The Development of an Educational Resource for Patients Post Myocardial Infarction

by © Reuben Bonnell

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Abstract

Background: In Newfoundland and Labrador, heart disease is the second leading cause of death (Botly, 2020). Patient education for this population is imperative to improve patients' health literacy and ability to self-manage their own heart disease. An informal needs assessment determined that Eastern Health needed an updated patient educational resource for this patient population. **Purpose:** To develop a patient resource for patients newly diagnosed with heart disease and admitted to hospital, to help this patient population better self-manage their heart health following discharge. **Method:** A literature review was completed to identify the benefits of patient education while in hospital and topics of information to include in this educational resource. As well, consultations were completed with staff and patients of a cardiac care unit. Finally, an environmental scan was completed for similar resources available elsewhere in Canada. **Results:** Key topics derived from the literature, included physical activity, healthy eating, mental health, and medications as being important components of patient education. The literature also showed that education received while in hospital leads to a lower rate of readmission for cardiac patients and better self-management. In consultation with staff and patients, it was determined that a gap existed in patient education regarding cardiac tests and procedures, explanations on heart disease and anatomy. It was also identified that it was necessary to provide this information in a patient resource. A review of resource manuals was made available by the Heart and Stroke Foundation and the University of Ottawa's Heart Institute. A patient resource manual that is 53 pages in length was developed to meet this need and includes information to address gaps in current patient education provided to cardiac patients admitted to hospital. **Conclusion:** This resource manual based on the literature, key themes and consultations will help patients to better understand their condition, be more prepared for tests

and procedures while they are in hospital and adopt healthy lifestyle changes that they are able to maintain post discharge.

Keywords: cardiac, patient, resource, patient education, heart disease, coronary artery disease.

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Table of Contents

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Coronary artery disease (CAD) continues to be a dominant health condition, in Newfoundland and Labrador (NL), across Canada and around the world. Heart diseases like CAD and other circulatory system diseases are the second leading cause of death in NL accounting for 31% of deaths. As well, heart disease accounts for 1105.53 per 100,000 of hospital admission in NL. This is the second leading cause of hospital admission in NL and the highest rate across Canada (Botly, et al. 2020; Newfoundland and Labrador Centre for Health Information, 2015; Statistics Canada, 2015). The high level of prevalence of CAD in NL emphasizes the need to focus on in-hospital patient education, to prevent further worsening of patients' heart disease and prevent readmission to hospital due to heart disease.

At present there is only one cardiac care unit that specializes in caring for and treating patients with heart disease in NL. The cardiology unit of the Health Science Centre (HSC) comprises 44 inpatient beds. Of these beds, 8 are dedicated to the special care unit, which primarily cares for post-operative cardiac surgery patients. The other 36 beds are used to provide care to patients experiencing varying acute cardiac issues such as heart failure, endocarditis, myocardial infarction (MI), cardiac arrhythmias, and valvular insufficiencies. Many of these patients experience multiple days in hospital waiting for diagnostic or interventional procedures such as angiography, percutaneous coronary intervention (PCI), cardiac echocardiogram, coronary bypass surgery, or valvular replacement surgery. Presently, there are educational resources for patients experiencing heart failure and patients who have had cardiac surgery readily available for nursing staff to provide patients during their stay on the cardiology unit.

However, at present, there is no educational resource available to provide patients that focus on living with and self-management of CAD.

The current practice for providing education to patients who are newly diagnosed with coronary artery disease on the cardiology unit, is inconsistent. The amount and quality of education each patient receives during admission is dependent on the experience of the nursing staff at the time of discharge. The registered dietitian is not always consulted for patients and if consulted, the registered dietician does not always get to see each patient before discharge. As well, patients are not always seen or consulted by physiotherapists before discharge.

There is a cardiac rehabilitation program staffed with physiotherapists, physicians, and a nurse coordinator. This program is in the field house on the campus of Memorial University. Patients require a consultation from the attending physician or nurse practitioner at the time of discharge. There is only one cardiac rehabilitation program in the province, and it is only available to those who live in the St. John's area. As well, there is an extensive wait list for patients to avail of this program. This educational resource will not replace the cardiac rehabilitation program. Rather, it will provide some guidance to patients who are unable to avail of the cardiac rehabilitation sessions on such topics as smoking cessation, medication adherence, dietary changes, and physical activity.

Objectives

The overall goal of the practicum project was to develop an educational booklet for patients who have been newly diagnosed with coronary artery disease. This booklet will act as a resource for patients throughout their admission and after they are discharged home.

The key practicum objectives were to:

1. Describe factors that influence patients' personal management of CAD in Newfoundland and Labrador.
2. Identify important information patients require to maintain a high quality of life while living with coronary artery disease based on consultations with key stakeholders.
3. Develop an education resource for patients newly diagnosed with CAD.
4. Demonstrate advanced nursing practice competencies: clinical, research, leadership, and consultations and collaboration.

Overview of Methods

This practicum project encompassed a 3-part process that led to the development of a patient educational resource for patients diagnosed with a MI and admitted to hospital. The first step in this practicum project was a review of the literature regarding patient education and the benefits of education for CAD patients received while in hospital. The guiding questions for this literature review was what are the benefits of a patient education resource for patients living with CAD? Also, can cardiac education that is provided while in hospital promote healthy lifestyle changes? This literature review was completed using Google scholar, CINAHL, and Pubmed. Search terms include "health literacy", "patient education", "patient discharge education", "healthy lifestyle", "secondary prevention", "patient experience", "medication adherence", "coronary artery disease", "myocardial infarction", "cardiac rehabilitation", "acute care", and "self-care". MeSH terms include: "cardiovascular disease", "patient education", "hospitalization" and "cardiac care". Journal articles were included if published between 2015 and 2021, written in English, focused on patient education and how patient education affects management and knowledge of CAD. Studies were completed in different areas around the

world including the United States, Europe, China, and Australia. No studies found were completed in Canada. The strength and quality of the studies included were determined using Public Health Agency of Canada's (PHAC) (2014) critical appraisal tool kits. The quality of the qualitative studies was determined by using the Joanna Briggs Institute's (JBI) (2020) "checklist for qualitative research".

The second step involved consultation with the staff of the cardiology unit, including nursing, medical physicians, physiotherapy, occupational therapy, and registered dieticians. This consultation also included CAD patients who were admitted to the cardiology unit. Consultations were completed using two questionnaires that were developed for this practicum project. One questionnaire was used to gather data from the staff of the cardiology unit. The second questionnaire was developed to gather information from patients admitted to the cardiology unit. Also, an informal interview was completed with the clinical educator for the cardiology unit regarding educational practices on the unit, current resources in place, and personal experience in providing patient education.

The final step of this practicum project development was the completion of an environmental scan of resources that are already available across Canada. This involved the review of resource manuals made available by the University of Ottawa's Heart Institute (UOHI) and the Heart and Stroke Foundation (HSF).

Summary of the Literature Review

To gather more information regarding cardiac health and patient education, the scope of this literature review (found in appendix A) was expanded to include cardiac rehabilitation programs and its benefits for patients with heart disease. With this expansion, 9 themes emerged

from this literature review which were divided into 3 categories. The first category encompassed benefits for patient education which included the themes health literacy, self-management, and admission rates. The second category identified topics to include in the education manual. This category involved information regarding healthy lifestyle changes, mental health, and patient perspective. The final category discussed resource development strategies which included the themes cardiac rehabilitation, rural setting, and technology.

Benefits of Patient Education

This category of themes discusses the role and benefits of patient education in the improvement of patient knowledge and management of their heart disease. These themes include improvement of health literacy levels, self-management skills and lower admission rates.

Health Literacy

Health literacy of patients is an emerging and important topic throughout healthcare. Having a level of health literacy contributes to the patient's ability to manage their own heart disease. Those who have a good understanding of their health condition are more likely to have better outcomes. An important part of the nursing process is improving patient's health literacy. Throughout the literature, patient education strategies were shown to be effective in educating patients and increasing their overall health literacy. While there were no studies that were found that focused on patient education received while in hospital, cardiac rehabilitation programs that took place during hospital admission or post hospital admission, were found to be effective in improving patient health literacy levels and decreasing the patient's chances of experiencing a second heart attack (Mattson, et al. 2015, Liu, et al. 2018). Furthermore, studies like those completed by Son & Yu, (2016) and Tschaftary, et al. (2018) found patients who had received

short sessions of education regarding heart disease still showed improvement in adopting healthier lifestyles.

Self-management

Providing patient education while in hospital is an integral aspect of patient care. It not only provides patients with information so they can make informed decisions, but it also assists with encouraging patient inclusion and self-efficacy in managing their health condition. There were several research studies that supported patient education received while in hospital. It was found to be effective in improving the self-management and skills of patients with chronic diseases such as diabetes. This is applicable to heart disease as it is also a chronic condition. For example, in Lu, et al. (2018) study, knowledge gained from education provided by healthcare professionals was found to improve self-management skills and self-efficacy of patients with diabetes. The education received while in hospital prepares patients to eventually return home and begin to make changes in their day-to-day health practices.

Admission Rates

One of the main objectives for providing patient education while in hospital, is to prepare the patients for life after returning home. It was found throughout the literature that effective patient education can lower the risk of experiencing another heart attack and requiring readmission to hospital. A study conducted by Bailey, et al. (2015) found that patients who were provided with even basic information about heart disease, had a decreased risk of 21% of needing readmission to hospital 30-days after discharge. Patients who received education while in hospital were shown to decrease readmission rates as they obtained a better understanding of their health condition, importance of medication adherence, and adopting a healthy lifestyle.

Topics to Include in the Education Manual

In addition to discovering the benefits of patient education, this literature review was conducted to determine what information is required in a manual for patients who have experienced an MI. Inclusion of the patient's perspective was also important in the development of this manual. Finally, Healthy lifestyle changes and modifications as well as mental health were found to be important topics of education for this patient population.

Healthy Lifestyle

There are several factors that can put an individual at risk for experiencing an MI. These risk factors include age, gender, heredity, and ethnicity. While there are uncontrollable risk factors, there are risk factors that can be modified to decrease the risk of experiencing an MI. These include diet, physical activity, adhering to medications and smoking cessation. To lower a patient's risk for experiencing a second MI, the patient must understand the importance of maintaining a healthy lifestyle. In-hospital education and other strategies like cardiac rehabilitation programs have shown to improve patients chances of achieving and maintaining a healthier lifestyle. After receiving this education, patients have been noted to have lower levels of cholesterol (Abbasi, et al. 2018, Ruiz-Bustillo, et al. 2019), improved heart function (Zhang, et al. 2018), increased activity levels (Zhang, et al. 2018), increased weight loss (Podvorica, et al. 2020), high levels of medication adherence (Thomson, et al. 2020), and improved success with quitting smoking (Badrooh, et al. 2020). Overall, patients who received education regarding healthy lifestyle changes have less of a chance of experiencing a second MI compared to those who do not receive any education (Fu, et al. 2019). Therefore, it was proven to be imperative that

this educational resource needed to include basic tips, guidelines, and information to assist patients in developing a healthier lifestyle.

Mental Health

Information on mental health and heart disease was also noted to be important throughout the literature. There is a high linkage between depression and anxiety disorders and heart disease (Celano, et al., 2016). Therefore, it was important to include information on depression and anxiety and their link to heart disease to better equip patients in managing their mental health. Many studies showed improvement in Hospital Anxiety and Depression Scale-anxiety (HADS-A) and Hospital Anxiety and Depression Scale-depression (HADS-D) scores after patients received education from healthcare staff or participating in cardiac rehabilitation programs (Nie, et al. 2019; Norlund, et al. 2018).

Patient Perspective

Throughout the literature, it was apparent that inclusion of the patient's perspective needed to be incorporated during the development of this educational resource. For information to be retained, the information must be meaningful to the patient and applicable to the patient's current situation and learning needs (Falun, et al. 2015). It was shown in Falun et al. (2015) that patients admitted to hospital are most concerned with their present situation, and what is going to happen to them in the immediate future. This included providing patients with information regarding decisions and actions they needed to take to prevent another heart attack from happening again. In addition to understanding their cardiac health, such as anatomy and causes of a MI, patients also reported wanting to know what they could do to improve their cardiac health upon returning home from hospital (Falun, et al. 2015).

Resource Development Strategies

In addition to researching the benefits of education for patients with heart disease and what topics should be included in a resource for heart disease patients, educational and resource development strategies were also included in this literature review. These strategies included cardiac rehabilitation, technology-based strategies and strategies being used in rural areas.

Cardiac Rehabilitation

Overwhelmingly, Cardiac Rehab programs have proven to be the most effective form of patient education for patients with heart disease. It was shown in numerous research studies to be effective in improving patient outcomes, adherence to a healthy lifestyle, and improved heart function. It was also found in Nie's (2019) study to improve patient's depression and anxiety levels. The implementation of cardiac rehab programs has also been found to be effective in improving patients' health literacy and decreasing readmission rates to hospital. However, as effective as cardiac rehab programs are, accessibility to cardiac rehab programs is a problem in NL as there is only one program in the province which is in the province's capital.

Rural Setting

Rurality was an important concept to include in the development of this education resource, as NL has a high percentage of its population living in rural areas. Surprisingly, there was little literature that focused on rural areas and providing patient education to those who live in rural areas. Furthermore, there were no studies found that focused on rural areas and heart disease within Canada. There was only one study found that focused on providing patient education to rural populations which showed only 33% of rural programs having access to multidisciplinary supports (Hamilton, et al. 2018). However, there were studies that, while not

rural based, use community and telehealth-based strategies to provide heart disease education (Barnason, et al. 2019; Zhang, et al. 2018). These studies were successful in providing education to patients with heart disease.

Technology

Technology was also an emerging theme during this literature review. There were different strategies identified which provided patients with education. Some of the strategies included videos, smartphone apps, and remote patient monitoring (Johnston, et al. 2016; Murphy, et al 2020; Princy, et al. 2020; Wischer, et al. 2018). The most successful technology-based strategy were videos. While patients did report educational videos improved their understanding of heart disease, the findings of these studies were not found to be significant. There is potential to use these technology-based strategies in NL. However, the use of technology-based education in Newfoundland is problematic as there is currently no infrastructure or accessibility at present to facilitate these strategies. As well, in older populations, the use of technology may be seen as a deterrent or barrier to accessing information.

Summary of Consultations

There were two consultations groups completed for this practicum project. These consultations (found in appendix B) were completed using two questionnaires that were developed to gather data from both the cardiology staff and admitted patients. The first consultation was with the cardiology staff including physicians (n=1), nurses (n =15), nurse practitioners (n=2), and allied healthcare professionals (AHP) (n=3) such as physiotherapists, occupational therapists, and registered dietitians. The second consultation was with patients who

were admitted to the cardiology unit and were waiting for a Cath Lab appointment. At the time that patient consultations were completed, there were not many patients waiting for dye test. Therefore, the scope of consultation was expanded to include patients that had a dye test completed but were referred for coronary bypass surgery (n=14).

Staff Consultation

Presently, the staff (n=21) on the cardiology unit are new to the cardiac care program with 71% of the staff having less than 5 years of experience, which can negatively affect aspects of performing patient education. Not all patients would receive the same amount of education nor the same quality of education. Furthermore, most staff (85%) reported spending less than 50% of their workday providing patient education. However, 95% of the staff members reported being either somewhat comfortable or extremely comfortable in providing patient education. This indicates that while teaching sessions were short in duration, it was effective in providing concise information to patients regarding aspects of their hospital stay, at least from the staffs' point of view.

There were several challenges and barriers that were identified by staff. The most common challenge to providing patient education was time. Staff felt there were many expectations placed on them by management and the healthcare organization. As well, staff expressed difficulty managing time between patients when trying to provide patient education, patient care, and other workplace duties. This was reported by both nursing staff, AHP, and physicians.

Resources availability for the staff was found to be important. Participants identified that there was a lack of informational resources on the unit for staff to provide to patients. Staff find

that current resources are either ineffective in providing information to patients or are difficult to find or access. Furthermore, the AHP experienced only receiving referrals immediately before discharge and did not get to provide education to patients before leaving the hospital. Therefore, resulting in the under utilization of AHPs in patient education.

Another challenge that staffs reported was the varying levels of patient education, level of understanding and support for patients. Staff had trouble identifying different ways to deliver information to patients who have different learning needs or challenges. As well, both nursing and AHP, reported patients are more focused on the acute stage of their heart condition. Staff were concerned that while patients are provided information, they may not be retaining the information.

There were two topics of education that were identified by staff as important. The first topic being the patient's heart condition. This included topics like function of the heart, heart anatomy, and information regarding tests and procedures. The second major topic was healthy lifestyles, and healthy lifestyle adherence. This primarily referred to health dietary adherence, physical activity, and importance of medication adherence. As well, staff were asked what format of educational resource they would like to provide patients. The top answers were manuals, booklets, pamphlets, and/or information printed from the intranet. Staff want to provide patients with something in hand that patients can refer to while in hospital and when they return home.

Patient Consultation

There was a total of 14 patients that completed and returned the surveys for this consultation. 80% of the patients that participated in this consultation were between the ages of

50 and 69 and 80% of the participants were male. Most of the patients were satisfied with the level of education they had received while in hospital, with 60% of patients being either satisfied or very satisfied. 60% of patients also reported receiving less than 30 minutes of education time with staff. Which means, while patients received only short periods of education, they were satisfied with the education they received.

Patients were asked what information should be included in an educational resource. 80% identified tests and procedures as being important and 60% identified heart disease and medication as being important topics of education. Diabetes was also identified as being important to patients in this consultation, as it was identified by 42% of participants. However, after discussion with the clinical educator of the cardiology unit, it was decided to exclude the topic of diabetes because of the broad amount of information that would be required to provide for patients. As well, there are resources already available for patients regarding diabetes such as diabetic educators and resource manuals, therefore making inclusion of diabetes in this resource manual redundant.

Environmental Scan

The purpose of the environmental scan (found in appendix B) was to review what information was available and already in place for patients with CAD. Two resources were reviewed, these included the UOHI resource manual "Coronary Artery Disease and Recovery After Heart Attack" and the resource manual titled "Living Well with Heart Disease: A Guide for People with Coronary Artery Disease" offered by the HSF.

Both resources were similar in what information was provided. Both resources provide information regarding CAD, anatomy, and risk factors. As well, both provide information for

making changes to have a healthier lifestyle. Topics such as, diet and eating habits, physical activity, smoking cessation, sexual health, mental health, and information regarding common medications for people with heart disease was providing in both resource manuals.

There were differences between the two resources. The HSF resource is 104 pages long. The information in the HSF manual is broad covering different heart conditions such as MI, valvular diseases, heart failure, and heart arrythmias. While this guide is rich with information, it is also very dense and at times difficult to read. It also uses language that could be difficult for people with lower education levels to understand. Also, information regarding tests and procedures was not provided by the HSF resource manual. As for the resource manual made available by the UOHI, it does provide information on tests and procedures that are experienced by admitted patients while in hospital. The UOHI's manual is less dense and more focused on providing information that is needed for day-to-day living. Furthermore, it is easier to read allowing for patients with different education levels to avail of its information.

After reviewing each resource, the UOHI was contacted to obtain permission to use and adapt their educational resource to fit the patients' needs and the specific functions of the cardiac care program in NL. After obtaining permission to adapt the educational resource from the UOHI, there were some changes that needed to be made to fit the practices of the cardiology unit. Information was added that was specific to the Cath Lab appointments and other tests and procedures that are done in NL. As well, changes were made to the healthy diet section to make it more applicable to the traditional diet practices in NL. Changes were also made to the physical activity section. Information for physical activity was limited to the first 6 weeks post discharge

from hospital, as to help patients return to baseline activity safely or to prepare patients to become more physically active.

Summary of the Resource Developed

The educational resource that has been developed for this practicum project is titled "Recovering from a Heart Attack: Information for in Hospital and Going Home" (found in appendix C). It is 53 pages long with 10 sections. Material included in this resource is aimed to guide patients from the day of admission to hospital, to when patients return home from hospital.

Heart Anatomy and Disease

The heart anatomy and disease section provided specific information regarding the structure and functions of the heart including a diagram of the heart labeled with its major arteries. A description of the common heart diseases such as atherosclerosis, angina, unstable angina, and heart attacks are provided. In addition, an analogy of the structure of a house is provided to explain the function of the heart in a way that may be more relatable to a larger variety of patients. As well, uncontrollable risk factors such as age, gender, heredity, and ethnicity are reviewed and controllable risk factors like diet, body weight, physical activity, and blood pressure are also reviewed.

Tests and Procedure

In accordance with the findings of both the literature review and consultations that were completed for this practicum project, information is provided for tests and procedures that may be completed while in hospital. These include an electrocardiogram (ECG), an echocardiogram, a multigated acquisition (MUGA) scan, ventriculogram, persantine myoview, stress test,

percutaneous coronary intervention (PCI) and angioplasty. Emphasis is placed on PCI and angioplasty as these are the most invasive and common procedures that are completed for patients diagnosed with an MI. A step-by-step description of a typical Cath Lab appointment is also provided to prepare patients for this process. Diagrams are then provided explaining the process of placing a stent.

Healthy Lifestyle

Providing information on adoption of a healthier lifestyle is important in the management of heart disease. Healthy lifestyle changes include the controllable risk factors. This section of the resource manual provides guidelines, tips, and information on how patients can make changes in their lives to help prevent a recurring MI or worsening of their overall health.

Diet

The healthy eating section starts with a table that provides tips for changing eating habits such as cooking more at home, as well as changing how and when patients should eat. Pictures are provided through this section to visually break up the amount of information and to maintain patients' interest in the information provided. Guidelines for a healthy diet are also provided. This section is divided into food groups such as fruits and vegetables, grains, meats and alternatives, and dairy. Information regarding salt, desserts, snacks, alcohol, caffeine, and tips for eating from restaurants is also provided.

Physical Activity

Physical activity and exercise are an important part of recovering from an MI. This section includes guidelines on how to gradually increase activity after returning home from hospital. Activities are presented in a way that allows for gradual progression in activity from

week one to week six post discharge. As well, guidelines for a walking program are provided. This section is also designed to promote a gradual increase in activity and was developed with the elderly in mind as well as patients who were not physically active prior to admission to hospital.

Mental Health

Mental health and heart disease is also discussed. This is a topic that is less frequently addressed by staff, and patients may not realize the link between mental health and heart health. Patients also may not recognize that they have developed symptoms of mental health issues like depression or anxiety when this is often a common occurrence after experiencing an MI. Therefore, a list of common symptoms of depression and anxiety can be found in this section. As well, tips and guidelines regarding management of heart disease, depression and anxiety disorders were provided.

Other Topics

There are a number of other topics of education provided in this resource. This includes information on topics such as smoking cessation, how smoking affects the body, the importance of quitting smoking, and resources to help quit smoking, is discussed. Medication information is also provided such as common medication names, purposes, and potential side effects. Information regarding maintaining a healthy sex life is also provided. This section was important to include as many patients may have questions regarding sexual health but may not ask their healthcare team about their sex life or any restrictions that may be caused by their heart condition. At the end there is space provided for patients to write notes and questions for their

health care team. Finally, a list of other resources is provided should patients want further information on any topic covered in this resource manual.

Discussion of Advanced Nursing Practice (ANP) Competencies

Advanced nursing practice is an umbrella term used to describe the advanced level and skills of graduate level nurses. There are four competencies that outline the characteristics of advanced nursing practice for these nurses. These include clinical, research, leadership, and consultation and collaboration competencies. This section will discuss how these competencies were met throughout the development of this practicum project.

Clinical

The clinical competencies are defined as being able to work in partnership with the client and other members of the healthcare team in providing care. A nurse must be able to use qualitative and quantitative data from multiple sources to initiate and manage change. This was demonstrated in the completion of the literature review of this project. Information was gathered from both qualitative and quantitative research studies to initiate the process of developing a resource manual. Clinical competencies also require Advanced Practice Nurses (APNs) to be able to analyze the interactions of sociological, psychological, and physiological processes and the client's lived experience. This was shown in the consultation stage of the practicum, as consultations with patients were completed to gain an understanding of their experience in waiting for a Cath Lab appointment. Furthermore, these consultations described how interactions with staff may have affected patients' knowledge of heart disease and their ability to self-manage their heart condition. As well, APNs must be able to explain the wide range of client responses to health problems. Demonstration of this competency can be found in the resource manual that

was developed. This is emphasized in the mental health section where common feelings of depression and anxiety are explained for patients that may experience them after being diagnosed with an MI.

Research

To meet the research competency, a nurse must be able to generate, synthesize and apply evidence that is found in research. In this practicum, a review of the literature was included to determine what topics were important to include in a resource. As part of the literature review process, large amounts of information needed to be synthesized and ultimately applied to the development of this patient resource manual. Also, consultations were completed with staff and patients of the cardiology unit. During the consultation process, questionnaires were developed and used to gain information regarding the educational processes of the cardiology unit. Furthermore, the data that was collected from these questionnaires was then analyzed, interpreted, and applied to the development of the resource manual. As part of the research competency, advanced practice nurses must also disseminate evidence-based findings. While this competency is only partially met by the completion of a presentation to the nursing faculty, more work must be done. Plans for implementation and dissemination are outlined in the "Next Steps" section of this practicum report which includes plans for this resource to be used at hospital, regional, and provincial wide levels.

Leadership

APNs must demonstrate leadership competencies in their practices. They must be agents of change and must be continuously seeking ways to improve delivery of care and aim to shape their organization in a way that benefits the public. By extension of delivery of care, this practice

was aimed to improve the delivery of patient education. The primary goal was to develop a patient education resource manual to improve nurses' practice of providing patient education on the cardiology unit. This is in line with fulfilling this competency by identifying the learning needs of nurses and members of the multidisciplinary team and developing a resource to meet these needs. This was also done through completion of the consultations with medical, nursing and AHP staff members. Another leadership competency that was demonstrated during this practicum project was being able to contribute to an organizational culture that supports professional growth and collaborative practice. This effectiveness of this project and its quality was heavily dependent on the collaboration with a multidisciplinary team. Input was gathered from physicians, nurse practitioners, physiotherapists, registered dietitians, occupational therapists, and nurses to ensure this educational resource would be effective and useful.

Consultation and Collaboration

Finally, being competent in completing consultations, collaborating with other members of the healthcare team, and having open communication with team members and patients is an important part of advanced nursing practice. This competency was also met in the completion of the consultation process with staff and patients of the cardiology unit. As well, once the resource manual was developed, further collaboration with members of the multidisciplinary team took place. Team members were asked to review the resource manual and provide feedback and recommendations for ways to improve the manual. Feedback from the team members was then applied and incorporated into the final version of the resource manual.

