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The Impact of Peer Education on Coronary Artery Bypass Surgery Readmission Rates

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THE IMPACT OF PEER EDUCATION ON CORONARY ARTERY

BYPASS SURGERY READMISSION RATES

A Thesis Presented to
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ABSTRACT

Coronary artery bypass surgery is the most common cardiovascular operation performed in the United States. Coronary artery bypass surgery lowers rates of cardiovascular death by restoring circulation to cardiac tissue in patients with coronary artery disease. However, this surgery is associated with unacceptably high readmission rates, posing both health risks for the patient and a substantial financial burden on the healthcare system. **Our objective is to investigate whether peer education can improve 30-day readmission rates of patients after coronary artery bypass surgery.** Adult patients undergoing a coronary artery bypass surgery will either receive the usual standard of care or four assigned group sessions with a peer educator, with the primary metric being 30-day readmission rate due to any cause. If successful, peer education could be integrated into the management of coronary artery bypass surgery patients, improving patient care and saving the healthcare-related costs.

CHAPTER 1 – INTRODUCTION

1.1 BACKGROUND

According to the World Health Organization (WHO), cardiovascular disease is the leading global cause of mortality for both women and men[1]. One frequent type is coronary artery disease, in which plaque builds up in the coronary arteries and prevents blood flow to the heart, which can have life-threatening results[2]. As of 2016, an estimated 18.2 million American adults had coronary artery disease[3]. The complex process of plaque build up, or atherosclerosis, begins naturally early in life. However, risk factors such as increased age, male gender, smoking, elevated blood pressure, diabetes, obesity, and living a sedentary lifestyle can augment increased narrowing of the vessels and an environment that is primed to incite a potentially fatal myocardial infarction ('heart attack')[4].

Treatment for those with coronary artery disease generally starts with medications that work to reduce LDL cholesterol, lower blood pressure, and/or prevent blood clot formation. When the disease progresses to a more severe state, or if the patient suffers a myocardial infarction, circulation to the high energy demanding cardiac tissue can be restored by a non-surgical procedure in which a stent is placed to open the narrowed vessel, or through coronary artery bypass (CABG) surgery.

Placing a stent through percutaneous coronary intervention (PCI) can sometimes be the more advantageous option. One of the main reasons to choose PCI lies in the procedure being non-surgical, thus it can be used for those that are not surgical candidates as it generally does not require full anesthesia or a large incision site. When comparing safety between PCI and CABG surgery, the SYNTAX Extended Survival study found that after 10 years, there was no significant difference in all-cause death between PCI using first-generation paclitaxel-eluting

stents and CABG, and that in patients with left main coronary artery disease, PCI was non-inferior to CABG[5].

While PCI may seem like the more favorable option, there are still contraindications and drawbacks to this procedure. PCI is solely focused on treating flow-limiting lesions and so will not prevent new infarcts[6]. Meanwhile, in CABG surgery a healthy artery or vein is harvested and grafted to provide a bypass around the blocked coronary artery[7]. CABG surgery is able to provide flow distal to vessel occlusions and can prevent future myocardial infarcts in this way[7]. Due to the mortality benefit over PCI in patients with multi-vessel disease[8,9], today CABG is the gold standard to revascularize those with multi-vessel coronary artery disease[6] and is the most common cardiovascular operation performed in the United States[10].

1.2 STATEMENT OF THE PROBLEM

A correctly performed CABG operation is only the first step to success. Following surgery, patients spend time recovering and are still at risk for subsequent events that may cause them to seek extra care. Despite the popularity of the CABG surgery, 30-day hospital readmission rates have been estimated to be around 16%[11]. While it is already alarming that about one in every six patients are getting readmitted to the hospital after surgery, it is also concerning that this rate is higher than the national surgical readmission rate of 13.9%[12]. This high post-CABG readmission rate has a significant financial burden on both hospitals and the nation, adding an additional $13,500 per patient per readmission[13]. Furthermore, hospitals with higher readmissions receive reduced payments as part of Section 3025 of the Affordable Care Act, creating added financial repercussions for hospitals that do not make an initiative to reduce readmission rates[14]. Overall, hospital readmissions contribute to increased stress and frustration

to patients, providers, and health systems, and is a prominent issue in the healthcare conversations of the present.

Most post-CABG readmissions occur within 1 week of the original surgical hospitalization[15]. Thus, the way to most effectively prevent these readmissions is through a strategic targeting of interventions to the pre-surgery and one-week post-surgery stages. Out of those patients that do get readmitted, 40% stay in the hospital for only 3 days or less[15]. With the three most common etiologies of 30-day post-CABG readmission being atrial fibrillation (26.7%), pleural effusion (22.5%), and wound infection (17.7%), the most successful intervention strategy would be one that could effectively lower all three outcomes[16].

A number of interventions have been implemented in attempts to reduce surgical hospital readmissions across the board. These have included making changes in the management of medication reconciliation, discharge summary responsibilities, post-operative appointments, nursing home visits, and patient education, in differing capacities. However, there is still no consensus on a way to reduce hospital readmissions that is maximally beneficial for the patient and the hospital system. Some studies have shown promise using peer education, but are not nationally representative. Other studies have only followed readmission rates long-term, or have had inconclusive data. There is a gap in the literature supporting peer education as an effective tool for reducing 30-day readmission rates in CABG surgery.

1.3 GOALS AND OBJECTIVES

This study will elucidate whether peer education can be utilized as a tool to reduce CABG 30-day readmission rates. In a broader sense, the objectives are trifold.

First, we would like to know whether readmission rates are subject to change, especially given that they are so elevated in the surgical specialties. In this study, we will specifically be

looking at an intervention that is administered closely around the patient's surgery. If readmission rates are found to significantly decrease, then that may corroborate the above studies suggesting that readmissions occur and are most heavily influenced by events directly following surgery.

Second, this study investigates a behavioral science intervention instead of one that strictly revolves around medicine or pharmacotherapy. If successful, this study would add to the body of literature in non-invasive non-medication based research.

Lastly, this specific intervention of using peer education, if found to be effective, could have lasting impacts on other medical specialties. Success in this area would give weight to the importance of this intervention and serve as a beacon of leadership for chronic problems that have not yet found promising results in current research.

1.4 HYPOTHESIS

Peer education will show a statistically significant difference in 30-day readmission rates post-CABG surgery when compared to 30-day readmission rates post-CABG surgery in the standard of care alone.

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CHAPTER 2 – REVIEW OF THE LITERATURE

2.1 INTRODUCTION

During the period of June 2019 to June 2020 a review of the relevant literature was conducted using the PubMed, Google Scholar, and Cochrane Library databases. Primary searches were performed using combinations of the MeSH terms "coronary artery bypass", and "patient readmission", with additional search terms including "peer education", "patient education", "peer-assisted learning", "peer teaching", "interpersonal relations", "peer group", "teaching/methods", "teach-back", and "quality improvement". All applicable articles written in the English language between 1985 and 2020 were analyzed for pertinence to the current topic. Preference was given to clinical studies, systematic reviews, meta-analyses, and articles published in the last 15 years.

