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### Cardiac Rehabilitation Benchmark Study

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**Cardiac Rehabilitation Benchmark Study**

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NURS 5382: Capstone

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## **Executive Summary**

One helpful intervention already in use is cardiac rehabilitation (CR). CR is a medically supervised program designed to prevent further damage to the cardiovascular system. It is a multidisciplinary program designed to educate participants on how to live a healthy lifestyle. A large body of scientific evidence is available today concerning the benefits of cardiac rehabilitation in terms of the containment of the progression of atherosclerosis, the increase in physical work, the reduction in symptomatology, the improvement in mental health, and the lowering of hospitalization rates. It can lower mortality rates, as well as prevent a second heart attack.

Unfortunately, CR is severely underutilized worldwide. Therefore, it is recommended that patients following myocardial infarction (MI) should enroll in a CR program to reduce the risk of reinfarction and/or death. A list of patients currently admitted to the hospital for MI would be collected for review. Literature concerning CR would be given to the selected patients as well as a detailed discussion to answer all questions. After cardiac clearance is obtained from the attending cardiologist, the patients would be enrolled in CR. Following hospital discharge, the participants would undergo a CR program and data would be collected related to 90-day mortality and reinfarction rates. This data would then be analyzed to display whether CR was truly beneficial in prevention of further heart-related events. If benefits can be proven, then CR could become the new standard of care.

### **1. Rational for the Project**

“Coronary heart disease (CHD) is a huge global problem accounting for the leading cause of death worldwide” (Sumner, Harrison, & Doherty, 2017, p. 1). It is the leading cause of death

in men and women alike with someone dying every 36 seconds from a heart attack. The associated healthcare costs are ever-growing, putting a strain on this country's taxpayers. An immense amount of research has been collected to aid in combatting this epidemic, unfortunately CR is currently underutilized. According to Coll-Fernandez et al. (2014) "cardiac rehabilitation appears to be vastly underused with poor referral, low participation rates, and large variations among countries" (p. 323). Cardiac rehabilitation has been proven to benefit people with heart disease. Recent research in CR has demonstrated that remarkable advantages can be developed from the use of cardiac rehabilitation in patients with various cardiac pathologies including ischemic heart disease, heart failure, and stroke. If this project can further prove that CR can prevent myocardial reinfarction, and reduce mortality and hospital readmission rates, then the burden of cost on the American people would be greatly diminished. Prevention of further damage on the cardiovascular system would lead to lower rates of hospital readmissions, translating to a decrease in healthcare-related costs, as well. Milligan (2012) found that "quantitative data analysis provided evidence of effectiveness of participation in CR in reduced hospital readmission rates and use of recognised pharmacological management strategies" (p. 782).

## **2. Literature Synthesis**

Random control trials, cohort studies, qualitative studies and systematic reviews were examined to find articles that aligned with the issue discussed previously. A substantial amount of evidence supports the use of cardiac rehabilitation programs. Several studies found that exercise-based cardiac rehabilitation was beneficial to the participants enrolled. Mortality rates and reinfarction in post MI patients was discussed in three of the articles (Lawler, Filion & Eisenberg, 2011; Witt et al., 2004; Coll-Fernandez et al., 2014). Readmission and mortality rates

in post MI participants were studied in two of the articles (Dunlay, Pack, Thomas, Killian & Roger, 2014; Graham, Lac, Lee & Benton, 2019). Two of the articles dissected mortality rates even further into subcategories of cardiac-related deaths and all-cause related deaths (Sumner, Harrison & Doherty, 2017; Fang, Ayala, Luncheon, Ritchey & Loustalot, 2017). Lawler et al. (2011) also examined the magnitude of CR benefits, while Dunlay et al. (2014) looked at the impact of readmissions. Witt et al. (2004) categorized the participants by age and gender. Graham et al. (2019) stated that the short-term benefits had been evaluated sufficiently so it focused on long term benefits of CR. Every clinical trial included, shows a significant decrease in mortality rates for participation in CR.

A random control trial by Chen et al. (2018) looked at home-based CR programs utilizing exercise three times per week for 30 minutes each time and found that 90-day readmission rates for patients reduced to 5% from 14% after receiving cardiac rehabilitation. Davidson et al. (2010) found that “the risk of readmission was reduced (absolute risk reduction 13%,  $P=0.03$ ) and the number of admissions for HF was halved” (p. 401) by employing an exercise-based cardiac rehabilitation program.