Next Steps

The first steps to implement this resource is to present it to the manager of the cardiology unit and to seek approval from the Eastern Health Evaluations Proposals Approval Committee to complete a pilot of the resource on the unit. A pilot study will then be implemented on the cardiology unit, which will involve staff and patients, for approximately six months. Staff will be asked to provide the manual to patients and a questionnaire will be included in the resource for patients to complete. Patients will be asked to complete and return their questionnaires before or after discharge from hospital. To inform and introduce the resource to the staff, staff huddles will be used. These are completed twice a week on the cardiology unit and are approximately 20 to 30 minutes long. They are used to address unit issues and educational needs such as the introduction of new resources or practices. Once feedback is received from patients and staff, changes will be made to the resource as needed.

For further dissemination of this resource, after receiving feedback from staff and patients, an application will be submitted to participate in next year's Eastern Health's "Living Lab Health Innovation Summit". This will be done to introduce key stakeholders to the resource manual. As well, an email will be sent to notify Eastern Health employees and physicians of the development and use of this resource. The target group of this email would include, but not limited to AHPs, registered nurses on other nursing units besides cardiology, nurses working in preadmission clinics, and public health nurses.

The goal of this resource manual is to provide it to patients across the province as they are admitted to hospital and waiting for a dye test. The participation in Eastern Health's "Living Lab Health Innovation Summit" will help reach this goal. However, to further reach this goal,

information regarding this manual and a copy of the manual itself will be sent to clinical educators across the province.

Conclusion

Patient education is an important aspect of nursing practice. Patient education is an important first step in preparing patients to manage and live with chronic conditions like heart disease. However, nursing staff must be equipped with the tools and resources needed to provide high quality and effective information to their patients. This practicum project included a multi-step process and development of an educational resource manual for patients who have been diagnosed with an MI. This process began with a review of the literature on in-hospital patient education and the self-management of heart disease. The literature supported the effectiveness of resource manuals for patients with heart disease, provided topics of education for patients, and emphasized the importance of including patients in the development of educational resources. The next step involved gathering feedback from those who would be availing of the resource manual, the staff of the cardiology unit and patients who have been diagnosed with an MI and admitted to hospital. These consultations with key stakeholders were imperative in the development of this resource. Consultation with nursing staff also supported the need for an educational resource and identified challenges to providing patient education. Consultation with AHP's ensured the resource was accurate and of high quality. As well, consultations with patients ensured the resource was applicable to them and met their needs. The third step in this practicum project was the completion of an environmental scan to evaluate what resources are already available. From this environmental scan, information from the UOHI's resource manual

for patients with coronary artery disease proved to be appropriate and applicable to the cardiac care program in NL.

While the process for the development of this resource manual has been long and tedious, the work of this practicum is far from done. Now the resource manual must be piloted, implemented, and evaluated before it is officially incorporated into the day-to-day practices of patient education on the cardiology unit. As well, once the implementation and evaluation processes are completed, there are plans to further disseminate this resource on a local, regional, and provincial wide basis. This resource manual has the capability to not only improve the practices of patient education for nurses, but also improve the health literacy and self-management skills of patients with heart disease. This in turn assists patients in experiencing better long-term outcomes after returning home from hospitals.

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Appendix A: Literature Review

The Importance of Patient Education in Patients with Coronary Artery Disease: A Literature Review.

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Glossary

Term	Definition
Cardiac Rehabilitation	Cardiac rehab is a medically supervised program designed to improve patients' cardiovascular health who has experienced a myocardial infarction, heart failure, angioplasty or heart surgery. This includes counselling for physical activity and other healthy lifestyles changes.
Coronary Artery Disease	The result of a buildup of plaque along the walls of the coronary arteries and causing narrowing of the arteries affecting blood flow, nutrients and oxygen supply to the muscles of the heart. Also used as an umbrella term to refer to types of myocardial infarctions and angina.
Education Resource	Any material such as books, Pamphlets, posts, or audio-visual which provided information that assists in simplifying the teaching-learning process.
Healthy Lifestyle Changes	Adoptable new, healthier habits that can help protect an individual from serious health problems from happening or reoccurring. This can include a change in diet, increase in physical activity or quitting smoking.

Health Literacy	An individual's ability to comprehend, evaluate and communicate information as a way to promote, maintain and improve their health.
Medication Adherence	The extent to which a patient takes their medication as it is prescribed by their doctor. This included getting prescriptions filled, taking medication as directed and understanding directions of taking medication.
Percutaneous Coronary Intervention (PCI)	Also known as angioplasty or dye test, is a non-surgical procedure that uses a catheter to place a stent in the coronary arteries to open up narrowed areas of the arteries, caused by plaque buildup.
Quality of Life	The standard of health, comfort, and happiness experienced by an individual or group.
Readmission	The process or fact of being admitted to a hospital again. Many researchers look at readmission rates within 30 days from being discharged the first time.

The Importance of Patient Education in Patients with Coronary Artery Disease: A Literature Review.

Coronary artery disease (CAD) has been a dominant health concern in Canada and around the world. CAD continues to be the leading cause of death in multiple countries including Canada. This has led to an increased number of patients being admitted to acute care units with diagnoses such as ST segment elevation myocardial infarction (STEMI) and Non-ST segment elevation myocardial infarctions (NSTEMI). As a result, the number of percutaneous coronary interventions (PCI) that are being performed on a daily basis, is also increasing (Agarwal, et al.2017). As of 2018, heart disease was the second leading cause of death in Canada and one of the leading reasons for hospital admission (Canadian Institute for Health Information, 2021; Public Health Agency of Canada, 2018). This trend continues to be showcased in Newfoundland and Labrador (NL) where the current rate of admission for cardiovascular diseases are the highest in Canada at 1105.53 per 100,000 (Botly et al. 2020). To improve and reduce the rate of cardiovascular diseases in NL, healthcare providers must improve and implement informational resources for these patients throughout the province (Anderson, et al. 2018).

Patient education is important in any situation. Education allows for the prevention of worsening health status of patients with chronic diseases such as CAD. There is a common misconception that with the placement of stents in coronary arteries, patients' heart disease is cured and is therefore not considered a chronic illness (Anderson, et al. 2018, Botly et al. 2020). CAD requires life-long and ongoing management in order to prevent patients from experiencing a second cardiac event (Piepoli, et al. 2016; Tusa, et al. 2020). In order to prevent the worsening of CAD, patient education is instrumental in ongoing management of CAD as it encourages

behavioral change. This means patient education is imperative to encourage the adoption of healthy lifestyle changes needed in order to manage CAD. This is especially important in NL where there is a significant rural population and a lack of access to resources (Hamilton, et al. 2018; Makelarski, et al. 2019; Scheckel, et al. 2020). Therefore, it is important for patient education to be initiated as early as possible after being diagnosed with CAD (Anderson, et al. 2018, Liu, et al. 2018; Wischer, et al. 2018). Hospital admission, while waiting PCI, is an excellent time to initiate this education. By providing patients with a resource during admission, nursing staff are able to optimize education with patients during admission and prepare the patient for discharge (Anderson, et al. 2018; Ding, et al. 2016; Yang, et al. 2020)

The current practice to providing education to patients with CAD is either a referral to the cardiac rehabilitation (CR) program and/or information received from the assigned nurses that a patient has throughout their admission. At present there is only one CR program in NL which is only offered in St. John's. The CR is a team which is made up of three general practicing physicians, two physiotherapists, and a nursing coordinator. In order for patients to attend the CR program they do require a referral from a physician. This referral is traditionally done by the attending cardiologist or nurse practitioner at the time of discharge. However, not all patients who are discharged with a diagnosis of CAD, receive a referral for CR. The reasons for not referring a patient to CR varies from the year long waitlist, to where the patient lives, to the patient refuses the referral.

The amount and quality of education that a patient receives during their stay on the acute care unit for cardiology (5SA) is not consistent. Patient education is dependent on the experience of the assigned nurse and their interest in providing patient education. There are booklets and

pamphlets with information available for patients regarding some cardiac diseases such as heart failure and patients who have had open heart surgery. However, there is no current and up to date patient resource for patients going home after experiencing a myocardial infarction (MI) and receiving PCI for stent placement. As well, patients who have experienced an MI and receive PCI are referred to the unit dietician. The dietician works Monday to Friday and from 8 in the morning to 4 in the afternoon. The dietician does not get to see all patients especially if they are admitted on Friday and then discharged on Sunday or Monday. Education with the dietician lasts approximately 15 to 20 minutes and occurs at the bedside. As for other allied healthcare professionals, patients are not seen by physiotherapy, occupational therapy, or social work unless the patient is referred for assessment by the assigned nurse.

The primary purpose for this literature review is to examine the current literature surrounding cardiac health, benefits of patient education, and how cardiac education can benefit patients in the management of their cardiac disease. In this literature review, I will discuss the benefits that patient education can have on the management of CAD after returning home from hospital. This will include topics such as cardiac rehabilitation, patient self-management, and patient experience and the importance these factors have on management of CAD out of hospital. This goal of this literature review is to support the need of a patient education resource for the only cardiology nursing unit in NL. Therefore, I will also discuss rurality and how it can influence CAD management. Finally, I will include a discussion on patient education resource development and what a patient education resource should encompass. The hypothesis for this literature review is patient education during and after hospital stay is important to patient knowledge and management of CAD. With this literature review, I will show there is a need for

a patient education resource for CAD and that it will be beneficial to the management of CAD out of hospital.

Guiding Theory

The guiding theory for this literature review is Orem's self-care deficit theory of nursing (Denyes et al. 2001). Orem's theory of self-care emphasizes providing support and education for patients in order to promote their self-care and self-management. The theory of self-care is suitable to guide this literature review as it fits with the purpose of resource development to better prepare patients to live with CAD after discharge from hospital.

Search Strategies

The guiding questions for this literature review were what are the benefits of a patient education resource for patients living with CAD? and can cardiac education that is provided in hospital promote healthy lifestyle changes? This literature review was completed using Google scholar, CINAHL, and Pubmed. Search terms include "health literacy", "patient education", "patient discharge education", "healthy lifestyle", "secondary prevention", "patient experience", "medication adherence", "coronary artery disease", "myocardial infarction", "cardiac rehabilitation", "acute care", and "self-care". MeSH terms include: "cardiovascular disease", "patient education", "hospitalization" and "cardiac care". Journal articles were included if published between 2015 and 2021, written in English, focused on patient education and how patient education effects management and knowledge of CAD. The strength and quality of the studies included were determined using Public Health Agency of Canada's (PHAC) (2014) critical appraisal tool kits. The quality of the qualitative studies was determined by using the Joanna Briggs Institute's (JBI) (2020) "checklist for qualitative research".

A total 342 articles were found through the literature review process. The relevance of the article was determined through review of article abstracts. 41 articles were identified as being applicable to the topic for this literature review. Randomized controlled trials (RCT), cohort studies, and uncontrolled before and after (UCBA) studies were used in most of the research studies. 6 studies were found where qualitative research methods such as phenomenology were used in order to explore patient perceptions and values of receiving education regarding CAD and disease management. Studies were completed in different areas around the world including the United States, Europe, China, and Australia. No studies found were completed in Canada.

Literature Review

The aim of this literature review is to gain an understanding of what information is important for patients with CAD to better manage their CAD at home. This section will discuss the key topics that were found throughout the literature review process. This includes: (a) health literacy; (b) gender; (c) cardiac rehabilitation; (d) healthy lifestyle changes; (e) self-management; (f) mental health; (g) rural setting; (h) education strategies; and (i) patient perspective.

Health Literacy

Health literacy is a newly emerging topic throughout the healthcare environment. Having a high level of health literacy is important to a patient's self-management of CAD. Patients who have a good understanding of their individual health are more likely to experience better outcomes (Gonzalez-Chica, et al. 2016; Mattson, et al. 2015; Schaik, et al. 2017; Peltzer, et al. 2020). Improving the patient’s health literacy is an important part of the nursing process. The time spent in hospital is an excellent and convenient opportunity for nurses to provide much needed education to patients regarding management of CAD.

There are a number of benefits for patients with CAD who have a basic level to high level of health literacy. The first benefit that was found was lower rates of readmission to hospital. Bailey, et al. (2015) completed a retrospective cohort study involving 696 patients in different hospitals between North Carolina and Illinois. In this study patients who had at least a basic level of health literacy regarding CAD had a 18% lower risk for readmission and a 21% lower incidence rate of readmission within 30-days of discharge, compared to those who had a low level of health literacy (Bailey, et al. 2015). The findings of Bailey, et al. (2015) was based on a predictive model which may have affected the accuracy of the study's findings. Lu, et al. (2018) used a cross-sectional study to study health literacy of 598 patients in 2 hospitals in China. In this study, patients who had a low level of health literacy regarding CAD were more likely to fail to adhere to a healthier lifestyle (OR 1.69) (Lu, et al. 2018). Although Lu, et al. (2018) used a strong study design, the study also used a convenient sample thereby decreasing the generalizability of the findings in populations outside of China.

These studies revealed very little information regarding the impact that education received during hospital admission had on patients' health literacy. However, in Mattson's, et al. (2015) cohort study (n = 191) that looked at health literacy of patients at the start of a CR program and at the end of the CR program found improvements in health literacy levels. Participants were found even those who had high levels of health literacy at the beginning of the CR program ($r=0.46$, $p<0.001$), but still experienced a gain in cardiac knowledge through participation in the CR program ($r=0.41$, $p<0.001$). These findings could be applied to the hospital setting as education is provided from a similar multidisciplinary team. However, Mattson, et al. (2015) used a convenient sample from one site decreasing the generalizability of

the findings. Furthermore, some of the participants had already started a CR program before completing the pre-test, potentially affecting the baseline test scores of the participants. Nonetheless, these findings also show that no matter the level of health literacy, patients can still benefit from education regarding CAD management (Mattson, et al. 2015; Son & Yu, 2016; Tschaftary, et al. 2018).

Gender

Many research studies have been completed to help understand risk factors for patients who are most likely to not adopt a healthier lifestyle in order to manage their CAD and prevent another cardiac event. These risk factors include gender, a diet consisting of high sodium and fat levels, and an inactive lifestyle (Jung & Yang, 2021; Kahkonen, et al. 2017; Perera, et al. 2021; Schutter, et al. 2018; Tschaftary, et al. 2018).

The comparison of genders has been well documented throughout the literature. In Perera's, et al. (2021) cohort study, women (n=192) were noted to be less likely to smoke (7.7% versus 12.2%, $p<0.001$), less likely to be physically active (61.5% versus 78.2%, $p<0.0001$), less likely to attend CR (58.2% versus 66.4%, $p<0.045$), and less likely to adhere to medication therapies (85.4% versus 94.7%, $p<0.0001$) in comparison to men (n=537). However, the statistical power of these findings is limited as there were not enough female participants to determine significance of these results. As well, the findings were based on self-reported data from the participants which may have led to bias of the findings. Schutter, et al. (2018), another cohort study involving 1171 participants, also found women were less likely to participate and complete CR programs, especially if they were diabetic and had a higher waist circumference. Schutter, et al. (2018) study was taken from one site which would affect the generalizability of

its findings. However, in Kahkonen's, et al. (2018) cohort study of 416 participants, males were found to be more likely to adhere to treatment for CAD. There could be various reasons for these mixed findings. In the same study, men who were in a close personal relationship were more likely to follow treatment guidelines.

In the cross-sectional cohort study completed by Tschaftery, et al. (2018), there were no differences between gender with regard to attitudes toward healthy lifestyle changes or CR programs. However, it was also noted that men were found to require longer education sessions and further clarification of reasons for lifestyle changes (Tschaftery, et al. 2018). Men were also more likely to attend smoking cessation classes (OR: 3.1, C.I. 95% = 1.1-8.6, p=0.03) and women were more likely to attend relaxation courses such as yoga and meditation (OR: 1.8 and 2.8 respectively). Tschaftery, et al. (2018) used a convenient sample from one site affecting generalizability and the data was self-reported by participants affecting bias of the study's results.

Overall, the differences between genders and management of CAD indicate varying topics of education that is needed for both men and women. Men require an overall understanding and explanation of ongoing management and treatment of CAD (Kahkonen, et al. 2017; Tschaftary, et al. 2018). As for women, the literature indicates a need for education on the importance of physical activity and tailoring exercises to meet women's individual needs. (Perera, et al. 2021; Schutter, et al. 2018). Both men and women require education on varying aspects of adopting a healthy lifestyle but should be provided teaching in a way that is generalizable and can be tailored to meet individual needs.

Cardiac Rehabilitation

CR programs have been found to be the most effective strategy for secondary prevention of CAD (Lynggaard, et al. 2021; McMahon, et al. 2017; Prabhu, et al. 2020; Zhang, et al. 2018). The structure of CR programs allows patients to gain knowledge and guidance from a multidisciplinary team as they develop a healthier lifestyle. In fact, patients who are enrolled and complete CR programs are more likely to adopt a healthier lifestyle compared to those who do not complete CR programs ($p<0.05$) (Meng, et al. 2016).

There are multiple benefits of CR programs. The first being improvement in physical activity and bodily function. CR programs not only provide knowledge of physical activity but also provide exercise programs for patients to participate in while being supervised and guided by trained professionals (e.g. physiotherapists). Patients who had participated in CR programs were found to have increased physical activity times and improved physical activity endurance (Meng, et al. 2016; Schutter, et al. 2018; Zhang, et al. 2018). For example, Zhang, et al. (2018) used a randomized control research design to compare a study group (n=65) who participated in a CR program, to a group which did not participate in a CR program (n=65). Patients in the study group were found to be more active (phase I: 10.36 mins $\pm$ 1.43, phase II 45.85 mins $\pm$ 2.65, $p<0.001$) and were able to endure exercise longer (study group: 412.71 steps $\pm$ 74.37 versus control group: 302 steps $\pm$ 101.81, $p<0.001$) than those in the control group.

In addition to the improvement in physical activity levels, patients who had participated in the CR programs also experienced improvements heart function (Lynggard, et al. 2021; Meng, et al. 2016; Schutter, et al. 2018; Zhang, et al. 2018). Zhang, et al. (2018), also examined participants' ejection fractions from beginning of the study (study group: 55.52 $\pm$ 4.11 versus

controlled group: 54.40 $\pm$ 3.45, p=0.242) to the end of the study (study group: 60.81 $\pm$ 2.77 versus controlled group: 53.33 $\pm$ 2.19, p<0.001). Participants of the study group experienced a significant improvement in heart function compared to those in the controlled group (p<0.001). As well, it was found that patients who participated in CR programs were less likely to experience another MI (10.8%) compared those who were not involved in CR programs (21%) (OR: 0.46, 95% CI: 0.26-0.82, p<0.01) (Fu, et al. 2019). However, this study did use a convenient sample, preventing the findings from being generalized in other populations outside of China.

The findings discussed above, are important to patient education as it shows the effectiveness of structured, multidisciplinary teams. These findings can be applied to the acute care setting as the same multidisciplinary team is available to admitted patients. However, what is not fully understood is how effective CR programs are in influencing aspects of a healthy lifestyle.

Healthy Lifestyle Modifications

The primary goal of providing patient education for those who have been diagnosed with a chronic disease like CAD is to prepare them with the knowledge they need in order to prevent the worsening of their heart health and encourage the adoption of a healthy lifestyle (Anderson, et al. 2018; Piepoli, et al. 2016). Throughout the literature, physical activity, a healthy diet, smoking cessation, and medication adherence were identified as the key cornerstones for which a healthy lifestyle were built upon for patients who have experienced CAD. This section will discuss these three topics and how they pertain to CAD patients. As well, the importance of

patient education to the adoption and modification of these components of a healthy lifestyle, will also be discussed.

Physical activity.

Maintaining an active lifestyle is important, especially for those with CAD. Physical activity and exercise promote healthy blood circulation, eases management of cholesterol, and assists in the prevention of atherosclerosis in the walls of the cardiac arteries (McMahon, et al. 2017). The studies all found improvements in participants ability to perform physical activity. For example, Schutter, et al. (2018), Zhang, et al. (2018), and Fu, et al. (2019) all found improvements in physical activity as previously discussed. In using a quasi-experimental design, Podvorica, et al. (2020) saw a significant increase in physical activity of 98 participants, after the implementation of a nursing led education program aimed at providing education to patients with CAD (pre-education physical activity levels: 2.14 + 0.71 versus post-education physical activity levels: 1.66 + 0.57, $p<0.001$).

Another common measure that was used to indicate improvement in physical activity was body mass index (BMI). Patients who had increased levels of physical activity and received education regarding physical activity were noted to have lower BMIs. Participants in Podvorica, et al. (2020) study experienced a significant decrease in their BMI from 3.08 ($\pm$ 0.74) to 2.7 ($\pm$ 0.79) ($p<0.001$) after receiving education regarding heart health and CAD. While the findings in Podvorica, et al. (2020) is highly supportive of nursing led education for CAD patients, the study was completed in a single site affecting the generalizability of the findings. Participants (N=157) in Kohler's, et al. (2020) RCT study also had decreased BMIs (-0.17 $\pm$ 1.5 vs 0.50 $\pm$ 1.6, $p= 0.038$) after receiving CAD management education. This study had issues with obtaining

participants and retaining participants. The number of eligible participants was 446 which means they study only recruited 35% of the target population (Kohler, et al. 2020). Zhang, et al. (2018) also assessed BMI values of participants and did not find any significant change in BMI after participating in a CR program (before: 23.30 $\pm$ 2.67 versus 23.65 $\pm$ 3.29, p = 0.63).

Finally, an important finding that was found is the association of depressive symptoms and physical activity. Chair et al. (2020) completed a cohort study involving 593 participants that evaluated the relationship between depressive symptoms and physical activity. Physical activity was found to have a statistically significant, negative association with depressive symptoms (beta= -0.223, p = 0.040). This means that with increased levels of physical activity, there was a decrease in patients' experiencing depressive symptoms (Chair, et al. 2020). This is important to consider in the development of an educational resource as it further emphasizes the importance of physical activity and its health benefits. However, these findings were found using a convenient sample taken from a CR center in China (Chair, et al. 2020)

Diet.

Diet is a very important part of the equation when it comes to managing CAD. A diet consisting of food that is high in sodium, fat, and highly processed foods increases the likelihood of a person being diagnosed with CAD (Devries, et al. 2017). Interestingly, very few research studies were found that measured the quality of food that is consumed by patients who have CAD and how education influenced patient's food selection. For example, no studies were found regarding strategies to improve healthy eating or how healthy diets were affected after a patient has received CAD education. Rather, many of the studies that were found focused on blood values such as high-density lipoprotein (HDL), Low density lipoprotein (LDL), blood sugar, and

hemoglobin A1c (HbA1c) in order to measure dietary improvements in patients with CAD (Abbasi, et al. 2018; Kohler, et al. 2020; Podvorica, et al. 2020; Zhang, et al. 2018).

The results found in this literature review regarding dietary modifications and management of blood values were mixed. LDL is a blood value that was measured in 4 different studies. Abbasi, et al. (2018) completed an uncontrolled before and after study (UCBA) of 32 CAD patients that received education using multimedia software. Participants did experience improvements in their overall health. However, the findings of this study were based on a small convenient sample size, with no adjustments made to account for bias, and no comparison to a control group of participants. Both Abbasi, et al. (2018) and Podvorica, et al (2020) found significant decreases in LDL levels (before intervention: 108.8 + 46.88 versus after intervention: 98.4 $\pm$ 31.73, $p = 0.04$. and pre-education 3.26 $\pm$ 1.01 versus post education 2.73 $\pm$ 0.72, $p < 0.001$, respectively). As for Kohler, et al. (2020) and Zhang, et al. (2018), either very little improvement in LDL levels was found or no difference was found. Kohler, et al. (2020) compared two groups, where one group was sent home with education and follow up telephone calls and the control group did not. Kohler et al. (2020) did not find any improvement in LDL level between the two groups (study group: 2.1 $\pm$ 0.0 versus control group: 2.1 $\pm$ 0.1, $p = 0.373$). Zhang et al. (2018) did find some improvement in LDL levels but none of significance (study group: 2.11 $\pm$ 1.13 versus control group: 2.57 $\pm$ 1.01, $p = 0.11$). As for HDL, there were 3 studies that measured HDL in participants. In all 3 studies HDL levels were noted to be improved significantly (Abbasi, et al. 2018; Kohler, et al. 2020; Zhang, et al. 2018). The other blood value that was of most interest in the literature with regard to diet management was HbA1c. Abbasi et al. (2018) did find an improvement in HbA1c among their study participants (before

intervention: 13.06 ± 3.44 versus after intervention: 9.15 ± 3.22, p <0.001). However, Podvorica, et al. (2020) did not find there was a significant difference in HbA1c levels in patients after they had received CAD education (pre-education: 1.64 ± 0.86 versus post education: 1.52 ± 0.84, p = 0.23).

Based on the findings of this literature review, little is currently known about the effect that patient education has on CAD patients adopting a healthier diet. This is a concern for CAD management as diet is very important to CAD management. Some improvements were found in the above-mentioned blood values. However, the use of blood values may not be effective indicators of a healthy diet as blood values could also be affected by the amount of physical activity a person completes or how compliant a person is with their medication. As well, the lack of research on diet, could be due to diet being included under the umbrella term of "Healthy lifestyle" or "healthy lifestyle behaviors" which appear to be more predominantly used in the literature.

Smoking cessation.

Quitting smoking is one of the ways that people who have been diagnosed with CAD can improve their health practices and decrease their chances of experiencing a second cardiac event. Smoking is highly linked to the development of plaque that causes the narrowing of coronary arteries in CAD (Feodoroff, et al. 2018). However, smoking cessation is very difficult to achieve due to the addictive ingredients that are found in cigarettes (Badrooh, et al. 2020; Feodoroff, et al. 2018; Hoog, et al. 2016; Katz, et al. 2019).

Studies that assessed the effectiveness of patient education and smoking cessation in patients with CAD showed varying levels of success. The study that was previously discussed,

Kohler, et al. (2020), did not find significant improvement in the rate of smoking among participants over time, either in their study group (baseline: mean = 10 versus one-year follow up: mean = 8, p = 0.240) or their control group (baseline mean = 9 versus one-year follow up: mean = 4, p = 0.240). However, Badrooh, et al. (2020), an RCT study that was completed in a hospital in Iran (n=255), did find that education provided by nurses, regarding smoking cessation, was effective whether the education was provided individually (before intervention: 8.50 $\pm$ 2.30, after intervention: 13.75 $\pm$ 2.80, p <0.001) or in a group setting (before intervention: 8.87 $\pm$ 2.40, after intervention: 13.30 $\pm$ 2.70, p<0.001). The findings of Badrooh, et al. (2020) were not generalizable to other populations due to its convenient sample. As well, a significant number of participants were male (n=85) compared to female participants (n= 2). Therefore, findings may not be applicable to the female patients with CAD.

