to find current metrics for the MI population. One hundred and nine initial studies were found. Eighty-nine of those were excluded due to irrelevant abstracts or titles. Sixteen more were excluded due to inpatient treatment emphasis with no discharge planning. Four studies met these inclusion criteria and were reviewed.

Literature

There were no randomized control trials (RCT) found.

Pertinent Study Findings

Medication adherence. A study by Matthews, et al., (2015), revealed that medication adjustment and adherence can be an opportunity for improvement in all settings. This study sample included 7,425 MI patients who had undergone percutaneous coronary intervention (PCI). Interviews were conducted via telephone between 2010 and 2012 using the eight question Morisky Medication Adherence Scale (MMAS) to evaluate self-reported medication adherence and any re-hospitalizations at six weeks and six months post-procedure. The self-reported information was verified with the actual hospital bill. The study found that more than 25% of the

discharged patients did not fill their prescriptions, thereby increasing their risk for readmission. The rate of readmissions was not reported.

The reasons for non-adherence to drug therapy included: forgetting to take medication; feeling the plan was too imposing; stopping medication due to feeling worse or assuming the condition was under control. Lower adherence was attributed to less prescription assistance and financial hardship. An important finding, though this study did not focus on readmission rates, was that follow-up appointments made prior to discharge were positively associated with medication adherence, which may correlate with lower risk for readmission (Matthews, et al., 2015).

(Yang, Olomu, Corser, Rovner, & Holmes-Rovner, 2006), studied the pattern of outpatient medication use following hospitalization in patients with coronary disease. A telephone survey of 433 patients was used to collected information at three months and eight months after discharge to describe self-reported medication use and hospital readmissions. The results showed that re-hospitalization within three months after discharge predicted a subsequent readmission within eight months. The findings indicated that early medication adjustments were essential to preventing subsequent readmissions.

Multidisciplinary team. Coons and Fera, (2007) employed a multidisciplinary team consisting of physicians, nurses, clinical pharmacists, nutrition specialists, cardiac rehab specialists, and the performance improvement department, during hospitalization to facilitate healthy behaviors and attempt to remove barriers to behavioral change for patients admitted with a principal diagnosis of MI or Heart failure (HF). These efforts were intended to reduce readmissions to the hospital. A pharmacist provided medication education and counseling to improve medication adherence, and to reduce errors or confusion that could place an MI patient

at higher risk for readmission. The study was conducted at one hospital in Pennsylvania over a one year period. The total size of the sample was not reported, but outcomes improved for the MI population that exceeded the nationwide standard during the time of this study in administering the correct medications on arrival and prescribing the correct medications at discharge. The focus was on pharmacist's involvement with patient care and medication management.

Early access. Hess et al., (2014) analyzed data linked to Medicare claims in 228 hospitals for 25,872 patients, 65 years and older, who had been admitted with an MI that required no procedural intervention. The analysis used registry data over a three year period from 2003-2006. The study adjusted for patient, various hospital characteristics, and treatments to examine the relationship between early access, physician follow-up within seven days, and readmissions within 30 days after discharge. The findings revealed that one in five of the older MI patients were readmitted within 30 days and found no association between early physician follow-up and lower readmission rates. The researchers suggested targeting other strategies to lower the readmission rates.

Framework. The Health Belief Model (HBM) presumes that anyone with a perceived or real threat to their health who is susceptible to serious consequences will modify their behaviors to produce positive outcomes. In 2008, Schwartzer wrote that many adults can control their behavior if properly motivated and realize the connection between conduct and consequences. Schwartzer was not referring to any specific disease but speaking to general human behaviors. Based on the Health Belief Model's six constructs of perceived susceptibility, severity, benefits, barriers, a cue to action, and the belief they will successfully be able to perform the action, this model is applicable in any setting (U.S. Department of Health and Human Services, National Cancer Institute., 2005). Self-efficacy is integral to the success of behavior change, regardless of

diagnosis, and provisional upon how one perceives success in their outcomes (Bandura, 1977). Further evidence of the HBM having positive outcomes is suggested from a media campaign done by Jones, et al., (2015). The campaign was conducted over two months for awareness of H1N1 flu vaccines in Indiana, and found that if the patient perceived that they were susceptible to the illness it had more impact than actually contracting the illness. The perception of the benefit to the patient was assessed using a short, four point questionnaire. Barriers were assessed using a scale of 10 questions. The results revealed that there is a strong correlation between high self-efficacy and perception of barriers. The higher self-efficacy, the lower the barriers become. Using this model of care as a framework for a multidisciplinary intervention post MI by properly informing and coaching patients, may reduce the rate of readmissions if the patient perceives the consequences of non-adherence to their plan of care. Using the HBM theoretical framework, patients who have recently suffered an MI will benefit from taking action if they understand and believe that there is a positive benefit from participating in healthy behaviors (Jones et al., 2015)

Implications

Four studies met criteria for final inclusion in this review. After careful review, medication adherence was identified as the major factor in preventing readmissions.

In conclusion, this review of the literature found no published evaluations of early post discharge interventions to reduce readmission for the MI patient. This gap in the literature can begin to be filled by conducting studies to answer the question: what are the outcomes of an early post-discharge multidisciplinary MI (MDMI) clinic to reduce readmissions?

Method

The preceding literature review found few evaluations of the impact of interventions to address early complications post-discharge for the MI patient. The goal of this multidisciplinary MI (MDMI) clinic was to ensure early identification of problems and implement appropriate interventions to avoid readmissions.

Purpose

The purpose of this study was to examine whether early access to a MDMI clinic following discharge for an acute myocardial infarction would reduce readmission rates within 30 days following discharge.

Hypothesis

Thirty day readmission rates will be lower for post discharge MI patients who attend a multidisciplinary MI clinic compared to those who receive treatment as usual.

Definitions of Terms

An acute myocardial infarction (AMI), more commonly referred to as a heart attack or MI, happens when blood supply carrying oxygen to the heart muscle is compromised or cut off entirely. The coronary arteries are responsible for supplying blood to the heart and any obstruction due to substances known as plaque that narrow the arteries cause disruption of blood flow preventing oxygen from reaching the heart muscle (American Heart Association, 2016). The diagnosis is made by the following two positive findings: electrocardiogram (ECG) changes and biomarkers that reflect muscle damage.

Electronic Medical Record (EMR). The electronic chart is the repository for all patient health related information and is secured by authorized password access.

Readmission to the hospital following an MI is defined as occurring within 30 days of

discharge for any cause.

UHC readmission rate. Mean national readmission rate reported by University Health System Consortium (UHC), defined as a national organization comprised of 118 leading academic medical centers and their affiliations with a focus on quality and safety.

Study Design

The design was a retrospective, descriptive, comparative study of patients who were discharged with the diagnosis of acute myocardial infarction. Study data were obtained from the EMR review. EMR files of those who were enrolled in the MDMI clinic were compared based on: those who received treatment as usual; on 30-day readmission rates, and on selected demographic characteristics. In addition, the medical records of those patients who attended the MDMI clinic were examined for medication issues.

Sample description

The data for this study was drawn from the EMR of patients discharged with a documented primary or secondary diagnosis of an acute myocardial infarction to any setting from January 1, 2016 through May 31, 2016 (see Table 2). The sample consisted of 307 patient records, eighty-eight (29%) of whom attended the MDMI clinic. The sample was predominantly male (62%) and the mean age was 65 years. The descriptive statistics of gender and age were compared between the group of patients who attended the MDMI clinic and those who received usual care. Both groups of MI patients contained more men than women and, subsequently, more men than women came to the clinic post-discharge. Overall, the younger patients within the groups were seen in the MDMI clinic compared to the usual treatment group. Both groups had age ranges within five years of each other (See Table2).

Study setting

The MDMI clinic was implemented within the outpatient cardiology clinic in a 600 bed tertiary academic medical center, with approximately 30,000 admissions each year, located in central Virginia. This medical center includes inpatient and outpatient facilities. The outpatient cardiology clinic has been operational for more than three decades and serves only adult cardiology patients each day during the week. Patients are scheduled for their appointments with a specialist in cardiology, based on history and symptomatology, and all of their medical information is entered and stored in an electronic medical record. This clinic sees between 100 and 150 cardiac patients each day. Subspecialties include: heart rhythm disorder; heart failure; cardiac valve disease, and interventional cardiology. Clinic staffing consists of receptionists, patient care assistants, nurses, social workers, pharmacists, dieticians, nurse practitioners (NP), cardiology Fellows and cardiologists.

