THE DEVELOPMENT OF A TELEPHONE FOLLOW-UP INTERVENTION FOR ADULT PATIENTS AFTER CARDIAC SURGERY

by © Nick Anthony Millar a Report submitted

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Abstract

Background: Hospital re-admission among adult patients after cardiac surgery remains high with an estimated rate of 18.7% in the United States and in Canada (Iribarne et. al., 2014). This results in additional healthcare costs and poor patient hospital experience. Although there are limited studies in the benefits of telephone follow-up in cardiac surgery, the development of this type intervention can potentially improve patient outcomes. **Purpose:** The main goal of this practicum project was to develop a telephone follow-up intervention for adult patients after cardiac surgery following discharge from the hospital from the Cardiac Surgery Department of Hamilton Health Sciences in Hamilton, Ontario. **Methods:** An integrated literature review and key stakeholder consultations were completed to help determine the content and structure of the telephone follow-up intervention. **Results:** The telephone follow-up intervention will involve a registered nurse (RN) performing a telephone call to the eligible patients who meet an inclusion criterion/criteria 10 days after discharge from the hospital. In addition, this practicum project includes a Telephone Follow-up Toolkit, which was created for the nursing staff, and a Telephone Follow-up Intervention after Cardiac Surgery form, which will be used for the patient interview and the documentation of information during the telephone follow-up. **Conclusion:** The implementation of this practicum project will assist improve the outcome and delivery of cardiac surgery services in the supporting agency. It is recommended that a pilot should be conducted for one to two months to evaluate the effectiveness and efficiency of this intervention.

Acknowledgements

The completion of this practicum and my graduate work is made possible by the inspiration and motivation provided by my closest family, friends, and co-workers.

I would like to extend my special thanks to my co-workers on 5-South, Cardiac Surgery Department of Hamilton Health Sciences for providing me the opportunity and guidance to grow as a cardiac surgery nurse. This experience provided me with the inspiration for this practicum project.

To my practicum supervisor, Ms. Mary Bursey, thank you for your guidance and sharing your knowledge and expertise in developing this practicum project. I will never forget your very kind and understanding nature.

The development of a telephone follow-up intervention for adult patients after cardiac surgery

Hospital re-admission among adult patients following coronary bypass grafting and/or cardiac valve replacement is one of the main preventable causes of poor patient experience, unsatisfactory quality of life, suboptimal cardiac surgery outcomes, unnecessary health resources utilization, and incremental healthcare cost expenditures (Canadian Institute for Health Information [CIHI], 2012a; CIHI, 2012b; Fredericks & Da Silva, 2010; Gardner, Elliot, Gill, Griffin, & Crawford, 2005; Theobald & Murray, 2004). The provision of transitional care interventions have been proven to curtail re-admission rates in different care hospital programs by augmenting hospital care beyond acute care settings (Hanssen, Nordrehaug, Eide, & Hanesad, 2009; Harrison, Hara, Pope, Young, & Rula, 2011; Johnson, 2000; Weaver & Doran, 2001). As a specific example, the aim of this project is develop a telephone follow-up intervention for adult patients after cardiac surgery. This final report will summarize the different stages of the development of this project and the various components of the telephone follow-up intervention.

Background

Most of the re-admissions are preventable by instituting a comprehensive, patient inclusive, and effective discharge planning and a streamlined process in providing patient follow-up after their hospital visits (Harrison et al., 2011). Extending the acute care services through different modalities ensures the continuity of care and early identification and management of complications, in order to prevent the need for subsequent hospital re-admissions (Harrison et al.). As a strategy to potentially support the transitional care of adult patients after their cardiac surgery and their families or informal caregivers, the telephone follow-up intervention was developed to extend hospital care from acute care settings to the patients' home

(Courtney et al., 2010; Harrison et al.; Wakefield et al., 2009). This intervention can potentially decrease the rate of re-admissions among adult patients who had cardiac surgery by providing another layer of professional monitoring and management from an RN working in the cardiac surgery unit through telephone calls after hospital discharge.

Practicum Goal and Objective

The main goal of this practicum was to develop a telephone follow-up intervention for adult patients after cardiac surgery from the Cardiac Surgery Department of Hamilton Health Sciences (HHS), in Hamilton, Ontario. The four main objectives of this practicum project are the following: to determine the effectiveness of a telephone interventions in preventing post-operative complications and hospital re-admissions through conducting an integrative literature review; to identify a tool that can predict the re-admissions after cardiac surgery among adult patients; to complete a stakeholder consultation in the Cardiac Surgery Department of HHS and other cardiac centers in Canada regarding the possible content, format, and design of a telephone follow-up intervention; to utilize four Advanced Nursing Practice (ANP) Competencies for example, advanced clinical expertise, research, leadership, and consultation in the development of this telephone follow-up intervention.