Like other studies found in this literature review, Siudak, et al. (2018) also found some success in assisting CAD patients to quit smoking. This study used a cohort study design to assess the effect of education on quitting smoking in CAD patients (n=100). At 1 month, 61 out of 100 participants had quit smoking. However, after 6 months 10 participants had reported to start smoking again, leaving the number of smokers who had successfully quit smoking at n =51. Siudak, et al. (2018) is also the only study found that examined what strategies participants used to quit smoking. 5% of participants used nicotine gum or patches to quit, and 6% of participants used electronic cigarettes. However, 78% or participants did not use any form of nicotine or medication in order to quit. These strategies did have a significant effect at the 6-month mark (p=0.004) but not at the 1-month mark (p= 0.098). However, it is unclear as to whether the implementation of patient education had a causative effect on these findings. The findings of

Siudak, et al. (2018) were self-reported by participants potentially causing bias of the findings. Also, the study used a convenient sample, making the findings not generalizable to other populations.

Medication adherence.

Medication adherence is as important to management of CAD as maintaining a healthy lifestyle. Medication contributes to maintenance of HDL levels, HbA1C levels, and the prevention of thrombus formation (Hald, et al. 2019; McAleer, et al. 2016).

The medication that was the focus for medication adherence was "statins" or medication that was taken to lower levels of LDL. Ruiz-Bustillo, et al. (2019), implemented a nurse-led lipid-lowering secondary prevention strategy in their RCT study. This strategy included initial patient education and follow up phone calls with participants. This study involved 96 patients who were admitted to a hospital in Spain between April of 2012 and February of 2013. In this study, an LDL level of $\leq$100 mg/dL was achieved by 97% of participants in the intervention group compared to 67% of participants in the controlled group ($p<0.001$). These findings are not generalizable to other populations as a convenient sample was used. Thomson, et al. (2020), also found patients had increased medication adherence after completing a CR program. This was found in a cohort study of 40 patients in a CR center in Northern Ireland. Patients who participated in the CR program were more likely to be fully adherent to medication by 60% (Thomson, et al. 2020). However, a small and convenient sample in this study may have made the finding not generalizable. As well, an unvalidated instrument (the brief illness perception questionnaire) was used to gather data affecting the reliability of the findings.

Another finding that emerged from this literature review was the importance of medication literacy and patients' understanding of their medications. In a retrospective cohort study, Colavecchia, et al. (2017) found that CAD patients were more likely to be readmitted to hospital due to the higher level of complexity of their medication regimen (OR: 1.76; CIL 1.03-3.00). Of the 1,452 participants in this study, 81 patients or 5.9% were readmitted to hospital 30-days after discharge with a diagnosis of CAD. These findings were based on readmissions to only one hospital. Therefore, if one of the participants were admitted to another hospital, that data was lost. In addition, these findings are less generalizable as the data was only taken from one site. Furthermore, Zhong, et al. (2016), a cohort study on medication literacy, assessed 153 patients' understanding of their medications. >20% of patients did not have adequate knowledge of type of drug and the frequency that they needed to take the drug, >30% did not know the name and the dosage of the drugs they were taking, and >70% did not understand the side effects of the drugs they were taking (Zhong, et al. 2016). These findings are limited to one hospital site that the sample was collected from. This lack of knowledge of medications could be addressed during hospital admission through the provision of education and educational resources.

Self-Management

The management of chronic diseases requires patients to have some level of self-management of their own health (Kohler, et al. 2020; Tusa, et al. 2020). One of the purposes for providing patient education is to assist patients in their development of being able to manage their own health.

In multiple studies found in this literature review, knowledge gained from education provided by healthcare professionals was found to improve self-management skills and self-

efficacy of patients with CAD (Liu, et al. 2018; Makelarski, et al. 2019; Meng, et al. 2016; Tusa, et al. 2020). For example, Liu, et al. (2018), a cross-sectional study, found significant improvements in patient's (n= 160) self-management of CAD and type 2 diabetes in patients that received more education during admission to a single hospital in Shanghai, China. Researchers found improved scores in the C-ACSRI (Chinese version of acute coronary syndrome response index) (11.08 $\pm$ 2.31 versus 13.85 $\pm$ 2.52, $p<0.001$), the C-DKS (Chinese version of diabetes knowledge scale) (5.37 $\pm$ 1.64 versus 6.23 $\pm$ 1.21, $p<0.001$) and the C-DMSES (Chinese version of diabetes management self-efficacy scale) (115.03 $\pm$ 23.07 versus 133.29 $\pm$ 26.21, $p<0.001$).

Meng, et al. (2016) also looked at the effects of an education program that aimed to improve patient's self-management using an RCT study design. In this study researchers collected data from 449 patients before receiving self-management education and at 6-months follow-up. There were no significant differences between the intervention group or the controlled group with regards to the self-monitoring (pre-intervention: study group: 3.20 $\pm$ 0.54 versus, control group: 3.22 $\pm$ 0.56; 6-month follow-up: study group: 3.47 $\pm$ 0.47 versus, control group: 3.47 $\pm$ 0.47, $p = 0.685$) and insight outcome and the self-efficacy outcome (pre-intervention: study group: 64.03 $\pm$ 25.12 versus, control group: 65.63 $\pm$ 23.64; 6-month follow-up: study group: 80.64 $\pm$ 16.94 versus, control group: 80.64 $\pm$ 17.03, $p = 0.666$). In this study, the participants were aware of differences in the intervention group and controlled group. This led to a social desirability bias of the participants and thereby potentially affecting the results of the study. However, there were small improvements found in both groups regardless of the amount of education they received. This means that any amount of education could be beneficial to patients with CAD in developing their self-management of their health.

Mental Health

There is a link between mental health disorders and CAD, more specifically anxiety and depression (Celano, et al. 2016; Norlund, et al. 2018). It is common for onset of anxiety and depression disorders to occur at the same time as CAD (Celano, et al. 2016; Norlund, et al. 2018). Patient education can help ease any anxiety and depression symptoms that patients may feel when they are diagnosed or living with CAD.

The primary outcomes that were used to measure the effect of patient education had on anxiety and depression were Hospital Anxiety and Depression Scale-anxiety (HADS-A) scores and HADS-Depression scores (HADS-D). Overall, there were improvements in HADS-A and HADS-D scores through the literature (Nie, et al. 2019; Norlund, et al. 2018). Nie, et al. (2019) used an RCT study in order to assess the effect a lifestyle improvement program would have on 224 CAD patients in a CR program. Nie, et al. (2019) found there were improved HADS-A scores of the intervention group (n=142) (baseline: $M= 10.15 \pm 2.41$ versus 12-month follow-up: $M= 7.80 \pm 2.38$, $p<0.001$) and HADS-D scores (baseline: $M= 10.35 \pm 2.27$ versus 12-month follow-up: $M= 8.12 \pm 3.03$, $p = 0.021$). However, the controlled group (n=142) (who attended the CR program but did not receive special training) also seen improvement in HADS-A scores (baseline: $M= 10.12 \pm 2.27$ versus 12-month follow up: $M= 8.88 \pm 2.36$, $p<0.001$) and HADS-D scores (baseline: $M= 10.09 \pm 2.04$ versus 12-month follow up: $M= 9.08 \pm 3.30$, $p = 0.021$). These findings show that any amount of education could have a positive influence on the mental health of CAD patients. While Nie, et al. (2019) showed that education can be improve anxiety and depression of CAD patients, there were some limitations to this study. The data collection tools (HADS-D and HADS-A) are validated tools in detecting anxiety and depression, these

tools may not be reliable tools to detect level of change of anxiety and depression over time. As well, patients involved in the study received education prior to beginning the study and receiving the intervention, potentially affecting results. Finally, the study used a convenient sample from a single CR program potentially making the findings not generalizable to other populations.

Norlund, et al. (2018), another RCT study, also assessed HADS-D and HADS-A scores and how they were affected when participants completed cognitive behavioral therapy (N=239). In this case, there were improvements in HADS scores over time (mean delta= -5.1, $p<0.001$). However, there were no difference in anxiety scores or depression between the intervention group (n=117) (HADS-A for intervention group at baseline: 10.9 $\pm$ 2.4 versus, follow-up: 7.4 $\pm$ 3.2; HADS-D for intervention group at baseline: 9.9 $\pm$ 2.2 versus, follow-up: 6.6 $\pm$ 3.3) and the control group (n=122) (HADS-A for controlled group at baseline: 10.8 $\pm$ 2.5 versus, follow-up: 7.3 $\pm$ 3.7; HADS-D for controlled group at baseline: 10.3 $\pm$ 2.5 versus, follow-up: 8.0 $\pm$ 3.8) ($p = 0.32$). Even though there were no statistically significant changes in scores, patient education was still found to improve in anxiety and depression scores to some extent. In order to recruit more participants, the HADS score was lowered from >10 to >7. Therefore, participants who had lower HADS scores had less room to gain better scores over time.

Rural Setting

Management of CAD for patients living in NL could not be discussed without addressing the topic of rurality and its effect on resource availability and reliable education information availability. NL has a high percentage of its population living in rural areas. The only CR program in NL is presently in the St. John's urban center. As a result, patient's living in rural and remote areas of NL are not being provided the same education and resources they need in order

to self-manage their own CAD. Therefore, it is important to evaluate what resources and programs are being used in other rural areas so that these educational strategies could be potentially adapted and applied to patient's living in rural NL.

No studies were found that explored rural CR programs or CAD education programs within NL or even in Canada. Only 1 study was found that assessed CAD education in rural and remote areas, which was completed in Western Australia (Hamilton, et al. 2018). Hamilton, et al. (2018) is a mix-method study that investigated the current CR services that were available in rural and remote parts of Australia. The researchers used a combination of quantitative questions and interviews using open-ended questions in order to gather data on 70 services that provided CR resources. Of these 70 services, education that was found to be provided in rural and remote regions (60% and 80%, respectively) was primarily exercise focused and provided mainly by physiotherapists. Less than half (33%) of these programs provided multidisciplinary support. As well, only 27% of rural or remote programs provided education classes focusing on CAD issues and healthy lifestyle modifications. While this study completed an in-depth investigation into CR services in western Australia, these findings have limited generalizability to the Australian region. As well, there was a lack of analysis and data collection resources of both quantitative and qualitative data due to a lack of resources in the Western Australian region, potentially missing important information.

Despite there being few programs that targeted rural populations for CAD education and management, there are some studies that had success in assisting patients in managing their CAD. Zhang, et al. (2018) included a community-based CR program setting as opposed to a clinical or hospital setting. Zhang, et al. (2018) had extensive success in providing CAD

education and support to participants. Participants involved in Zhang, et al. (2018) improvement in their blood values, activity levels, and BMI as discussed in previous sections. Barnason, et al. (2019) also found success in supporting CAD patients (N=43) with management of their CAD by adopting healthy lifestyle changes. Barnason et al. (2019), a RCT study, used telehealth technology and take-home educational resources in order to provide rural patients with a CR program. 22 patients received the intervention and 21 patients received routine education and treatment. This study found improvements in primary outcomes of weight loss (study group: 13.8 + 2.8 pound versus control group: 7.8 + 2.2 pounds, $p = 0.05$), diet management (study group: 2.6 + 0.62 versus control group: 1.9 + 0.51, $p = 0.002$), self-efficacy (study group: 5.2 + 0.27 versus control group: 4.9 + 0.37, $p = 0.006$) and physical activity (study group: 2.2 + 0.42 versus control group: 2.0 + 0.33, $p = 0.04$) (Barnason, et al. 2019). There are 2 main concerns for this study. the first being the small sample size of only 43 participants, limiting the effectiveness of the results. The second concern was that data was self-reported by participants which potentially causing a socially desirable bias. Nonetheless, the findings of these studies are important as they show that education of CAD management can potentially be provided to patients in rural areas successfully.

Educational Strategies

In addition to the benefits of providing patient education to patients with CAD, different strategies or instruments were used to provide knowledge to patients. The primary instruments that were implemented and studied throughout the literature were technology based [e.g., smartphone-based applications (Johnston, et al. 2016; Murphy, et al. 2020), video assisted teaching (Princy, et al 2020), and iPad provided education (Wischer, et al. 2018)]. Each study

found in the literature found some level of success in improving patient knowledge or adherence to healthy lifestyle habits.

Both Princy, et al (2020) and Wischer, et al. (2018) found improvement in patient knowledge scores regarding CAD, after the implementation of videos to assist in patient education. Princy, et al. (2020) provided their video assisted teaching to 40 patients after receiving PCI. The before and after test results of patients' knowledge of CAD, who received the educational video were significant (pre-test: 8.05 ± 4.35 and post-test: 21.13 ± 2.289, $p<0.001$). While these findings were significant, a unvalidated data collection tool was used potentially affecting the findings. Wischer, et al. (2018) also experienced statistically significant improvement in test scores of 224 CAD patients who received educational videos (pre-test $m= 88.97$ and post-test $m= 96.62$, $p<0.001$). Both Princy, et al. (2020) and Wischer, et al. (2018) used a UCBA design and convenient samples to complete their studies on using technology for education of CAD patients, thereby affecting the generalizability of findings in both studies. Furthermore, Wischer, et al. (2018) reported that 34.9% of participants skipped many of the educational videos that was part of the education intervention and there was poor retention of patients as many patients did not complete the follow-up questionnaire.

While not all the studies found assessed patient knowledge of CAD, some other benefits were found through the use of technology. A RCT design was used in the Johnston, et al. (2016) study. Participants were randomly assigned to the intervention group (n=91) which used the smartphone app, and the control group (n=83) which received routine treatment. Johnston, et al. (2016) found significant improvements in medication adherence with the use of a smartphone app (nonadherence scores: study group: 16.6 versus control group 22.8, $p = 0.025$). There were

also improvements in the study's secondary outcomes such as smoking cessation [Intervention group: 16 participants quit smoking (80%) versus control group 5 participants quit smoking (45.5%), p=0.139], physical activity [Intervention group: 33.8% reported increased exercise (>150 minute per week) versus control group: 21.1% reported increased exercise (>150 minute per week), p=0.649], and QOL (Intervention group: 82.7 $\pm$ 11.6 versus control group: 78.2 $\pm$ 15.3, p = 0.090). However, these findings were not found to be significant. The sample size of this study was small with only 174, which decreases the power of the study. As well, participants were aware of differences between the intervention and control groups which potentially bias in-patient knowledge.

Finally, despite varying levels of success with the use of success, patient satisfaction with the use of technology was found to be high in the two studies where patient satisfaction was assessed. In Wischer, et al. (2018), 86.3% of participants were satisfied with the educational videos while 98.1% of participants reported the videos improved their knowledge and confidence in managing their CAD. Johnston, et al. (2016) found that the study group were more satisfied with the use of the smartphone app compared to the control group that did not (87.3 versus 78.1, p= 0.001, respectively).

The findings of these studies support the use of technology in providing patient education and support patient self-management of their CAD. However, some studies noted that use of technology may be inappropriate for individuals with lower education levels or older populations as patients who fall into these categories may lack the knowledge to use the technology (Abbasi, et al 2018; Murphy, et al. 2020; Tsai, et la. 2019). As well, cost of technology was also cited as concern for using technology in providing patient education to those in low socioeconomic

groups, as patients who fall into this category may not be able to afford technology like iPads or computers (Abbasi, et al 2018; Murphy, et al. 2020; Tsai, et la. 2019)

Patient Perspective

It is important to take into consideration the patient's perspective and values when developing an educational resource. Inclusion of the patient's perspective and preference for strategies regarding their individual learning process allows the education resource to be more meaningful to the patient (Candela, 2020; Phillips, 2020). Adults are more likely to retain information and implement new knowledge when the knowledge is presented in a way that is specific to the health and learning needs of the patient (Candela, 2020; Phillips, 2020).

A major theme prominent throughout the literature was the motivation of patient's to better understand CAD and how it pertains specifically to each individual patient. Falun, et al. (2015) interviewed 20 CAD patients using 4 main open-ended questions. The data that was collected from these interviews was transcribed and read by multiple researchers and final themes were determined through negotiating consensus procedure. Sefcik, et al. (2016) used a qualitative descriptive design in order to gain an understanding of 30 patient's experience with being admitted to hospital with CAD. Each theme was derived from interviews using coding in order to cluster them. Patient's reported wanting information regarding their diagnoses and direction as to what to expect in the immediate future (Falun, et al. 2015; Sefcik, et al. 2016). This includes explanations of procedures and tests (e.g., dye test, PCI, and echocardiogram) that they experience while in hospital. Both Falun, et al. (2015) and Sefcik, et al. (2016) had congruity between their methodology, objectives and interpretations of results. However, both studies also failed to discuss the influence the researchers had on the research. Furthermore, the

findings were not reviewed afterwards with participants to help ensure that the findings were congruent with their perceptions and experiences.

In addition to understanding their cardiac health, patients also reported a want to know what they can do to improve their cardiac health upon returning home from hospital. This was one of the key findings in Nadarajah, et al. (2016), who completed a phenomenological study with 10 participants who were diagnosed with CAD. This study used a Husserlian approach in understanding the participants' lived experience. The researchers were able to maintain congruity between research methodology and findings. As well, in order to ensure findings were accurate, synopsis of the study was reviewed by 6 participants who agreed with the findings.

Jepma, et al. (2021) found that patients also wanted guidance as they began living with CAD. For example, diet, medications, and physical activity are some topics patients want more information on in order to better live with CAD. Jepma, et al. (2021) was a qualitative study that used semi-structured interviews that were completed with 13 CAD patients over the age of 70. Themes were determined by 2 researchers that independently coded transcriptions of each interview. A goal of this study was to understand the transition process for older CAD patients into having a healthier lifestyle. However, participants in general had already adopted a healthier lifestyle after discharge. This means there was an incongruence between the research methodology and the research objectives. Information pertaining to developing a healthier lifestyle should be provided in a meaningful, adaptable, and understandable manner to patients' individual situation (Candela, 2020; Jepma, et al. 2021; Sefcik, et al. 2016). Patients wanted a plan to aid them in management of their cardiac health prior to discharge. This emphasizes the

importance of discharge planning and tailoring CAD self-management to the individual patient (Falun, et al. 2015; Jepma, et al. 2021; Sefcik, et al 2016).

Developing a Resource

The aim for this practicum is resource development for patients diagnosed with CAD. The literature that discussed resource development was not of high quality. Articles that were found were opinion pieces, hospital or location specific, and interviews with key stakeholders. No study was found where a resource was developed and then implemented.

An educational resource should include information that is relatable and specific to the patient's health situation. For example, a description of procedural processes while in hospital, guidelines for physical activity such as performing activities of daily living, exercise, and adhering to a healthy lifestyle (e.g. medication use, diet management, importance of follow up appointments) (Mitchell, et al. 2016; Putnam, 2016; Wang, et al. 2014). The resource should also provide information of disease processes and an explanation of why it is important to make changes to lifestyle habits in a way that is meaningful and understandable for patients of varying educational and socioeconomical backgrounds (Wang, et al. 2014).

Patient education should have a multidisciplinary approach in complex diseases such as CAD. The resource should be organized into sections such as physical activity, medication, diet, so that allied healthcare workers such as physiotherapist and dieticians can easily refer to sections and address patient specific concerns (Putnam, 2016; Wang, et al. 2014). Addressing emotional needs of patients is also important in resource development. A discussion on mental health linked to CAD, disease specific disease concerns, and available resources should be provided in order to support patients (Svavarsdottir, et al. 2016; Wang, et al. 2014).

Gaps in the Literature

Many of the articles that were critiqued in this literature review focused on adherence to healthy lifestyle changes, which was used as an umbrella term to include physical activity, diet management, and smoking cessation. However, there was a lack of research found that spoke specifically to the importance of diet and how patient education effected diet management. More research is needed that specifically focuses on diet and how patient education influences patient's food selection, motivation to eat healthier, and strategies for diet management that work best for patients with CAD. Another topic that lacked research that was noted during this literature review was how discharge education received in hospital affected patients' management and understanding of CAD and maintaining a healthy lifestyle, once home and on a long-term scale.

No quantitative descriptive research was found that investigated patient perception of what education they believed was required in order to better understand CAD and develop healthy lifestyle habits. While there were some qualitative studies found, more research is needed in order to better understand the experiences of CAD patients while in hospital and after returning home. As well, there is a lack of understanding of patient preference for type of learning and how information is received with regard to patients with CAD (e.g., educational booklet, video, smartphone app, or a combination of multiple styles of resources).

Surprisingly there was a lack of research studies completed in Canada that focused on patient education, CR programs and potential strategies for providing information to patients with CAD. The majority of studies found were set in European and Asian countries. Due to the differences in cultures and values, the location that the studies were completed may affect the

generalizability of the findings in a Canadian population. No studies were found that assessed the specific cultural, geographic, and socioeconomical needs and barriers to providing CAD education to patients in Canada and more specifically NL.

Implications to Nursing

Nurses and advanced practice nurses are in a great position to assist patients in learning more about their specific health concerns. Nurses are equipped with the knowledge needed in order to provide education and support patients' needs in a hospital setting, primary care setting, CR programs and in the community (David, et al. 2015). Education practices need to be consistent and patient specific. However, nurses require access to reliable educational tools and resources in order to ensure all patients receive consistent and effective sources of education.

More research is needed regarding the role of the nurse in providing patient education for post discharge CAD management. The efficacy of the nursing role in patient education needs further assessment. As well, the effectiveness of discharge education and its effect on short- and long-term self-management of CAD received from nursing staff needs to be further evaluated. Finally, nurses have the capability of providing education, support, and direction to patients living in rural areas. However, assessment of nursing resources and how these should be implemented or provided in rural areas requires further assessment.

Summary

Patient education is an imperative part of management of CAD upon return to home after having PCI. As previously discussed, the higher level of health literacy of patient, the more successful patients are in managing their own health. The quality and amount of education that patients receive is important in helping patients adhere to CAD management, maintain a healthy

lifestyle, and in preventing of patients experiencing another cardiac event. As well, patient education on CAD management was closely linked to a patient perceived higher QOL, lower reports of anxiety, and moderate to high rates of medication adherence. The most effective and most common intervention in providing this education has shown to be structured CR programs using a multidisciplinary approach. However, since NL has a large rural population, it was important to examine strategies on how to provide patient education effectively for rural living patients. Community or home-based CR programs provided via telehealth appears to have promising effect on management of CAD and providing patients with the support they need in living with CAD. However, these types of programs require the allocation of financial and workforce resources that are not always available. Therefore, as healthcare professionals, nurses must make the most of patient education opportunities such as those that occur during hospital admission. This means, although take home education resources may not be as effective as CR programs, research has shown that short educational sessions and readily accessible resources is more effective than no education.

Conclusion

CAD continues to be a dominating health concern in NL, across Canada, and around the world. It has been shown that CR programs are important for quality patient education and CAD management. However, CR programs are not always available especially to those living in rural areas. Therefore, strategies like take home resource booklets are important to continue to provide knowledge and support needed by patient living with CAD. Throughout this literature review, the importance of patient education for CAD management has been discussed. Patients require knowledge on disease processes and healthy lifestyle management for CAD. An educational

resource booklet can contribute to the education process and knowledge base of patients with CAD. This literature review supports that hypothesis that there is a need for an inpatient resource that can be taken home. This is of particular benefit for patients living in rural NL due to the lack of access to resources like CR programs.

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Literature Summary Table

Table 1: Summary Tables for Quantitative Studies Examining Patient Education and Benefits for Coronary Artery Disease

Study/Design	Methods	Key Results	Comments
Authors: Abbasi, et al. (2018) Design: UCBA	N: 32 patients with CAD Country/Setting: The Chamran hospital in Isfahan, Iran Study Group: 32 participants received the intervention. Data Collection: Paired t test (T0) before the intervention and post-test (T1) after receiving the intervention. -personal information questionnaire.	Statistically Significant: p <0.05 **HDL:** Mean before intervention: 36.53 Mean after intervention: 43.33 p = 0.001 **HbA1C:** Mean before intervention: 13.06 Mean after intervention: 9.15 p= 0.000	Strength of Design: **Weak** Quality: **Weak** Issues: • No control for bias • No information provided regarding timeline (does not provide when intervention was implemented and how long after implementation of the intervention the study group was tested) • Use a Convenient sample of participants.

Study/Design	Methods	Key Results	Comments
	-Blood pressure cuff -Glucometer -Scale -SPSS software Outcomes: Multiple secondary outcomes e.g. blood pressure, weight, HDL, HbA1C, FBS	**FBS:** Mean before intervention: 120.16 Mean after intervention: 109 p= 0.045	• Did not compare study group to a controlled group. • Not generalizable as sample was only taken from one site.
Authors: Badrooh, et al. (2020) Design: RCT	N: 255 patients with CAD Country/Setting: Bu-Ali Sina hospital in Qazvin, Iran	There were improvements with FTND and Q-MAT scores in all groups. A high score on the FTND means high dependence on nicotine. A high score on the Q-MAT means high motivation to quit smoking. P >0.05	Strength of Design: **Strong** Quality: **Moderate** Issues: • Nongeneralizable of finding to women

Study/Design	Methods	Key Results	Comments
	Group 1: 84 patients received individual education Group 2: 86 patients received group education Group 3: 85 patients received routine education (control) Main outcomes measured by questionnaire before intervention, 1-, and 3-months post intervention: • Fagerstrom Test of Nicotine Dependence (FTND) • Smoking Cessation Motivation Questionnaire (Q-MAT)	**FTND scores:** Individual education: Baseline: 7.44 ± 1.37 1 month: 6.32 ± 0.99 3 months: 6.40 ± 0.90 p= <0.001 Group education: Baseline: 7.96 ± 1.53 1month: 6.30 ± 0.81 3 months: 6.30 + 1.07 p= <0.001 Control group: Baseline: 7.69 ± 5.50 1 month: 7.75 ± 1.90 3 months: 7.72 ± 1.27	population as most participants were men. • Concerns with information bias as the participants were not blinded • Not generalizable as sample was only taken from one site.