The MDMI intervention clinic was developed in April 2015 to provide transitional care from the hospital to home for patients who had sustained an acute MI in an effort to decrease readmission rates. This transitional care clinic was the first to employ multiple disciplines to address MI patient needs. MI patients are discharged to early follow-up intervention focusing on medication adherence and a healthy lifestyle. For the full description of the program see Procedural manual in Appendix A. Though the MDMI Clinic opened in April 2015, the process of establishing a fully functioning clinic with staffing reassignments took approximately six months. Therefore data was obtained from the EMR from January through June of 2016. This six month data collection period resulted in a sample that received the full complement of MDMI Clinic services. Approval was granted by the Chief of Cardiology and the clinic Medical Director to conduct this study (See Figure 1).

MDMI Clinic Protocol

Discharge order set. An order set (Appendix B) using established procedures for cardiology patients is available to discharging providers, at the time of discharge, regardless of the treatment unit of patient during admission. The order set includes medications, activity, diet, and a referral to the MDMI clinic within the academic medical center for an appointment within seven to ten days after discharge. During the discharge process a brochure is provided to the patient explaining the clinic (See Figure 2).

Pre-appointment phone contact. One to two days before each clinic, a schedule of patients is printed and a nurse calls each patient to remind them of the appointment. The nurse assesses for oxygen needs and needed assistance upon arrival for assistive devices. The patient is instructed to bring all medication bottles with them, provided directions to the clinic, informed of what to expect from the visit and the anticipated length of the visit.

Early access MI clinic. The MI clinic is a multidisciplinary model of care which is held one day each week and includes a cardiologist, registered nurse, dietician, pharmacist, exercise physiologist, and social worker, who all see the patient individually in the exam room. Each discipline rotates in 10 minute intervals with the nurse seeing the patient first after the patient care assistant (PCA) obtains vital signs. Nurses perform an assessment and review of symptoms and share any relevant findings with the team. The order of whom sees the patient next is random and dependent on whom is available. Each discipline reviews the patient's needs, questions, and provides education and makes referrals related to their specialty. The pharmacists' role is to clarify the medication list, correct doses, review side effects, and make any effort to lower the costs of medications. The physician establishes a plan of care and refers the patient to their primary physician or cardiologist; if the patient already has a physician, for ongoing care. If no physician is on record, a referral is made to establish care. The nurse completes the last visit to

the patient before they leave to provide the written plan of care, reinforce education that has been provided, and respond to final questions. Following the appointment, each MDMI clinic team member updates the EMR with their findings.

Study Procedures

All EMR files of MI patients discharged between January 1, 2016 and May 31, 2016 were selected for this study. All EMR files of patients who were admitted with a primary or secondary diagnosis of an MI and all patients who subsequently sustained an MI while admitted for another medical or surgical condition, were included in the sample review.

Measures

Hospital readmission rates: readmission data for January through June, 2016 were obtained from the EMR by the Quality department and provided to the investigator.

Gender and age: demographic characteristics were obtained from EMR data by the investigator.

Medication: data regarding medication issues were only known for patients who attended the MDMI clinic and were obtained from EMR data by the investigator. If the patient reported any of the following: confusion about prescriptions, side effects, costs, or non-adherence, or if staff discovered any medication errors, the patient was designated as having a medication issue.

Data Collection

Data were obtained from the EMR from January through June of 2016. This six month data collection period represented the best time for a fully functioning clinic with optimal staffing. At every MDMI clinic, each member of the team providing care to the patient, contributed to the EMR.

Data analysis strategy

Descriptive statistics for age and gender were computed and compared between the two groups: those who attended the MDMI clinic and those who received usual care. An exact Pearson chi-square test was used to determine whether the clinical group and the treatment as usual group differed with respect to age and gender.

Thirty-day readmission rates for those discharged in the first five months in 2016 were computed for both MDMI clinic and treatment as usual groups. An exact Pearson chi-square test was used to determine whether the clinic group and treatment as usual group differed with respect to 30-day readmission rates. The independent variable is attendance in the MDMI clinic. The dependent variable is readmission within 30 days. The 30-day readmission rates for all MI discharges in this six month period and for all MI patients who attended the clinic were computed and compared to the average of the UHC mean rates for the first and second quarters of 2016.

The 30-day readmission rates for all patients in the study dataset were compared to the mean UHC readmission rate. Records of patients who did not keep their appointments were excluded from the main analysis and reported as a percentage at the end of the study to compare how many attended to how many were scheduled. The number and percent of MDMI clinic patients identified as having a medication issue were computed and described.

Protection of human subjects

The application was submitted to the Institutional Review Board (IRB). No protected health information was used in the data collection or presentation to reveal patient identity. The EMR data was secured by the information technology division and protected by password access. The IRB granted approval for this study as minimal risk to human subjects (See Figures 3 & 4).

Results

The effectiveness of providing early access to multidisciplinary care for MI patients within 7-10 days of hospital discharge was measured and evaluated by comparing rate of readmissions to an academic medical center within 30 days for those patients seen in the MDMI clinic, to the rate of MI patient readmissions in the treatment as usual group. An exact Pearson chi-square test was used to test the hypotheses resulting in chi-square equal to 4.723 (p= .033). This result provides evidence that the readmission rate of patients seen in the MDMI clinic was lower than those who received the usual treatment (See Table 3). The percentage of MDMI readmission was compared to the overall rate of readmissions for the same diagnosis across the country as measured by UHC, a national quality and safety organization comprised of 118 foremost academic medical centers and their affiliates. The overall MDMI percentage of readmissions was 12.1%, lower than the 13.5% readmission rate reported by the UHC (see Table 3).

A retrospective review of the EMR data between January and June 2016 examined all patients who were discharged with an MI and were referred to the MDMI clinic, and MI patients who received care as usual. Approximately one third of those discharged with an MI were referred to the clinic and a high percentage kept those appointments. Those who did not keep the appointment were excluded from the analysis but reported as a "Did Not Keep Appointment" rate which compared the number of patients that attended to the number scheduled. This data can be found in Table 5.

The MDMI clinic sample had a younger average age than those in the treatment as usual group. It is unknown if age was a contributing factor to the reduced readmission rate within that sample. Presumably, younger patients would have better outcomes than older patients. These results can be seen in Table 6.

Since the mean age of the group that did not attend the clinic was greater than the mean age

of those who did attend the clinic, we investigated the possibility that the higher readmittance rate for those who did not attend the clinic might be secondary to their greater age. The evidence did not support that interpretation, however. In the whole set and separately within the group of clinic attendees and within the group of non-attendees, readmittance was associated with lower age; the mean age of those readmitted was lower than the mean age of those who were not readmitted. None of the differences was significant, however. A logistic regression of Readmitted (Yes/No) on Visited_clinic (Yes/No), Age, and Gender was performed. A clinic visit, greater age, and male gender were all estimated to reduce the odds of readmittance. Only Visited_clinic was significant (p=.023). When age and gender were taken into account, the odds of readmittance for those who attended the clinic were estimated to be less than a third of the odds of readmission for those who did not attend the clinic (Exp(B)=.316). These results can be found in Table 7.

A descriptive analysis for the medication issues of patients who attended the MDMI clinic is presented in percentages. This data reveals patients who either self-identified or were found to have a medication issue such as cost, adverse response, or confusion about usage. These results can be found in Figure 5.

To improve understanding regarding why the majority of MI patients were not referred to the MDMI clinic, a review of records of patients in the treatment as usual group was conducted. It revealed a high number of patients were on services other than cardiology at discharge, such as cardiac surgery, transplant, and general medicine. The non-medicine cardiology services used their own discharge order sets, which did not include a referral to the MDMI clinic. When the acute MI was a secondary diagnosis, discharge orders relevant to the primary diagnosis were used, especially in general medicine. For patients who were transferred from the cardiac

catheterization lab to the operating room for open-heart surgery, the cardiac surgeon did the follow-up care post hospitalization rather than the cardiologist.

Discussion

Summary

The MDMI clinic at academic medical center in Virginia was started in April of 2015 in an effort to decrease the number of readmissions to the hospital following discharge for an acute MI, as either a primary or secondary discharge diagnosis. The number of readmissions at the medical center was increasing and above the UHC mean rate at that time.

The pre-implementation stage was a collaborative effort among the divisions of cardiology, within the school of medicine, and the medical center outpatient cardiology clinic. It was agreed that the clinic would be held one day each week as a transitional care clinic from hospital to home. An interventional cardiologist with a research interest in MI patients agreed to serve as the clinic physician.