The literature search demonstrates the need to reduce surgical readmission rates, education as an effective tool for improving patient outcomes, the use of peer support for cardiac patients, and the effects of peer education on readmission. This review illustrates the need for a well-designed randomized controlled trial to evaluate the effect of peer education on 30-day readmission rates after coronary artery bypass surgery.

2.2 REVIEW OF EMPIRICAL STUDIES

2.2.1 Readmission as an Outcome Variable

In choosing to investigate readmission rate as an outcome variable, it is first important to distinguish it as a variable that is amenable to change. Sultan et al.[1] (2018) investigated a pool of 3,387 general surgery patients at a university hospital in Karachi, Pakistan and found that more than 50% of unplanned readmissions were avoidable. These unplanned readmissions were mostly due to minor post-surgical issues that were managed by minimal interventions. More

importantly, Sultan et al.[1] stated that most of these unplanned readmissions could have been prevented by additional communication, education, and attention to patient care beyond what was offered in the hospital. Gani et al.[2] took the research a step further and teased apart whether the variability in readmission was due to patient-, surgeon-, or hospital-level factors so that resources could be appropriately allocated to target the most responsible areas. They found that 82.8% of readmission variability was attributable to patient-related factors, with less than 3% of variability accounted for by the individual surgeon. More specifically, factors associated with readmission included those that were closely related to social determinants of health, including increased comorbidity (Charlson Comorbidity Index score of >2: 95% CI, 1.24-1.53; $p < 0.001$), African American race (95% CI, 1.11-1.36; $p < 0.002$), and postoperative complication (95% CI, 1.08-1.32; $p = 0.001$). While this study is limited in generalizability by a study population drawn only from John Hopkins Hospital, this data suggests that future efforts in reducing readmissions should be focused on factors at the level of the patient and the procedure. Furthermore, Morris et al.[3] made models to predict postoperative readmission and found that while readmissions were difficult to predict at the time of discharge, it was preoperative patient-level factors that had the largest contributions to the predictive models (R^2 7.0% [c-statistic 0.67]). These three studies support using readmission rate as a dependent variable, and further elucidated that readmission rate is likely most influenceable at the pre-operative stage by targeting factors at the patient level.

2.2.2 Education as an Effective Tool for Improving Patient Outcomes

Improving patient education as a means to improve hospitalization outcomes has long been a topic of discussion. In 1999, Jaarsma et al.[4] concluded that planned education and support from a nurse increases heart failure patients' self-care behavior. Conducted in the Netherlands, Jaarsma et al. prospectively evaluated 179 patients hospitalized with heart failure, randomly

assigning them to the standard of care or to an intervention of education from a nurse about the consequences of heart failure during the hospital stay and at a home visit one-week post-discharge. Only the intervention group showed a statistically significant retained increase in self-care behavior from baseline 9 months after discharge ($p < 0.001$). Although there are major differences between European and American health care systems, this study does provide a basis for further research to be conducted using education as a tool in improving patient outcomes, and elucidates a potential mechanism through which education could work.

The heart failure population is interesting as it is one that is recognized to be at high risk for readmission after index hospitalization. This was noted by Krumholz et al.[5], who believed that these readmissions were likely due to factors such as medication and diet noncompliance, and delays in seeking preventative care. They postulated that providing patient education and support would reduce the rate of readmission and death for heart failure patients, possibly through the mechanism of increasing compliance. This prospective, randomized trial of 88 heart failure patients from Yale-New Haven Hospital in Connecticut put 44 patients in the control group and 44 patients in the intervention arm. The intervention group patients received an hour-long face-to-face educational session with an experienced cardiac nurse within two weeks of hospital discharge. They were then subsequently contacted by the nurse by phone call every week for 4 weeks, then biweekly for 8 weeks, and then monthly for the remainder of one year. The control group received all usual care treatments and services ordered by their physicians. The primary outcome measure was readmission or death. In this study, 56.8% of patients in the intervention group and 81.8% of patients in the control group had at least one readmission or died during the one-year follow-up ($p = 0.01$). The total estimated extra cost for the intervention group (time with the nurse and social worker) was $530 per patient. However, even with this

extra cost, the 39% decrease in the total number of readmissions in the intervention group resulted in an overall reduction in cost of $6,985 less per patient in the intervention group. This study showed the effectiveness of patient education delivered from a cardiac nurse, without the addition of any medical management component, in reducing readmission rates. One limitation of this study however, is the small sample size that was only drawn from one hospital center, which limits generalizability. Future inquiries into whether this readmission effect can be seen in patients of other morbidities, as well as if there is an even more cost-effective method of ensuring patient education are warranted.

Preventing both lengthier hospitalizations and readmissions for patients beyond the scope of only heart failure has long been a topic of interest for both individual hospitals and larger epidemiological studies alike. Jack et al.[6] designed a trial aimed at standardizing hospital discharge procedures with the goal of reducing emergency department readmissions at an urban, academic hospital in Boston, Massachusetts. Their discharge intervention included nurse-delivered patient education and comprehensive discharge planning, and postdischarge telephone reinforcement from a clinical pharmacist. With a study sample of 376 in the usual care group and 373 patients in the intervention group, their primary end point was the total number of emergency department visits and readmissions within 30 days of the patient's initial discharge. They found that the rate of hospital utilization (as described above) was significantly lower in the intervention participants vs. the usual care participants ($p = 0.009$). This had a direct impact on hospital cost, with a $149 995 difference in total cost between the usual care group and the intervention group, representing a 33.9% lower cost for the intervention group. The economic and patient-centered success of this implementation hold promise for a practical and fairly easily implemented method for reducing the burden of readmissions on the healthcare system.

However, while this study found success with their bundled method, the design of the intervention makes it difficult to determine the effect contribution of each separate part of the intervention, and more research is warranted to narrow down the effectiveness of each component.

Similarly, Shaffer et al.[7] investigated decreasing 30-day readmission rates for ileostomy patients, adding to the body of literature by focusing specifically on 30-day readmission following a surgical procedure. The intervention involved implementing a quality-improvement program with standardized discharge orders with a home health agency, which included regular nursing home visits for 4 weeks as well as phone call check-ins. After the implementation of this program, the non-intervention ileostomy readmission rate was 24.5%, while the intervention ileostomy readmission rate was decreased to 8.7%, a comparison that was statistically significant ($p = 0.05$). One limitation to these results is that this was not a randomized controlled trial and insurance eligibility determined if patients were able to be included in the study. Regardless, Shaffer et al.'s work can still be used as a basis in investigating the potential to reduce 30-day readmission rates from a surgical procedure.