Study/Design	Methods	Key Results	Comments
	-Kolmogorov-Smirnov test -chi-square test -paired t-test -one-way analysis of variance (ANOVA). -SPSS software	**Q-MAT scores:** Individual education: Baseline: 8.50 + 2.30 1 month 13.53 + 2.58 3 months 13.75 + 2.80 p= <0.001 Group education: Baseline: 8.50 + 2.30 1 month: 13.45 + 2.58 3 months: 13.30 + 2.70 p= <0.001 Control group: Baseline: 9.40 + 7.70 1 month: 8.76 + 2.90	

Study/Design	Methods	Key Results	Comments
		3 months: 8.1 + 3.33 p= >0.050	
Authors: Bailey, et al. (2015) Design: Retrospective Cohort	N: 696 adult patients Country/Setting: Hospitals in North Carolina and Illinois, USA Cohort was not divided into groups or compared to another group Data Collection/Outcomes - Medicare claims used to determine	Significances was determined as p <0.001 **HL estimates:** REALM = 0.38 TOFHLA= 0.42 NVS= 0.50 **Individual literacy measures:** REALM K Score = 0.38 (p <0.0001)	Strength of Design: **Moderate** Quality: **Moderate** Issues: • Use of estimation scores to compare to actual Health literacy scores • Use of Medicare claims forms may affect classification bias

Study/Design	Methods	Key Results	Comments
	readmission to hospital. - The Rapid Estimate of Adult Literacy in Medicine (REALM) - The Test of Functional Health Literacy in Adults (TOFHLA) - The Newest Vital Sign (NVS) -Pearson product-moment -Spearman correlations -SAS software -STATA software	TOFHLA K Score= 0.37 ($p < 0.0001$) NVS K Score = 0.40 ($p < 0.0001$)	
Authors: Barnason, et al. (2020) Design: RCT	N: 43 participants living in a rural with CAD	A decrease of BMI and a weight loss was seen over time. However, the weight loss in the intervention group was the only outcome found to be significant.	Strength of Design: **Strong** Quality: **Moderate**

Study/Design	Methods	Key Results	Comments
	Country/Setting: 2 midwestern hospitals, USA Intervention group: 22 participants received the Weight management intervention Controlled group: 21 participants received regular care Main outcomes measured at baseline, 4-, and 6-months • Body mass index (BMI) • Weight Change (# of pounds) Secondary outcomes include physical activity and level of activity.	p = ≤ 0.05 Intervention group: **BMI:** Baseline = 37.6 4 months= 35.8 6 months= 35.2 p= 0.18 **Weight loss:** Baseline = 242.8 lbs 4 months = -11.29 lbs 6 months = -15.8 lbs p = 0.05 Controlled group: **BMI:** Baseline = 32.8	Issues: • Small sample size Most measures were based on participants' self-reports which may have affected bias.

Study/Design	Methods	Key Results	Comments
		4 months = 31.8 6 months = 31.3 p = 0.99 **Weight loss:** Baseline = 217.7 lbs 4 months = - 6.2 lbs 6 months = - 9.3 lbs p = 0.67	
Authors: Chair, et al. (2020) Design: Cohort	N: 593 participants from a CR center Country/Setting: CR center in Hong Kong, China Data Collection:	**Outcome 1:** Leisure-Time Physical Activity - Median = 15.0 **Outcome 2:** Physical Activity Self-Efficacy - Mean = 36.1 **Outcome 3:** HADS	Strength of Design: **Moderate** Quality: **Weak** Issues:

Study/Design	Methods	Key Results	Comments
	- Godin-Shephard Leisure Time Physical Activity Questionnaire (GSLTPAQ) - Self-Efficacy for Exercise (SEE-C) - Hospital Anxiety and Depression Scale (HADS) Outcomes include leisure-time physical activity, physical activity self-efficacy, and depressive symptoms.	Mean = 4.7	- No tables or graphs were used to explain findings. - Lack of discussion regarding findings. - Article did not disclose all findings that were obtained using the questionnaires. - Convenient sample used. - Not generalizable as sample was only taken from one site.
Authors: Colavecchia, et al. (2017) Design: Retrospective Cohort	N: 1,452 participants were included in the study. Country/Setting: USA Data Collection:	**Findings:** - 81 patients were found to have been readmitted to hospital (5.9% of cohort) - Patients that were prescribed	Strength of Design: **Moderate** Quality: **Moderate** Issues:

Study/Design	Methods	Key Results	Comments
	- Eligible participants were identified using the University Health System Consortium - Medication complexity was determined using the Medication Regimen Complexity Index (MRCI) - Microsoft Excel Outcomes: readmission rates And most common types of medications that correlated with readmission	angiotensin-converting-enzyme inhibitors or angiotensin receptor blockers were less likely to be readmitted 30-days after discharge. - Patients with CAD were more likely to be readmitted 30-days after discharge.	- Data only collected from one hospital meaning data was lost if participants were admitted to other another hospital. - Not generalizable as data was only collected from one site
Authors: Gonzalez-Chica, et al. (2016) Design: Cross-Sectional Study	N: 587 patients with ischemic heart disease	The higher score of health literacy measurement questionnaire indicated a high level of literacy. $p = <0.05$	Strength of Design: **Moderate** Quality: **Moderate**

Study/Design	Methods	Key Results	Comments
	Country/Setting: Queensland and South Australia, Australia Data Collection: - Australian socio-economic index for areas (SEIFA) and Index of Relative Socio-economic advantage and disadvantage (IRSAD) used to measure socio-economic status - A 16-item questionnaire was used to measure health literacy. - Multivariate linear regression used to evaluate association between health literacy and heart related QOL (HRQOL)	**Health Literacy:** - M = 39.6 ± 6.7 points - 35.2% of participants had adequate level of health literacy - 14.3% of participants had inadequate level of health literacy. - Older participants were more likely had worse health literacy (23.1%). **HRQOL:** **Physical components mean score**: 42.7 ± 10.9	Issues: - Lower quintile of socioeconomic position was not included. This means that findings may not be accurate. - Sample was only 28% of the target population.

Study/Design	Methods	Key Results	Comments
	- STATA software Outcomes: Health literacy and HRQOL	**Mental components mean score:** 48.0 ± 7.9	
Authors: Hald, et al. (2019) Design: Cohort study	N: 379 patients who were diagnosed with CAD between 2000 and 2004 Country/Setting: Aarhus University Hospital, Denmark Data Collection: - Unique personal 10-digit number used in data collection - The danish national prescription register used to determine medication adherence.	$p < 0.05$ **Adherence to antithrombotic:** 2 years mean = 0.90 (p=0.37) 5 years mean = 0.92 (p=0.46) 10 years mean = 0.94 (p=0.33) **Adherence to beta-blockers:** 2 years mean = 0.82 (p=0.00) 5 years mean = 0.68 (p=0.02)	Strength of Design: **Moderate** Quality: **Weak** Issues: - Medication adherence were defined by how often participants bought their prescription affecting information bias as the patient may have bought the medication does not mean that

Study/Design	Methods	Key Results	Comments
	- 2 year, 5 year and 10 year follow up was completed. Outcomes: - Primary outcomes include medication adherence to antithrombotic, beta-blockers, statins, and angiotensin-converting enzyme inhibitor. - Secondary were biological and lifestyle risks factors	10 years mean = 0.58 (p=0.16) **Adherence to statins:** 2 years mean = 0.82 (p=0.04) 5 years mean = 0.88 (p=0.74) 10 years mean = 0.91 (p=0.79) **Adherence to angiotensin-converting enzyme inhibitor:** 2 years mean = 0.38 (p=0.23) 5 years mean = 0.44 (p=0.22) 10 years mean = 0.50 (p=0.43) Only significance that was found is between years 2 and 5 for adherence to beta-blockers.	they took the medication - Not generalizable as sample was only taken from one site.

Study/Design	Methods	Key Results	Comments
Authors: Hoog et al. (2016) Design: Longitudinal Cohort	N: 245 patients admitted to a cardiology ward and had smoked for a minimal 4 weeks Country/Setting: The Netherlands Data Collection: - Baseline questionnaire developed by researchers - Telephone follow-up interview - Data collection was completed at baseline and six months later - McNemar Chi-square test - Outcomes: participants who had	**Findings:** - 6-months follow up: quit smoking - 31% of respondents had not smoked the previous 5 months - 43% had not smoked the previous 7 days. - Participants were more likely to have quit smoking if they had higher income, higher perceived self-efficacy, and had intention to quit smoking - Patient perception of self-efficacy: 0.54 p=0.000	Strength of Design: **Moderate** Quality: **Moderate** Issues: - Retention of participants resulted in lost data - Data collection questionnaire was not validated or determined to be reliable.

Study/Design	Methods	Key Results	Comments
	quit smoking and self-efficacy.		
Authors: Johnston, et al. (2016) Design: RCT	N: 174 patients who had been treated with the medication ticagrelor Country/Setting: Sweden Intervention group: 91 patients were provided with patient support smartphone app Control group: 83 patients received routine treatment Data Collection: - European Quality of Life-5 Dimensions	**Nonadherence to Ticagrelor:** Intervention group: 16.6% Control group: 22.8% p= 0.025 **Exercise minutes per week:** Intervention group: +90 minutes Control group: +65 minutes p = 0.612 **QOL:** Intervention group: 14.7 Control group: 8.4 p = 0.059	Strength of Design: **Strong** Quality: **Moderate** Issues: - Participants were not blinded in testing - Results may be highly affected by confounders such as patient education programs.

Study/Design	Methods	Key Results	Comments
	Visual Analogue Scale (EQ-5D VAS) - Physical Activity questionnaire - Medication Adherence Rating Scale (MARS-5) - Mann-Whitney test -Patients were evaluated at baseline and during 2 study visits during the 6-month study period. Primary outcome: adherence to ticagrelor Secondary outcomes: - Body mass index - QOL Physical activity		

Study/Design	Methods	Key Results	Comments
Authors: Kahkonen, et al. (2017) Design: Cohort	N: 416 patients who received percutaneous coronary intervention. Country/setting: 3 central hospitals in Finland Data collection: - A modified version of the Adherence of People with Chronic Disease Instrument (ACDI). Was validated - A separate questionnaire was used to collect sociodemographic information - SPSS software	**Adherence to medication:** 95.2 % of participants (n=396) **Adherence to healthy lifestyle:** 89.9 % of participants (n= 374) **Motivation for self-care:** 85.3% of participants (n= 355)	Strength of Design: **Moderate** Quality: **Moderate** Issues: - Data was self-reported by participants

Study/Design	Methods	Key Results	Comments
	Primary Outcomes: - Adherence to medication - Adherence to healthy lifestyle - Motivation for self-care		
Authors: Katz, et al. (2019) Design: Cohort	N: 1,307 participants who had recently been diagnosed with CAD and currently smoking and enrolled in CR. Country/setting: USA Data collection: - Data was used from the Translational Research Investigating Underlying Disparities in Acute	**Findings:** - 40-69% of participants resumed smoking after being diagnosed with CAD. - 36% of participants attended 1 or more session of CR - 74% of participants were referred to CR.	Strength of Design: **Moderate** Quality: **Weak** Issues: - A large amount of data was lost due to retention of participants. - Data and participants were used from other studies.

Study/Design	Methods	Key Results	Comments
	Myocardial Infarction Health Status (TRIUMPH) study and the Prospective Registry Evaluating Outcomes after Myocardial Infarction: Events and Recovery (PREMIER) quality improvement registry. - Standardized interviews used to collect sociodemographic information. <u>Outcomes:</u> Smoking rates among participants, attending rates to CR	- Most patients that smoked did not attend CR - Older, less education, poor, and uninsured were less likely to attend - Patients who smoked and did attend CR were more likely to quit.	
<u>Authors:</u> Kavradim, et al. (2019)	<u>N:</u> 62 participants who were newly diagnosed and admitted for CAD	$p < 0.05$ **<u>Coping adaptation</u>:**	<u>Strength of Design:</u> **Strong** <u>Quality:</u> **Moderate**

Study/Design	Methods	Key Results	Comments
Design: RCT	Country/setting: University Hospital in Antalya, Turkey Intervention group: n= 31, received face-to-face education and received an education booklet and telephone follow-up Controlled group: n= 31, Received routine education and treatment Data collection: - Data was collected using face-to-face interviews at baseline and by telephone 12 weeks after discharge from hospital.	Intervention group: Baseline: m = 116.10 ± 15.25 12 weeks follow up: m = 148.90 ± 13.87 p= 0.0001 Controlled Group: Baseline: m = 121.71 ± 13.33 12 weeks follow up: m = 11.58 ± 18.03 p=0.7142 **Self-efficacy:** Intervention group: Baseline: m = 27.71 ± 5.40	Issues: - Small sample size - Mainly male participants and not resembling the general population - Used a Convenient sample. - Not generalizable as sample was only taken from one site.

Study/Design	Methods	Key Results	Comments
	- General Self-Efficacy Scale (GSES) - Coping and Adaptation scale (CAPS) - Myocardial Infarction Dimensional Assessment Scale (MIDAS) - Cronbach alpha Primary outcomes: QOL, coping adaptation, and self-efficacy Secondary Outcomes: Physical activity and waist circumference.	12 weeks follow up: m = 34.45 ± 3.70 p = 0.0001 Controlled group: Baseline: m = 27.87 ± 4.98 12 weeks follow up: m = 25.52 ± 6.47	
Authors: Liu, et al. (2018) Design: Cross-sectional Study	N: 160 patients who received patient education while admitted to hospital regarding management of CAD	P (2-tailed) <0.05 **C-ACSRI scores on discharge:**	Strength of Design: **Strong** Quality: **Moderate**

Study/Design	Methods	Key Results	Comments
	Country/setting: Tenth People's Hospital of Tongji University in Shanghai, China Data collection: - The Chinese language version of the acute coronary syndrome response index (C-ACSRI) - Cronbach's alpha Outcomes: Knowledge of CAD at discharge from hospital	- (N= 111) participants had limited knowledge of CAD M= 11.08 + 2.31 - (N= 49) participants had Sufficient knowledge of CAD M= 13.85 + 2.52 P < 0.001	Issues: - Not generalizable to other populations besides China - Not generalizable as sample was only taken from one site.
Authors: Lu, et al. (2018) Design: Cross-sectional Study	N: 598 patients with CAD and admitted to hospital Country/setting: two tertiary hospitals in China Data collection:	**Findings** - 74.5% of participants had limited health literacy. - 25.5% of participants had adequate health literacy	Strength of Design: **Strong** Quality: **Moderate** Issues: - Used a convenient sample

Study/Design	Methods	Key Results	Comments
	- European Health Literacy Survey Questionnaire (HLS-EU-Q16) - Medical Outcomes Study Specific Adherence Scale (MOS-SAS) - Chi-square test - Regression analysis Outcomes: - Health Literacy - Adherence to medication	- Participants' Adherence to medication was 84.7% - Adherence to heart healthy lifestyle was 53.2%	- Only collected from 2 urban hospitals - Data was self-reported by patients which could contribute to bias.
Authors: Lynggaard, et al. (2021) Design: RCT	N: 825 patients hospitalized with ischemic heart disease or heart failure. Country/setting: Three Danish hospitals in Denmark	**Physical Functioning Score:** Intervention group: Baseline: m = 62.8 (±31.4) Follow up: 73.7 (±30.8) p <0.001 Controlled Group:	Strength of Design: **Strong** Quality: **Strong** Issues: - Was not a blind study - There was of data in follow up

Study/Design	Methods	Key Results	Comments
	Intervention group: 413 patients received the "Learning and Coping" pedagogical approach to CR (LC-REHAB) Controlled group: 412 patients received routine treatment Data collection: Data was collected immediately after the 8-week CR program, 3-months, and 3 years after patients received the intervention. - Body Mass Index - Waist circumference - Major Depression Inventory (MDI) - Sense of Coherence Scale (SOC)	Baseline: 63.9 (±31.2) Follow up: 64.2 (±23.0) p <0.001 **General Health Score:** Intervention group: Baseline: 54.1 (±22.3) Follow up: 64.7 (±21.3) p <0.001 Controlled group: Baseline: 53.3 (±24.0) Follow up: 64.2 (±23.0) p < 0.001 **Mental Health:** Intervention group:	- The baseline values may have been overestimated

Study/Design	Methods	Key Results	Comments
	Outcomes: Physical Functioning, General Health, Mental Health	Baseline: 72.1 (±20.5) Follow up: 78.2 (±18.7) p <0.001 Controlled group: Baseline: 71.5 (± 21.5) Follow up: 77.2 (±19.6)	
Authors: Marzec, et al. (2015) Design: Cohort	N: 249 patients with CAD Country/setting: 4 health centers in the, USA Data collection: - Rapid Estimate of Adult Literacy in Medicine, Revised (REALM-R)	**Health Literacy scores:** - 34% of participants (n = 85) were considered to have poor health literacy. - 25.6% of patients were nonadherent to their cardiovascular medications	Strength of Design: **Moderate** Quality: **Weak** Issues: - Poor discussion and analysis of data collected. - Affected by bias - Many influences for reasons as to why they

Study/Design	Methods	Key Results	Comments
	Outcomes: Health Literacy		did not take their medication.
Authors: Mattson, et al. (2015) Design: Cohort	N: 191 patients enrolled in CR between May 2010-April 2011 Country/setting: Summa Health System's Phase-II CR program in Akron, Ohio, USA Data collection: - The Cardiac Knowledge Assessment Tool - Data was collected prior to beginning CR and prior to discharge - Short Test of Functional Health Literacy in Adults (s-TOFHLA)	**Findings:** - Health literacy was strongly related to cardiac knowledge at both the beginning and the end of CR. ($r= 0.46$, $p <0.001$; $r= 0.41$, $p <0.001$) - Health literacy predicted gains in cardiac knowledge at the end of the CR ($p <0.01$)	Strength of Design: **Moderate** Quality: **Moderate** Issues: - Not all participants were assessed prior to beginning CR, some has already started the CR when first assessed. - Used a small and convenient sample size. - Not generalizable as sample was only taken from one site.

Study/Design	Methods	Key Results	Comments
	Outcomes: Health literacy		
Authors: McAleer, et al. (2016) Design: Cohort	N: 109 patients who were prescribed statin medication in the previous 4 weeks Country/setting: Northern Ireland Data collection: - Dietary intervention in primary care (DINE) food frequency questionnaire - The Godin questionnaire - Food Diary Outcomes: Lifestyle advice, Dietary Behavior, Physical activity behavior.	**Lifestyle advice:** - 53.2% recall receiving lifestyle advice. **Dietary Behavior:** - Total daily fat consumption was 12.85% - Daily fiber intake was 13.8 grams/day - 4 months after the prescription, there was no significant change in mean saturated fat, fiber or fruit and vegetable intake. **Physical activity behavior:** - 80.7% at one month was insufficiently active	Strength of Design: **Moderate** Quality: **Weak** Issues: - Date was self-reported by participants - There was loss of date in follow up and loss of retention of participants

Study/Design	Methods	Key Results	Comments
		- 83.7% at 4 months was insufficiently active	
Authors: McManus, et al. (2016) Design: Cohort	N: 804 patients over the age of 65, discharged from hospital between 2011 and 2012. Country/setting: 6 Hospitals in Massachusetts and Georgia, USA Data collection: - Patient health questionnaire - Generalized Anxiety Disorder questionnaire - Perceived Stress Scale - Patient Activation Measure 6 - Medical outcomes study social support survey	**Findings** - 13% of participants experienced - readmission withing 30-days of discharge. - 47.2 % of participants required a second PCI. p = 0.0006 - 69.8% of participants were readmitted for second cardiac event. p = 0.006 - 25.5% of participants required coronary bypass surgery. p = 0.73	Strength of Design: **Moderate** Quality: **Strong** Issues: - Small sample size

Study/Design	Methods	Key Results	Comments
	- Alcohol Use Disorders Identification Test (AUDIT-C) Outcomes: Readmission rates, and admission for CAD requiring percutaneous intervention (PCI).		
Authors: Mei, et al. (2021) Design: Correlational descriptive	N: 315 patients that were admitted to a cardiology department with CAD. Country/setting: a third-grade hospital in Changchun, Jilin province, China. Data collection: - Generalized Anxiety Disorder Scale (GAD-7)	**Findings:** - Depression and anxiety influenced participants perception to Quality of Life and life satisfaction. - Participants with poor life satisfaction, participants were more likely to high level of depression and anxiety, which in turn experienced poor quality of life.	Strength of Design: **Weak** Quality: **Weak** Issues: - Data was participant self-reported causing bias - Used a convenient sample. - More analysis of data could be completed.

Study/Design	Methods	Key Results	Comments
	- EuroQol Five Dimensions Questionnaires - SPSS 24.0 for Windows - Correlational analysis Outcomes: Life satisfaction, Quality of Life, and Depression and anxiety		- Not generalizable as sample was only taken from one site.
Authors: Meng, et al. (2016) Design: RCT	N: 449 patients with CAD and attending CR. Country/setting: 4 CR clinics in Germany. Intervention group: 216 patients received a self-management education program	p <0.05 **Self-Monitoring:** Intervention group: - Pre-treatment: 3.20 - 6-month follow-up: 3.47 Controlled group: - Pre-treatment: 3.22	Strength of Design: **Strong** Quality: **Moderate** Issues: - Social desirability bias may have affected participants response to questionnaires - Used a convenient sample

Study/Design	Methods	Key Results	Comments
	Group 2: 233 patients received one lecture of basic illness related education. Data collection: - German version of the Health Education Impact questionnaire (heiQ) - The self-efficacy sub-scale of the Kansas City cardiomyopathy questionnaire (KCCQ). - SPSS 21.0, R statistics, and Mplus 7.2 - Chi-square - ANCOVA - t-test - questionnaires were completed pre-treatment and at a 6-month follow-up	- 6-month follow-up: 3.47 p = 0.685 **Self-efficacy:** Intervention group: - Pre-treatment: 64.03 - 6-month follow-up: 80.64 Controlled group: - Pre-treatment: 65.53 - 6-month follow-up: 80.64 p = 0.666 **Health related quality of life:** Intervention group: - Pre-treatment: 58.55 - 6-month follow-up: 69.11 Controlled group:	- Participants were not blind in the study.

Study/Design	Methods	Key Results	Comments
	Outcomes: Self-Monitoring, Self-efficacy, Health related quality of life.	- Pre-treatment: 58.79 - 6-month follow-up: 70.91 p = 0.338	
Authors: Nei et al. (2019) Design: RCT	N: 224 patients with CAD and anxiety and depression. Country/setting: A CR center China Group 1: 142 patients received patients' education and lifestyle improving program (IPEL) Group 2: 142 patients received routine education Data collection:	The higher score on the HADS-A and/or HADS- D the worse the anxiety and depression. p <0.05 **HADS-D scores:** Intervention group: Baseline: 10.35 (±2.27) 3-months: 9.85 (±2.48) 6-months: 9.44 (±2.84) 9-months: 8.26 (±2.81) 12-months: 8.21 (±3.03) (p = 0.021)	Strength of Design: **Strong** Quality: **Moderate** Issues: - Patient received education prior to beginning study in hospital setting. - Study was not blind - Small sample size - No control of confounders - Used a convenient sample - Data collection tools were meant as screening tools and

Study/Design	Methods	Key Results	Comments
	- Hospital Anxiety and Depression Scale- Anxiety (HADS- A). - Hospital Anxiety and Depression Scale – Depression (HADS- D). - Outcomes were measured at baseline, 3-months, 6-months, 9-months, and 12-months. - SPSS 22.0 and GraphPad Prism software - Pair t-test <u>Outcomes:</u> HADS-A scores And HADS-D scores	Controlled Group: Baseline: 10.09 (±2.04) 3-months: 9.71 (±2.94) 6-months: 9.48 (±3.06) 9-months: 9.13 (±3.22) 12-months: 9.08 (±3.30) (p = 0.021) **HADS-A scores** Intervention group: Baseline: 10.15 (±2.41) 3-months: 9.37 (±2.74) 6-months: 8.82 (±2.51) 9-months: 8.26 (±2.24) (p = 0.015) 12-months: 7.80 (±2.38) (p = <0.001)	may not detect changes over time. - Not generalizable as sample was only taken from one site.

Study/Design	Methods	Key Results	Comments
		Controlled Group: Baseline: 10.12 (±2.27) 3-months: 9.63 (±2.38) 6-months: 9.21 (±2.52) 9-months: 8.93 (±2.36) (p = 0.015) 12-months: 8.88 (±2.37) (p = <0.001)	
Authors: Norlund, et al. (2018) Design: RCT	N: 239 patients younger than 75 years and had a myocardial infarction in the last 3 months. Country/setting: 25 Swedish hospitals in Sweden. Intervention group: 117 patients received internet	The higher score on the HADS-A and/or HADS- D the worse the anxiety and depression. p = 0.05 **HADS-T scores:** p = 0.53 Intervention group:	Strength of Design: **Strong** Quality: **Moderate** Issues: - Adherence to the intervention treatment was low - Data collection tools were meant as

Study/Design	Methods	Key Results	Comments
	based cognitive behavior therapy (iCBT) Controlled group: 122 patient received usual treatment Data collection: - Hospital Anxiety and Depression Scale- Total (HADS-T) - Hospital Anxiety and Depression Scale- Anxiety (HADS-A) - Hospital Anxiety and Depression Scale- Depression (HADS-D) - Data was collected a baseline and at follow up - SPSS 22 for randomization	Baseline: 18.2 (SD 4.9) Follow up: 12.8 (SD 5.9) Controlled group: Baseline: 18.6 (SD 5.0) Follow up: 13.6 (SD 6.8) **HADS-A scores:** p = 0.82 Intervention group: Baseline: 10.9 (SD 2.4) Follow up: 7.4 (SD 3.2) Controlled group: Baseline: 10.8 (SD 2.5) Follow up: 8.0 (SD 3.8) **HADS-D scores:** p = 0.32	screening tools and may not detect changes over time - To increase recruitment rates the cut off score for participants on the HADS tool was lowered from >10 to >7. People who have lower scores (lower levels of depression and anxiety) have less room for improvement.

Study/Design	Methods	Key Results	Comments
	- R version 3.4.0 for analyses Outcomes: HADS-T scores, HADS-A scores, and HADS-D scores	Intervention group: Baseline: 9.9 (SD 2.2) Follow up: 6.6 (SD 3.3) Controlled group: Baseline: 10.3 (SD 2.5) Follow up: 8.0 (SD 3.8)	
Authors: Perera, et al. (2021) Design: Cohort	N: 729 participants with CAD and treated with PCI Country/setting: Three tertiary hospitals that provide PCI in Australia Group 1: n = 192 Female patients	$P < 0.05$ **Adherence to 3/3 healthy lifestyles:** $p = 0.081$ Total: 56.4 % (410) Female: 51.0 % (98) Male: 58.3 % (312) **Physically Active:** $p = <0.001$	Strength of Design: **Moderate** Quality: **Moderate** Issues: - Small female population size. - Data was self-reported which may have resulted in social bias.

Study/Design	Methods	Key Results	Comments
	Group 2: n = 537 Male patients Data collection: - Participants were recruited through the Victorian Cardiac Outcomes Registry (VCOR) - Data was also collected using the VCOR - 12-month telephone follow-up was completed - SPSS 23 - Chi squares - T-test Outcomes: Adherence to a healthy lifestyle (made up of 3 parts): a heart healthy diet, being physically active and not smoking	Total: 73.8 % (537) Female: 61.5% % (118) Male: 78.2 % (419) **Healthy Diet:** p = 0.29 Total: 83.2% (596) Female: 85.7 % (162) Male: 82.4 % (434) **Currently Smoking:** p = <0.001 Total: 12.2 % (87) Female: 7.7 % (14) Male: 13.8 % (73) **Attending CR:** p = 0.045 Total: 64.2 % (461)	

Study/Design	Methods	Key Results	Comments
	Secondary outcomes: cr attendance, medication adherence for 12 months	Female: 58.2 % (110) Male: 66.4 % (351)	
Authors: Princy, et al. (2020) Design: UCBA	N: 40 patients who had received PCI Country/setting: The Jubilee Mission Medical College and Research Institute, Thrissur, India. Data collection: - Sociodemographic data was collected with study specific structured knowledge questionnaire and a structured practice checklist. - Pretest and posttest were completed.	P <0.001 **General information:** Pretest: 1.8 Posttest: 4.28 p = <0.001 **Diet:** Pretest: 1.80 Posttest: 3.88 p = <0.001 **Exercise:** Pretest:1.63	Strength of Design: **Weak** Quality: **Moderate** Issues: - Data collection tools were not validated - Lack of information regarding date management and handling - Small sample size - Not generalizable as sample was only taken from one site.