During this practicum project, the following steps were completed: (a) completion of a proposal of the project, (b) review of the literature and completion of an integrative literature review, (c) development of a consultation plan and its implementation, and (d) a written Consultation Report.

Proposal of Practicum Project

After three revisions, the proposal of the practicum project was completed and approved by my Supervisor, Ms. Mary Bursey. The contact person, Ms. Deb Bedini, Director of the

Cardiac and Vascular Program of HHS verbally agreed to support the intent of the practicum project before the start of the winter semester. Later in the semester, following an explanation of the proposed project, Ms. Bedini, confirmed her support for the practicum project through a written e-mail correspondence to my Supervisor and myself.

Summary of the Integrated Literature Review

A total of three revisions were completed in the preparation of the integrative literature review of this project. The Cumulative Index to Nursing and Allied Health Literature (CINAHL) database was searched three times in order to retrieve research articles related to hospital readmission, telephone follow-up, and cardiac surgery. The first search included the search terms readmission and telephone follow-up. The second search was completed using the search terms re-admission and cardiac surgery. Lastly, the third search used the search terms telephone follow-up and cardiac surgery. The database searches were limited to the following conditions: peer reviewed article and research study. The publication date was excluded as one of the filter fields, in order to search the entire database for all available related literature on telephone follow-up for example, a strategy to prevent hospital re-admission after cardiac surgery.

In total, the searches retrieved 97 research studies: re-admission and telephone follow-up (39 studies), re-admission and cardiac surgery (54 studies), and telephone follow-up and cardiac surgery (four studies). All of the following research studies are individually screened for relevance to the focus of this literature search, which is telephone follow-up intervention as a strategy to prevent subsequent re-admissions. After further deliberating the research articles, a total of 13 studies were included in this literature review: one retrospective cohort study, six randomized control trial studies, and six prospective cohort studies. Although the telephone follow-up intervention had been investigated in other programs, there is notably very limited

information on the application of this intervention in cardiac surgery (one study). After examining the current evidence on telephone follow-up, this strategy has demonstrated possible beneficial effects in the prevention of post-operative complications and re-admission rates in cardiac surgery (Hanssen, Nordrehaug, Eide, & Hanesad, 2009; Harrison, Hara, Pope, Young, & Rula, 2011; Johnson, 2000; Weaver & Doran, 2001). For the next phase of the project development, an additional literature search was completed, in order to examine Canadian-based literature pertaining to a telephone follow-up.

The telephone follow-up after hospitalization has been proven to be an effective strategy to prevent hospital re-admissions, improve functional ability and mobility after hospitalization, and decrease the hospital cost. After the implementation of a telephone follow-up in a multi-center retrospective cohort study involving a total of 30, 272 patient discharges, Harrison et al. (2011) observed a decrease in the risk for re-admission by 23.1 percent. In addition, the 30-day re-admission rate among participants who did not received a telephone follow-up within 14 days is 1.3 times at risk for re-admission (Harrison et al.). Aside from preventing hospital re-admission, the implementation of a telephone follow-up intervention as a complement to a post-discharge transitional care that includes; (1) post-discharge visits from a registered nurse and a physiotherapist, (2) an individualized exercise package and (3) follow-up care has demonstrated to be effective in promoting functional ability and mobility among elderly after hospitalization (Courtney et al., 2010). In terms of economic benefits of a telephone follow-up intervention, the implementation of this type of follow-up resulted in a substantial decrease of unnecessary health expenditures and incremental healthcare cost savings. For example, Harrison et al. demonstrated that over the course of one calendar year the telephone follow-up intervention has contributed to a total of $1.4 million of total health expenditure savings.

In designing a telephone follow-up intervention, the designation of the health professional making the phone call and the type of complementary interventions may also play a critical factor in the success of this intervention. There were three studies that were compared: (a) a study involving an RN providing a series of telephone call for post-Myocardial Infarction (Hassen, Nordrehaug, Eide, & Hanestad, 2008), (b) a study involving an advanced nurse practitioner providing telephone follow-up for first time low-income mothers (Hannan, 2011), and (c) a cardiac nurse providing a weekly telephone follow-up to patients for 1 month (Weaver & Doran, 2001). Upon comparison, it was noted that there was only significant positive outcomes on the advanced practice nurse group. There was no available single study in the literature that compared effectiveness of the different roles in providing telephone follow-up. It was also noted that patients who received additional interventions from telephone follow-up, such as, videoconferencing (Wakefield et al., 2009), home visits from an RN or physiotherapist, or family physician appointment, have lower re-admission rates and better post-discharge outcomes.