2.2.3 Use of Peer Support

These studies have exemplified the potential to reduce 30-day readmission rates through some form of education on discharge care facilitated by nursing staff either at the hospital or conducting home visits. However, with the increasing strain on the health care system and the fiscal constraints it faces, nurses have a narrower scope of time to educate patients and providing detailed follow-up care may not be possible. Similar but alternative strategies should be investigated. Peer education and support may hold great potential and be the answer to facilitating discharge recovery and reducing readmission rates after surgery.

There are distinctions between support provided by professionals and that from peers. While both can provide direct information about a stressor and influence efforts to alleviate it, peer relationships also indirectly provide social comparison. Thus, peer support may positively affect not only physical health results, but also play a role in improving psychological outcomes. In women with breast cancer, group counselling resulted in significantly higher perceived self-efficacy compared to the control group at four weeks post-intervention[8]. Mohammadpourhodki et al.[9] found that patients with myocardial infarction that received peer education had significantly higher self-efficacy compared to those who received nursing education.

Peer education has also been implemented in other specialities. It has been widely used for HIV prevention in developing countries, and a meta-analysis by Medley et al. (2009) found that peer education interventions were significantly associated with increased HIV knowledge, reduced equipment sharing among injection users, and increased condom use[10]. In psychiatry, online peer-to-peer support is already frequently used, both moderated by health professionals and community-directed[11].

In 1984, two Canadian university nursing professors developed the Open Heart Patient Support Group[12], a program in Nova Scotia in which patients who have successfully recovered from cardiac surgery volunteer for dyadic support for peers about to undergo the same surgery. This program was driven on an informal basis with no structured programming, with most visits lasting ~20 mins and taking place with the patient on the ward before surgery. Many volunteers reported that their visits helped assuage patient fears and that patients appeared more relaxed from their interactions. One surgeon noted that due to this program "after surgery they do better". One severe limitation to this study is the lack of empirical and statistically driven evidence to support their anecdotal reports. Additionally, the decade and country in which this

was conducted differ vastly from current times, which affect the generalizability of these results as the major stressors patients face now may differ. Regardless, Meagher et al.[12] exemplified that peer support improved cardiac patients' self-reported readiness for surgery and their motivation for cardiac rehabilitation.

Similar to this study, Parent and Fortin[13] conducted a randomized controlled trial in Montreal, Canada to test whether vicarious experience through peer support, that is, seeing the success of former patients, would decrease anxiety, increase self-efficacy expectation, and result in higher self-reported activity postsurgically. A volunteer patient who had had CABG provided the experimental group 3 dyadic supporting visits at 24 hours before surgery, on postoperative day 5, and 4 weeks after surgery. They found that patients that received the peer support visits had significantly less anxiety post-op than the control group ($p < 0.05$), and displayed higher self-efficacy scores and self-reported activity scores 5 days post-op than the control group ($p < 0.01$). One limitation to this study is the method of simple randomization of the 56 patients to the control or experimental group by flipping a coin. Additionally, it was not possible for them to perform a double-blinded study due to the type of experimental treatment being tested, and so placebo effect may have been included in the results. Nevertheless, the results of this study are significant for recovery after CABG, and show that peer support may have a role in cardiac surgery patients and may positively impact patients in both their physical and psychological health following surgery.

2.2.4 Effects of Peer Education on Readmission

People put more effort into learning when they learn from people perceived to be similar to themselves, and peer education has been utilized successfully to reduce readmission rates in other specialties. In patients with severe spinal cord injury/disease, about 36% of individuals

were found to have an unplanned hospital readmission after their injury. Several studies investigated the effect of peer mentoring in spinal cord injury/disease, with Gassaway et al.[14] designing the first randomized controlled trial to determine whether intensive peer mentoring could improve severe spinal cord injury/disease readmission rate. 158 participants from a nonprofit inpatient rehabilitation hospital were randomly assigned to either intensive peer mentoring or a traditional (standard of care) peer support group. Those in the intensive peer mentoring group were assigned a peer mentor that they met with weekly throughout the inpatient stay and for 90 days after discharge who encouraged them to participate in the monthly peer-sponsored activities. Those in the traditional peer support group were introduced to peer support and only provided services upon request. This trial yielded a statistical power of 0.80 with a medium effect size at an α level of 0.05. They found statistically significant differences between the control and experimental groups for cumulative days rehospitalized at the 30 day (p=0.018), 90 (p<0.001) and 180 (p<0.001) days postdischarge time points. The experimental group spent fewer days rehospitalized at each time interval. While they also found a difference in the percentage of patients rehospitalized at each time interval, they were not found to be statistically significant and this may be attributed to the traditional group's access to peer support services as requested. Overall, this study showed that intensive peer mentoring in those with spinal cord injury/disease resulted in fewer hospital readmission days 6 months after discharge, and provides a basis for extending this research to investigate the effects of peer mentoring on other diseases and long-term.

Varaei et al.[15] designed a similar randomized controlled trial investigating the effects of peer education but changed the sample population to patients undergoing coronary artery bypass graft surgery in Iran. They took 60 adult patients from two hospitals in Iran and randomly

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assigned them into two groups using the block randomization method, for 80% power at a significance level of 5%. Both groups were given the standard of care information about the surgery and recovery process by healthcare professionals. The intervention group received two additional 1 hr peer education sessions before their surgery. The cardiac self-efficacy was evaluated at 5 days, 4 weeks, and 8 months after the surgery, and their readmission investigated 8 months after their surgery. The authors found a statistically significant higher level of cardiac self-efficacy in the intervention group compared to the control group at each time interval. In addition, they found a 29% difference (p = 0.011) in readmission rate between the intervention and control groups at 8 months using the χ^2 test. This study provides evidence that peer education administered pre-operation significantly reduces the rate of readmission following coronary artery bypass surgery. This study is limited by the small sample size of 30 patients allocated to each group but nevertheless provides a basis for further development of the role of peer education in cardiac surgery.

2.3 REVIEW OF STUDIES TO IDENTIFY POSSIBLE CONFOUNDING VARIABLES

As discussed previously in Chapter 1, numerous fields in medicine are already employing some form of peer education with differing levels of promising success. For instance, peer support is popularly used as an adjunct to other treatments for a number of mental health conditions. If not considered or controlled for, this could act as a confounder and muddle the true statistical difference between cohorts. People who have received peer education or been a peer mentor for a separate co-morbidity in their past may be more familiar with and better adapted to this unique learning style, lending them an advantage over their peer education-naïve counterparts. Thus, in our study we will screen for this experience in our pre-trial questionnaire and exclude those that have participated in any form of formal peer education before.

Additionally, as a behavioral intervention, peer education is influenced by the socioeconomic and cultural milieu in which it is received. There are social aspects of learning that must be accounted for in the wider aspect of delivery.

This proposed study is based on the foundational premise that readmission rate is a modifiable variable. As such, there must exist certain factors that are directly associated with readmission rate, but not as a consequence of it. In 2011, Hannan et al.[16] conducted a retrospective secondary data analysis of 33,946 patient records and identified that there were preventable and modifiable factors associated with 30-day readmissions from CABG surgery, especially those that were related to preoperative comorbidities, postoperative clinical factors, and discharge status. The most common readmission diagnoses for CABG surgery are atrial fibrillation, respiratory complications, infection, and heart failure[17,18,19].