The team's staffing model was multidisciplinary by design. The Health Belief Model was the theoretical framework used and allowed latitude with designing a group of content experts who could impart their respective specialty knowledge to the patients. It was hypothesized that this personal interaction with each patient could encourage healthy life choices and positively impact health. An improved or sustainable quality of life with positive outcomes would ideally follow their choices. There was no evidence in the literature that a clinic of this kind existed.

Within the cardiology department, there was an existing multidisciplinary clinic for cardiology patients with diabetes. The team had a core group of 3-4 providers who saw patients over the long term. The heart failure clinic began with a single provider, nurse practitioner, transitional clinic several years earlier for follow-up one week after discharge, in an attempt to

reduce readmissions and continued to see those patients for follow-up. Those two models served as background for the MDMI clinic's inception. The MDMI clinic evolved over a period of six months to include every discipline that was needed to provide comprehensive care to the MI population. New staffing resources were not added, but schedules of existing team members were adjusted so the team could attend the clinic regularly.

The clinic was established and continues to see each patient for a one-time visit. It works as an extension of the hospital care to identify early complications. After the MDMI visit, the patient is referred back to their primary doctor or cardiologist. If neither exists, referrals are made to a provider of patient choice to establish care.

The evidence suggests that these interventions have had positive effects on readmission rates. From the initial patient call from the clinic nurse to the first meeting with the team members, the patient is the focus of care and caring. The clinic venue allows and encourages patients to ask questions and express concerns that may not have been otherwise addressed. If patients are found to be in distress during the visit, they are quickly assessed and sent to the emergency room or directly admitted to the hospital. All readmissions are not preventable, therefore, the MDMI clinic is proactively focused on the early identification of problems that can result in serious complications and quality of life issues.

Limitations

This study was only conducted at one academic medical center site, which limited generalizability of the findings.

The readmission data were not available for patients who were admitted to other hospitals, which limited the accuracy of findings.

Inconsistent use of the cardiology discharge order sets limited the number of patients who

could have been referred to the MDMI clinic at discharge.

The data was reviewed and analyzed by one nurse investigator in one sub-population and findings cannot be generalized for all MI patient populations or other hospitals.

The clinic is held one day each week. Constraints with the limited accessibility impact potential patient care.

Approximately one third of all MI discharges are referred to the MDMI clinic. Ideally, half would be referred.

Implications for nursing practice

The gap in the literature regarding early clinic follow-up, post-discharge for MI patients, may correlate to similar deficits in other patient populations. This allows nursing to explore opportunities for future evidence-based projects in which other settings or populations may be studied or considered for implementation of similar models of care.

Nursing is pivotal to the immediate post event care of the MI patient. The nurse is the first point of contact with the patient from the clinic between the hospital and the follow-up visit, thus plays an essential role in the assessment of needs before the patient presents to the clinic. Communicating those concerns beforehand has allowed the team to operate at optimum efficiency during the visit, and utilizing the nurse as the first contact can be replicated with pre-clinic processes in other patient populations.

The nurse functions as the caregiver, educator, and coordinator of care along the continuum. Nurses in the MDMI clinic are in the unique position to broadly assess the needs of the patient and family unit during the clinic visit as they have additional knowledge of the patient from the phone interaction. Nursing is central to the team for salient communication.

Nurses are able to network with large numbers of colleagues and share the successes of

innovative projects by disseminating outcomes through professional organizations and publications. Regional, state and national conferences provide the opportunity to share findings to build professional practice.

Conclusions

The decreased readmission rate resulting from early access to the MDMI clinic for the MI patient following hospital discharge has demonstrated that early intervention of current or potential complications can prevent unnecessary hospital readmissions. Based on the logistic regression conclusion with readmission as the dependent variable and clinic attendance, sex, and age as predictors, the clinic attendance was still significant in the presence of the other two predictors. In this study, age has a negative effect on readmission. In the whole set, and separately in the clinic and no clinic groups, the mean age of those readmitted was less than the mean age of those not readmitted.

The project implementation included six disciplines who work interdependently to bring expert clinical knowledge to each patient to improve their lifestyle. The individual disciplines included in the team were carefully considered to provide the best compliment of services to the patient. Similar clinics can be replicated for other cardiac populations and teams can be designed with specific disciplines that could serve the patient needs.

This approach to care has been received well by the patients who do not mind a longer appointment to get information tailored for them. Cardiac rehab referrals have increased and patients often see the same exercise physiologist in the MDMI clinic whom they saw while in the hospital. The same is true with the clinic physician who might have performed a cardiac catheterization on the patient or perhaps cared for them in the hospital while on service. The familiarity of patients with providers and staff adds a dimension of trust and increases

satisfaction.

Pharmacy services offer a critical role as content experts since 18% (See Figure 5) of all MDMI patients had a medication issue. The pharmacist has been prominent in assisting the patients with cost reduction of prescriptions and smoking cessation counseling. Readmissions due to medication issues can be serious and preventable and reducing them should be a primary interest of all healthcare providers.

The number of patients seen each week varies and some clinics are overbooked to accommodate. The variation in the volume of patients seen in clinic demonstrates the need for clinics to have increased times of operation, despite only seeing one third of all MI discharges. To meet this demand, human resources will need to be extended. Without incremental staff, the challenge will be to adjust existing schedules to meet the need without compromising care in other areas.

This evidence based project reinforces the significance of early access to care following hospital discharge for an MI and showcases the role of multidisciplinary collaboration in providing optimal care for the patient while reducing 30-day readmission to the hospital. Additional education needs to occur to stress the importance of utilizing the cardiology discharge order set in order to extend more opportunity to patients for early access of care. This evidence encourages expanding the model of care to other patient populations for early identification of current or potential problems that could lead to re-hospitalization or have other detrimental consequences for patients.

Recommendations

The clinic model of care using a multidisciplinary approach to early access for the acute MI patient, following discharge from the hospital, is contributing toward reducing the gap in the

existing literature by using evidence based findings. To strengthen these findings, replication of similar studies in other subpopulations within cardiology, and different settings or populations outside of cardiology would be needed.

Observation and comparison of gender and age at different times of the year within the MI population would serve to more clearly illustrate if seasonal activities impact volumes and subsequent readmission rates.

Studies over a longer period of time in the MI population could increase the power of the findings.

In a replicative study, it might be useful to gather more potential predictors. The regression illustrated that these three predictors (clinic attendance, age, gender) had only a small influence on the outcome.

A next step would include a study to evaluate the cost savings to the organization from lower readmission rates.

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Table 1

Studies to Reduce Readmission Rates for MI Patients

Authors, Year	**Purpose**	**Design**	**Subjects and Setting**	**Pertinent Findings**
Coons & Fera (2007)	To test whether a multidisciplinary approach before discharge would reduce readmission rates	Used evidence based treatments guidelines. Six criteria for recommended MI medications and smoking counseling were measured: 1.Aspirin at arrival 2.Aspirin at discharge 3.Ace inhibitor 4.Smoking counseling *5.B*-Blocker at arrival *6.B*-Blocker at discharge	All MI inpatients from FY 2005 through quarter 1 FY 2006.	Pharmacists improved medication adherence to 100% for four of the six criteria, except aspirin at discharge was 99.1.%, and 92.3% for angiotensin-converting-enzyme inhibitor by providing medication evaluation and education with pre-printed orders, education materials, clinical pathways and patient evaluation forms.
Hess, Shah, Peng, Thomas, Roe & Peterson, (2014)	To find an association between early physician follow up post discharge and 30-day readmission rates for MI patients	Correlational Data analysis of Medicare claims	N=25,872 patients from 228 hospitals	No association between early physician f/u and readmissions. The median percentage of patients receiving early follow-up was 23.3% (IQR 17.1%-29.1%). 18.5% of Medicare patients were readmitted within 30 days. For each 5% increase in early follow-up was insignificant for risk reduction for readmission (adjusted OR 0.99; 95% CI, 1.02; p=0.60)

Authors, Year	Purpose	Design	Subjects and Setting	Pertinent Findings
Matthews, Peterson, Honeycutt, Chin, Effron, Zettler, et al., (2015)	To determine if low or non –adherence to medication following an MI resulted in adverse reactions and readmissions	Longitudinal assessment of PCI treated pts with MI	N=7425 acute MI patients at 216 US hospitals	A significant portion of pts have sub-optimal medication adherence, both moderate and low, 25% and 4%, respectively that may relate to worse long term outcomes but a prescheduled visit following discharge was strongly associated with medication adherence. At 60 days the risk of mortality and readmission was higher with low adherence to medication but did not reach statistical significance P = 0.049 and multivariate adjusted comparisons (adjusted hazard ratio, 1.35; 95% confidence interval, 0.98-1.87) compared to patients with moderate/high adherence p=0.59; (adjusted hazard ratio, 1.02; 95% confidence interval, 0.80-1.30).
Yang, Olomu, Corser, Rovner, Holmes-Rovner (2006)	To investigate the impact of outpatient medication readmission in patients with coronary disease	Prospective observational study. 3 month baseline interview and 8 month follow-up interview related to medication adherence and readmission	N=433 patients with acute coronary syndrome (including MI pts) who had been discharged from the hospital	There was an association between medication and health outcomes, including readmission to the hospital. At the 3 month survey 124 patients or 28.6% were readmitted. The result of a multivariable logit regression is shown at 8 months, only: 0.94 (0.31) and is

Authors, Year	Purpose	Design	Subjects and Setting	Pertinent Findings
				statistically significant at the 95% confidence interval. At the 8th month survey the *n* changed to 381 and the rate of readmission dropped to 19.9% but no information as to why the reason for readmission.