Study/Design	Methods	Key Results	Comments
	- Pretest was done by direct interview and posttest was completed via telephone interview. <u>Outcomes:</u> Knowledge of: - General information - Diet - Exercise - Medication - Lifestyle Modification - Overall score	Posttest: 3.48 p = <0.001 **Medication:** Pretest: 0.40 Posttest: 3.15 p = <0.001 **Lifestyle Modification:** Pretest: 2.48 Posttest: 6.55 p = <0.001 **Overall score:** Pretest: 8.05 Posttest: 21.13 p = <0.001	

Study/Design	Methods	Key Results	Comments
Authors: Ruiz-Bustillo, et al. (2019) Design: RCT	N: 96 patients admitted to hospital between April 2012 and February 2013 with CAD Country/setting: A medical hospital in Spain Intervention group: 39 patients received a nursing led intervention including periodic follow-up, serial lipid level controls, and optimization of lipid-lowering therapy. Controlled Group: 39 patients received routine care	p <0.05 **Total Cholesterol (mg/dL):** Intervention group: 130 Controlled group: 151 p = <0.001 **LDL Cholesterol (mg/dL):** Intervention group: 67 Controlled group: 82 p = 0.006 **HDL Cholesterol (mg/dL):** Intervention group: 43 Controlled group: 48 p = 0.051	Strength of Design: **Strong** Quality: **Strong** Issues: - Small Sample size - Used a convenient sampled from one health center - Not generalizable as sample was only taken from one site.

Study/Design	Methods	Key Results	Comments
	Data collection: - Low density Lipoprotein (LDL) levels. - Samples were collected at baseline of study and at 6 months follow-up - Fisher's exact test - STATA version 15.0 Outcomes: Total Cholesterol, LDL Cholesterol, and HDL Cholesterol		
Authors: Schutter, et al. (2018) Design: Cohort	N: 1171 patient with varying cardiac diseases that were referred to a CR program	$p < 0.05$ **BMI (Kg/m2):** Responders to CR: -0.3 ± 1.7 Non-Responders to CR: 0.2 ± 1.2	Strength of Design: **Moderate** Quality: **Moderate** Issues:

Study/Design	Methods	Key Results	Comments
	Country/setting: The Ochsner Medical Center in Jefferson, Louisiana. Group 1: (n= 905) Responders to CR (participants that adhered to the CR program) Group 1: (n = 266) Non-Responders to CR (participants that did not adhere to the CR program) Data collection: - Waist circumference - Ejection Fracture from 2D echocardiography - Kellner Symptom Questionnaire. - Data was collected at the start of CR	p = <0.001 **Body Fat (%):** Responders to CR: -1.8 ± 3.9 Non-Responders to CR: -0.8 ± 3.5 p = <0.001 **Weight Change (kg):** Responders to CR: -2.3 ± 8.8 Non-Responders to CR: 1.2 ± 6.9 p = <0.001 **Peak Heart Rate (beats/min):** Responders to CR: 4.3 ± 16.1	- Study looks at correlation of improvements and outcomes does not imply causation - The study is observational in nature meaning participants were more motivated to be healthy and participate in the CR program. - Not generalizable as sample was only taken from one site.

Study/Design	Methods	Key Results	Comments
	and 4-5 weeks after completing CR. - R statistical analysis software version 3.2.1 - JMP statistical software suite version 11 Outcomes: BMI, Body Fat, Weight Change, Peak Heart Rate, and HDL	Non-Responders to CR: -5.5 ± 16.6 p = <0.001 **HDL (mg/dL):** Responders to CR: 3.1 ± 7.2 Non-Responders to CR: 1.6 ± 6.8 p = <0.003	
Authors: Siudak, et al. (2018) Design: Cohort	N: 100 patients admitted with CAD received PCI and active smokers. Patients were participants in the education campaign about tobacco addiction "Heart without smoke" Country/setting: The Center for Invasive Cardiology, Angiology, and	p >0.05 Nonsmokers at time of discharge: 0 Nonsmokers at 1-month after discharge: 61 (p <0.001)	Strength of Design: **Moderate** Quality: **Weak** Issues: - No adjustments made to account of bias or confounders - Small sample size

Study/Design	Methods	Key Results	Comments
	Electrotherapy in Pinczow, Poland Data collection: - Telephone based interview by a trained nurse at 1-month and 6-months - Shapiro-Wilk test - Statistical analysis was completing using STATISTICA v12. Outcomes: Non-smokers	Nonsmokers at 6-months after discharge: 51 (p = 0.154)	- Used a convenient sample - Data was self-reported by participants. - Not generalizable as sample was only taken from one site.
Authors: Son & Yu (2016) Design: Cohort	N: 238 patients with CAD and underwent PCI Country/setting: the cardiology department of an internal medicine ward and an outpatient clinic at a	Health literacy: m = 10.72 (SD 3.16) (score of 11-12 is considered adequate health literacy)	Strength of Design: **Moderate** Quality: **Weak**

Study/Design	Methods	Key Results	Comments
	university hospital in Cheonan, Korea. <u>Data collection:</u> - A three-item set of brief screening questions assessing health literacy - Medication adherence measured by use of Morisky Medication Adherence Scale-8 - HRQOL measured using 10-item questionnaire revised and modified for Korean patients - Cronbach alpha - SPSS 22.0 - Pearson's correlation coefficient. - Data was collected at baseline and at 6-months follow-up.	Medication knowledge: m = 16.92 (SD 2.51) (higher scores means more knowledge of medication) Medication Adherence: m = 6.17 (SD 0.58) (good medication adherence is 8) HRQOL: m = 43.89 (SD 4.12) (higher scores mean better HRQOL)	Issues: - Used a convenient sample - Measurements for medication adherence was patient self-reported which can have bias and caused overestimation of medication adherence. - Not generalizable as sample was only taken from one site.

Study/Design	Methods	Key Results	Comments
	Outcomes: Health literacy, Medication adherence, and HRQOL.		
Authors: Thomson, et al. (2020) Design: Cohort	N: 40 patients with CAD participating in a CR program Country/setting: A hospital-based CR program in Northern Scotland Data collection: - Brief Illness Perception Questionnaire (B-IPQ) used to measure patient's illness perceptions - Beliefs about CR questionnaire (BCR-Q) used to measure patient beliefs of CR	p <0.005 **Patient perceptions (Total scores):** Baseline Median: 32.00 Follow-up Median: 26.50 (no significance reported) **Medication Adherence (MARS-5 total scores):** Baseline Median: 25.0 Follow-up: 25.0 (no significance reported)	Strength of Design: **Moderate** Quality: **Moderate** Issues: - A small sample size was used - A convenient sample was used - Limited generalizability - B-IPQ has not been validated as a reliable measure of patient perceptions of illness - Not generalizable as sample was only taken from one site.

Study/Design	Methods	Key Results	Comments
	- Medication adherence report scale (MARS-5) used to measure self-reported medication adherence - Medical outcomes short form used to measure QOL - Data was collected at baseline and 6-month follow-up telephone interview - Wilcoxon Signed Ranks test - Cronbach's alpha Outcomes: Patient perceptions, Medication Adherence, and QOL.	**QOL:** Physical Health: - Baseline: 48.85 - Follow-up: 52.80 (no significance reported) Mental Health: - Baseline: 47.29 - Follow-up: 50.61 (no significance reported)	
Authors: Tschaftary, et al. (2018) Design: Cross-sectional cohort	N: 1,039 of the patients attending a cardiology/primary care practice	**Health Literacy Scores:** Excellent Health Literacy: Total:11.4%	Strength of Design: **Moderate** Quality: **Weak**

Study/Design	Methods	Key Results	Comments
	Country/setting: A cardiology/primary care practice in Berlin, Germany Male participants: 401 Female participants: 638 Data collection: - European Health Literacy Survey (HLS-EU) used to obtain health literacy data - Sociodemographic information was collected using the German population health survey Outcomes: Health literacy in male and female participants	Males:10.6% Females: 12% Sufficient Health Literacy: Total:37.4% Males:37% Females: 38% Problematic Health Literacy: Total: 32% Males: 32.5% Females:31.7% Inadequate Health Literacy: Total: 19.2% Males: 19% Females: 19.3%	Issues: - Surveys were independently filled out and not witnessed by researcher resulting in error of filling out questionnaires - Used a convenient sample - Data was self-reported by participants. - Not generalizable as sample was only taken from one site.

Study/Design	Methods	Key Results	Comments
		Other Findings: - Time constraints was the most frequently barrier to attending clinic (32%) - The second most common was costs (19%)	
Authors: Tusa, et al. (2020) Design: Cohort	N: 597 patients living in Siilinjarvi that had diabetes, ischemic heart disease or hypertension Country/setting: the Siilinjarvi Health Center in Siilinijarvi, Finland Data collection: - Patient's activity in self-care were evaluated using the Patient Activation	**Findings:** - 76 patients with low activity. - 185 patients had moderate levels of activity. - 336 patient had high levels of activity. - Patients with the highest level of activity tend to be	Strength of Design: **Moderate** Quality: **Moderate** Issues: - Used a convenient sample - Data was self-reported by participants - Data of data as some questionnaires were not completed correctly

Study/Design	Methods	Key Results	Comments
	Measurement (PAM). - Self-rate Health (SRH) was measured using a 5 item Likert scale. - Analysis of covariance (ANCOVA) - Normality of variables was evaluated using Shapiro-Wilk W test - Stata 16.0 used for statistical analyses - Patients were mailed questionnaires in the mail. - Questionnaires were filled out and returned at the patient's next follow-up appointment. <u>Outcomes:</u> Patient's level of activity in self-care.	younger, less depressed, had a lower body mass index and higher level of physical activity.	- Not generalizable as sample was only taken from one site.

Study/Design	Methods	Key Results	Comments
Authors: Wischer, et al. (2018) Design: UCBA	N: 224 patients who were admitted to a 24-hour overnight post recovery unit after receiving PCI. All patients in the study received education using a video provided via iPad. Country/setting: A 24 hour postcardiac catheterization recovery unit at a Midwestern US, regional, acute care, Magnet teaching hospital. Data collection: - Pre- and posttest were collected before intervention and 3 months after the intervention - Data was collected using a questionnaire	**Patient's knowledge of Heart disease:** - Pre-video knowledge percentage mean was 88.97 - Post-video Knowledge mean was 96.62 Attendance to CR: - 162 (78.8%) of participants understood and wanted to attend CR. - 44 (21.2%) of participants had no plans to attend CR even after the intervention. - 37.7% of participants attended CR program. Patient Satisfaction: - 86.3% of participants were very satisfied or	Strength of Design: **Weak** Quality: **Weak** Issues: - 34.9% of participants fast-forwarded parts of the intervention and continued to answer the questionnaire - There was data lost in follow-up - No adjustment was made for bias and confounders. - Not generalizable as sample was only taken from one site.

Study/Design	Methods	Key Results	Comments
	developed specifically for the study - 7 questions tested for knowledge regarding CAD, PCI and CR - 2 questions evaluated satisfaction - REDcap software toolset for collection and management of data. - Data was analyzed using SPSS 24. - Paired t-test and Fisher exact test. <u>Outcomes:</u> - Patient's knowledge about heart disease and discharge instructions. - CR attendance record post receiving education.	somewhat satisfied with the intervention - 98.1% of participants believed the intervention improved their knowledge and confidence in caring for their CAD. - No patient was dissatisfied with the intervention.	

Study/Design	Methods	Key Results	Comments
	- Level of satisfaction with education		
Authors: Zhang, et al. (2017) Design: RCT	N: 130 patients who had experienced a ST-segment elevated myocardial infarction (STEMI) and were admitted to hospital. Country/setting: A Cardiology unit in China Intervention group: 65 participants in a community-based CR group Controlled group: 65 participants received routine care. Data collection:	p < 0.05 **6-Minute walking distance:** Intervention group: 412.71 ± 74.37 Controlled group: 302.27 ± 101.81 p= 0.001 **Left ventricular ejection fracture:** Intervention group: 60.81 ± 2.77 Controlled group: 53.33 ± 2.19 p <0.001 **Cardiovascular Risk Factors after CR:**	Strength of Design: **Strong** Quality: **Strong** Issues: - Used a convenient sample. - Not generalizable as sample was only taken from one site.

Study/Design	Methods	Key Results	Comments
	- Data was collected by trained researchers. - Heart rate and blood pressure were collected before exercise and after exercise. - Borg Scale was used to measure exertion during physical activity <u>Outcomes:</u> - 6-minute was distance. - Left ventricular ejection factures - Cardiovascular risk factors	**BMI:** Intervention group: 21.84 $\pm$ 2.02 Controlled group: 23.67 $\pm$ 2.37 p = 0.01 **Systolic Blood Pressure:** Intervention group: 137.9 $\pm$ 9.1 Controlled group: 144.6 $\pm$ 8.2 p <0.001 **Diastolic Blood Pressure:** Intervention group: 75.1 $\pm$ 6.2 Controlled group: 79.6 $\pm$ 19.4 p = 0.001	

Appendix B: Consultation Report

The Development of an Educational Resource for Patients Post Myocardial Infarction

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Consultation Report and Environmental Scan

Patient education is an important part of the nursing process in assisting patients in understanding and managing their health. In patients with coronary artery disease (CAD), effective patient education has shown to improve patient health literacy (HL) and quality of life (QOL) (Gonzale-Chica, et al. 2016; Lecturer, et al. 2019; Mei, et al. 2021; Son & Yu, 2016). In order to provide high quality and consistent patient education while in hospital and upon discharge from hospital, nurses must have access to patient education resources that are of high quality, multidisciplinary focused, and meaningful to patients (Lau-Walker, et al. 2016; Mitchell, et al. 2016; Svavarsdottir, et al. 2016). After a review of the literature regarding patient education and CAD, it was shown that patients who are diagnosed with CAD require education on a number of health-related topics such as diet, physical activity, medication, and disease processes (Johnston, et al. 2016; Kohler, et al. 2020; Liu, et al. 2018; Meng, et al. 2016; Tsai, et al. 2019). A patient education resource developed in order to assist patients in understanding their diagnosis and management of CAD, has been shown to improve adherence to a healthy lifestyle and medications, promote smoking cessation, and decrease readmission rates to hospital (Bailey, et al. 2015; Hald, et al. 2019; Hoog, et al. 2016; Kahkonen, et al. 2017; Lecturer, et al. 2019; Siudak, et al. 2018).

The cardiology unit of the Health Science Centre (HSC) has recently experienced a number of senior nursing staff leaving the unit and the hiring of several novice nurses. Consequently, this has contributed to inconsistency in education that patients received while admitted for complications of CAD. Furthermore, the current patient education resource that is geared toward CAD is primarily focused on percutaneous coronary intervention (PCI) procedures and does not include any information regarding lifestyle modifications, cardiac

rehabilitation (CR) processes, or long-term management of CAD. The development of a patient education resource will assist nurses in providing education to their patients regarding CAD and will benefit patients in their understanding and management of CAD after discharge.

The goal of this practicum is to develop an educational booklet for patients who have been newly diagnosed with CAD. This booklet will be a resource during their admission and when they discharge home. The practicum objectives are:

1. Describe factors that influence patients' personal management of coronary artery disease in Newfoundland and Labrador.
2. Identify important information patients require in order to maintain a high quality of life while living with coronary artery disease based on consultations with key stakeholders.
3. Develop an education resource for patients newly diagnosed with coronary artery disease.
4. Demonstrate advanced nursing practice competencies: clinical, research, leadership, and consultations and collaboration.

Specific Objectives for the Consultations

The objectives for the consultations were focused on what content should be included in the patient education resource booklet.

Objectives for Allied Healthcare professionals (dietician, physiotherapy, occupational therapy, and social work) were:

1. To gather information on current educational resources that are being used to provide patient education.
2. To gather information needed for patient discharge from the respective allied healthcare profession.
3. The identify barriers in providing patient education from allied healthcare professions in

the acute care setting

Objectives for nursing staff consultations were:

1. The obtain feedback on the need for a patient education resource booklet for patients diagnosed with CAD.
2. To gain an understanding of current attitudes of nursing staff towards patient education in an acute care setting.
3. To gather information needed for patient discharge from the nursing perspective.
4. To gather information on the barriers to providing patient education in an acute care setting.

Objectives for physicians' consultations were:

1. The gather information needed for patient discharge from the physician perspective.
2. To identify gaps in patient education from hospital discharge to follow up appointment.
3. To identify challenges in providing patient education regarding CAD.

Objectives for patient consultations were:

1. To gain feedback on what information is needed for patients while in hospital.
2. To gain feedback on what information is needed for patients who are being discharged home.
3. To gain an understanding of the patient's experience with education during admission to hospital.
4. To gain an understanding of patient's understanding of CAD.
5. To gain an understanding of patient's goals of CAD management.

Specific Objectives for the Environmental Scan

The objectives for the environmental scan were:

1. To determine what patient educational resources are available regarding CAD in other health authorities across Canada.
2. To identify what resources are available across Canada to inform content and structure of a patient educational resource for patients with CAD.

Participants

There were two groups of participants involved in this consultation. The first group was the staff of the cardiology department (5SA). It was important for this consultation to receive input from a multidisciplinary team perspective as this was found to be an effective form patient education strategy (Barnason, et al. 2017). Therefore, the nursing staff, nurse practitioners, medicine, physiotherapy, social work, dietician and occupational therapy were asked to complete questionnaires regarding their roles in patient education and their perception of patient education quality on 5SA.

The second group that was included in this consultation were patients themselves. Patient input and perceptions of education is important so that the development of the educational resource is meaningful to patients and meet their educational needs regarding self-management of their CAD. The target patient population were those who were admitted to the 5SA nursing unit and were waiting for PCI or were being discharged after receiving PCI. Patients were excluded if there was a history of cognitive impairment such as dementia. On the days that the questionnaires were provided to patients, there were only a few patients that met the inclusion criteria for this consultation. Therefore, patients who had received PCI but were waiting for coronary bypass surgery, were also asked to complete questionnaires.

Methods of Consultation

Members of the 5SA staff were recruited via email that was sent out by the clinical educator. This email included a letter explaining the purpose of the survey, the survey itself, and information regarding confidentiality, which can be seen in appendix A. When little to no surveys were returned via email, the surveys were printed out and given to staff members in person. For patient recruitment, I visited the unit on two separate days that I was not working. Patients were identified through discussion with the assigned nurses. This discussion consisted of the patient's diagnosis, their ability to answer questions, and their plan of care. The co-signed nurse approached the patients first in order to identify willingness to participate. Once verbal approval was obtained, I introduced myself and explained the purpose of the survey. Patients were then provided with the survey, instructions for completing the survey and a statement explaining their rights as a participant, which can be seen in appendix B. I also, explained that I would remain on the unit should the participants have any questions. Patients were provided with pens to complete the surveys and envelopes to seal and return to me once they had completed the survey.

Data Collection

A survey was chosen to gather information for this consultation due to the large number of staff that work on the unit. A survey would be able to gather the most information from a larger quantity in a short period of time. A survey was also used to gather information from patients as it allowed for better management of confidentiality. As well, 5SA has a high patient turnover rate. The simplicity of surveys allowed me to gather larger quantities of information promptly during our patient relatively short hospital stay.

Data was collected through two different surveys that was developed for the purpose of this consultation. The first was made in order to gather information from the staff of 5SA (see Appendix A). This survey contains 6 multiple choice questions, 4 open-ended questions, and one question that required participants to check all that apply. The questions in the survey are used to gather information on the participant including their profession and years of experience working with CAD patients. The questions were also directed at gaining an understanding of each participating staff member's comfort in providing patient education and the amount of time they spend during their workday providing patient education. As well, questions examined members of the 5SA staff that provide follow up appointments with patients after they are discharged home. These questions were included in order to understand staff's experience of patient's retained knowledge after discharge. Questions also explored staff's opinion of what challenges exist that make providing patient difficult to provide, as well as a way to gather information regarding recourses they use and recommend for use to CAD patients.

The second survey made for this consultation was developed to gather information from patients (see Appendix B). this survey was made up of 10 questions which also included a mixture of multiple choice and open-ended questions. The first two questions focus on demographic information of the participants. Questions 3 through 8 were included in order to understand the patients' experience and perception of receiving education during their admission to 5SA. The last two questions of the survey focus on topics and information that patients feel they require more education in order to manage their own CAD.

Management and Analysis of Data

A total of 35 surveys were completed and returned. 21 surveys were completed by staff members of 5SA and 14 were completed by patients. When both staff and patient participants

had completed and returned their surveys in a sealed envelope, the data was transcribed onto my personal computer which is password protected. I am the only person who has access to this computer. Surveys were kept in a locked file folder in my home office and will be destroyed once this practicum project is completed. Microsoft Excel was used to process the descriptive data from the surveys. Data was entered into a spreadsheet in order to identify important findings. Themes were determined from the open-ended questions using thematic analysis. Thematic analysis is a process of analyzing qualitative data in which themes are derived from codes that are identified in open-ended questions or interviews (Clarke, 2014).

Ethical Considerations

This practicum project does not require a review by the Health Research Ethics Authority (HREA), as shown by the HREA screening tool provided in Appendix C. For further clarification regarding the inclusion of patients in this consultation, an email was sent to HREA, which is provided in Appendix D. As the consultation is aimed at quality improvement of patient education, a HREA review is not required. However, the findings from this consultation can only be used for the development and improvement of patient education practices specifically for the cardiology unit (5SA) of Eastern Health, as per Appendix D. In addition, approval was granted from the manager of the cardiology unit to conduct consultations with the above-mentioned staff members and to approach admitted patients regarding participation.

Results

It is important that the results of the consultation be analyzed and applied appropriately in order for this educational resource to be effective.

Staff Results

There was a total of 21 surveys completed and returned. The majority of the results were completed by nursing staff and nurse practitioners (n= 18). One survey was completed by a practicing cardiologist, one was completed by a physiotherapist, and one was completed by a dietician all of whom are currently working on 5SA. The majority of staff working on 5SA are relatively new to the unit with most participants working on the unit between zero and ten years (n= 21), with most participants working between 1 and 5 years (n=9). One participant reported working on the unit for more than 21 years.

Providing Education

Even though the staff of this unit is relatively young, most of the staff reported feeling comfortable in providing education to CAD patients. Nine participants were extremely comfortable in providing education and 12 reported being somewhat comfortable. Only one reported being neutral when it came to providing patient education. Although, most of the staff felt comfortable in providing education, many felt they did not provide enough education (52% or n=11). Where the rest of the staff (n=10) reported that they spent at least some of their day providing education. This was also shown when staff were asked what percentage of their day is spent providing patient education. The majority spends 50% or less of their workday providing patient education with 47% of participants (n=10) spending between 25 and 50% and 38% of participants (n=8) spending less than 25% of their day providing education. Only 3 participating staff reported that they spent more than 50% of their day providing education to patients.

Barriers and Challenges

There were a number of barriers and challenges that staff identified that prevented or effected their ability to provide quality and timely education to patients. These include a) Time; b) Available resources; c) Patient education level; d) Patient support; and e) Rurality.

Time.

Time was found to be a common challenge for many of the participating staff of 5SA. Eleven participants reported time restraints and feeling of being rushed to discharge patients. Staff reported not having enough time in order to provide quality education to their patients. A lack of time was due to a number of reasons such as performing other job obligations, pressure from management to maintain patient flow and improve bed allocation, and lack of planning for discharge. Some nursing staff and Allied Healthcare Professions (AHP) mentioned that not all discharges are planned and are often sudden which makes providing patient education difficult before discharge. As well, the time between PCI procedures and discharge is short for many CAD patients which also adds to the difficulty of providing adequate patient education.

Available Resources.

Having resources available to the staff of 5SA was found to be important. However, the lack of resources on the unit was identified as a challenge by the staff. Ten participants identified that there was a lack of informational resources on the unit for staff to provide to CAD patients. The staff refer to this lack of reliable resources as extending to both online and hardcopy sources. Staff find that current resources that are present on the unit are either ineffective in providing information to patients or are difficult to find or access.

While AHP are viewed as a reliable and accessible resource for nursing staff and patients, they are sometimes a secondary resource and not involved in patient education from admission.

Some of the AHP experienced only receiving referral immediately before discharge and do not get to provide education to patients before leaving the hospital. Therefore, resulting in the underutilization of AHP in patient education.

Patient Education Level.

While it is recognized as being out of their control, patient education level and level of understanding of their health was seen as a barrier to providing patient education for staff. Some of the staff recognized many patients have differing education levels and as such different understandings of their health condition. However, many of the staff have difficulty addressing these differences. Staff have trouble identifying different ways to deliver information to patients who have different learning needs or challenges.

Furthermore, many staff both nursing and AHP, stated that patients are more focused on the acute stage of their heart condition, receiving treatment, and then returning home. The patient's focus on their illness prevents them from absorbing and understanding what they need to do in order to manage their CAD on a long-term basis. Staff are concern that while patients are provided information, they may not be retaining the information.

Patient Support.

Support for patients was also found to be an issue that was identified by the staff. The lack of patient support was in the context of COVID-19 and rules regarding family visiting. Recent practice on 5SA for COVID-19 precautions, limits the amount of time family are able to be present. Therefore, also limiting the amount of education that can be provided to close family members such as spouses or significant others. As well, this lack of family support can also affect patients' mental health. One of the participants made the point that a lack of familiar support could affect patient moral and willingness to participate in learning.

Rurality.

The challenge of having a large population living in rural areas of the province was recognized by staff. Living in a rural area provides its own set of challenges in managing CAD. Many of the staff cited the cardiac rehabilitation outpatient program as a reliable source of patient education after returning home. However, many staff stated that as many patients live in rural Newfoundland and Labrador (NL), they do not have access to this program. Staff also stated that they are unaware of what resources are available to patients in different regions of the province. Therefore, staff are unable to properly direct patients to support resources in the area that they live.

Another aspect of rurality that was seen as a challenge is the lack of follow up with patients after discharge. Staff identified the fact that patients in rural areas sometimes follow up with internal medicine physicians as opposed to the cardiologist that had cared for them while hospitalized, was seen as a lower quality of patient care. As well, the lack of follow up with AHP's was also seen as a challenge. AHP's stated that patients are provided with contact information if they have questions. However, it is not a regular practice for AHP's to contact patients after discharge.