The findings of Anderson et al. (2016) “show important benefits of exercise-based cardiac rehabilitation that include a reduction in the risk of death due to a cardiovascular cause and hospital admission and improvements in health-related quality of life, compared with not undertaking exercise” (p. 3). This was a systematic review that focused on hospital-based CR and community-based CR program that included a psychosocial aspect within the programs. Another systematic review by Powell et al. (2018) had three dependent variables which included all-cause mortality, cardiac-related mortality, and hospital readmission rates. It reported a decrease in all mortality rates but did not show statistically significant reductions in hospital

readmission rates. A systematic review by Sumner et al. (2017) displayed reductions in cardiac-related mortality and recurrent MI but showed no statistically significant drops in all-cause mortality rates following completion of a CR program. Lawler et al. (2011) aimed to evaluate “the efficacy of exercise-based CR; (2) all patients who recently survived an MI; (3) the intervention under examination that involved any form of supervised or unsupervised exercise-based CR program (which may or may not include other interventions) in an outpatient, community, or inpatient setting; (4) a minimum intervention duration of 2 weeks; (5) a minimum follow-up of 12 weeks; (6) inclusion of a non-exercising control group; and (7) published in an English-language peer-reviewed journal” (p. 572). Overall, patients randomized to exercise-based CR had a lower risk of reinfarction, cardiac mortality, and all-cause mortality. Graham et al. (2019) included male and female patients, 18 and older, admitted with a MI with or without an intervention of percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG). The CR group had a subsequently lower rate of mortality and hospital readmission rates compared with patients in non-cardiac rehabilitation group.

An observational study was included by Coll-Fernandez et al. (2014). The purpose of the study was to “compare the mortality rate and the rate of subsequent ischemic events (myocardial infarction [MI], ischemic stroke, or limb amputation) in patients with recent MI according to the use of cardiac rehabilitation or no rehabilitation” (Coll-Fernandez et al., 2014, p. 322). This study found significant decreases in the group of participants who completed a CR program.

Numerous cohort studies support the intervention of CR for post MI patients. Dunlay et al. (2014) conducted an extensive longitudinal study over 20 years. They pulled the records of over 1500 people that had been admitted to the hospital for MI and only selected candidates that fell within a specific criteria. They found significant reductions in hospital readmission and



mortality rates after 90 days post MI. Witt et al. (2004) also did a longitudinal study examining medical records of post MI patients between 1982 and 1998. Among 1,821 persons identified with myocardial infarction, 55% participated in a CR program. Participants exhibited a marked survival advantage compared with non-participants. Fang et al. (2017) reviewed data within a systematic review and through the Behavioral Risk Factor Surveillance System to attain information on whether CR was being used by post MI patients. The conclusion was it was being grossly underutilized even though it has been proven to benefit patients following MI in clinical studies. A cohort design by Milligan (2012) found several advantages to a CR program, including reports of a better quality of life following completion of a CR program.

### **3. Project Stakeholders**

To implement a successful project, an entire team of people fully vested in your idea must be actively involved. The major stakeholders that would need to be a part of this undertaking would include senior-level hospital leaders, cardiac physicians, cardiac rehabilitation facilities, dieticians, physical therapists, and nurses. On the front end, senior-level management would need to be on board to approve the process and allow information to be shared among a variety of disciplines. Cardiologists would be involved to clear the patients for a CR program, as well as recommend and refer over to the program. Their clinical expertise would be crucial in designing a safe and appropriate CR program for cardiac patients with a multitude of other chronic illnesses. A team consisting of physical therapists, dieticians, and nurses would then be involved to enroll and implement the program seamlessly. A collaborative effort among this multidisciplinary team would increase the efficacy of the program. A nurse would support the participants throughout the program by answering any questions and following up with each participant periodically to ensure program adherence. Lastly, a hospital

liaison would notify the project leader of any hospital readmissions and/or deaths within 90 days of CR completion.