Case et al.[20] designed a study to determine predictors of 30-day readmission in patients who sustain an acute myocardial infarction and undergo CABG as the primary revascularization strategy from 2011 to 2017. They found that 80% of readmissions were non-cardiac related, and that female sex (OR 2.51, 95% CI 1.042-6.549, p = 0.041) and CABG performed <7 days following myocardial infarction (OR 2.82, 95% CI 1.21-6.59, p = 0.017) are predictors of unplanned readmission. Interestingly, they did not find diabetes mellitus (p = 0.3879), chronic kidney disease (0.9349), or acute kidney injury (p = 0.5524) to be significant predictors of unplanned 30-day readmission following acute myocardial infarction and revascularization with CABG. While this study is limited by being a small (only 150 patient cohort), single center study that may have been underpowered to detect every factor associated with readmission, it is nevertheless useful in identifying female sex and CABG performed <7 days following

myocardial infarction as significant demographic factors to ensure are balanced in our study groups.

Shah et al.[21] queried the National Readmissions Database and found 288,059 patients who underwent isolated CABG in the United States between 2013 and 2014. They determined that independent preoperative predictors for 30-day readmission were Medicaid status (odds ratio [OR], 1.33), female sex (OR, 1.32), chronic renal failure (OR, 1.26), greater than 4 Elixhauser comorbidities (OR, 1.20), chronic pulmonary disease (OR, 1.15), and nonelective operation (OR, 1.10) (all $p < 0.05$).

Khoury et al.[19] used the Nationwide Readmissions Database to identify adult patients who underwent isolated CABG between 2010 and 2014, sequestering a large population size of 855,836 patients. They then retrospectively developed a model of 30-day readmission risk, and found that independent predictors of 30-day readmission include female gender (OR 1.27; 95% CI 1.24 to 1.31, $p < 0.001$), age > 75 years (OR 1.07; 95% CI 1.03-1.11, $p < 0.001$) emergent index admission (OR 1.29; 95% CI 1.25 to 1.33, $p < 0.001$), and preoperative co-morbidities, including atrial fibrillation (OR 1.24; 95% CI 1.21 to 1.28, $p < 0.001$), liver disease (OR 1.29; 95% CI 1.17 to 1.41, $p < 0.001$), renal failure (OR 1.38; 95% CI 1.34 to 1.43, $p < 0.001$). By using a large all-payer nationwide database, this study overcame the limitations of a small sample size and only including patients of certain demographics that previous studies struggled with. However, while using the Nationwide Readmissions Database is advantageous for this regard, it does not including certain variables such as race, and is subject to reporting biases that may have impacted results.

2.4 REVIEW OF RELEVANT METHODOLOGY

2.4.1 Choice of variable measurements

Section 3025 of the Affordable Care Act reduces payments to hospitals for excess readmissions, and specifically includes 30-day readmission from CABG surgery as one of their six condition/procedure-specific measures in the program[22]. In the literature, 30-day readmission is a commonly used metric. However, Varaei et al[15] chose to use 8-month readmission as their primary outcome. Using a readmission rate past 30 days is more likely to be due to other factors and not the care given in the hospital. In order to be most relevant and applicable to hospitals, this study will add to the growing body of literature by using 30-day readmission rate as the primary variable.

Varaei et al[15] chose to look at not only readmission rates as a variable measurement, but also Cardiac Self-Efficacy. This was based on previous work by Sarkar et al[23] and Negarandeh et al[24] who found that for those with coronary artery disease, self-efficacy is effective in the prediction of the chance of readmission. Patients with lower Cardiac Self-Efficacy do not believe in their abilities, and a lower Cardiac Self-Efficacy is correlated to poor health and depression. It is possible that these factors contribute to a higher possibility of readmission. Cardiac Self-Efficacy, as measured by the Cardiac Self-Efficacy Scale[25] will be used in this study as the secondary outcome.

2.4.2 Randomization techniques

Randomization is important in clinical trials to prevent selection or accidental bias. In this study, randomization will be conducted to ensure that each patient has an equal chance of the intervention and control. Simple randomization by tossing a coin for each trial subject to determine what group they would be assigned is often used. One disadvantage to this randomization technique is that it can get imbalanced in smaller trials. Varaei et al[15] had a

smaller sample size of 60 patients and randomly assigned subjects into the control and treatment groups using a block randomization method. Our study will have a large sample size and thus a computer-generated simple randomization method will be used.

2.4.3 Selection criteria

In Varaei et al's study[15], they included patients who did not have any record of CABG surgery, could understand and speak the Persian language, were willing to participate in the research, were between 40 and 70 years old, and did not have dementia, confusion, mental and psychological problems which might hinder their participation. This study is the most similar to our study and thus our selection criteria will mirror theirs with one modification of an ability to understand and speak the English language at least a high-school level instead of understanding and speaking Persian. Varaei et al[15] put forth their exclusion criteria as patient's death, serious physical problems after CABG surgery, emergency and unexpected surgeries, or cancellation of the CABG surgery due to the patient's situation. Our exclusion criteria will be the same.

2.4.4 Sampling techniques

While random sampling would be the preferred way of sampling, it is not feasible to do for this study as doing so would require a complete list of all possible participants be obtained from the start. Convenience sampling will be the most feasible sampling technique for this study and will be conducted until the sample size population is reached.

2.4.5 Blinding techniques

In Varaei et al's study[15], no blinding of the participants, the peer educators, the researchers, or the surgeons occurred. While the intervention proposed is one in which no placebo can be given and no blinding of the participants and peer educators can be conducted, we can improve upon Varaei et al's study by blinding our study's cardiac surgery team and researchers.

2.4.6 Follow up

In Varaei et al[15], 8 months after the patient's surgery they were contacted via phone to determine readmission status. Our study will be using 30-day readmission rate as the primary outcome. Using Varaei et al as a guide for follow-up, we will track down the readmission of our patients 30 days after their surgery via phone. Building upon this, if the patient is not able to be contacted in this manner, then we will use the electronic medical record to check if they have any evidence of being readmitted to the hospital system 30 days after their surgery date.

2.4.7 Statistical analysis

Since Varaei et al[15] has the same primary and secondary outcomes as this study, we will be using the same type of data analysis. Varaei et al applied the χ^2 test, independent samples t-test, repeated measures analysis of variance, and Bonferonni, with the normality of the data tested using two Sample Kolmogorov-Smirnov test.

2.4.8 Statistical significance and Power

A p-value < 0.05 has been consistently considered statistically significant in the literature and as such will be our study's threshold for statistical significance. A power of 0.80 will be used in order to confidently reject the null hypothesis if an effect is present.