Education Resources

For this consultation, staff members were asked to identify what resources they provide or recommend to patients to assist in the management of CAD. The most common resource that was recommended by staff was cardiac rehabilitation which was identified by 8 participants. The next most common resource was those that are available on the unit. These include discharge forms provided by nursing staff, pamphlets, and information that is printed from the internet regarding cardiac health. Websites, videos, and smartphone apps were mentioned but no specific

websites, videos, or apps were named. Healthy heart clinics which are offered by some health authorities in NL and follow up doctor's appointment were seen as potential sources of patient information after discharge. Resources that were not associated with Eastern Health was mentioned such as the Heart and Stroke Foundation and smoking cessation programs.

Dietary management resources were found to be an important topic among staff members. there were many resources that were identified by staff in regard to dietary information and support. These included Canada's food guide and NL's Healthline 811 which does provide access to registered dietician. Outpatient dietician was the most recognized resource for dietary management.

Topics of Education

There were two primary topics of education that was identified by staff as important. The first topic being the patient's heart condition. This topic of education included topics like function of the heart, information regarding test and procedures such as echocardiograms, blood work, and PCI. Many staff members believe that patient's need to understand the function of the heart in order to learn how to manage their CAD. The second major topic was healthy lifestyles, and healthy lifestyle adherence. For many of the staff members, this primarily meant health dietary adherence, but also included physical activity, smoking cessation, and importance of medication adherence.

Patient Results

There was a total of 14 patients that completed and returned the surveys for this consultation. 11 of these participants were male and 3 were female. Patients were found across a wide variety of age groups ranging from 40 to 80 plus. Most patients were in the age groups 50-59 (n=5) and 60-69 (n=7).

Patient Understanding

Patient's overall felt that they had a good understanding of their CAD (n=6) or at least felt that their understanding of their CAD had improved since their admission to hospital. Two patients did report that they did not understand their CAD at the point in time that they completed this survey.

Regarding the topics of patient's comfort level of discussing and managing their CAD, there was an overall high level of comfort among the participants. All patients felt that they were either very comfortable or somewhat comfortable in discussing their CAD with healthcare professionals such as doctor and nurses. A number of participants also felt comfortable in managing their own cardiac health. 6 participants reported feeling very comfortable while 6 participants reported feeling somewhat comfortable in managing their own CAD.

Patient Satisfaction

As part of this consultation, it was important to understand the patient's experience in receiving education during their time on 5SA. Many of the participants (n=10) felt that the staff of 5SA were knowledgeable regarding CAD, tests and procedures that patients would be experiencing while in hospital. As well, participants also reported that they were satisfied with the amount education that they received while in hospital. 64% of participants reported being either satisfied or very satisfied with their education. Most participants also reported being satisfied with the amount of time spent receiving education while in hospital. Patients reported being satisfied with short education sessions with most participants having received less than 30 minutes (n=12) and 6 participants having received less than 10 minutes of education.

Topics of Education

As part of this consultation, participating patients were asked what topics they would like to see as part of an educational resource for patients with CAD. The most popular topic of education that patients identified was information on their heart condition and explanation of tests and procedures they will experience while admitted to hospital. These findings indicate that patients are more focused on understanding the acute stage of their CAD rather than long term management of CAD. The second most popular topics were dietary changes, physical activity, medication, and smoking cessation.

Environmental Scan

An environmental scan allows for resources that are currently available to for use. In the case of this practicum, the environmental scan involves an informal discussion with the clinical educator for 5SA regarding any potential educational resources that have already been developed for CAD patients. This section will provide a summary of the environmental scan process for this practicum and the findings that resulted.

Sources of Information

The environmental scan was conducted by having an informal discussion with Renee Hayley, the clinical educator for the cardiology inpatients unit and the Cath Lab. She is knowledgeable about any written educational resources that are available within in Eastern Health, in other health authorities, and throughout the community.

During this informal discussion with the clinical educator, it was recommended reviewing the Heart Institute of Ottawa's website and the Heart and Stroke Foundation's website. These websites provide reliable information for both the general population and healthcare professionals.

Results

Following the review of the Heart and Stroke Foundation (HSF) website, a guide entitled "Living Well with Heart Disease: A guide for people with coronary artery disease". This guide was written in 2018, is 104 pages long, and is broken down into 5 chapters that covers the topics of understanding CAD, medications, dietary, physical activity and recovery, and adapting lifestyles. Each chapter was written by different authors that who are experts in their own fields of study. Authors were from across Canada with varying associations with different companies and universities. As well, the contents of this guide were reviewed by persons with CAD.

The content that is present in the HSF's guide covers a wide range of information that is important for CAD management. This information ranges from heart function to dietary restrictions, physical activity guidelines, medication, and more. There is also space provided so that people are using the guide are able to make notes, track progression over time, and record important information that is pertinent to them specifically. While this guide is rich with information, it is also very dense and at times difficult to read. It also uses language that could be difficult for people with lower education levels to understand. As well, information regarding tests and procedures that CAD patients experience while in hospital is not included, which was important information as identified by patients and staff of 5SA.

The other website that was reviewed was the University of Ottawa Heart Institute (UOHI) (2019). The UOHI and 5SA have a history of working closely together as many patients who require specialized cardiac procedures or cardiovascular surgeries in NL are referred to the UOHI. Upon review of UOHI's website the booklet titled "Coronary Artery Disease and Recovery After a Heart Attack: A guide for patients and families" was found. Like the guide that is offered by HSF, this provides information regarding CAD and important information that

CAD patients need in order to develop and maintain a healthy lifestyle. Also, the UOHI guide provides space for patients to write notes and questions should they have any for hospital staff. Unlike the guide for CAD by the HSF, the UOHI guide also includes information regarding test and procedures that patients will experience while in hospital. As well, the information in the UOHI guide is less dense and more focused on providing information that is needed for day-to-day living. Furthermore, it is easier to read allowing for patients with different education levels to avail of its information.

The guide provided by the UOHI is more applicable to the educational needs of the CAD patients that are admitted to 5SA. Therefore, I contacted the UOHI in order to obtain permission to use their educational resource in order to develop an educational resource specific to the 5SA unit and NL. The email regarding the UOHI's approval for their CAD guide can be seen in Appendix E.

Implementation of Findings

For the educational resource that will be developed for this practicum to be effective, it is important to include the findings from this consultation and environmental scan. Input from the staff and patients of 5SA are important as this ensures the teaching and educational needs of those who will utilize this resource, are met.

Findings from the staff survey identify what the staff of 5SA require to effectively provide CAD education to their patients. Based on the results of the survey, staff want an educational resource that is easily accessible and can be provided to patients in a short period of time. The staff want a condensed and concise educational resource that can be utilized by any patient despite their level of understanding or education. Concerns regarding providing care to patients living in rural areas was also a result found in the staff consultation. Therefore, it is

important that this educational resource can be taken home with the patient and contain information regarding resources that are available to the patient in whatever portion of NL they live in.

A finding that was found in both the staff and the patient surveys was the focus on the acute care and investigation of the patient's CAD. Therefore, it is important to address this in the educational resource. Information regarding tests and procedures (e.g., dye test, echocardiogram, PCI) need to be included as part of the guide to CAD. Other topics of education were also identified in the patient surveys. These topics include dietary changes, the purpose of medications, the dos and don'ts of physical activity, and smoking cessation. All of these topics are addressed in CR programs however not all patients have access to these programs depending on where they live. Therefore, it is important that this educational resource contains practical guides and tips that patients can do from home without access to a CR programs.

Finally, the environmental scan showed that there are guides available for CAD patient. However, these guides are not ideal to provide to CAD patients that are admitted to 5SA. In order to be effective, this educational resource must be concise, provide specific information regarding practices of CAD patient care in NL, and resources that are available to patients who live in NL. The guide that had been developed by UOHI contains information is that highly applicable to CAD patients while they are in hospital and when they return home. Therefore, the UOHI guide for CAD patient will act as a template for the development of this practicum.

Conclusion

In conclusion, the consultation of staff and patients of 5SA is an important step in the development of this practicum project. Involving the thoughts, opinions, and experiences of those who will utilize this educational resource for CAD patients, will make the resource more

effective. Input from these groups allow for the information that will be included in this resource to tailored to their needs. As well, the environmental scan identified what resources are presently available to staff and to patients. As well, the UOHI guide for CAD patient can act as a reference point for the development of this practicum.

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Appendix A: Staff Questionnaire

Dear staff member of the Cardiology Unit (5SA),

This letter is an invitation to participate in a practicum project that Reuben Bonnell is completing as part of his master's degree in nursing at Memorial University under the guidance of Dr. Ann Noseworthy. The goal of this practicum project is to develop a patient education resource to be used in the education of patients who are admitted with coronary artery disease and are waiting for percutaneous coronary intervention or are being discharged home post percutaneous coronary intervention.

Participation in this practicum project is voluntary. It will include the completion of a questionnaire which will take approximately 5-10 minutes to complete. You can decline to answer any of the questions if you so wish and you can withdraw your participation at any time. All information you provide is considered confidential. Your name will not appear in any report for this practicum project. Data that is collected for this practicum project will be kept in a locked file folder and will be stored on a password protected computer accessible only to Reuben Bonnell. There are no known or anticipated risks to you as participant.

Once you have completed your questionnaire, it can be returned directly to Reuben through his Eastern Health email at reuben.bonnell@easternhealth.ca or by placing the questionnaire in a sealed envelope and depositing it in the sealed box that will be present in the Unit 1 classroom. By July 1, 2021.

Thank you in advance for your contribution to this project.

Sincerely,

Renee Hayley,

Clinical Educator for the Cardiac and Critical Care program

Staff Questionnaire

Instructions:

-For multiple choice questions, please select the answer that you feel is most relevant to you.

-For long answer questions, you may answer in point form or in paragraph form.

-Please do NOT write your name on the questionnaire

-Once you have completed the questionnaire, please place in the provided envelope and return to me or place the sealed envelope containing the questionnaire in the sealed box located in the unit one nurses' station.

1. What is your position in Eastern Health?

   __ Physician

   __ Nursing/ Practitioner

   __ Allied Healthcare Professional. Please specify: _____

2. How long have you work on the Cardiology/Cardiac surgery unit of the Health Science Centre?

   __ 0-1 year

   __ 1-5 years

   __ 6-10 years

   __ 11-15 years

   __ 16-20 years

   __ 21+ years

3. How comfortable do you feel in providing education to patients with coronary artery disease (CAD)?

   __ Extremely comfortable

   __ Somewhat comfortable

   __ Neutral

   __ Uncomfortable

   __Extremely uncomfortable

4. Do you feel you spend enough time during the workday in providing patient education?

   __ Yes, most if not all of my day is spent educating patients

   __ Some of my day is spent educating patients

   __ Unable to assess

   __ I do provide patient education but not enough

   __ I do not provide any patient education

5. What percentage of your day do you spend providing patient education?

   __ More than 75%

   __ Between 50-75%

   __ Between 25-50%

   __ Less than 25%

6. Do you provide patient follow up services (e.g., appointments, education sessions) post discharge?

   __Yes

   __No

7. If yes to question #6. Do you feel that patients have a better understanding of how to manage their CAD after leaving hospital? Please explain.

_____

_____

_____

_____

_____

8. What do you think are some challenges with the discharge processes regarding patients diagnosed with CAD?

_____

_____

_____

_____

_____

9. What do you feel are some gaps in patient discharge education for patients who are diagnosed with CAD?

_____

_____

_____

_____

_____

10. What resources can you identify that are available for patients to help them manage their CAD post discharge?

_____

_____

_____

_____

_____

_____

_____

11. What educational resources do you presently provide to patients regarding CAD (select all that apply):

__ Websites

__Unit provided information booklets

__Unit provided Pamphlets

__Information from the intranet

__Own personal knowledge of CAD

__ Referral to the cardiac rehabilitation program

__Other organizations outside of Eastern Health (e.g. The Heart and Stroke foundation)

__ Smartphone Apps

__Videos

__Outpatient programs

__ Other (please specify): _____

Appendix B: Patient Questionnaire

Dear Patient,

This letter is an invitation to participate in a project that I am completing as part of my master's degree in nursing at Memorial University under the guidance of Dr. Ann Noseworthy. The goal of this project is to develop a patient education book that will be used in the education of patients who are admitted with a heart condition that requires a dye test or are being discharged home after receiving stents.

Participation in this project is voluntary. It will include a questionnaire which will take about 5-10 minutes to complete. You can refuse to answer any of the questions that you so wish and can withdraw your participation at any time. All information you provide is considered private. Your name will not appear in any report for this project. Information that is collected for this project will be kept in a locked file folder and will be stored on a password protected computer accessible only to me. There are no known or expected risks to you as a participant.

Once you have completed your questionnaire, it can be returned directly to me or by placing the questionnaire in a sealed envelope and placing it in sealed box that will be present in the Unit 1 nurses' station, by July 1, 2021.

Thank you in advance for your contribution to this project.

Sincerely,

Reuben Bonnell, BNRN

Patient Questionnaire

Instructions:

-For multiple choice questions, please select the answer that you feel is most relevant to you.

-For long answer questions, you may answer in point form or in paragraph form.

-Please do NOT write your name on the questionnaire

-Once you have completed the questionnaire, please place in the provided envelope and return to me or place the sealed envelope containing the questionnaire in the sealed box located in the unit one nurses' station.

1. What is your gender?

   __ Male

   __ Female

   __Other

2. What is your age?

   __ 20-29 years old

   __ 30-39 years old

   __ 40-49 years old

   __ 50-59 years old

   __60-69 years old

   __ 70-79 years old

   __ 80+ years old

3. Do you feel you have a better understanding of your heart condition after being admitted to hospital?

__Yes, I have a very good understanding

__I have a somewhat better understanding

__Has not changed

__I do not understand my heart condition

__I have a worse understanding of my heart condition

4. How comfortable do you feel discussing your heart condition with your family doctor or cardiologist?

__ Very Comfortable

__Somewhat Comfortable

__Neutral

__Uncomfortable

__Very Uncomfortable

5. How confident to you feel in managing your heart condition?

__Very comfortable

__Somewhat Comfortable

__Neutral

__Uncomfortable

__Very Uncomfortable

6. Are you satisfied with the amount of education you have received while in hospital?

__Very satisfied

__ Satisfied

__ Neutral

__Dissatisfied

__Very dissatisfied

7. How much time during your admission to hospital has been spent on receiving education?

   __ less than 10 minutes

   __between 11 minutes to 30 minutes

   __between 31 minutes to 60 minutes

   __greater than 60 minutes

8. Do you feel members of the healthcare team are knowledgeable regarding your heart condition, tests, and procedures?

   __ Yes, very Knowledgeable

   __ Knowledgeable

   __Unsure

   __Not knowledgeable

   __Very Unknowledgeable

9. What topics do you feel you need more information on regarding your heart condition, before being discharged home?

   _____

   _____

   _____

   _____

   _____

10. What topics have you received education on during your admission to hospital (select all that apply):

    __ Medication

    __Physical activity

    __Diet

    __Support services

__Heart condition

__Cardiac Rehabilitation

__Diabetes

__Tests and procedures

__ Local resources

__Financial Support

__ Quitting Smoking

__Salt intake

__ Other (Please specify): _____

Appendix C: Health Research Ethics Authority (HREA) Screening Tool

Student Name: Reuben Bonnell

Title of Practicum Project: The Development of a Discharge Educational Resource for Patients with Coronary Artery Disease

Date Checklist Completed: May 18, 2021

This project is exempt from Health Research Ethics Board approval because it matches item number _____3_____ from the list below.

1. Research that relies exclusively on publicly available information when the information is legally accessible to the public and appropriately protected by law; or the information is publicly accessible and there is no reasonable expectation of privacy.
2. Research involving naturalistic observation in public places (where it does not involve any intervention staged by the researcher, or direct interaction with the individual or groups; individuals or groups targeted for observation have no reasonable expectation of privacy; and any dissemination of research results does not allow identification of specific individuals).
3. Quality assurance and quality improvement studies, program evaluation activities, performance reviews, and testing within normal educational requirements if there is no research question involved (used exclusively for assessment, management or improvement purposes).
4. Research based on review of published/publicly reported literature.
5. Research exclusively involving secondary use of anonymous information or anonymous human biological materials, so long as the process of data linkage or recording or dissemination of results does not generate identifiable information.
6. Research based solely on the researcher's personal reflections and self-observation (e.g., auto-ethnography).
7. Case reports.
8. Creative practice activities (where an artist makes or interprets a work or works of art).

For more information, please visit the Health Research Ethics Authority (HREA) at https://rpresources.mun.ca/triage/is-your-project-exempt-from-review/

Appendix D: E-mail from HREB Regarding Consultation of Admitted Patients.

Hi Reuben, thanks for getting in touch. Program evaluation, quality assurance, and quality improvement studies do *not* require Health Research Ethics Board (HREB) review. In making the determination as to whether a study constitutes (a) program evaluation/QI or (b) research, the key factor for the HREB concerns the type of findings that will be produced and how these findings will be used. Are you planning on using the results of your project solely to improve processes or outcomes specific to that particular cardiology unit? If so, then we would likely categorize your project as QI/program evaluation, in which case it would be exempt from HREB review. If, on the other, hand you aim to produce findings that can be generalized to cardiology units elsewhere in the province or country, then we may well determine that the project constitutes research according to TCPS definitions, and we would ask you to submit an application to the HREB.

Hope this clarifies things for you. Let me know if you'd like to discuss further.

-rob

Rob Kean

Ethics Officer (Non-Clinical Trials)

Health Research Ethics Authority

Suite 200, 95 Bonaventure Avenue

St. John's, NL A1B 2X5

Appendix E: E-mail from University of Ottawa Heart Institute Regarding Utilization of The Guide: "Coronary Artery Disease and Recovery After a Heart Attack: A guide for patients and families"

From: Karine PROULX
Sent: Tuesday, May 18, 2021 1:42 PM
To: rfb314@mun.ca
Subject: RE: Guide for patients dealing with coronary artery disease

Hello Reuben,

Thanks for reaching out and seeking permission to use our material.

We are always happy our patient education resources get to be shared with patients elsewhere. Please credit the University of Ottawa Heart Institute when using and/or adapting the material.

If you require more guidance, don't hesitate to ask.

All the best,
Karine

Karine Proulx
Director, Public Affairs • Directrice, affaires publiques
Communications and French Language Services • Communications et Services en français
University of Ottawa Heart Institute
Institut de cardiologie de l'Université d'Ottawa

613-696-7000 ext. 14427
kproulx@ottawaheart.ca

ottawaheart.ca

Appendix C: A Patient Resource Manual for Recovering

From A Heart Attack: Information for in Hospital and Going Home

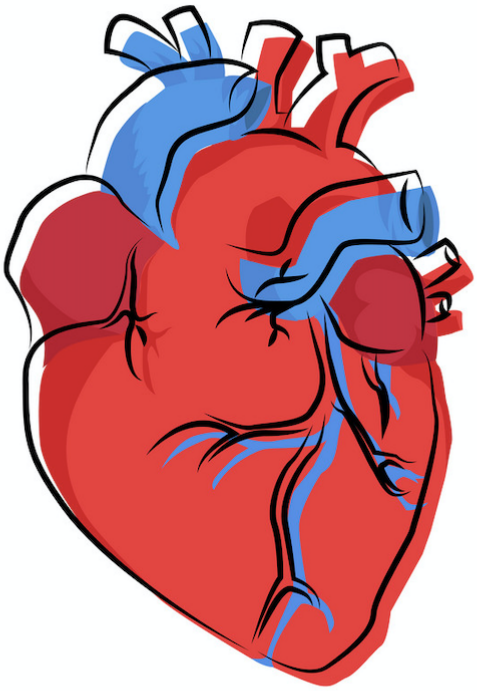
Reuben F. Bonnell

Master of Nursing

Faculty of Nursing

Memorial University of Newfoundland

St. John's, Newfoundland and Labrador



Recovering from a Heart Attack:

Information for in Hospital and Going Home

Adapted from the

University of Ottawa Heart Institute's

Coronary Artery Disease and Recovery After a Heart Attack

UNIVERSITY OF OTTAWA
HEART INSTITUTE
INSTITUT DE CARDIOLOGIE

Table of Contents

Introduction

Hello, if you are reading this, it means you have experienced a heart attack or a cardiac event that has required you to be admitted to hospital in order to be monitored and to undergo further tests and/or procedures.

This booklet was developed to:

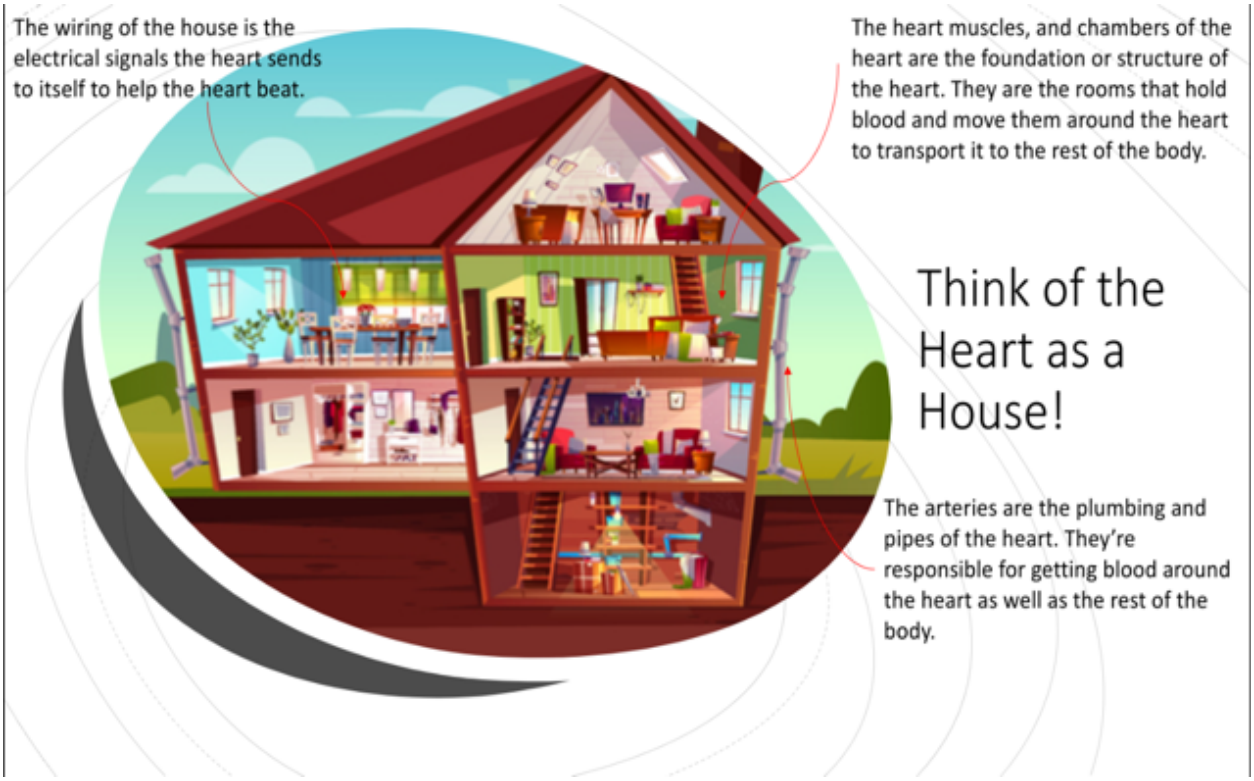
1. To guide you through your stay in hospital.
2. Provide you with information regarding heart disease, tests and procedures that you may experience while in hospital.
3. Provide information that will help you live with heart disease.
4. Provide information that will help you recover from having a heart attack.

This booklet was developed using the University of Ottawa Heart Institute's 2019 book "Coronary Artery Disease and Recovery After a Heart Attack: A Guide for Patients and Families". Thank you to the University of Ottawa Heart Institute for granting permission for the use of their educational resource.

!!Important!!

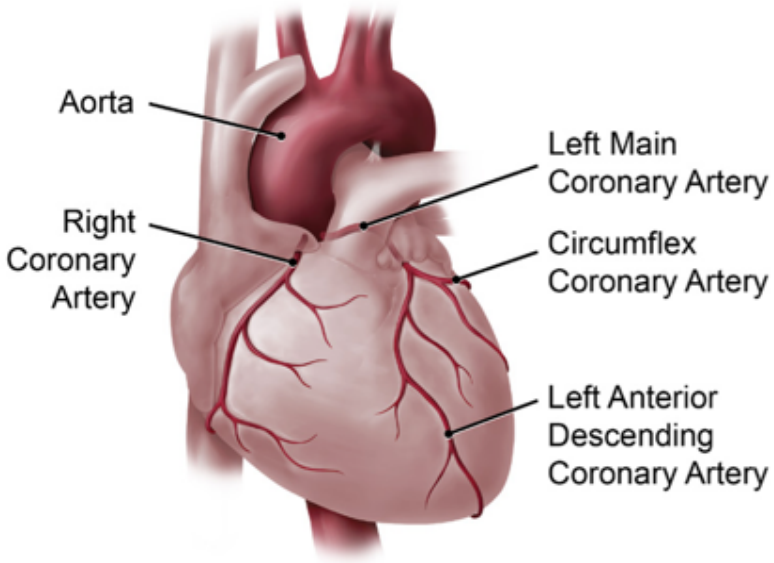
Keep in mind that everyone is different. Do not compare your health with that of others. Recovering from a heart attack takes time and patience. You may need to make some changes in your life habits. If you do have any concerns after being discharge from hospital, please see your family doctor or call 811 for more information.

How Does the Heart Work?



All parts of the house have to come together to create a safe and happy home! While in hospital you will experience a series of tests and procedures that will determine how your house is built and working. Think of these as an inspection, your health care team wants to make sure everything is up to code!

Heart Anatomy



University of Ottawa Heart Institute, (2019)

The heart is a muscle that pumps blood around the body through a series of pipes. These pipes are called arteries. The left side of the heart receives fresh, oxygen-rich blood from the lungs and then pumps it out through a large artery called the aorta that branches into smaller arteries that go to all parts of the body.

The various parts of the body then take the oxygen out of the blood and the now oxygen-poor blood is returned to the right side of the heart through pipes called veins. The right side of the heart pumps this oxygen-poor blood to the lungs where it picks up more oxygen and the cycle begins again.

The Coronary Arteries

The heart muscle, like every other part of the body, needs its own oxygen-rich blood supply. Arteries branch off the aorta and spread around the outside of the heart. There are three main arteries that supply blood to the heart. The Right Coronary Artery (RCA) supplies the bottom part of the heart. The short Left Main (LM) artery branches into the Left Anterior Descending (LAD) artery that supplies the front of the heart and the Circumflex (Cx) artery that supplies the back of the heart.

HEART DISEASE

Heart disease, or cardiovascular disease, are general terms for a variety of conditions that affect the heart and blood vessels. It is a disease that can lead to serious events including heart attack and death. Heart disease is one of the leading causes of death in Canada and worldwide. The most common form of heart disease is coronary artery disease (CAD) caused by atherosclerosis.