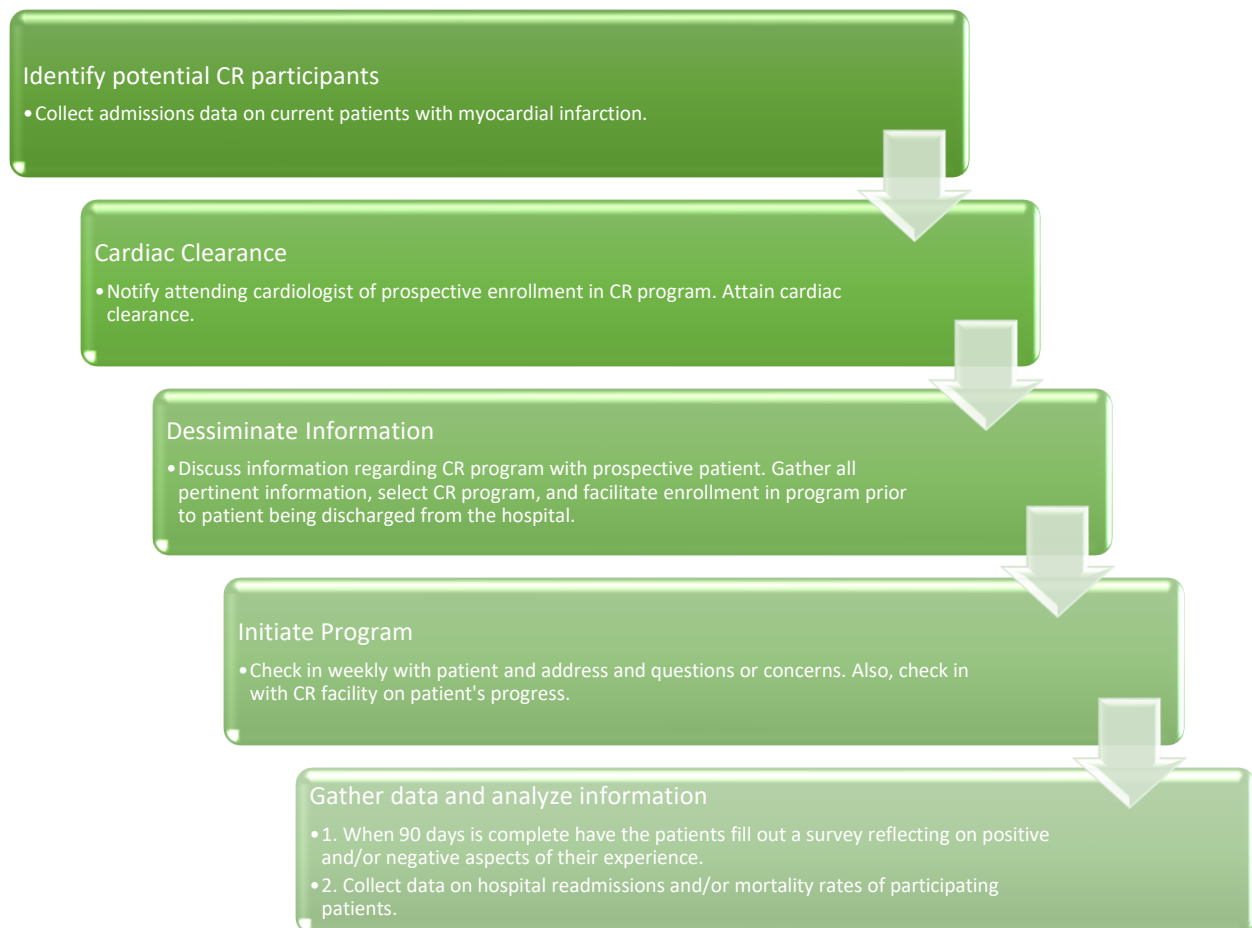
#### **4. Implementation**

For this change project to be successful, certain steps are necessary to follow, as well as due diligence on the front end. Before the implementation process begins, CR programs within a specified area must be identified. Once a list of potential programs has been selected, each program should be contacted to attain information regarding how the program works, hours of operation, eligibility, and cost. Once this information is gathered and the facility is approved, a point of contact (POC) at the CR program facility will be attained to aid in ease of enrollment. This person's contact information will be given to the potential participants so that they may easily ask questions and enroll. After this data is collected, the change project may commence. First, post MI patients must be identified. The admissions department will notify the project POC when a person is admitted with a myocardial infarction. This specific POC is the person leading the change project. Once this person is notified, they will contact the attending cardiologist and discuss whether the patient is a candidate for CR. If the patient is cleared by the physician, then a meeting will be set up with the patient to discuss CR. This can be done by the project POC or the staff nurse caring for the patient. During the conversation, specific information will be disseminated to the patient, including a pamphlet that touches on all the important facts about CR. Also, during this meeting, information regarding the patient's address, transportation access, support system, and insurance provider will be discussed. If the patient agrees to participate, the CR program within the patient's travel range will be selected and that specific CR program POC will be contacted. The patient will be enrolled in the CR program, and they will begin, following discharge from the hospital. The CR programs selected should

include a nutrition counseling, psychosocial counseling, and exercise training. The patient should be counselled on healthy lifestyle changes and heart healthy activities to prevent further cardiac damage. At the end of 90 days, data concerning hospital readmission and mortality will be collected from a designated hospital liaison to analyze the benefits of CR.