Table 2

Age and Gender Descriptive Statistics

	Total Sample	**MI Clinic Patients**	**Treatment as usual**
N	307	88 (29%)	219 (71%)
Mean Age (range, median, mode)	64.55(18-96, 64.5, 63)	61.7 (23-92, 61.5, 58)	67.4 (18-96, 68, 68)
Female (%)	126 (38%)	28 (31.82)	88 (40.18)
Male (%)	191 (62%)	60 (68.18)	131 (59.82)

Table 3

Exact Pearson chi-square test

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.723[a]	1	.030	.033	.019	
Continuity Correction[b]	3.918	1	.048			
Likelihood Ratio	5.368	1	.021	.033	.019	
Fisher's Exact Test				.033	.019	
Linear-by-Linear Association	4.708[c]	1	.030	.033	.019	.013
N of Valid Cases	307					

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.61.

b. Computed only for a 2x2 table

c. The standardized statistic is -2.170.

Table 4

Readmission Rate Comparison of Sample to UHC AMA

			Readmitted		
			0 NO	1 Yes	Total
Visited_clinic	0 NO	Count	187	32	219
		% within Visited_clinic	85.4%	14.6%	100.0%
	1 Yes	Count	83	5	88
		% within Visited_clinic	94.3%	5.7%	100.0%
Total		Count	270	37	307
		% within Visited_clinic	87.9%	**12.1%**	100.0%
Comparison academic medical centers		Count	34,770	5,437	40,207
		% of UHC AMA	86.5%	**13.5%**	100.0%

Table 5

Did Not Keep Appointment (DNKA) Rates for MDMI Clinic (1/1/16 to 5/31/16)

	Scheduled Appts	**DKNA***	**DKNA Rate**
January 2016	21	1	4.8%
February 2016	25	2	8.0%
March 2016	21	4	19.0%
April 2016	21	1	4.8%
May 2016	8	0	0.0%
Total	**96**	**8**	**8.3%**

Table 6

Exact Pearson chi-square test 2

Variable	**MI clinic patients N=88**	**Treatment as usual group N=219**	**P value**
Age	62 ± 13.5	67 ± 13.3	.001
Female gender	28 (31.8%)	88 (40.2%)	.194

Table 7

Logistic Regression

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	*Visited_clinic*	-1.152	.508	5.149	1	.023	.316
	Age	-.020	.013	2.548	1	.110	.980
	Sex_coded_0_1	-.192	.360	.284	1	.594	.825
	Constant	-.305	.874	.122	1	.727	.737

a. Variable(s) entered on step 1: Visited_clinic, Age, Sex_coded_0_1.

Figure 1. Administrative Approval

UNIVERSITY of VIRGINIA HEALTH SYSTEM

Amy Tucker, MD
P.O. Box 800158
Charlottesville, Virginia 22908-0158
Phone (434) 924-9591 Appointments 434-243-1000
Fax (434) 982-1998

Ellen Keeley, MD
University of Virginia School of Medicine

Kathryn Ward, MSN, PHCNS-BC
University of Virginia Health System

February 22, 2016

Dear Ellen and Kathie:

As you know, analysis of our post-acute care data for patients discharged after myocardial infarction indicated that we needed to offer early ambulatory access and expanded post-acute services to this population. Dr. Brian Annex and I have fully endorsed your efforts to establish the Post-MI clinic, which launched in the spring of 2015.

As far as I am aware, this innovative, patient-centered clinic is the first of its kind. We are anxiously awaiting the results from a full year of data to see what impact this initiative has had on 30 day hospital readmission rates, patient experience, access, and other quality metrics.

Both Dr. Annex and I appreciate your work to provide early access and reduce avoidable readmissions in our post-MI patients. The resource allotment to this clinic is generous, but it is the right service to provide for this patient population.

Sincerely,

Amy L. Tucker, MD
Director of Cardiovascular Ambulatory and Consultative Services

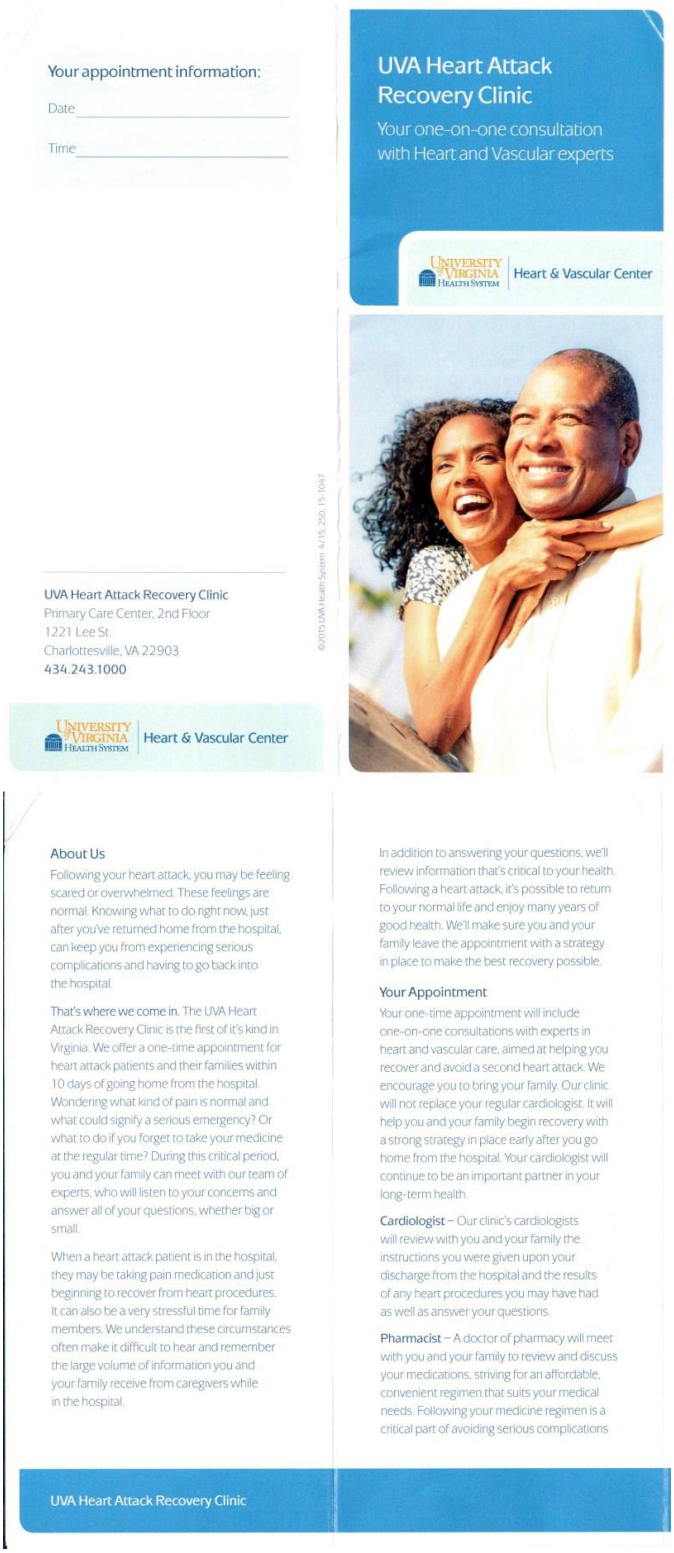


Figure 2. Patient brochure

Created by the University of Virginia Marketing Division

or being hospitalized again. The pharmacist will discuss with you such topics as when and how to take your medications, what to do if you're taking other medications and what to do if you forget a dose. If you smoke, the pharmacist will discuss options to help you quit.