2.4.9 Sample size

An adequate sample size is essential to demonstrate that peer education will produce a change in readmission rate in CABG patients. The decision to use G*Power to calculate sample size is because there is no previous randomized clinical trial comparing peer education to 30-day readmission rate in CABG patients. We will use the estimations from a small effect size to make the sample size calculations.

2.5 CONCLUSION

In this study, the effects of peer education on readmission rate will be investigated. Readmission rate is a dependent variable which is most effectively influenced by targeting factors at the patient level[1,2,3]. Patient education has long been used in various deliveries in the attempt to improve hospitalization outcomes[4,5]. It has shown to provide some improvements in readmission rate and self-care behavior in heart failure patients[5], a reduction in emergency department readmissions[6], and a decrease in 30-day readmission rates for ileostomy patients[7]. Building on this research, peer education is the next step in interventions, as education delivered by a peer rather than a professional may be more efficacious and cost-efficient. Some studies have used peer education in cardiac surgery with reported success[12,13,15]. However, these studies have had a small sample size, were conducted in a different country, or did not measure readmission rate as their primary outcome. This novel study will determine the effects of peer education on 30-day readmission rate and cardiac self-efficacy.

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CHAPTER 3 – STUDY METHODS

3.1 STUDY DESIGN

The proposed study will be a prospective randomized controlled trial that uses rolling enrollment to assign participants randomly to an experimental (peer education) or nonexperimental (traditional standard of care) group. The site for this study will be Yale New Haven Hospital. Each eligible patient will be approached when they are being referred/scheduled for CABG surgery weeks in person to introduce the concept of peer education, gauge interest, and describe the research study. The consent from will be reviewed with the patient, who will be allowed to ask questions and decline participation at any time. Signed consent forms will then be assigned to an experimental or nonexperimental group by simple randomization using computer-generated random numbers.

3.2 STUDY POPULATION AND SAMPLING

Eligible participants will be all persons admitted to the cardiac program of Yale-New Haven Hospital in New Haven, CT during a 12-month period who are undergoing their first CABG surgery. Recruitment will occur with referrals from Yale cardiac surgeons. A convenience sample will be drawn from this source population until the sample size reaches 393 in each study arm.

Inclusion criteria used to select the suitable patients will be the following:

- Men and Women

- No record of previous CABG surgery

- Able to understand and speak the English language at least a high-school level

- Age between 40 and 70 years

- Willingness to participate in the research

- Does not have dementia, confusion, mental or psychological problems which might hinder their participation

Exclusion in this study will be:

- The patient's death

- Serious physical problems after CABG surgery

- Additional emergency or unexpected surgeries

- Cancellation of the CABG surgery.

Once it is confirmed that the patient meets eligibility criteria for this study, the study investigator will explain the study rationale and purpose, as well as provide a detailed explanation of the study risks and benefits.

3.3 SUBJECT PROTECTION AND CONFIDENTIALITY

Before implementation of the study, we will submit the study protocol to the Yale University Institutional Review Board for approval of study design and safety. The selected participants will undergo informed consent and be thoroughly informed about the purpose and the process of the study, as well as their rights to privacy and protection of health information under the Health Insurance Portability and Accountability Act (HIPAA). They will be provided with a HIPAA authorization form (see Appendix B). All patient data will be de-identified in accordance with the Human Research Protection Program (HRPP) policies and procedures. All patient data will be cataloged with individualized study numbers only. Paper and non-computerized study documents will be locked in a file system and electronic records will be password protected and handled on secure servers only. Only the principal and co-principal investigator will have access to information. All individuals involved in the study will be

required to take an online HIPAA course before proceeding with their roles and required to sign a confidentiality form.

All study subjects will be ensured that participation in the study is completely voluntary and they may withdraw at any time. They will be informed of the possible risks associated with the study and informed consent will be obtained from each participant (see Appendix A). The informed consent will explain the purpose of the study, interventions involved, time commitment, risks and benefits, alternative treatments, and confidentiality. Eligible subjects and the principal investigator must sign the informed consent form in order to proceed with registration.

3.4 RECRUITMENT

- Of the study participants: patients will be approached by principal investigator when they are recommended/scheduled for surgery. The principal investigator will provide a verbal explanation describing the study and what participation would entail. The possible participant will be encouraged to ask questions at any point during the explanation. They will be given the opportunity to sign the consent form during that visit, or to take home an informational handout and call-back if interest arises. No monetary compensation will be provided for study participants.

- Of the peer educators: peers will be selected from patients who have already undergone a CABG surgery at Yale-New Haven Hospital. These patients will be recruited by a phone call as per the Electronic Medical Record until a total of 27 peers are selected.

3.5 STUDY VARIABLES AND MEASURES

The following baseline characteristics will be collected from each study participant: age (years), sex, presence of hypertension, congestive heart failure, chronic renal insufficiency,

pulmonary disease, peripheral vascular disease, liver disease, payer status (Medicaid, Medicare,

private, or self/other), and whether this is an elective or nonelective surgery. See Table 1 below

for more details.

Table 1: Patient and Hospital Characteristics

Variable			P Value
Age, years			
Female			
Comorbidities			
Hypertension			
Congestive heart failure			
Chronic renal insufficiency			
Pulmonary disease			
Peripheral vascular disease			
Liver disease			
Payer status			
Medicaid			
Medicare			
Private			
Self/other			
Elective surgery			
Nonelective surgery			

The independent variable in this study is assignment to either the intervention or control

group. Participants in the intervention group will be assigned a peer educator based on age, sex,

and interests. The educator will meet with the participant in-person for two consecutive sessions

two days before surgery, on the day of hospital discharge, and over the phone one week after

discharge. The control group will receive the standard of care, which will include regular

education from hospital clinicians and nurses about the surgery and post-discharge care.

Twenty-seven volunteer peer educators will be selected who fit the following criteria: 1)

are 8-16 months from their last CABG surgery, 2) possess a high school diploma, and 3) show a

high level of self-efficacy using the cardiac self-efficacy scale. All peer educators will be trained in the dos and do nots of mentorship, which will emphasize that mentors cannot provide medical advice. They will be encouraged to share personal experiences to depict resolution of issues relevant to patients. The peer education session will take place in the hospital, except for the session one week after discharge which will occur over the phone.

The primary dependent variable in this study is 30-day readmission rate after CABG surgery. Readmission will be seen as a dichotomous variable – either the patient is readmitted to a hospital within 30 days after their CABG surgery, or they are not. To note, readmission will include patients who are readmitted under the "Observation" status in the Emergency Department but discharged < 24 hours later.

The secondary outcome variable will be the cardiac self-efficacy score, measured on the cardiac self-efficacy questionnaire (see Appendix C). The cardiac self-efficacy questionnaire will be administered to each patient at baseline (pre-operatively and before any intervention takes place), on the day of hospital discharge, and over the phone one week after discharge.