## 5. Flowchart

This EVB change project can be implemented for however long the facility executing the plan desires. The time in which the patient begins the CR program until completion should be 90 days. Once the 90 days has elapsed, data concerning hospital readmission and mortality rates should be attained.



## **6. Data Collection Methods**

Data collection for the benchmark study included thorough review of previous studies that implemented CR. These studies showed a strong correlation between CR and decreased hospital readmission and mortality rates. If this project is approved, a comparison of hospital readmission and mortality rates in post MI patients will be documented. Those patients completing a CR program versus not participating in a CR program will be included. Every patient admitted to the hospital for MI will be tracked, regardless of whether they participate in CR. Those that do partake in CR will be followed closely throughout the program. Any medical issues that arise during the 90 days will be recorded. Following discharge from the hospital, all post MI patients that are readmitted to the hospital or die within 90 days will be included in the data collection. Once the 90 days has elapsed the information will be analyzed.

## **7. Cost/Benefit Discussion**

Cardiac rehabilitation programs have been in existence for quite some time. Unfortunately, they are extremely underutilized. This trend is due to many factors including cost, but this notion of being “too expensive” should be reexamined. “Though proven to be effective, cardiac rehab is underutilized by most eligible patients, even though it’s covered by original Medicare and many Medicare Advantage plans” (Holmes, 2021). Many insurance companies, including private insurance, are beginning to cover most of the cost of CR with a 20-30% out-of-pocket copay. Oftentimes patients have met or almost met their insurance deductible following admission to the hospital for MI. At this point, CR might be fully covered, which should further entice the patient to enroll. “Compared with other post-MI treatment interventions, cardiac rehabilitation is more cost-effective than thrombolytic therapy, coronary bypass surgery, and cholesterol lowering drugs” (Ades, Pashkow, and Nestor, 1997, p. 222).

As far as implementing the change project, very little cost is associated. The current employees would be implementing the project, so there would be no additional overhead related to manpower. The only expenditure would be designing and producing informational CR pamphlets to distribute to the patients.

CR has proven benefits regarding heart health as well. “It is estimated that increasing cardiac rehabilitation participation from about 20 percent to 70 percent could save nearly 25,000 lives and prevent about 180,000 hospitalizations a year” (Agency for Healthcare Research and Quality [AHRQ], 2019). The AHRQ also found “research suggests that cardiac rehabilitation reduces cardiovascular deaths by nearly 30 percent and risk of hospital admissions by 31 percent” (2019). Lowering hospital readmissions would greatly reduce the costs associated with heart disease. Medications and procedures associated with heart disease can also be costly. Healthy lifestyle changes learned through a CR program could also reduce the need for costly medications and procedures.

## **8. Overall Discussion**

Cardiac rehabilitation is a medically supervised, multifaceted, secondary prevention program. It is aimed at improving heart health and quality of life. It includes supervised exercise activities, patient education on heart healthy nutrition, and counseling on stress and other psychosocial factors. Although this project was not implemented and therefore has not been evaluated, it has definitely raised awareness about the pros and cons of CR. The overall results of CR based on many clinical trials, is that it is beneficial in preventing heart-related complications. This simple intervention will not only reduce the likelihood of adverse events, but it can also improve overall health and quality of life. Hopefully, CR will become a standard of care in future practice, saving on healthcare costs associated with heart disease.

## 9. Recommendations

Prevention is key to improving the health of mankind. Cardiac rehabilitation is a secondary prevention tool that already exists and is proven effective. It is capable of reducing healthcare-related costs, improving health, and saving thousands of lives annually. If instituted properly it could become the standard of care for post-myocardial infarction patients.

The recommendation for this change project is to continue implementing CR and collecting data on its' effects. We should continue to explore all the benefits CR has to offer as it relates to heart disease and other chronic illnesses. CR includes exercise training and proper nutrition education, which are the fundamental building blocks to good health. It has the potential to prevent and/or treat a variety of disease processes.

The next steps would include designing a CR standard protocol to implement in all cardiac departments. As CR becomes a mainstay therapy, hospitals could begin their own CR programs in-house for their patients. This would eliminate some of the issues regarding the availability of programs within an area.

A personal recommendation would be to endorse CR programs to all cardiac patients. Many people are unaware of what a cardiac rehabilitation programs entails. It is crucial that healthcare professionals educate the public of the benefits of CR. Healthcare facilities should educate their staff so that correct and accurate information is disseminated to patients.

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