Registered dietitian – You will also meet with a dietitian who will help you identify a diet best suited to your health and medical needs and will provide you information and support for pursuing it.

Exercise physiologist – This specialist will analyze your health and fitness level and will then assist you in setting up a step-by-step plan tailored to your specific situation and needs. We'll help you understand when and how it's safe to exercise.

We will also provide recommendations from the American College of Cardiology and American Heart Association to you, your cardiologist and your primary care doctor.

Please bring to your appointment:

- All medications you are taking
- Your glucometer and any readings you have recorded, if monitoring your blood sugar
- Your blood pressure machine and any readings you have recorded, if monitoring your blood pressure

Our Team

Ellen C. Keeley, MD, MS
Interventional Cardiologist

Dr. Ellen Keeley received her medical degree from Thomas Jefferson Medical College. She completed fellowships in cardiology and interventional cardiology and received a master's degree in clinical research from the University of Virginia. She is an associate professor of medicine and interventional cardiologist at UVA and cares for heart attack patients in the catheterization laboratory and coronary care unit.

Michelle Adams, MEd
Exercise Physiologist

Michelle Adams received her bachelor's and master's degrees in exercise physiology from UVA and is an exercise physiologist at UVA Cardiovascular Rehab and Wellness Center. Her primary interest is educating patients who have had a heart attack about the importance of an active lifestyle, focusing on the long-term cardiac benefits of exercise.

Katherine Basbaum, MS, RD
Clinical Dietitian

Katherine Basbaum graduated from Tufts University and completed her dietetic internship at UVA Health System, where she works as a clinical dietitian in outpatient and inpatient settings. She provides dietary counseling focused on coronary artery disease, heart failure,

diabetes and weight loss and serves as the nutrition expert for Club Red, a UVA Heart and Vascular Center heart-healthy initiative for women.

Courtney Connors, MS
Exercise Physiologist

Courtney Connors received her master's degree in kinesiology and clinical exercise physiology from James Madison University and is an exercise physiologist at UVA Cardiovascular Rehab and Wellness Center. Her primary interest is to individualize exercise goals and motivate patients to exercise using unique techniques, such as smart phone applications.

Svetlana Goldman, PharmD, BCACP
Clinical Pharmacist

Svetlana Goldman graduated from the University of Pittsburgh School of Pharmacy and completed a pharmacy residency at Charles George VA Medical Center. Her interests include teaching patients about their medications; finding a regimen for them that is safe, affordable and easy; and helping them to stop smoking.

Cherie M. Parks, RN
Care Coordinator Clinician IV

Cherie Parks received her nursing degree from West Virginia Wesleyan College. She is a registered nurse and clinical lead in the cardiology outpatient clinics at UVA. She focuses on patient safety and education and is instrumental in guiding patients through the outpatient setting.

MyChart®: Your Health Connection

MyChart is a secure and easy online (computer-based) resource available to all patients of UVA Health System where patients can view their health information and connect with their care providers. With MyChart Proxy, parents of UVA patients can view their child's records including test results, upcoming appointments, medication lists and more.

To enroll, visit **mychartuva.com** and click "Sign Up Now." For questions or to get an activation code, call **434.243.2500**.

Insurance

The Heart Attack Recovery Clinic participates in most major insurance plans, including Medicare. Please feel free to ask us about your plan. We can file claims with your insurance company and accept all major credit cards for fees not covered by insurance. Please pay all copays, coinsurances and deductibles at the time of your visit.

Financial Assistance

Patient Financial Services connects uninsured and underinsured patients with resources to help cover expenses for necessary medical care. For information about assistance available through UVA and government programs, visit **uvahealth.com/financialassistance** or call **434.924.8718** or **866.320.9659**.

Figure 3. IRB Approval

University of Virginia
Institutional Review Board for Health Sciences Research
Protection of Human Subjects Approval
Assurance Identification/Certification/Declaration
(Common Federal Rule)

HSR # 18448		
Event: Approval New Protocol - Expedited	**Type:** Protocol	**Sponsor(s):** **Sponsor Protocol #:** **Principal Investigator:** Ellen Keeley, MD
Title: Post Myocardial Infarction Clinic Database		
Assurance: Federal Wide Assurance (FWA)#: 00006183		
Certification of IRB Review: The IRB-HSR abides by 21CFR50, 21CFR56, 45CFR46, 45CFR160, 45CFR164, 32CFR219 and ICH guidelines. This activity has been reviewed by the IRB in accordance with these regulations.		
Event Date: 10/12/15 **Protocol Expiration Date:** 10/11/16 **Number of Subjects:** 600 **HSR Protocol Version Date:** 10/06/15		
Current Status: Open to enrollment		
Consent Version Dates: Adult Consent -- 10/09/2015		
Committee Members (did not vote):		
Comments: The IRB determined this protocol met the criteria for approval per the federal regulations; thus, it was approved. It is open to enrollment. The purpose of this study is to collect data for use in future IRB-approved protocols to learn more about the effectiveness of the post-MI clinic at UVa. Participants will complete two questionnaires: a depression screen, and a discharge process evaluation survey. Subjects will also provide a 30 cc sample of venous blood. This Assurance provides approval to collect data or specimens, as outlined in the protocol, into a repository. An additional protocol with IRB approval is required to remove any data or specimen for analysis. There is no outside sponsor for this study. N= 600 subjects Ages: greater than or equal to 18 years		

The following documents were submitted with this protocol: depression screen tool, discharge evaluation survey.

IBC # 400-06 on file.

No other committee approvals are required.

REGULATORY INFORMATION:

The IRB determined this protocol met the criteria of minimal risk.

Protocol Expedited by Category #2b: Collection of blood samples by finger stick, heel stick, ear stick or venipuncture from other adults (other than healthy, non-pregnant adults who weigh at least 110 pounds) and children considering the age, weight, and health of the subjects, the collection procedure, the amount of blood collected, and the frequency with which it will be collected.

For these subjects, the amount drawn may not exceed the lesser of 50 ml or 3 ml per kg in an 8 week period, and collection may not occur more frequently than two times per week.

Protocol Expedited by Category #5: Research involving materials (data, documents, records or specimens) that have been collected solely for non-research purposes (such as medical treatment and/or diagnosis).

Protocol Expedited by Category #7: Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

This protocol has been granted a Waiver of Consent to identify potential subjects via 45CFR46.116.

This protocol has been granted a Waiver of Consent via 45CFR46.116 to contact potential subjects by direct contact by a person who is their health care provider.

Direct contact may include phone, letter, direct email or potential subject approached at UVa by a person is their health care provider.

Phone, letter or emails will be approved by the IRB-HSR prior to use.

Written consent will be obtained for this study.

The consent form signed will have a non-expired IRB-HSR approval stamp.

PLEASE REMEMBER:

* If an outside sponsor is providing funding or supplies, you must contact the SOM Grants and Contracts Office/ OSP regarding the need for a contract and letter of indemnification. If it is determined that either of these documents is required, participants cannot be enrolled until these documents are complete.
* You must notify the IRB of any new personnel working on the protocol PRIOR to them beginning work.
* You must obtain IRB approval prior to implementing any changes to the approved protocol or consent form except in an emergency, if necessary to safeguard the well-being of currently enrolled subjects.
* If you are obtaining consent from subjects, prisoners are not allowed to be enrolled in this study unless the IRB-HSR previously approved the enrollment of prisoners. If one of your subjects becomes a prisoner after they are enrolled in the protocol you must notify the IRB immediately.
* You must notify the IRB-HSR office within 30 days of the closure of this study.
* Continuation of this study past the expiration date requires re-approval by the IRB-HSR.

The official signing below certifies that the information provided above is correct and that, as required, future reviews will be performed and certification will be provided.