3.6 METHODOLOGY CONSIDERATIONS

3.6.1 Blinding

Given that peer education is an intervention that is blatantly obvious to the study participant, a method of blinding to intervention or control variables at the level of the participants will not be possible. It will also not be possible to blind the participant to the outcome of readmission.

It is, however, possible to blind the cardiac surgeons perform the CABG surgery to which group the participant was assigned to, so that it does not affect the quality of care they receive

during the surgical procedure. In addition, we will also be blinding the data collector and data statistician to which group was the control and which was the intervention.

3.6.2 Assignment of Intervention

The selected patients will be randomly assigned in a 1:1 ratio into the control or intervention group using a computer-generated simple randomization method (Research Randomizer Version 4.0).

3.6.3 Adherence and Monitoring of Adverse Events

To monitor adherence, the peer mentor will use an attendance sheet documented on Excel following each session. Adverse events will be reported in real time from the start date of the study until 30-days after the CABG surgery. Adverse events are not anticipated from the intervention of peer education. Both the control and intervention group will be encouraged as per the standard of care to seek medical attention post-operatively if they develop any unusual symptoms.

3.6.4 Data Collection

Initial Questionnaire for Demographics:

- Immediately after the participant signs the consent form, a questionnaire will be distributed (see Appendix D) to determine baseline characteristics of each participant

30-day Readmission (Primary Outcome):

- 30 days after the participant's CABG surgery, they will receive a phone call asking whether they were readmitted in this period. If they say they have, this will be verified using the electronic medical record and then recorded in the data collection spreadsheet.

Cardiac Self-Efficacy Score (Secondary Outcome):

- A cardiac self-efficacy questionnaire (see Appendix C) will be given to each participant at the initial meeting (after they complete the demographics questionnaire), on the day of discharge, and again at 7 days post-operation

3.6.5 Sample Size Calculation

Sample size was calculated using G*Power, which suggested using at least 393 cases per group to conduct a χ^2, for a randomized trial yielding a statistical power of 0.80 with a small effect size at an α level (Type 1 error) of 0.05. Adjustments will be made to exclude patients that are lost to follow-up.

3.6.6 Analysis

All patients will be included in the (intention to treat) analyses, regardless of the amount of intervention received. Patients for which no outcome data is received will be removed. Data will be analyzed using Statistical Package for the Social Sciences (SPSS). Descriptive statistics will be utilized to describe the data frequency. Baseline characteristics will be compared for each treatment group. For continuous variables, such as age (years), comparisons will be made using a student *t*-test and reported as a mean +/- standard deviation. Categorical and dichotomous variables will be compared using a Pearson's chi-squared test. These variables include: sex, presence of comorbidities (hypertension, congestive heart failure, chronic renal insufficiency, pulmonary disease, peripheral vascular disease, or liver disease), payer status (Medicaid, Medicare, Private, or Self/other), and whether it is an elective or nonelective surgery.

In the event that any between treatment group differences are found at baseline for any of these variables post-randomization, they will be considered covariates and accounted for in the outcome analysis.

For the primary outcome in this study we will only be considering the exposure and outcome. Therefore we will be using the bivariate analysis of Chi-squared to measure % of participants being readmitted within 30 days of their CABG surgery. Statistical significance is defined as p-value < 0.05 for all measurements. The secondary outcome will be compared between the treatment and control groups at baseline, on the day of discharge, and one week after discharge. This will produce ordinal data, and thus will be analyzed using a t-test.

3.6.7 Timeline and Resources

Timeline:

A total of 2 years will be required for the recruitment and intervention phases of the study. Obtaining IRB approval for Yale New Haven Hospital and training of study investigators will span the first 3 months of the study. Then choosing suitable peer mentors who meet the criteria listed above and are willing volunteers will begin at month 3 and end at month 6. The selection of peer mentors will be conducted by the study investigators who will comb through the electronic medical record and call suitable candidates until 27 people are chosen. During this time period, the selected peer mentors will be trained through a series of 2 training sessions led by the study investigators.

Then the rolling enrollment period and data collection, the main phase of the study, will begin at month 6 for the following 17 months. At month 23, enrollment will stop and data collection will continue for the final month of the study. Once the study is completed, data analysis and manuscript preparation will occur. The data statistician will perform the statistical analysis as described in the previous section, and the lead clinician will be involved in documenting the results and implications of this study.

Personnel:

The study center will be at Yale New Haven Hospital, Section of Cardiac Surgery. The data statistician will assist with the 1:1 simple randomization on participants with consent forms received, and with running the statistical analysis on the outcomes of readmission and cardiac self-efficacy score. The student primary investigator is Melissa Ling, PA-S2. The primary investigator is Pramod Bonde, MD. Dr. Bonde will be in charge of project oversight and administering the consent form. Dr. Bonde and Melissa will both be responsible for training the peer mentors. The peer mentors will be responsible for distributing and collecting the cardiac self-efficacy questionnaires. Melissa will organize the questionnaires collected and input the primary and secondary outcome data into a spreadsheet for the data statistician to then use.

CHAPTER 4 – CONCLUSION

4.1 ADVANTAGES AND DISADVANTAGES

This study investigating whether peer education is an effective tool to reduce 30 day readmission rates from CABG surgery will be the first of its kind in America. The intervention of peer education, if found to have a significant impact on readmission rate, is unique in that the implementation of this intervention is purely volunteer driven and uses time and human effort instead of monetary resources. With potential savings of $13,500 per patient per readmission[1], the value of reducing readmission rate would have large positive effects in allowing these hospital resources to be allocated to other needs. One particular advantage to this study is its large sample size. A target number of participants of 786 patients (393 participants in each group) ensures a large enough sample size that differences between treatment groups will be able to be seen and eliminate individual variance.

One major limitation of this study is that the sample size will only be drawn from the Yale New Haven Hospital network, thus opening up the possibility for a small selection bias. If found to be successful, a multi-center study will be needed to determine whether the results are generalizable to other hospitals, states, and countries. Additionally, this study focused on reducing admissions only from CABG surgery. In order to best reduce the burden on the health care systems, the best treatment would be one that is applicable to all areas with high readmission rates. Further studies including other surgeries and health conditions with high hospital readmission rates are recommended.

4.2 CLINICAL AND PUBLIC HEALTH SIGNIFICANCE

For many patients suffering from coronary artery disease, medication and minor procedures are not effective enough and surgery becomes the only option. While surgery is a

stressful experience for many, patients that must receive a CABG surgery may be especially

frightened as their lives depend on having a successful surgery. Peer education could be a

practical, clinical, and effective tool for increasing a patient's perceived self-efficacy, as

measured through the cardiac self-efficacy score. One study by O'Neil et al[2]. indicated that a

higher cardiac self-efficacy score is protective against any hospital admission at follow-up.

Furthermore, with psychosocial problems such as depression and anxiety associated with

morbidity after CABG surgery[3], having regular meetings with a peer mentor could also provide a

positive outlet for expressing these worries and finding support from someone with a shared life

experience.