The available research studies that investigated cardiac surgery re-admissions identified several risk factors that predispose patients to being re-admitted to the hospital. The unplanned re-admission after cardiac surgery can be predicted by pre-operative co-morbidities such as, stroke, heart failure, (Redzek et al., 2015) and obesity (Rockx et al., 2004). Mochari-Greenberger et al. (2014) demonstrated the link between requiring a caregiver prior to cardiac surgery and a greater chance of hospital re-admission. It was also noted that patients who suffer from depression and anxiety have a higher chance of being re-admitted to hospital (Tully, Baker, Turnbull, & Winefield, 2008). Meanwhile, the most common causes of re-admission after cardiac surgery are heart failure, sternal dehiscence, cardiac dysrhythmias, recurrent chest pain,

and pericardial effusion (Redzek et al., 2015). Therefore, this evidence demonstrates the need for a telephone follow-up intervention.

Summary of the Stakeholder Consultation

To assist with the development of this telephone follow-up intervention, a Consultation Plan was completed with the different internal and external key stakeholders. This consultation was focused on the following three objectives: to identify the current follow-up process that exists in the cardiac surgery program; to gather the perspectives and suggestions of frontline staff and the management team of the cardiac surgery program on the design and scope of the telephone follow-up intervention; and to perform an environmental scan of pre-existing telephone follow-up in other provincial and out of the province cardiac surgery centers. A Consultation report was prepared and submitted to my Supervisor.

The setting of this project consultation is the Cardiac Surgery Unit at HHS. For the other cardiac surgery centers, the consultation was completed for three main cardiac surgery centers in Ontario, one in Newfoundland and Labrador, and one in British Columbia. The consultation at HHS was completed through two group discussions with frontline staff. There were also expert interviews with four Cardiac Surgeons. A semi-structured questionnaire was used to guide the discussions in the interview. In consulting with other cardiac surgery centers, telephone and email correspondence were completed to obtain information. The results of these interviews were summarized through basic note taking and then subsequently processed with content analysis.

Group Discussions

The first group discussion was completed during the monthly Unit Council meeting to gather information on the current follow-up process and their suggestions related to the

telephone follow-up intervention for adult patients after their cardiac surgery. This group consisted of four registered nurses (RN), one physiotherapist (PT), one dietician (DT), one nurse practitioner (NP) and two nurse managers. Using a semi-structured questionnaire, the group was asked about the current process, challenges, and suggestions for improvement in relation to post-discharge follow-up for adult patients after cardiac surgery. The last part of the group discussions was suggestions for the content, structure, and implementation process of the telephone follow-up intervention.

Another group discussion was organized with the eight secretaries who work for the Cardiac Surgeons to understand the current process, challenges, and suggestions for improvement related to post-discharge follow-up for adult patients after cardiac surgery. Out of the eight secretaries that were invited, a total of five of them attended the group discussion. Using a semi-structured questionnaire, they were asked for suggestions related to the content, structure, and implementation process of the proposed telephone follow-up intervention.

Key Informant Interview

A key informant interview was completed with the four out of the eight Cardiac Surgeons to understand the current process, challenges, and suggestions for improvement related to patient follow-up for cardiac surgery patients after discharge. During the interview, the concept of the telephone follow-up intervention was presented to the Cardiac Surgeons. Using the semi-structured questionnaire, they were asked for suggestions for the content, structure, and implementation process of the telephone follow-up intervention.

Telephone interviews and email correspondence were completed, in order to gather information regarding the development and implementation of pre-existing telephone follow-up interventions in two provincial and two out of the province Cardiac Surgery Centers. The focus

of the discussions was on pre-existing telephone follow-up interventions in other cardiac surgery centers in Canada. These interviews focused on identifying the strengths, challenges, opportunities, and threats of their current telephone follow-up.