Atherosclerosis

Over time, plaque builds up on the inside wall of arteries. Plaque is mainly made up of cholesterol. This build up is called atherosclerosis or hardening of the arteries. It can start at an early age and is caused by a combination of genetic and lifestyle factors. Atherosclerosis can cause a narrowing in the arteries to various parts of the body which slows or blocks blood flow. Poor blood flow to the brain can cause a stroke. Poor blood flow to the arms or legs is called peripheral artery disease (PAD). Poor blood flow to the heart is called CAD and can cause angina or a heart attack.

Angina

Plaque buildup in the coronary arteries to the heart causes poor blood flow and the heart may not receive all the oxygen that it needs. This usually occurs when the heart has to work harder such as while walking, climbing stairs, or feeling worried or upset. When the heart isn't getting enough oxygen, it can cause pain or pressure in the chest that may spread to the arms, neck, or jaw. There may also be shortness of breath, sweating, or nausea. This pain is called angina and usually goes away within two to 20 minutes by resting or taking a medication called nitroglycerin. It does not cause any heart damage.

Unstable Angina

Sometimes, the plaque in the artery can crack open suddenly. The blood forms a clot over the crack, but this clot causes a sudden narrowing of the artery. The chest pain or angina may now occur more frequently, with less exercise, or last longer than usual. This change in the pattern of angina is called unstable angina.

Heart Attack

If the heart needs blood and not getting enough oxygen for more than 20 minutes, then a part of the heart muscle dies causing some permanent damage. This is called a heart attack or myocardial infarction (MI). Heart attacks are confirmed with blood tests and a test that shows the electrical activity of the heart called an electrocardiogram (ECG).

Some heart attacks involve only a small area of the heart and can be managed with standard medical treatment in hospital. Some heart attacks involve a larger area of the heart.

CHEST PAIN	ANGINA	UNSTABLE ANGINA	HEART ATTACK
While Resting	Rare	Sometimes	Common
Goes Away with Rest or Nitroglycerin	Yes	Yes	Sometimes
Lasts More than 20 Minutes	No	No	Yes
Causes Permanent Heart Damage	No	No	Yes

NOTE: Sometimes chest pain or heart pain can occur in other parts of the body than the chest. The pain may occur in your jaw, out your back, down your arms or feel like heartburn. This is often more common for women and people with diabetes. Therefore, it is important you let the healthcare team know if you feel any pain similar to what brought you to the hospital because heat pain can be different for everyone.

Heart Damage

Some heart attacks cause very little damage to the heart muscle and the heart can still pump strongly. Some heart attacks are larger, and the muscle damage causes a weak heart. There are several heart tests that measure the strength of the heart such as an echocardiogram (an ultrasound of the heart that looks at the pumping strength of the heart and how the heart valves work), nuclear scans such as a MUGA scan, or a ventriculogram which is commonly done during an angiogram.

If you are not sure how much damage was done to your heart, please speak with your doctor.

Tests and Procedures

There are many tests and procedures that can potentially be done to assess the function of your heart. These include Electrocardiogram (ECG), Echocardiogram (ECHO), stress test, CT angiography scan, persantine myoview scan, coronary angiogram, and percutaneous coronary intervention (PCI).

Electrocardiogram (ECG)

An ECG is a test that is not painful. It provides the medical staff with a snapshot of the electrical function of the heart. An ECG requires the placement of 10 stickers in specific places on your chest, arms and legs. You will be asked to not move for this test and is best done lying down.

Echocardiogram (ECHO)

An ECHO is an ultrasound of the heart and is not painful. It provides the medical staff with information about the structure and function of the chambers of your heart. Once the nursing staff is given a time for your ECHO appointment, you will be given a hospital gown which needs to be open in the front. As well, you will need an IV. When it is time for your ECHO, you will be taken to the ECHO lab either by stretcher or wheelchair. The ECHO takes about 45 minutes to complete.

Stress Test

There are three types of stress tests. The first stress test is an exercise stress test where you walk on a treadmill while connected to an ECG machine. The second type of stress test is a medication induced stress test. You will be given medication through an IV which will cause your heart muscles to work harder similar to exercise. This is for patients that cannot use the treadmill but still need a stress test. The third type of stress test is a combination and uses both medication and a treadmill.

Persantine Myoview

This is a test that shows how well blood flows to the heart muscle. It is an alternative to an exercise stress test for people who are unable to walk on a treadmill. Pictures of your heart are taken “at rest”. You will then be given a medication called Persantine which causes the heart to react as if you were exercising. More pictures of your heart will be taken during the “stress” phase of the test and compared to your resting pictures. If it is determined that you require this test, your healthcare team will provide you with more information.

MUGA scan

A multigated acquisition (MUGA) scan is a nuclear medicine imaging test completed in the nuclear medicine department of the Health Science Centre. This test checks how well the heart is pumping during rest or exercise. A MUGA scan uses a radioactive material that targets the heart. With the use of a camera and a computer, a MUGA scan creates images of the blood flowing through the heart.

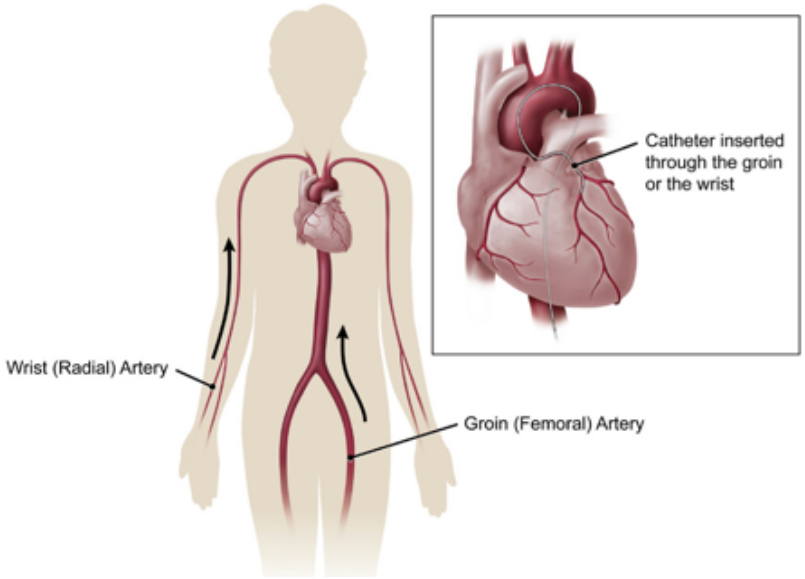
Ventriculogram

A ventriculogram is a test that shows images of your heart. The images show how well your heart is pumping. Dye is injected into the chambers of the heart in order for doctors to check the function of the lower chambers. This test is done as part of the angiogram (Dye test).

Percutaneous Coronary Intervention (PCI)

With this test, a small tube or catheter is inserted into an artery in the groin or wrist and guided to the heart. A dye is injected through the tube and into the coronary arteries so that they can be seen with an X-ray. This shows if there is plaque blocking the arteries and whether the blockages should be treated just with medications or if there is also need for a PCI or coronary artery bypass grafting (CABG) surgery. Sometimes dye is injected into the pumping chambers of the heart to check how strong the heart is and if there was any damage to the heart muscle. This is called a ventriculogram. The catheter is then removed.

Insertion Sites for PCI



University of Ottawa Heart Institute, (2019)

Angioplasty and Stents

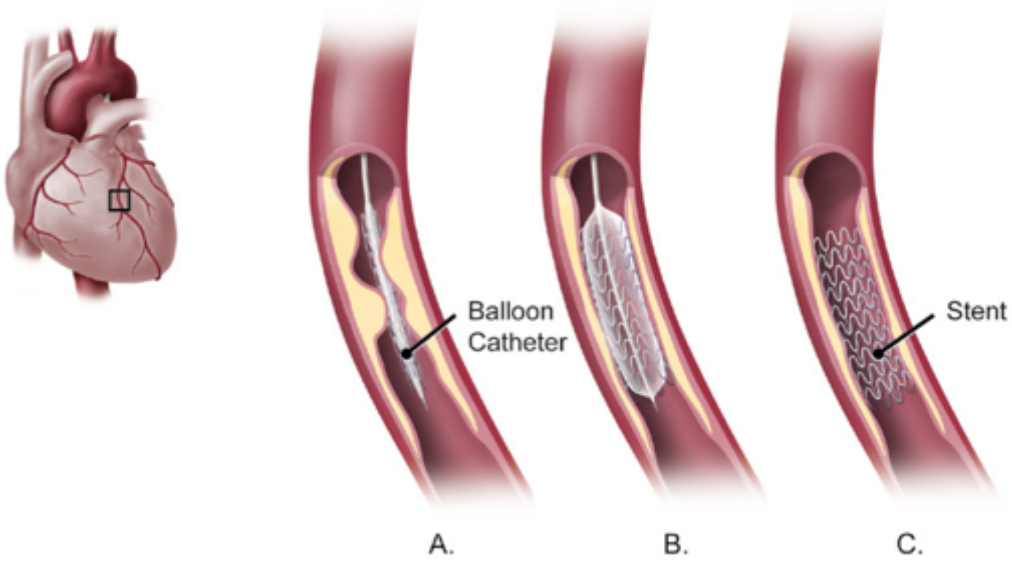
Sometimes blockages in the coronary arteries can be fixed with angioplasty. A small tube or catheter is inserted into an artery in the groin or wrist and guided to the heart as with the angiogram. In this procedure, a small balloon at the end of the catheter can be inflated for a short period of time to push the plaque back against the wall of the artery so that blood can flow better.

In many patients, a small metal mesh tube or stent, is placed over the balloon. When the balloon is deflated and removed, the stent stays permanently where the blockage was and lowers the risk of this area narrowing again.

A. The balloon catheter and collapsed stent are inserted into the narrowed artery.

B. The balloon is inflated to expand the stent.

C. The balloon catheter is removed leaving the stent in place.



University of Ottawa Heart Institute, (2019)

RISKS OF ANGIOGRAM AND ANGIOPLASTY

Angiogram and angioplasty (with or without stent placement) are common procedures. Your physician has carefully considered your clinical condition and believes that the benefits of the procedure outweigh the risks. However, since these procedures are invasive there are risks associated with them.

Common risks include:

• Bleeding at the catheter insertion site or other areas due to blood thinning medication (antiplatelet or anticoagulant)

The less common but potentially more serious risks include:

- Heart attack
- Stroke
- Unknown dye allergy
- Kidney problems, including kidney failure requiring dialysis
- Emergency heart surgery
- Death

In 1% to 2% of angioplasty cases, the artery collapses or is damaged by the wire or balloon. Discuss the risks and benefits of your procedure with your doctor.

Coronary Artery Bypass Grafting

Sometimes the blocked arteries cannot be fixed with angioplasty/stents and may require coronary artery bypass grafting (CABG) which is surgery that requires opening the chest. Arteries inside the chest, an artery from the wrist, or pieces of vein from the leg are used to go around the blockages in the coronary arteries. This surgery requires a recovery time of five to seven days in hospital and one to two months at home.

If it is determined that you require heart surgery, you will be provided with more information by your healthcare team.

Next Stop: The Cath Lab!

The Cath Lab is located on the main floor of the Health Science Centre. The Cath lab is the department where dye tests and stenting are completed among other procedures. This section will guide you through the process of having a dye test and receiving stents as well as the recovery time after the procedures are completed.

Leading Up to the Cath Lab

- Cath lab appointments are normally determined at 2pm the day before your appointment. However, the time of your appointment is not set in stone. Your appointment may be changed due to emergencies or to your own health condition.
- An IV is needed for these procedures. Ideally, the IV should be in your left arm.
- You are allowed to eat and drink prior to your Cath Lab appointment unless told otherwise by your healthcare team.
- Immediately before your Cath Lab appointment you will be asked to remove your all clothing including jewelry, bras, underwear, and socks.
- You will be provided with a hospital gown to wear that opens in the back. You may keep on glasses, dentures or hearing aids if applicable.
- You will then be taken to the Cath lab from your hospital room by wheelchair or stretcher by hospital staff.

During Your Cath Lab Visit

- Once you arrive in the Cath Lab, you will meet the nursing staff who are specially trained to prepare and care for you before, during, and after your procedure. The nursing staff will prepare you for procedure. This will include vital signs (heart rate, oxygen level, and blood pressure), and shaving of hair. The nurses will prepare both your wrist and groin for the procedure.
- You will also meet the doctor who will be completing your dye test at this time. They will review the procedure with you and answer questions you may have.
- Once you are prepared for the procedure, you will be moved into the procedure room. You will be given medication to help you relax, but you will be awake during the procedure so that you can follow instructions from the doctor and nurses. The doctor will administer freezing to your groin/wrist. A small catheter will be threaded through a blood vessel up to the heart. A contrast dye will be injected through this catheter to

highlight the heart's arteries. Most patients experience a sensation of body warmth or the urge to empty their bladder as the dye is injected.

- X-ray pictures will be taken throughout the procedure. The X-ray machine will move over your body.

- During the procedure, you may be asked to take a deep breath and hold it for a few seconds, or to cough. It is not unusual to experience some chest pain, but make sure to let the health care team know if you experience any discomfort or have concerns.

- The time for the procedure in the lab is usually between 30 to 90 minutes. If your condition is complex, your procedure may be longer.

After Your Cath Lab Appointment

Once your procedure is completed, what happens next depends on whether your groin or wrist is used during the procedure.

Following a groin insertion:

- If the doctor used your groin (femoral artery), you may remain in the Cath Lab for up to 1 hour before you leave the Cath Lab area as the instrument (sheath) used to access the femoral artery must be removed before you return to your room.

- When the sheath is removed manual pressure must be applied to groin for up to 20 minutes, possibly longer if there are signs of bleeding.

- Once the sheath is removed, you must remain on bed rest for up to 4 hours after the procedure even after you return to your room. This may include remaining flat on a stretcher or bed upon returning to the hospital that you are admitted to. If this is outside St. John's, this will happen via ambulance.

- It is important to keep your head on the pillow and your affected leg straight. You will be reminded frequently to do these two things to avoid bleeding from the puncture site.

- If you experience back discomfort, you can be repositioned with the help of a nurse, keeping your affected leg straight. The head of your bed may be elevated slightly.

- You will be instructed by the nursing staff when you are able to sit up in bed and walk.

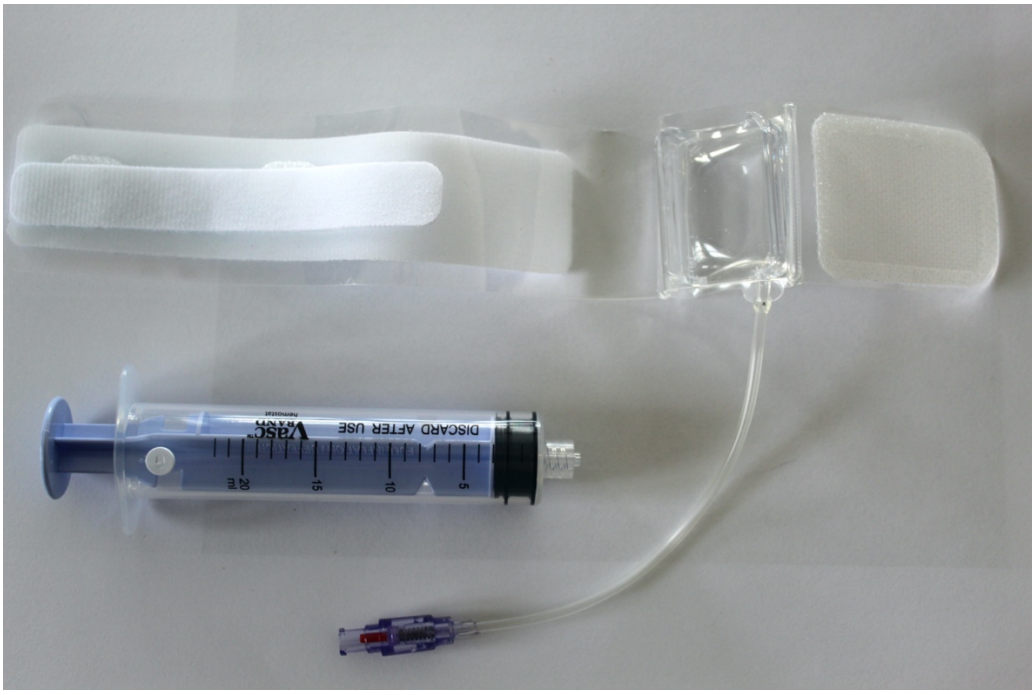
- Limit the amount of stair climbing as much as possible. Try to climb the stairs only once on the day of your procedure.

- Do not lift anything heavy—greater than 10 lbs. (4.5 kg) —for 48 hours.

- Apply pressure to your groin if you have to sneeze or cough hard for 48 hours.

Following a wrist insertion:

- If the doctor used your wrist (radial artery) you will have a band applied to your arm (like the one in the picture below) that is filled with air in order to apply pressure and prevent bleeding.
- Nursing staff will slowly remove air from the band and eventually remove the band. They will then apply a dressing once the band is removed.
- You may remove the clear dressing or band-aid the day after the procedure.
- A small amount of dried blood on the old dressing and puncture site is normal.
- While the band is in place, you are encouraged to “drum” your fingers. This will help with any pain, numbness, tingling, and improve circulation to your hand.
- The band will remain on your wrist for about 90 mins. However, the band may remain on longer if bleeding occurs. The band may also be reapplied if bleeding occurs.
- It is important that you do not push, pull, or lift anything over 5 lbs. for 48 hours after the band is removed.



Risk Factors for Heart Disease

During your stay in hospital, you have received the best available cardiac care to treat and manage your heart condition, but your heart disease is not cured. Heart disease is a chronic health condition, and like any health problem, it can bring uncertainty and changes into your everyday life. Learning about your risk factors, taking charge of your heart health, and staying involved in your health and health care will help you to continue to do the things that you wish to do.

Causes of Heart Disease

Coronary artery disease is caused by a combination of genetic and lifestyle factors. These are called risk factors.

The following risk factors are important to be aware of but are <u>not controllable</u>:

- **Your age**
    - As you get older, your risk for heart disease increases
- **Your gender**
    - Men over the age of 55 are at higher risk for heart disease
    - After menopause, a woman's risk for heart disease gradually becomes the same as a man's
- **Your family history**
    - Your risk for heart disease is increased if close family members (a parent or sibling0 developed heart disease before the age of 55 or, in the case of female relatives, before menopause.
- **Your ethnicity**
    - First nations people and people of African or Asian descent are at higher risk for developing heart disease

The risk factors that you <u>can control</u> are:

- Smoking
- Excess body weight, especially around your waist
- High blood pressure (hypertension)
- High cholesterol levels
- Lack of regular exercise
- Blood sugar control, prediabetes and diabetes
- High stress levels
- Depression

High Blood Pressure

High blood pressure makes your heart work harder, damages your blood vessels, and can also cause greater plaque build-up. All these factors can lead to heart damage. Controlling your blood pressure can reduce the progression of your heart disease and may reduce your risk of having a stroke.

To control your blood pressure:

- Aim to make healthier food choices
- Reduce intake of foods high in sodium (salt)
- Be active every day
- Manage stress levels
- Take your medications as prescribed
- Quit smoking
- Limit your alcohol intake

High Blood Cholesterol

Cholesterol is a fat-like substance that is produced mostly in your liver, although some of the cholesterol in your blood comes from the foods you eat.

The most important types of cholesterol in your blood are:

- Low density lipoprotein cholesterol or “LDL”
- High density lipoprotein cholesterol or “HDL”

L is for “Lousy” cholesterol:

- LDL cholesterol carries fats to your body organs to be stored away for future use.
- It causes a build-up of cholesterol (plaque) on the walls of the blood vessels (arteries) in your heart.
- High levels of LDL can damage blood vessels.
- Making healthier food choices can help lower your LDL.

H is for “Healthy” cholesterol:

- HDL cholesterol is good because it carries excess fats away from your body organs for elimination.
- The more HDL you have in your blood, the better protected you are against the build-up of plaque in your arteries.
- Regular exercise and quitting smoking can help increase HDL.

Tips to improving your cholesterol levels:

- Be aware of your cholesterol levels
- Aim to make healthier food choices
- Quit smoking
- Be active every day
- Take your cholesterol medications as prescribed

Healthy Lifestyle

Unfortunately, you cannot change uncontrollable risk factors like gender and family history. Therefore, the best way to treat heart disease and decrease the chances of you experiencing another heart attack or other cardiac event is to make healthy lifestyle changes such as dietary habits, physical activity, and quitting smoking. This section will provide you with information on changes that you can make the day-to-day management of your heart disease.

The Healing Process

Every year, thousands of Canadians survive a heart attack, go back to work and enjoy a normal life. Your heart is healing and with each passing day you'll get stronger and more active. With a heart attack, a portion of your heart muscle has been damaged. This is sometimes a difficult concept to understand because you cannot see the damage that has been done to your heart. This section will provide you with the information that will help you recover from having a heart attack, return to your activities of day-to-day life, and help you start to develop a healthy lifestyle.

How Long It Will Take Your Heart to Heal

The healing period after a heart attack varies, often depending on the size of your heart attack and can last anywhere from one to three months. If you are not sure how big your heart attack was, please ask your doctor before you are discharged.

The first week is important because your heart is starting to heal. It is important to have a calm and relaxing environment for the heart to rest and recover.

From the second week on, your heart will continue to heal through the following weeks. During this time, we will ask you to gradually increase some physical activities and limit others. You may be told not to drive for four weeks following your heart attack. Check with your doctor before your discharge regarding when you can drive.

It is normal to sometimes feel tired or drained for the first few weeks. Some patients find it helpful to plan short rest periods to allow them to have more energy to complete daily activities. You will find more information on activity after a heart attack in the Physical Activity section.

Healthy Eating

(Retrieved from: https://www.nicepng.com/ourpic/u2q8t4t4u2a9r5o0_healthy-eating-plate-v3-healthy-diet/)

HOW WHAT YOU EAT AFFECTS YOUR HEART

The food that you eat affects many of the important risk factors associated with heart disease, for example:

- Your blood cholesterol
- Your blood pressure
- Your blood sugar if you have diabetes
- Your risk for another heart attack

Tips for Changing Your Eating Habits

To help you make changes in managing your health, it is important to make changes to your eating habits and the foods that you eat. This section will provide you with information, tips and tricks in changing your eating habits and developing a diet that is better for your heart.

Change	Comments	Tips
COOK AT HOME MORE OFTEN	• Cooking at home gives you more control over what goes into your food. • Meals cooked at home should include at least 3 food groups (Vegetables and fruit, Grain Products, Milk and alternatives, Meat and alternates.) • Food cooked at home is lower in salt fat and sugar. • Cooking at home is cheaper than eating pre-made meals or at restaurants.	• Cook with your family and friends. • Try new recipes. • Cook large batches of soups, stews and casseroles on the weekend to eat during the week or freeze for another day. • Keep ingredients like canned fish, eggs, frozen vegetables, and brown rice in your cupboard for fast easy meals. • Plan ahead and make a weekly meal plan. • Use whole, unprocessed foods.
HOW YOU EAT IS AS IMPORTANT AS WHAT YOU EAT	• Eating while doing other things means you pay less attention to what you eat and may end up eating faster and more food. • By sitting at the table you will enjoy what you are eating. You will also be more aware of how much and what you are eating. • Eating with others is a great opportunity to connect with friends and family.	• Sit at the table to eat. • Don't do other activities while eating. • Turn off all screens including television, phones, tablets, and computers. • Start by eating at the table once or twice each week. • If it's too difficult to eat supper together at the table, start with breakfast. • At work eat lunch away from your desk.

Change	Comments	Tips
LISTEN TO YOUR BODY	• There is no one right way to eat. • Don't diet. Think about making small changes. • Choose foods which are healthy and taste good. • Eating is about more than just nutrients. • Eating is social and should be enjoyable. Listen to your body's cues. • Eat when you feel hungry.	• Stop eating when you feel full. • Don't rush. Eat slowly and taste the food you are eating. • Pause during and after your meal to ask yourself how full you are.
EAT AT REGULAR TIMES	• Skipping meals leaves you feeling extra hungry. By the time you get to the next meal you might eat too much. • When you are very hungry it's hard to reach for healthy foods and to eat slowly.	• Eat breakfast within one to two hours after waking up. • Start by including breakfast on a daily basis. If you have never eaten breakfast, start by aiming to eat it one or two days a week. • Set an alarm to remind yourself to eat. • Aim to eat every 4 to 6 hours after breakfast. • Try not to skip meals. • If you know it will be longer than 4 to 6 hours between meals plan a snack. • Plan your meals in advance

Change	Comments	Tips
PLAN HEALTHY SNACKS	• Healthy snacking can help you feel full between meals. • Healthy snacking can help you to keep your energy level up. • Snack when you are hungry, not because you are bored or stressed. • Snacking can make it easier to eat enough vegetables and fruits.	• Plan snacks ahead of time. • Don't snack out of the container, portion it into a bowl. • Don't eat while driving. • Don't eat in front of the TV, while reading, while using your phone, computer or tablet.

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Guidelines to a Healthy Heart Diet

Fruits and Vegetables

- Include vegetables and/or fruit in each meal
- Fruits and vegetables are good sources of nutrients, minerals and fiber.
- Frozen or canned vegetables are great options. Just remember to use “no salt added” options when using canned food.
- Eat fresh fruit more often than juice. If using canned fruit, choose those packed in water or fruit juice.
- Have an apple, orange, banana, kiwi or melon for a snack
- Keep raw, cut up vegetables in the fridge for snacking.
- Move your fruit and vegetables out of the crisper and onto a higher shelf.

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What is a Serving of Fruit and Vegetables?

- A serving of most raw or cooked vegetables is ½ cup.
- A serving of most fruit is ½ cup or 1 small piece of fruit (size of a tennis ball)
- 7 servings of fruit and vegetables a day is the goal!

Whole Grains

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- Whole grains include the entire seed of the plant
- Whole grains are higher in fiber, vitamins and minerals.
- Oatmeal, barley and psyllium are high in soluble fiber which helps to reduce LDL (lousy) cholesterol.
- They include oatmeal, brown or wild rice, barley, quinoa and popcorn.
- Use whole grain foods such as bread, cereal, and pasta instead of white.

What is a Serving of Grains?

Examples of a serving of grain are:

- 1 slice of bread,
- ½ cup of cooked oatmeal, pasta or rice
- 1 cup of dry cold cereal.

6 servings of grains a day is the goal!

Meats, Fish, Poultry, and Alternatives

Meat

- Meats are a good source of protein. However, highly processed meats such as bacon, deli meat, salt meat, salt fish, potted meat, prepared patties and breaded meat such as chicken nuggets and fish sticks can be high in bad fats and salt.
- Choose lean meats such as lamb, beef, and pork and trim visible fat before cooking.
- Make stew, gravy, and soup ahead of time. Chill and skim the fat which forms on top.
- Try different ways to prepare food such as poaching, boiling, steaming, stews, bake on a rack, broil, barbecue, or microwave.
- **Do not deep fry** and limit pan frying.
- Limit organ meats such as liver.