  The findings of this study could provide a basis for the development of future peer

education programs in CABG patients. It may also transform the way that pre-operative and

post-operative care is managed in CABG patients, promoting an emphasis on an educative-

supportive approach in cardiac surgery. If peer education proves to be successful, this could even

have extended impacts on other fields.

4.3 REFERENCES

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APPENDIX

Appendix A

Information Sheet

Verbal Consent for Participation in a Research Study
YALE UNIVERSITY

YALE UNIVERSITY SCHOOL OF MEDICINE – YALE-NEW HAVEN HOSPITAL

200 FR 9 (2017-2)

Title: The impact of peer education on coronary artery bypass surgery readmission rates

Principal Investigator: Dr. Pramod Bonde

Funding Source: Yale University

Introduction
You are being asked to join a research study. The following information will explain the purpose of the study, what you will be asked to do, and the potential risks and benefits. You should ask questions before deciding whether you wish to participate, or at any time during the course of the study.

Purpose
The purpose of this study is to determine whether peer education can reduce 30-day readmission rates after coronary artery bypass surgery. You are being asked to participate because you have been identified as someone who is between the ages of 40 and 70 and will be undergoing a coronary artery bypass surgery for the first time.

Procedures
If you choose to participate in the study, you will be asked to either continue with the usual standard of care or participate in three in-person peer mentoring sessions and one peer mentoring session over the phone. The first peer mentoring session will occur two days before your surgery date, the second session one day before your surgery date, and the third session on the day of your hospital discharge. The fourth peer mentoring session will take place one week after your discharge date over the phone.

Possible Benefits
This research may or may not benefit you directly. However, knowledge gained from the results may help us to better understand whether peer education is effective in reducing 30-day readmission rates from coronary artery bypass surgery.

Possible Risks
Your part in this research study consists solely of four peer education sessions and completing three cardiac self-efficacy questionnaires. This study does not require you to have additional procedures or treatments. Therefore, being in this study does not involve any physical risks to you. However, there is a slight risk regarding the confidentiality of your participation in this study, if information about you becomes known to persons outside this study. The researchers are required to keep your study information confidential, however, so the risk of breach of confidentiality is very low.

Privacy / Confidentiality

To protect your confidentiality, your name and other identifying information will not be recorded on any study documents. You will be assigned a study number and the code linking your number with your name will be stored in a separate locked file cabinet. We will only collect information that is needed for research. Only the researchers involved in this study and those responsible for research oversight will have access to the information you provide

Research Authorization:

Except as permitted by law, your health information will not be released in an identifiable form outside of the Yale University research team and collaborating researchers' institution. Examples of information that we are legally required to disclose include abuse of a child or elderly person, or certain reportable diseases. Note, however, that your records may be reviewed by those responsible for the proper conduct of research such as the Yale University Human Research Protection Program, Yale University Human Subjects Committee. The information about your health that will be collected in this study includes: whether there was re-admission within 30 days, one demographics baseline survey, and three cardiac self-efficacy questionnaires.

Information may be re-disclosed if the recipients are not required by law to protect the privacy of the information. At the conclusion of this study, any identifying information related to your research participation will be destroyed.

By agreeing to participate in this study, you authorize the use and/or disclosure of the information described above for this research study. The purpose for the uses and disclosures you are authorizing is to ensure that the information relating to this research is available to all parties who may need it for research purposes.

This authorization to use and disclose your health information collected during your participation in this study will never expire.

Voluntary Participation

Participation in this study is completely voluntary. You are free to decline to participate, to end participation at any time for any reason, or to refuse to answer any individual question at any time. Refusing to participate will involve no penalty or loss of benefits to which you are otherwise entitled (such as your health care outside the study, the payment for your health care, and your health care benefits). By providing verbal consent, you have not given up any of your legal rights.

Authorization

I have read (or someone has read to me) this form and have decided to continue to participate in the project described above. Its general purposes, the particulars of involvement and possible hazards and inconveniences have been explained to my satisfaction. My signature also indicates that I have received a copy of this consent form.

Name of Subject:_____

Signature:_____

Date:_____

_____   _____
Signature of Person Obtaining Consent   Date

<u>Questions</u>

You have heard the above description of the research study. You have been told of the risks and benefits involved and, at this point, all of your questions regarding the study have been answered.

If you have any further questions about this study, you may contact the investigator, Dr. Pramod Bonde. If you would like to talk with someone other than the researchers to discuss problems, concerns, and questions you may have concerning this research, or to discuss your rights as a research subject, you may contact the Yale Human Investigation Committee at (203) 785-4688.

Appendix B

Yale Medicine   YaleNewHaven**Health**

Authorization for Access/Release of Information

Legal Name: _____   _____   ____   _____   _____
                (Last)   (First)   M.I. Preferred Name (Maiden/Other Name)

Date of Birth: _____   **Phone:** _____   **Email:** _____

_____
Complete Address (street or box#, city, state, zip)
This information is to be used for purpose of: ☐ Personal use ☐ Continuing care ☐ Legal ☐ Disability ☐ Workers Comp
☐ Insurance Eligibility/Benefits ☐ Social Security Card ☐ Other _____

I hereby authorize Yale New Haven Health/Yale Medicine entity(ies) named below to:

_____
☐ **RELEASE information from my medical record TO:** ☐ **OBTAIN information FROM:**

Name: _____   **Phone:** _____

Address: _____ **City/State:** _____ **Zip Code:** _____

Fax (optional): _____ **Email** (optional): _____

If medical records are being requested from an external provider/facility for patient care at YNHHS, please provide name of YNHHS location to send medical information:

YNHHS Provider Name: _____

Complete Address: _____

Fax Number: _____ Phone Number: _____

Method of Disclosure: ☐ MyChart (Must have active account)
☐ Mail ☐ Fax ☐ Secure Email ☐ Pick-up Please indicate how you would like to be contacted when ready for pick-up: _____

Visit Type: ☐ Admission ☐ Outpatient Surgery ☐ Emergency Dept. Visit ☐ Physician Office/Clinic ☐ Other _____

Location: ☐ Yale New Haven Hospital (York Street Campus/St. Raphael's Campus/Smilow Care Centers)

☐ Bridgeport Hospital (includes Milford Campus after 6/8/2019) ☐ Milford Hospital (prior to 6/9/2019) ☐ Greenwich Hospital
☐ NEMG Provider Practice Name: _____

☐ Yale Medicine Provider Practice Name: _____

Date(s) of Service: _____

Medical Information Requested:

☐ Abstract of Medical Record   (History & Physical Exam, Discharge Summary, Consult Report, ED Report, Operative Report,
  Pathology Report, Lab Results, Radiology Report)

☐ History & Physical Exam/HP   ☐ Lab Results   ☐ Stress Test   ☐ Consult Report
☐ Discharge Summary/DS   ☐ Radiology Report   ☐ Echocardiogram/EKG   ☐ Clinic/Office Notes
☐ Emergency Visits/ED   ☐ Pathology Report   ☐ Pulmonary Function Test   ☐ Medication List
☐ Operative/Procedure Report   ☐ Immunization Record   ☐ PT/OT/Speech Notes   ☐ Other _____
☐ Complete Medical Record *(Includes all of the above, plus nursing notes, ancillary notes, and consents. Excludes nursing
  flowsheets unless specifically requested).*

☐ Itemized Bill   ☐ Radiology Image(s): _____
                              Please note date and type

                                                 Reasonable cost-based fees apply.