Name: Lynn R. Noland , RN PhD Title: Vice Chair, Institutional Review Board for Health Sciences Research Phone: 434-924-9634 Fax: 434-924-2932	Name and Address of Institution: Institutional Review Board for Health Sciences Research PO Box 800483 University of Virginia Charlottesville, VA 22908
Signature: Lynn R. Noland	Date: 10/15/15

Figure 4. IRB Addition

ADDITIONS

Last Name Ward	**First Name** Kathryn	**Middle Initial**
Degrees MSN, RN	**Email address** kkw5j@virginia.edu	**UVA Computing ID** kkw5j
Telephone 434-982-1625	**Fax** 434-243-0042	
Messenger Mail Address: Box #		
Mailing Address McKim Hall		
School Nursing	**Department** Medicine	**Division** Cardiology

Experience Kathie was instrumental in creating the post-MI clinic, is the nursing director of the post-MI clinic and manager of the heart and vascular center outpatient cardiology clinics. She is in charge of collecting UVA hospital re-admission data post-MI as well as collecting quality measures data regarding the post-MI clinic. This data will be incorporated into our statistical analysis.
*Provide a 2-3 sentence description of the experience of the new personnel in doing this type of research. If this modification is for a **PI CHANGE,** this information should be added to the Protocol instead of this form.*

Do you confirm that this person has current training in Human Subject Research Protection? *If an individual is not an employee of UVA you may attach proof of completion of Human Subject Research Protection training from their home institution.*	☒ Yes ☐ No
Do you confirm that if this person is at UVa as a volunteer and wishes to work on medical research that you have obtained approval from SOM for this person to work on the research? *To obtain approval complete the SOM Volunteer in Research Form*	☐ Yes ☐ No ☒ NA

Check the position they will hold for this project: NO OTHER CATEGORIES ALLOWED CHOOSE ONLY ONE OPTION

☐ *Principal Investigator *ONLY individuals who are paid by UVa may serve as a PI. Visiting professors, those employed by Morrison's, those with professor emeritus status and students may NOT serve as PI.*	☐ *Study Coordinator I
☒ Sub-investigator	☐ *Study Coordinator II
☐ *IRB Coordinator	☐ *Study Coordinator I Add as new contact for website advertisement. Only one SC allowed as contact for website advertisement *Note to staff- update contact in IRB Online and in text of website advertisement.*
☐ *Department Contact *Note: this person may not have access to subjects or their identifiable data. If this person requires such access they should be added in a different position.*	☐ *Study Coordinator II Add as new contact for website advertisement. Only one SC allowed as contact for website advertisement *Add as new contact for website advertisement. NOTE: Only one SC allowed as contact for website advertisement*

**** Only one person is allowed in positions other than sub-investigator. If you add new personnel to a position for which someone is already listed, the person currently in the position will automatically be removed!***

The section below is only completed for protocols in which the IRB-HSR is the IRB of record. If the IRB-HSR is NOT the IRB of record, the event is noted in IRB Online as a receipt as is not noted on the IRB-HSR meeting agenda.

For IRB-HSR Use Only

Does this study involve a change PI, addition of unaffiliated personnel or required additional changes to the protocol and/or consent? ☐ Yes ☑ No

IF YES, was the modification sent to IRB-HSR Compliance Coordinator for review? ☐ Yes ☐ No

☐ Modification not approved: Reason:
- ☐ Modification included a PI change, addition of unaffiliated personnel or required additional changes to the protocol and/or consent.
- ☐ Other *Explain:*

☐ Modification approved with another event (continuation or modification)

IRB: HSR Staff Member: **Date:**

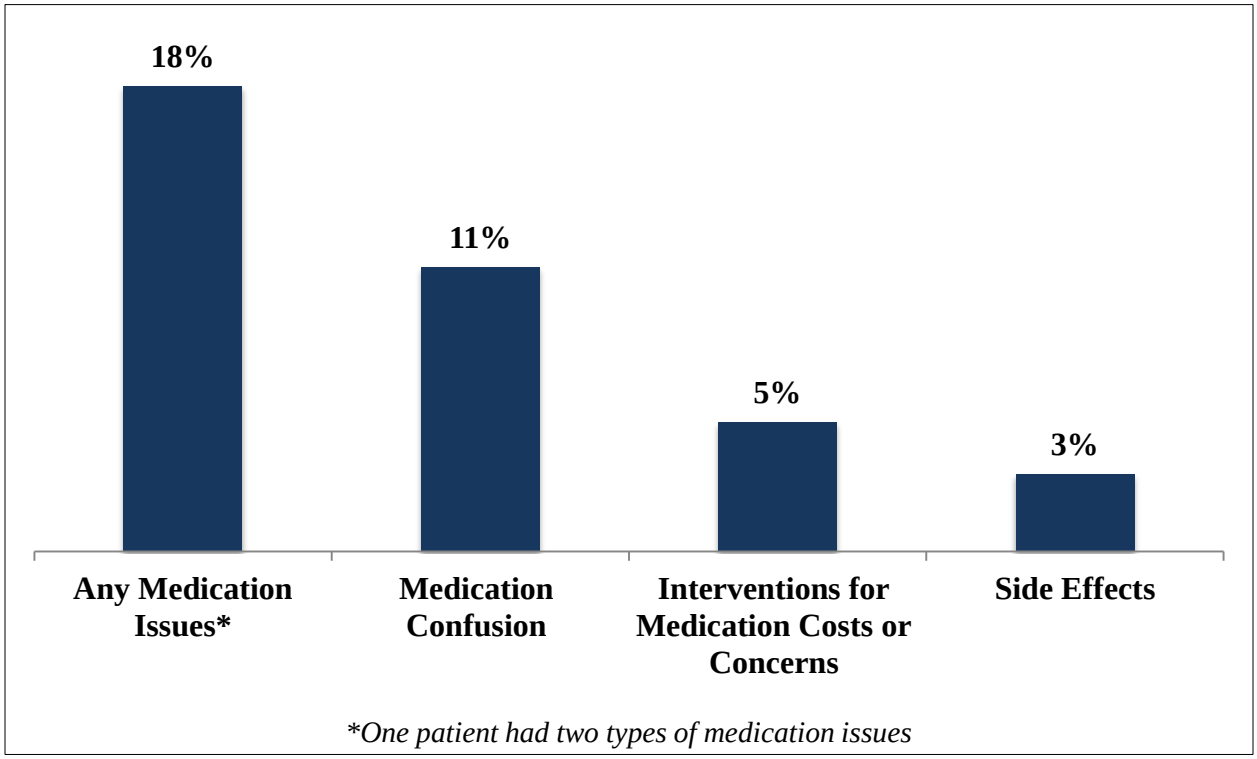
☑ Modification approved with this form

The following is required if modification approved with this form.

Signed Robert Banks **Date** 1/14/16
IRB Chair, Vice Chair or Member Designee

Name Printed: Robert Banks

Figure 5. Identified Medication Issues



Appendix A

Procedural manual for clinic visit

Process Order	Responsible Parties	Activity	Completed
1.	Discharging Provider	Before discharge All patients diagnosed with an acute MI will be referred to Cardiology for a one time visit to the post MI clinic within 7-10 days of discharge • Referral can be made through EMR, Telephone or Fax A brochure is given to the patient explaining the clinic before discharge	
2.	Scheduling team	Schedulers schedule all discharged patients up to the Monday before to the next post MI clinic	
3.	Clinic nurse	Call patient 1-2 days before appointment to confirm attendance, assess for portable oxygen needs, and assistive devices or assistance getting into building. Review duration of visit and multidisciplinary model. Remind to bring current medications with them and to arrive 30 minutes early for parking and registration	
4.	Receptionist	Registers patient and tracks in electronic medical record (EMR)	
5.	Patient Care Assistant	Obtains height, weight, vital signs and EKG if ordered. Sits patient in chair. If Fall risk is ascertained by flag in EMR or use of an assistive device, the door to the room will remain open and a sign placed on the outside of the door for staff to be aware	
6.	RN	Assesses patient, reviews problem list, completes review of systems (ROS) and reports to MD and team any relevant findings.	
7.	Team including MD	Each discipline sees pt for approximately 10 minutes on a rotational schedule as they and the patient are ready	
8.	Team	Makes notation of interactions with patient, including relevant clinical information that MD needs to know. Face to face dialogue with MD from each team	

		member as needed.	
9.	MD	Finalizes plan of care, makes necessary medication adjustments and places orders for tests if needed.	
10.	RN	Gives patient their discharge paperwork, reinforces education and explains future tests and follow-up with PCP or Cardiologist	
11.	Data entry	Clinical information for each patient, to be used for analysis, is entered into the EMR by each discipline that sees the patient	

Appendix B

University of Virginia Cardiology discharge order set

CARD Discharge [3040000355]