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Fish

- Choose fatty fish at least **2 times a week**.
- Fatty fish include salmon, mackerel, sardines, trout, or tuna
- Seafood like oysters, mussels, shrimp, and lobster are also good choices
- You can use fresh, frozen or canned fish
- Avoid or limit Breaded fish such as fish sticks.

Poultry

- Remove the skin from poultry
- Limit egg yolks to 3 per week
- Avoid or limit Breaded chicken such as chicken nuggets, chicken fingers, and pre-made chicken burgers.

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Alternatives

- Include beans (kidney beans, black beans, & white beans), chickpeas, lentils, nuts and seeds more often.
- They can help reduce cholesterol and blood pressure.
- Eat unsalted nuts as a snack.
- Choose baked beans without pork fat and add beans and lentils to stews, soups and chilis.

What is a Serving of Meat or Alternatives?

- Serving size is 3 ounces (90 grams) or about the size of a deck of cards
- 2 servings of Meats per day is the goal!
- Including beans, nuts, seeds, lentils, or chickpeas 4-5 times a week is the goal!

Dairy

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- Use skim, 0.5% or 1% milk.
- If using canned milk, choose fat free or 2%.
- Choose low fat yogurt with 1 % or less M.F. (Milk Fat).
- Choose lower fat cheese (21% M.F. or less)
- Choose cottage cheese with 1% or less M.F.
- Avoid cream, coffee cream and ice cream.
- Try using alternative creams such as soy or oat milk in coffee

Special Considerations

Desserts and Snacks

Avoid or limit these:

- Doughnuts
- Croissants
- Commercial muffins
- Pastries
- Cakes
- Cookies
- Chocolate
- Potato chips and cheezies

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Salt

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- Limit your salt intake to 2000mg a day
- Remove the saltshaker from the table.
- Prepare and cook foods with little or no added salt.
- Limit/avoid salt meat and salt fish.
- Limit flavorings which are high in sale such as soya sauce, Oxo®, Accent®, garlic or onion salt, celery salt, and sea salt.
- Limit/avoid canned and processed foods such as canned soup, dried soup mixes, canned vegetables, processed/deli meats, TV dinners, flavored rice and noodle mixes (ex: Hamburger Helper®, Kraft Dinners®). And potato chips.
- Choose herbs, spices and flavorings that do not contain salt.
    - For Example: onions, garlic (or onion/garlic powder),
        - Mrs. Dash ®
        - lemon juice
        - vinegar
        - pepper

Fat

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- Limit the use of healthier added fats to 2-3 teaspoons per meal. (Example: margarine, oil, salad dressing and mayonnaise).
- Choose unsaturated fats (healthier fats) such as:
    - Soft “nonhydrogenated” margarines that contain no more than 1 gram of saturated fat per serving
    - Unsalted nuts/seeds or peanut/nut butters. A serving is equal to ¼ cup (30grams) or nuts/seeds or 1 Tablespoon of peanut/nut butter.
- Avoid foods that contain trans fat. Trans fats are found in foods that contain hydrogenated or partially hydrogenated oil or vegetable oil shortening. (For example: baked goods, cookies, snack foods and deep-fried foods.)
- Avoid using saturated fats such as butter, lard, pork fat or scrunchions, palm oil and coconut oil.

Alcohol

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- You should limit alcohol intake. Alcohol is a source of calories. Moderate alcohol intake is **1-2 drinks per day,** but alcohol can raise your blood pressure and triglyceride levels.

One serving is:

- 140 ml (5 oz) wine or
- 355 ml (12 oz) beer or
- 45 ml (1.5 oz) spirits

Caffeine

- Limit drinks containing caffeine to no more than **4 cups per day**. Examples include:
  - Coffee,
  - Tea,
  - Colas,
  - Ice coffee,
  - Chocolates drinks

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It is recommended to eat at home as much as possible. However, if you do eat out, here are some rules to follow when eating from restaurants.

- Look for items that are steamed, broiled, boiled, grilled, baked, roasted or poached.
- Avoid items that are fried, deep-fried, battered, breaded, pickled or smoked.
- Choose healthier sides like a salad, vegetables or rice for a healthier side dish.
- Get the gravies, dips and sauces on the side so you can control how much to add.
- Avoid menu items with a cream, cheese or butter sauce.
- Skip the bread and butter.
- Choose fresh fruit, yogurt or sherbet for dessert.
- Take leftovers home if you can't finish your meal.

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PHYSICAL ACTIVITY

Regular physical activity will:

- Improve the function of your heart and lungs
- Improve your HDL (good) cholesterol and triglycerides
- Lower your blood pressure
- Improve your blood sugar levels
- Improve your muscle tone and bone density
- Increase your endurance and improve your confidence
- Improve your ability to cope with stress and decrease anxiety and depression

Rest and Activity at Home

It may be hard to understand why we recommend such a slow return to your normal activities, especially if you were very physically active before your heart attack and are relatively young.

It is important to understand that your heart is a muscle and at any age or fitness level, your heart and your body needs time to recover. This means taking it slow, and gradually increasing your activities back to normal. After recovery, most people are able to do all the activities they enjoyed before their heart attack. For higher intensity activities, such as playing hockey, starting back to the gym to lift weights or running, you may benefit from some guidance on how to progress gradually.

The following guidelines offer some helpful advice about activity in general:

- Try to get eight hours of sleep every night during your recovery period.
- Stop and rest when you feel tired.
- Give yourself enough time for activities so that you won't feel tense or rushed.
- Plan your day to achieve a balance between active periods and quiet times. Spread out more difficult tasks and alternate an easy task with a difficult one.
- Housework is not advised for the first week you are home. After that, you may resume light housework, such as helping with meals, and increase as your tolerance improves.
- Standing still for any length of time is very tiring. During your recovery, sit for as many activities as possible, e.g., washing dishes, food preparation.

Some additional guidelines for resuming activities of daily living:

WEEK 1

- Walking slowly
- Writing, drawing, painting
- Reading
- Watching TV, using computer
- Knitting, needlework
- Meditation
- Stretching exercises
- Climbing stairs slowly
- Short outings
- Lifting no more than 5 to 10 pounds (when necessary, not for strength training)

WEEKS 2 TO 3

- Light laundry
- Easy sweeping, dusting
- Washing dishes, preparing light meals
- Walking the dog

WEEKS 3 TO 6

- Walking at a moderate pace
- Cleaning sinks and toilets
- Mopping floor, vacuuming
- Ironing, bed-making
- Light gardening, raking leaves
- Pushing light power mower
- Lifting up to 20 pounds (when necessary, not for strength training)
- Bowling
- Golfing with power cart
- Shuffleboard, croquet, billiards
- Playing a musical instrument

How to Increase Your Physical Activity

Once you are home, you should continue all the activities you followed while you were in the hospital. The longer you are home, the more you should be able to do.

A balance of rest and activity should still be maintained to allow for continued healing and to conserve your energy. Activity should be increased gradually. Everyone's recovery is different. The rate at which you progress will depend on the severity of your cardiac event and your previous activity level. After four to six weeks, you should be back to performing your regular activities.

Walking is one of the earliest activities you are allowed to resume, and it is one of the best exercises for improving your health. We have given you a walking guide below to help get you started.

Walking Program

The instructions provided below on how to start a walking program are important to follow for anyone who has had a heart attack or who did not have a regular exercise program before their cardiac event.

WALK AND TALK TEST

This is the simplest test of all. At all times, you should be able to carry on a light conversation while exercising, without being short of breath. If you are too short of breath to speak clearly, you should slow down.

WEEKS 1 TO 2

• 5 to 10 minutes of leisurely walking once or twice daily

WEEKS 3 TO 6

At this point you are ready to begin your walking program:

- Begin with 10 minutes of slow walking once or twice daily.
- Increase by one minute per day until you are walking 20 to 30 minutes per walk.
- Increase your speed and distance as tolerated, remembering that it is important to avoid shortness of breath and fatigue. Always begin your walks at a slow stroll for the first few minutes, then increase your pace. Your walking time can be maintained at 30 minutes once or twice daily.

After your walks, stretch your calf muscles. They are likely to get tight as you begin to increase your daily activity.

- Stand up straight close to a solid surface on which you can use your hands for balance.
- Step back with one foot, with both your feet pointing forward.
- Bend the knee that is forward while keeping the back leg straight until you feel a stretch in the back leg.
- Hold for 30 to 60 seconds. Repeat with the other leg.

If the above program, feels too difficult for you, you can use interval training. This is a type of exercise where you alternate harder exercise with easier exercise for short periods of time For example, each interval could include:

- Walking two to five minutes
- Then resting two to five minutes

Repeat this pattern as many times as you are able to, gradually increasing the number of intervals.

Dreamstime, (2021)

Medications

You will be taking medications following your heart attack. Your doctor has carefully chosen the type of medications and dosage you need based upon your present condition. It is important to recognize that not everyone will be taking the same medications. Your blood pressure, any abnormal heart rhythm, and the extent of damage to the heart muscle, will influence your doctor's decision.

The following is a brief outline of the medications most used and their role in treating heart disease. If your medication is not listed or you want more detailed information about your specific medications, ask your doctor or pharmacist.

Types of Medication	Names of Medication	How Medication Works	Potential Side Effects
Antiplatelets	ASA (Aspirin®, ECASA) Clopidogrel (Plavix®) Ticagrelor (Brilinta®)	• Helps prevent blood clots in injured coronary arteries • Helps prevent blood clots on stents (clopidogrel, prasugrel) • Decreases the risk of future heart attacks	• Increased risk of bleeding & bruising • Stomach upset (nausea, diarrhea, heartburn) • Shortness of breath (Ticagrelor)
NEVER STOP OR CHANGE YOUR ANTIPLATELET MEDICATIONS UNLESS YOU HAVE BEEN INSTRUCTED TO DO SO BY YOUR CARDIOLOGIST			
ACE Inhibitors (Angiotensin Converting Enzyme Inhibitors)	Enalapril (Vasotec®) Fosinopril (Monopril®) Lisinopril (Zestril®, Prinivil®) Perindopril (Coversyl®) Quinapril (Accupril®)	• Widens blood vessels and lowers blood pressure • Decreases the risk of future heart attacks • Maintains the heart's shape	• Cough • Dizziness, lightheadedness • Increased potassium level in blood • Swelling of lips/ face/ throat (rare) – Call 911

	Ramipril (Altace®) Trandolapril (Mavik®)	promoting normal function	
Types of Medication	**Names of Medication**	**How Medication Works**	**Potential Side Effects**
Beta Blockers	Atenolol (Tenormin®) Bisoprolol (Monocor®) Metoprolol (Betaloc®, Lopressor ®) Nadolol (Corgard®)	• Lowers blood pressure and heart rate • Helps prevent angina • Improves heart function • Slows down irregular heart rhythms • Decreases the risk of future heart attacks	• Fatigue/tiredness • Dizziness, lightheadedness • Depression • Wheezing
	Statins Atorvastatin (Lipitor®) Lovastatin (Mevacor®) Pravastatin (Pravachol®) Rosuvastatin (Crestor®) Simvastatin (Zocor®)	• Lowers LDL (“bad”) cholesterol • Decreases the risk of future heart attacks	• Constipation, gas • Indigestion • Mild decrease in liver function • Muscle pain – Notify doctor
	Cholesterol Absorption Inhibitors	• Usually used with a statin to lower LDL (“bad”) cholesterol	• Diarrhea • Mild decrease in liver function

Cholesterol Lowering Medications	Ezetimibe (Ezetrol®)		• Muscle pain – Notify doctor

Types of Medication	Names of Medication	How Medication Works	Potential Side Effects
Nitrates	Isosorbide Dinitrate (ISDN, Isordil®) Isosorbide Mononitrate (Imdur ®) Nitroglycerin spray (Nitrolingual®) Nitroglycerin patch (NitroDur®, Minitran®, Trinipatch®)	• Improves blood flow to the heart by widening the blood vessels • Helps prevent angina (patch and tablets) • Stops angina (spray)	• Headache • Skin irritation at application site (patch) • Lightheadedness (spray)
Angiotensin II Receptor Blockers (ARBs)	Candesartan (Atacand®) Losartan (Cozaar®) Olmesartan (Olmetec®) Telmisartan (Micardis®) Valsartan (Diovan®)	• Widens blood vessels & lowers blood pressure • Decreases the risk of future heart attacks • Alternative to ACE inhibitors	• Dizziness, light-headedness • Headache • Increased potassium level in blood
	Amlodipine (Norvasc®)	• Lowers blood pressure	• Dizziness, lightheadedness

Calcium Channel Blockers	Felodipine (Plendil®, Renedil®) Nifedipine (Adalat XL®) Diltiazem (Cardizem C®, Tiazac®) Verapamil (Isoptin®)	• Lowers heart rate (diltiazem, verapamil) • Helps prevent angina • Slows irregular heart rhythms (diltiazem, verapamil)	• Fatigue/tiredness • Headache • Swelling of ankles/ feet

Types of Medication	Names of Medication	How Medication Works	Potential Side Effects
Diuretics (Water Pills)	Furosemide (Lasix®) Hydrochlorothiazide (HCTZ, HydroDiuril®) Metolazone (Zaroxolyn®)	• Removes excess water by increasing urine production • Reduces swelling in legs and ankles	• Dizziness/ lightheadedness • Decreased potassium level in blood • Gout
Anticoagulants	Apixaban (Eliquis®) Dabigatran (Pradaxa®) Edoxaban (Lixiana®) Rivaroxaban (Xarelto®) Warfarin (Coumadin®)	• Helps prevent blood clots from forming or getting bigger	• Increased risk of bleeding and bruising

Anti-arrhythmics	Amiodarone (Cordarone®)	• Makes the heart beat more regularly	• Nausea/vomiting • Skin may burn more easily under the sun • Sun exposed skin may turn bluish grey • Thyroid abnormality • Decrease in liver function • Lung damage (rare)
	Sotalol (Sotacor®)		• Fatigue/tiredness • Dizziness, lightheadedness • Depression • Wheezing

Types of Medication	Names of Medication	How Medication Works	Potential Side Effects
Digitalis	Digoxin (Lanoxin®, Toloxin®)	• Slows down irregular heart rhythms • Strengthens the heart's pumping ability	• Nausea/vomiting – Notify doctor if persistent

Smoking

HOW SMOKING AFFECTS YOUR HEART

The nicotine in smoke causes the arteries of the heart to narrow. The carbon monoxide released from cigarettes causes damage to the walls of the arteries encouraging the build-up of fat on those walls.

Smoking also:

- Raises your LDL (lousy) cholesterol
- Lowers your HDL (healthy) cholesterol
- Speeds up your heart rate
- Increases your blood pressure

  Smoking after a heart attack or angioplasty greatly increases the chances of a second heart attack and/or restenosis (re-blocking) of the coronary arteries.

IF YOU SMOKE, QUIT!

- Quitting smoking is the single most important thing you can do to positively affect your heart health.
- The benefits of quitting occur within 20 minutes of your last cigarette and at one year your risk of a heart attack is reduced by 50%.

Keep in mind this one important tip: most people find that the more support they get while trying to quit, the better.

MORE INFORMATION ABOUT QUITTING SMOKING

- Newfoundland and Labrador Smoker's Helpline: www.smokershelp.net **or** 1-800-363-5864 (LUNG)

Mental Health:
Stress, Depression and Anxiety

Patients with heart problems may experience a variety of emotions after being diagnosed or treated for heart disease. It is very common for patients to experience depression and anxiety. Emotional reactions are influenced by a number of factors (e.g., work or family stress, type of heart problem or treatment, medication side effects, poor sleep, one's emotional health before being hospitalized). Understanding one's health condition and treatment, engaging in exercise and speaking about one's experience with peers, significant others, and/or health professionals help recovery.

The good news is that, for most patients, these overwhelming emotions resolve over time. For some, however, emotions such as depression and anxiety persist.

Stress

HOW STRESS AFFECTS YOUR HEART

In situations that are perceived as stressful, your body reacts by releasing stress hormones. In response, your heart rate and blood pressure increase, your breathing becomes faster, you start to sweat, and your entire body revs up into high gear.

In the short term, these reactions make you more alert and able to deal with the stressful situation. But if you are under stress for a long time, other changes occur:

- Fat cells that were released into the bloodstream for extra energy become converted into cholesterol
- Platelets circulating in the blood become more "sticky"
- Insulin resistance can occur causing blood sugar levels to rise outside of the normal range
- Patterns of daily life may change, making it more difficult to eat well, exercise regularly, and get enough rest

HOW TO MANAGE YOUR STRESS

How we think about an event determines its impact on our health.

- Be physically active every day to help reduce the effects of stress
- Identify and use your support networks (e.g., friends and family)
- If you feel overwhelmed or if you are having difficulty functioning in your daily activities, speak to your doctor or nurse about options available to help you (e.g., books, websites or a referral to counselling services).

10 TIPS FOR MANAGING STRESS

1. Exercise regularly. Exercising at least three to five times a week helps to relax and condition your body and mind.

2. Breathe deeply. Take a few deep breaths. Notice how it changes how you feel.

3. Be aware of quick fixes. Try to avoid the tendency to consume more alcohol and non-prescribed drugs in stressful times.

4. Notice your thoughts. Reflect on how you think about what's causing you stress. A trusted person or a counsellor can help you see things in a new way.

5. Relax the muscles in your body. Stress can make your body tense. Try to relax the areas where you carry the most stress.

6. Recognize what you can't control. Reflect on what you can control, and let go of things beyond your control.

7. Take a break. Give yourself permission to nap, listen to music, read, meditate or just have some quiet time.

8. Make time for things you enjoy. Set time aside for hobbies or learning something new.

9. Avoid exposure to stress. If possible, avoid unnecessary triggers for stress, such as distressing TV shows.

10. Evaluate your commitments. Consider how you spend your time and letting go of some commitments.

Depression

Depression is an understandable and common reaction among people with heart problems. About one in five patients (20%) experience clinical (or major) depression. If you are feeling at least five of the symptoms listed below for a two-week period or more, you may be developing depression and you may need to speak to your doctor, nurse or mental health professional.

These symptoms may include:

- Sad feelings
- Loss of interest in activities that you usually enjoy
- Changes in appetite
- Significant unplanned weight loss or weight gain
- Sleep problems
- Loss of energy
- Difficulties with concentration or memory
- Decrease in your normal social activities or withdrawing from friends and family
- Feelings of worthlessness, helplessness, or hopelessness
- Changes in sexual desire
- Thoughts about death or suicide

HOW DEPRESSION AFFECTS YOUR HEART

Depression may affect your heart in two ways: directly and indirectly. Depression affects your heart directly by increasing the risk of blood clotting, plaque build-up and atherosclerosis. Depression also negatively affects your immune system, so you are less able to fight off germs and viruses.

Depression may affect your heart indirectly by influencing some of the decisions you make. People with depression often find it difficult to make healthy choices about quitting smoking, exercising, eating, or taking medications as prescribed. They find it difficult to find the drive or energy to make healthy lifestyle changes.

Anxiety

Anxiety is one of the most distressing emotions that people feel. At some point in time, most cardiac patients will experience varying degrees of fear or nervousness related to their health condition.

Anxiety describes a number of problems including generalized anxiety (a mixture of worries experienced most of the time), panic attacks (intense feelings of anxiety where people often feel like they are going to die), and posttraumatic stress disorder (repeated memories of terrible experiences with high levels of fear).

Like depression, about one in five patients with heart disease experience significant anxiety symptoms. These symptoms may include:

- Uncontrollable worry
- Feeling “on edge” or restless
- Feeling irritable
- Muscle tension
- Light-headedness
- Sleep problems
- Being easily fatigued
- Difficulty breathing
- Increased heart rate
- Headaches
- Sweating
- Gastrointestinal (stomach) problems

HOW ANXIETY AFFECTS YOUR HEART

Anxiety may play a role in heart problems by increasing the risk of an irregular heartbeat and triggering spasms; both of these responses may lead to cardiac complications. Anxiety may also lead to unhealthy behaviours such as: smoking, overeating, poor sleep and decreased physical activity.

WHAT YOU CAN DO IF YOU ARE FEELING DEPRESSED OR ANXIOUS

- Talk to your doctor or a mental health professional (social worker, psychologist, or psychiatrist) about proven treatments for depression and/or anxiety.

- Try to get a least 8 hours of sleep a night. A good night’s sleep helps you manage your emotions.

10 TIPS FOR EMOTIONAL HEALTH

1. **Practice deep breathing.** Deep breathing relaxes your body and lowers your blood pressure and heart rate.

2. **Name your emotions.** Naming your emotions helps you be more aware and decide how you will react.

3. **Try not to judge your emotions.** Judging our emotions can make them seem worse.

4. **Know your emotional triggers.** Knowing what makes you angry, sad or anxious will help you be better prepared.

5. **Be more mindful.** Be aware of what is around you and try to notice your thoughts and feelings.

6. **Move your body.** Physical activity decreases anxiety and improves mood and self-esteem.

7. **Talk to someone you care about.** Humans are social! Make time to talk and connect with others.

8. **Sleep well.** Sleep is important for your mind and body.

9. **Stop "should" in their tracks.** Don't put too much pressure on yourself about what you "should" or "shouldn't" be doing.

10. **Do the things that make you happy.** Identify the things that make you happy and make time for them.

SEXUAL HEALTH AND HEART DISEASE

Sexual activity is an important part of quality of life and is often a great concern for both patients and their partners after a heart attack. Fears and concerns may temporarily interfere with sexual spontaneity and response. Feel free to talk about your questions and concerns with your health provider. He or she is used to discussing these matters and will answer your questions in a professional and understanding way.

A few factors may interfere with your sexual health after your discharge from the hospital. You might temporarily suffer from mild depression which will affect your sexual desire. Some medications may also impact sexual function. You might fear that sexual activity will cause another heart attack, or your spouse might silently think the same. For the majority of patients, this will last a short period of time and life will pick up where it left you before you had a heart attack.

Sexual Activity after a Heart Attack

If you have recently had a heart attack, your doctor might ask you to **wait up to 6 weeks** before resuming sexual activity. After this healing period, the risk of having a heart attack during sexual activity is actually quite low. The risk is comparable to that of getting angry and is reduced if you exercise regularly and take your medication.

From a heart health standpoint, sexual intercourse is like any other physical activity, your heart rate and your blood pressure increase. The activity is often compared to walking at three to six kilometers per hour on a level surface.

Recommendations for Engaging in Sexual Activity

- This period of time can be very stressful on your partner and yourself. Both of you might still be tired. Plan sexual activity for the time of day when you have the most energy and are least bothered by other issues.
- Avoid having sex after a large meal. Give yourself a few hours to digest.
- The effort on your heart is about the same regardless of your position.
- Limit the amount of alcohol you drink and avoid using tobacco as both of these may affect sexual function.
- If you have chest pain or shortness of breath, speak to your doctor.

Suggestions for Maintaining Your Sex Life

- Sex is not always about intercourse. Explore your senses: hold hands, hug and touch your partner.
- Create an intimate environment with music, candles and special scents.
- Agree to have honest discussions. Tell each other what you like and don’t like.

Prepare For Your Follow Up Appointment with Your Doctor:

A lot of information has been given to you in a short period of time. Therefore, please use this section to make notes or questions that you may have during the time leading up to follow up appointment you will have after returning home from hospital.

Cardiologist Name: _____

Important Appointments:

Purpose of Appointment: _____

Date: _____ Time: _____

Place: _____

Purpose of Appointment: _____

Date: _____ Time: _____

Place: _____

Purpose of Appointment: _____

Date: _____ Time: _____

Place: _____

Purpose of Appointment: _____

Date: _____ Time: _____

Place: _____

It is important to note that when you are discharged you will be provided with discharge information including an estimate of when you will have a follow up appointment with your cardiologist. A letter from Eastern Health, providing a date, time, and place of follow up appointment will be mailed to you after you return home.

Notes:

Notes:

??Questions??

Please write any questions you may have for your healthcare team here:

References

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Eastern Health. (2016). Healthy heart diet guidelines. https://www.easternhealth.ca

Eastern Health. (2017). Cardiac Patient Information. http://www.easternhealth.ca

Government of Canada. (2021). Canada's food guide [Image]. https://food-guide.canada.ca/en/

Heart and Stroke Foundation. (2016). Living well with heart disease: Guide for people with coronary artery disease. https://www.heartandstroke.ca/?gclid=EAIaIQobChMI6obGjIi-8wIVaEpyCh1KiAWKEAAYASAAEgLjcvD_BwE&gclsrc=aw.ds

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University of Ottawa Heart Institute. (2019). Coronary artery disease and recovery after a heart attack. https://www.ottawaheart.ca

Appendix

Where to Go for More Information

For more information on heart disease and risk factors for heart disease:

- Blood Pressure Canada: **www.hypertension.ca**
- Unlock Food: **www.unlockfood.ca**
- Heart and Stroke Foundation: **www.heartandstroke.ca**
- University of Ottawa Heart Institute: **www.ottawaheart.ca**

For more information on healthy eating:

- Dietitians of Canada: **www.dietitians.ca**
- Health Canada: **www.hc-sc.gc.ca**
- Diabetes Canada: **www.diabetes.ca**
- American Heart Association: **www.americanheart.org**
- Unlock Food: **www.unlock.ca**
- Heart and Stroke Foundation: **www.heartandstroke.ca**
- Obesity Canada: **www.obesitycanada.ca**
- Canadian Cardiovascular Society: **www.ccs.ca**
- Canada's Food Guide: **https://food-guide.canada.ca/en/**

For Recipe ideas for a healthy heart diet:

- Greta Podleski, (2017). **Yum and Yummer**
- Maureen Tilley, (2011). **Hold the Hidden Salt**
- N. Cronish, C. Rosenbloom, (2016) **Nourish: Whole Food Recipes Featuring Seeds, Nuts, and Beans**
- Mary Sue Weisman, (2012). **Dietitians of Canada! 275 recipes**
- Jamie Oliver, (2016). **15 Minute Meals**

For Information on management stress, depression and anxiety:

Books:

- R. Carlson (1997), **Don't Sweat the Small Stuff...and It's All Small Stuff**
- J. Kabat-Zinn (1990), **Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain and Illness**
- R. Woolfolk & F.C. Richardson (1979), **Stress, Sanity and Survival**
- M. Davis, M. McKay, & E. Robbins-Eshelman (2008), **The Relaxation & Stress Reduction Workbook: Sixth Ed**
- D. Burns. (1990), **Feeling Good: The New Mood Therapy**
- Greenberger & Padesky (1995), **Mind Over Mood: Change How You Feel by Changing The Way You Think**
- E. Bourne. (2005) **The Anxiety and Phobia Workbook (4th Ed.)**
- Antony & Norton (2009), **The Anti-anxiety Workbook**

Websites:

- Canadian Mental Health Association**: www.cmha.ca**
- Canadian Psychological Association: **www.cpa.ca**
- Anxiety Disorders Association of Canada: **www.anxietycanada.ca**

To speak to a Registered Dietician, you can 811.