HIV-BEHAVIORAL HEALTH- DRUG/ALCOHOL INFORMATION contained within the medical records indicated above will be released through this authorization unless otherwise indicated below. **(Medical records containing any of the protected information below must also be signed by the patient if a minor age 13 or older, with the exception of Behavioral Health, which also requires authorization by the patient if a minor age 16 or older.)**

Indicate which you do NOT want released with your initials:

_____ HIV _____ Substance Abuse (which includes Alcohol & Drug Abuse) _____ Pregnancy Test _____ Genetic Testing

_____ Behavioral Health/Psychiatric _____ Sexually Transmitted Disease _____ Other (please list) _____

I understand that:

- This authorization is valid for one year from the date below. I understand that after I have signed this form, I may change my mind and cancel (revoke) this authorization at any time by contacting in writing YNHHS Release of Information Services. Cancellation of the authorization will not apply to information that has already been released based on this authorization.

- The information disclosed in response to this authorization may be subject to re-disclosure by recipient, and will no longer be protected under the terms of this authorization or by federal privacy regulations. However, other state or federal law may prohibit the recipient from disclosing specially protected information such as substance abuse treatment information, HIV/AIDS-related information, and psychiatric/mental health information.

- That this authorization is voluntary and my treatment by YNHHS/Yale Medicine is in no way conditioned on whether or not I sign this authorization and that I may refuse to sign it. If I do not sign this form, payment for this care will only be affected if my health care insurer is requesting this information and is permitted to require this authorization.

- On request, I may review or have copied the information described on this form if I ask for it. There may be a charge for copies in accordance with Connecticut law.

- The parent or legal guardian must sign this authorization if the patient is a minor (under age 18) unless the records relate to treatment(s) for which the minor may provide consent under CT state law. If HIV, Behavioral Health, Drug/Alcohol information is included for a patient age 13 or older, the minor must sign as described above.

Return completed authorization by mail, fax, or email as designated below. Do not send medical records to this address.

Mailing Address:	**Yale New Haven Health** **Health Information Management** **Release of Information Services** **PO Box 9565** **New Haven, CT 06535**

YNHHS Hospital(s) Fax Number:	203-688-4645	**Email to: releaseofinfo-Hosp@ynhh.org**
NEMG Provider Fax Number:	203-200-1286	**Email to: releaseofinfo-NEMG@ynhh.org**
YM Provider Fax Number:	203-200-1287	**Email to: releaseofinfo-YM@ynhh.org**

Routine requests for medical records are generally processed within 10 business days. To contact a Customer Service Representative, please call 203-688-2231.

Printed Name: _____ Date: _____

_____
Signature of Patient or Authorized Representative
**must provide proof of authority (except parent of a minor)

Please check relationship to patient

☐ Self ☐ Parent ☐ Legal Guardian ☐ Executor/Administrator of Estate ☐ Healthcare Representative ☐ Conservator

☐ Other Authorized Legal Representative _____ (indicate)

_____	_____	_____
Printed Name of Minor (when applicable)	Signature of Minor (when applicable)	Date

Appendix C

                  Yale Medicine   YaleNewHaven**Health**

<u>Cardiac Self Efficacy Questionnaire</u>

Name: _____   Today's Date: _____
Date of Birth: _____   Date of Surgery: _____

How confident are you that you know or can:

    1. Control your chest pain by changing your activity levels

0	1	2	3	4
Not at all confident	Somewhat confident	Moderately confident	Very confident	Completely confident

    2. Control your chest pain by taking your medications

0	1	2	3	4
Not at all confident	Somewhat confident	Moderately confident	Very confident	Completely confident

    3. Control your breathlessness by changing your activity levels

0	1	2	3	4
Not at all confident	Somewhat confident	Moderately confident	Very confident	Completely confident

    4. Control your breathlessness by taking your medications

0	1	2	3	4
Not at all confident	Somewhat confident	Moderately confident	Very confident	Completely confident

    5. Control your fatigue by changing your activity levels

0	1	2	3	4
Not at all confident	Somewhat confident	Moderately confident	Very confident	Completely confident

    6. Control your fatigue by taking your medications

0	1	2	3	4
Not at all	Somewhat	Moderately	Very	Completely

                                                                                                          42

confident   confident   confident   confident   confident

7. When you should call or visit your doctor about your heart disease

0	1	2	3	4
Not at all confident	Somewhat confident	Moderately confident	Very confident	Completely confident

8. How to make your doctor understand your concerns about your heart

0	1	2	3	4
Not at all confident	Somewhat confident	Moderately confident	Very confident	Completely confident

9. How to take your cardiac medications

0	1	2	3	4
Not at all confident	Somewhat confident	Moderately confident	Very confident	Completely confident

10. How much physical activity is good for you

0	1	2	3	4
Not at all confident	Somewhat confident	Moderately confident	Very confident	Completely confident

11. Maintain your usual social activities

0	1	2	3	4
Not at all confident	Somewhat confident	Moderately confident	Very confident	Completely confident

12. Maintain your usual activities at home with your family

0	1	2	3	4
Not at all confident	Somewhat confident	Moderately confident	Very confident	Completely confident

13. Maintain your usual activities at work

0	1	2	3	4
Not at all confident	Somewhat confident	Moderately confident	Very confident	Completely confident

14. Maintain your sexual relationship with your spouse

0	1	2	3	4
Not at all confident	Somewhat confident	Moderately confident	Very confident	Completely confident

15. Lose weight (if overweight)

0	1	2	3	4
Not at all confident	Somewhat confident	Moderately confident	Very confident	Completely confident

16. Change diet (if MD recommended)

0	1	2	3	4
Not at all confident	Somewhat confident	Moderately confident	Very confident	Completely confident

Yale Medicine   YaleNewHaven**Health**

Baseline Characteristics Survey

Thank you for participating in this study. Please fill out the following to help determine baseline characteristics. All responses are confidential.

1. What is your age (in years)? _____

2. What is your gender? (Circle one) M / F

3. Circle if you have any/all of the following:

    a. Hypertension

    b. Congestive heart failure

    c. Chronic renal insufficiency

    d. Pulmonary disease

    e. Peripheral vascular disease

    f. Liver disease

4. What is your payer status? (circle)

    a. Medicaid

    b. Medicare

    c. Private

    d. Self/other

5. This surgery will be an [elective / nonelective] surgery (circle one)

Thank you for your cooperation!

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