General

Discontinue IV/Foley	
☐ Discontinue Foley catheter	Routine, ONE TIME Remove indwelling urinary catheter on:
☐ Discontinue IV	Routine, ONE TIME
Discharge - Activity (Single Response)	
◉ Activity as tolerated	Routine, Clinic Performed
☐ Sponge bath only until clinic visit	Routine, Clinic Performed
☐ Shower on day dressing removed (No bath)	Routine, Clinic Performed
☐ Keep surgical extremity elevated	Routine, Clinic Performed
☐ Ice to affected area	Routine, Clinic Performed
☐ Lifting restrictions	Routine, Clinic Performed, Weight restriction of *** lbs.
☐ Weight bearing restrictions (specify)	Routine, Clinic Performed
☐ Other restrictions (specify):	Routine, Clinic Performed
Wound Care	
☐ No dressing needed	Routine, Clinic Performed
☐ Leave dressing on - Keep it clean, dry, and intact until clinic visit	Routine, Clinic Performed
☐ Remove dressing in 24 hours	Routine, Clinic Performed
☐ Remove dressing in 48 hours	Routine, Clinic Performed
☐ Remove dressing in 72 hours	Routine, Clinic Performed
☐ Change dressing (specify)	Routine, Clinic Performed, Dressing change: *** times per day using ***.
☐ Wound Care for cardiac device implant patients	Routine, Clinic Performed
Discharge - Diet	
☑ Discharge diet: Cardiac	Routine, Clinic Performed, Low Sodium; 2 Liter fluid restriction.
☐ Discharge diet: Clear Liquid	Routine, Clinic Performed
☐ Discharge diet: Diabetic (Consistent Carbohydrate)	Routine, Clinic Performed
☐ Discharge diet: Dysphagia I (Pureed)	Routine, Clinic Performed
☐ Discharge diet: Full Liquid	Routine, Clinic Performed
☐ Discharge diet: Regular (General)	Routine, Clinic Performed
☐ Discharge diet: Low Sodium	Routine, Clinic Performed
☐ Discharge diet: Renal Simplified	Routine, Clinic Performed, Adjust potassium, low phosphorus
☐ Discharge diet: Tube feeding	Routine, Clinic Performed
Discharge - Call MD	
☐ Call MD For: Temperature >100.4	Routine, Clinic Performed
☐ Call MD For: Persistent Nausea and Vomiting	Routine, Clinic Performed
☐ Call MD For: Severe Uncontrolled Pain	Routine, Clinic Performed
☐ Call MD For: Worsening shortness of breath, Difficulty Breathing	Routine, Clinic Performed
☐ Call MD For: Awakening at night with shortness of breath	Routine, Clinic Performed
☐ Call MD For: Dry, hacking cough	Routine, Clinic Performed

☐ Call MD For: Persistent Dizziness Or Light-Headedness	Routine, Clinic Performed
☐ Call MD for: Chest pain	Routine, Clinic Performed
☐ Call MD For: Fatigue or tiredness	Routine, Clinic Performed
☐ Call MD For: Decreased desire for food	Routine, Clinic Performed
☐ Call MD For:	Routine, Clinic Performed

Discharge - Weight Monitoring

☐ Weight Monitoring: Weight yourself daily, at the same time each day. Record your weight in a notebook. Call your health care provider if you gain 3 pounds or more in one day, or 5 pounds or more in one week.	Routine, ONE TIME

Referrals

☐ Discharge referral to Home Health	External Referral
☐ Referral to Physical Therapy	Internal Referral
☐ Referral to Occupational Therapy	Internal Referral

Referrals - Cardiology

☐ Referral to Smoking Cessation Program	External Referral
☐ Referral to Anticoagulation Monitoring	Internal Referral
☑ Cardiac Rehab (Single Response)	
◉ Ambulatory referral to Cardiac Rehabilitation	Internal Referral
☐ Cardiac Rehabilitation: Patient is Ineligible/ Not indicated (reason required)	Routine, Clinic Performed Reason Ineligible:
☑ Ambulatory referral to MI Clinic (Single Response)	
◉ Ambulatory referral to Post MI Clinic	Internal Referral
☐ Post MI clinic is Not Indicated / Patient Ineligible	Routine, Clinic Performed

DME

☐ DME elevated toilet seat	Routine, Clinic Performed Side (if applicable): Prognosis: Present Physical Condition: Date Needed: Duration of Use: Expected Therapeutic Effect:
☐ DME Adult Walker	Routine, Clinic Performed Walker Type: Walker Size: Walker Attachments: Side (if applicable): Prognosis: Present Physical Condition: Date Needed: Duration of Use: Expected Therapeutic Effect:

■ DME Adult Walker with Platform	Routine, Clinic Performed Walker Type: Walker Size: Walker Attachments: Side (if applicable): Prognosis: Present Physical Condition: Date Needed: Duration of Use: Expected Therapeutic Effect:
■ DME Wheelchair	Routine, Clinic Performed Type: Width: Depth: Arm Rest Type: Swing away leg rest / foot plates: Safety Belt: Accessories: Prognosis: Present Physical Condition: Date Needed: Duration of Use: Expected Therapeutic Effect:
■ DME Straight Cane	Routine, Clinic Performed Side (if applicable): Prognosis: Present Physical Condition: Date Needed: Duration of Use: Expected Therapeutic Effect:
■ DME Bedside Commode	Routine, Clinic Performed Type: Prognosis: Present Physical Condition: Date Needed: Duration of Use: Expected Therapeutic Effect:
■ DME Shower Chair	Routine, Clinic Performed Type: Side (if applicable): Prognosis: Present Physical Condition: Date Needed: Duration of Use: Expected Therapeutic Effect:
■ DME Transfer Slide Board	Routine, Clinic Performed Side (if applicable): Prognosis: Present Physical Condition: Date Needed: Duration of Use: Expected Therapeutic Effect:

☐ DME OTHER	Routine, Clinic Performed Side (if applicable): Prognosis: Present Physical Condition: Date Needed: Duration of Use: Expected Therapeutic Effect:

Monitors

☐ Holter monitor	Routine, Ancillary Performed Ordering Attending?
☐ Cardiac event monitor	Routine, Ancillary Performed After Business Hours – Provider To Notify if Sudden Change in Cardiac Rhythm? Cardiology Consult Fellow Provider's Telephone Number? Call page operator at 924-0000, ask to page Cardiology consult fellow at 1323 Provider's Fax Number? 434-243-2787, after 1700 on weekends please fax to 434-982-2335 Is this monitor being ordered as an Event Monitor or Mobile Cardiac Outpatient Telemetry Monitor ("MCOT", continual telemetry, worn up to 30 days)? Ordering Attending? IF ANSWER TO QUESTION NUMBER 4A IS YES, THE ECG LAB WILL MAKE THE CONVERSION TO THE EVENT MONITOR.

Coagulation

☐ Basic metabolic panel	Routine, Lab Collect
☐ Protime-INR	Routine, Lab Collect

Cardiac Stress Tests

☐ Exercise Stress Test	Routine Should test be pharmacologic, treadmill or cycle ergometer? May substitute alternate pharmacological protocol as needed? Is submaximal exercise test needed? MVO2 with Oximetry? Evaluate for: Decisions to hold medications at the time of stress testing should be individualized per patient. In general, in patients without known coronary artery disease, if it is safe to do so, medications such as beta-blockers, calcium channel blockers, and long-acting nitrates should be held for 12 hours prior to testing. In general, if patients have known coronary artery disease, all medications should be continued. All patients can have a light breakfast but should not have caffeine for 12 hours prior to the study.

Follow-up Cardiology

■ Follow-up with cardiologist in 1-2 weeks	Routine, Clinic Performed Do you want Care Connection to make this appointment? If you answer yes, please answer questions below. No Indicate Service/Specialty for follow up appointment: Specify Provider, if indicated: Is this for a post-op visit? Reason for follow up care: In what time frame should follow up occur? Was patient seen as a consult by the requested service/specialty? If request is for Primary Care: Does the patient have a PCP?
■ Follow-up with Heart Failure NP Clinic (H2H) in 1-2 Weeks	Routine, Clinic Performed Do you want Care Connection to make this appointment? If you answer yes, please answer questions below. No Indicate Service/Specialty for follow up appointment: Specify Provider, if indicated: Is this for a post-op visit? Reason for follow up care: In what time frame should follow up occur? Was patient seen as a consult by the requested service/specialty? If request is for Primary Care: Does the patient have a PCP?
■ Follow-up with cardiologist (specify):	Routine, Clinic Performed Do you want Care Connection to make this appointment? If you answer yes, please answer questions below. No Indicate Service/Specialty for follow up appointment: Specify Provider, if indicated: Is this for a post-op visit? Reason for follow up care: In what time frame should follow up occur? Was patient seen as a consult by the requested service/specialty? If request is for Primary Care: Does the patient have a PCP?
■ No follow-up with cardiologist necessary	Routine, Clinic Performed Do you want Care Connection to make this appointment? If you answer yes, please answer questions below. No Indicate Service/Specialty for follow up appointment: Specify Provider, if indicated: Is this for a post-op visit? Reason for follow up care: In what time frame should follow up occur? Was patient seen as a consult by the requested service/specialty? If request is for Primary Care: Does the patient have a PCP?
Discharge - Follow Up	
■ Follow Up: With Primary MD in ___ days	Routine, Clinic Performed Follow up in __ days: Follow Up: With Primary MD in *** days

Follow Up: With Primary MD in 1-2 Weeks	Routine, Clinic Performed Do you want Care Connection to make this appointment? If you answer yes, please answer questions below. No Indicate Service/Specialty for follow up appointment: Specify Provider, if indicated: Is this for a post-op visit? Reason for follow up care: In what time frame should follow up occur? Was patient seen as a consult by the requested service/specialty? If request is for Primary Care: Does the patient have a PCP?
Follow Up: With Primary MD in 3-4 Weeks	Routine, Clinic Performed Do you want Care Connection to make this appointment? If you answer yes, please answer questions below. No Indicate Service/Specialty for follow up appointment: Specify Provider, if indicated: Is this for a post-op visit? Reason for follow up care: In what time frame should follow up occur? Was patient seen as a consult by the requested service/specialty? If request is for Primary Care: Does the patient have a PCP?
Follow Up Appointments:	Routine, Clinic Performed Do you want Care Connection to make this appointment? If you answer yes, please answer questions below. No Indicate Service/Specialty for follow up appointment: Specify Provider, if indicated: Is this for a post-op visit? Reason for follow up care: In what time frame should follow up occur? Was patient seen as a consult by the requested service/specialty? If request is for Primary Care: Does the patient have a PCP?

Medications

Nitroglycerin for Discharge

Consider for symptomatic ACS patients with incomplete or unsuccessful revascularization
Do not prescribe in patients concurrently receiving PDE-5 inhibitors (avanafil, sildenafil, tadalafil, or vardenafil)

nitroGLYCERIN (NITROSTAT) 0.4 MG SL tablet	25 tablet, 0, Print

Immunization - Influenza (Single Response)

Scheduling a date and time is preferred; however, If vaccine is ordered to be given “prior to discharge”, please ensure that it is administered.

influenza quadrivalent split (FLUARIX/FLUZONE) vaccine injection (36 mo and older)	0.5 mL, Intramuscular, PRIOR TO DISCHARGE For 1 Doses
influenza quadrivalent split (FLUZONE) vaccine injection (6 mo to 35 mo)	0.25 mL, Intramuscular, PRIOR TO DISCHARGE For 1 Doses
influenza split high-dose (FLUZONE HIGH-DOSE) vaccine (65 yr and older)	0.5 mL, Intramuscular, PRIOR TO DISCHARGE For 1 Doses

Immunization - Pneumonia Vaccine

pneumococcal vaccine (PNEUMOVAX-23) injection	0.5 mL, Intramuscular, PRIOR TO DISCHARGE For 1 Doses

Appendix C

Publication Submission Guidelines

Journal of Cardiovascular Nursing

Author Guide

Purpose of the Journal

The primary objective of *The Journal of Cardiovascular Nursing* (JCN) is to foster expert, evidence-based clinical practice of cardiovascular nurses by publishing outstanding clinically relevant cardiovascular research, and state-of-the art, systematic reviews of the cardiovascular research literature. Issues address the physiological, psychological, and social responses of cardiovascular patients and families in a variety of environments.

Publication Policy

JCN publishes unsolicited articles (research reports, brief reports, systematic reviews of the literature, instrument development papers, and articles on innovations in practice) on any cardiovascular topic. We also publish Brief Reports, which are shorter versions of research articles and which can include pilot or preliminary results, negative findings, descriptions of study designs (and which can include baseline participant characteristics), validation of an existing instrument, and descriptions of unique clinical trial or intervention study methods. We do not publish quality improvement projects because the knowledge gained is not generalizable beyond the local setting.

Authors are encouraged to submit (1) original research articles and brief reports; (2) analytical, systematic reviews that codify existing knowledge; (3) instrument development papers and testing of the psychometric properties of new instruments; (4) clinical articles that synthesize information in a specific area or guide the practice of specialists in the field; and (5) articles describing innovations in practice that are evidence-based. The decision to accept or reject an article will be based on the judgment of the editors and of peer reviewers.

Manuscript Submission

Online manuscript submission: All manuscripts must be submitted online through the Web site at http://jcn.edmgr.com/. **First-time users:** Please click the Register button from the menu on the Web site and enter the requested information. After successful registration, you will be sent an e-mail indicating your user name and password. *Note:* If you have received an e-mail from us with an assigned user ID and password, or if you are a repeat user, do not register again, just log in. Once you have an assigned ID and password, you do not have to reregister, even if your status changes (i.e., author or reviewer). **Authors:** If you are submitting a manuscript for the first time please review the Author Tutorial. Please click the *Log-In* button from the menu at the top of the page and log in to the system as an author. Submit your manuscript online according to the author instructions. You will be able to track the progress of your manuscript through the system. If you experience any problems, please contact the *JCN* Editorial Manager, Jeanine Vezie at jdvezi2@email.uky.edu.

No Special Formatting Required for Manuscripts Prior to Acceptance.
In order to increase ease of submission, JCN has moved to allowing authors to submit manuscripts without following many of our reference and other format guidelines until the manuscript is accepted for publication. We all have experienced the frustration of formatting a manuscript according to specific journal guidelines, only to have to reformat it if it is not accepted for publication in that journal. Thus, when submitting a manuscript for review, you need not follow many of the specific guidelines. However, please review the **Manuscript Contents** section below for a few formatting guidelines as we do require double spacing of manuscripts at all stages of review.

Manuscript Contents

Each manuscript **must** include the following:

- Title page including (1) title of the article, (2) author names (with highest academic degrees) and affiliations (including titles, departments, and name and location of institutions of primary employment), (3) **corresponding author's name and complete address including email, phone and FAX numbers,** (4) any acknowledgments, credits, or disclaimers, including funding sources and conflicts of interest, and (5) number of words in the text; number of tables and figures. PLEASE NOTE: #4 of the title page regarding any acknowledgments, credits, or disclaimers, including funding sources and conflicts of interest MUST ONLY BE LOCATED on the title page. Please do not put any of this information on your "Blinded Manuscript."
- Please do not use abbreviations in the title or any headers on your manuscript.
- Abstract of **250 words** (150 words for brief reports) or fewer describing the main points of the article. If it is a research article (including psychometric studies) or brief report, prepare a structured abstract with the following headings: (1) background; (2) objective; (3) methods; (4) results; and (5) conclusions. If the article is not a research article, please prepare a **structured** abstract with the following headings: (1) background; (2) purpose; (3) conclusions; and (4) clinical implications.
- Keywords: Include 3 to 5 key words that describe the contents of the article. To identify key words that help readers find your article, look in the *National Library of Medicine's Medical Subject Headings* (MeSH). Using keywords that are compatible with MeSH will help people find your article, identify it as relevant, and increase your citations.
- Each *research article* or *review of the literature* must include a table entitled, "What's New?" that includes in bullet point form (2-3 short bullets only) a summary of the findings with implications for practice. Place this section on a separate page after the references. Use this section to address the "so what?" of your findings. All *other types of articles* must include a table entitled "Clinical Pearls" that that includes in bullet point form (2-3 short bullets only) a summary of the important clinical points of the article.
- Each person listed as an author should be thoroughly familiar with the substance of the final manuscript and be able to defend its conclusions.
- **Again, Please note: ACKNOWLEDGEMENTS, DISCLOSURES, and CONFLICTS OF INTEREST or Persons who make subsidiary contributions may be listed on the Title**

Page only. If you wish to make a statement regarding disclosures or conflicts of interest, you must also put these only on the Title Page.

- **Word limit: There is a word limit of 2800 words (text only) for all manuscripts except Brief Reports, which must be 1800 words (text only) or less.**
- Written permission, including complete source, for any borrowed text, tables, or figures submitted by mail or fax (form attached to the end of this file).
- The entire manuscript should be double spaced for ease of reading/review.
- Cover letter: We do not require a cover letter.
- When attaching manuscript items, you must be sure to load manuscript items (i.e., title page, copyright transfer form, manuscript without author information, etc.) into the correct folder using the drop down list. Failure to attach the correct file to the corresponding folder will result in having your manuscript returned to you to make changes and resubmit. Please note that specific folders are only available to specific persons, i.e., the blinded manuscript is available to reviewers. The Title Page is not available to reviewers. Use the drop down list when attaching items to ensure you are attaching/loading the correct item into the correct folder.