Consultation Results

Through this consultation, the current state, strengths, and weaknesses of the existing follow-up process were highlighted in the Cardiac Surgery Department. In addition, the suggestions of frontline staff, management team, and the Cardiac Surgeons on the proposed telephone follow-up intervention were also discovered during these consultations. The current follow-up process involves four main post-discharge appointments: family physician within one week, Cardiologist after two to four weeks, Cardiac Surgeon after four to eight weeks, and cardiac rehabilitation after six to eight weeks. Although this is a standardized scheduled for all patients, there is an opportunity to book an earlier appointment through the Cardiac Surgeon if he/she feels that it is necessary for the patient. As a weak point in this process, the patients and their families are left alone to navigate their clinic appointments and find answers to their post-operative questions after discharge from the hospital. Also, it was identified that the time before the patient sees the Cardiac Surgeon maybe too long and often times, a complication has already progressed to a point that would require hospital re-admission.

The result of this consultation has demonstrated that this intervention is viewed as beneficial for patients and the Cardiac Surgery Department of HHS in helping to prevent post-operative complications, hospital re-admission, and in promoting optimal recovery. Consensus was achieved in all of the stakeholder consultations for example, the telephone follow-up intervention should be conducted within the first to second week after discharge and followed by subsequent calls if necessary. An emphasis was highlighted regarding the importance of clinical

and theoretical expertise of the healthcare professional making the phone calls, the use of standardized questionnaires, and the implementation of protocols and medical directives in the development of this telephone follow-up intervention. With the development of this project, several stakeholders, although outside of the scope of this practicum project, have questioned the cost involved in the implementation of this intervention. Overall the consultation with HHS frontline staff had been implemented smoothly. There was good participation and willingness to provide information during the different consultations.

In consultation with the five Cardiac Surgery Centers, it revealed that only one of the centers have a telephone follow-up for patients after discharge from hospital. However, the center was not able to release the details pertaining to the telephone follow-up because a third party service provider is delivering this service.

Summary of the Telephone Follow-up Intervention

The telephone follow-up is an intervention whereby a registered nurse (RN) will call patients at risk for re-admission after cardiac surgery 10 days following discharge from the hospital. During the follow-up telephone call, the RN will ask the patients or their caregivers, if patients are unable to access the telephone, structured questions in relation to their recovery at home. Examples include several screening questions pertaining to the most common complications that are encountered during the first 30 days following cardiac surgery. This intervention has been developed to assist in decreasing the re-admission rate for patients after cardiac surgery by improving the transition to the community.

A Telephone Follow-up after Cardiac Surgery form was also developed as part of the project. This form has three main purposes in the implementation of the telephone follow-up intervention: (a) screening and eligibility, (b) guide in the telephone follow-up process and, (c)

documentation. The RN or RPN, who is taking care of the patients on the day of discharge, will use the first and second section of the form to screen the patient for inclusion criteria into the telephone follow-up intervention. The RN calling the patient will use the remaining sections (Section 3 to 6) to ask the screening questions, give recommendations, and provide health teaching. Lastly, this form will be used for the documentation for both the referral and actual telephone follow-up.

As a last component of this practicum project, the Toolkit for Nursing Staff: A Telephone Follow-up Intervention for Adult Patients after Cardiac Surgery was also created to act as a resource for the nursing staff. Aside from the description of the telephone follow-up intervention, it also includes a process map and a copy of the Telephone Follow-up after Cardiac Surgery form. The intent for this Toolkit is to become available online in the HHS policy library.

Advanced Nurse Practice Competencies

The initial part of this project development allowed an opportunity to apply the four core competencies of the Advanced Nursing Practice Framework of the Canadian Nurses Association (CNA) 2008. These competencies include advanced clinical competency, research competency, leadership competency, and consultation and collaboration competency. Since the development of this tool focuses on a telephone follow-up intervention for adult patients after cardiac surgery, the advanced clinical competency was demonstrated through the understanding and identification of the complex needs of adult patients after cardiac surgery post-hospitalization. The research competency was practiced when investigating the current literature available and designing a consultation plan. When developing this project, the research skills related to problem identification, the literature review, information gathering, and evaluation were also utilized in the development of the project. This competency had also been valuable in the interpretation and

management of the consultation results. Leadership competencies were used in incorporating stakeholder engagement and participation in the project development. Since the development of this practicum project required an enormous amount of information gathering, stakeholder interviews and group meetings, as well as expert consultations, the consultation competencies became instrumental in the development of this practicum project. This includes the ability to communicate with several key stakeholders, members of the healthcare team, and other individuals in the development of this telephone follow up interventions.

Next Steps

After the successful development of this practicum project, the next stage of this project is the implementation and evaluation phase. The initial step should include a presentation of the project to the Cardiac Surgery Department of HHS and Ms. Bedini, Director of the Cardiac and Vascular Program. A pilot study of this project should also be competed for one or two months, in order to perform a process evaluation and outcome evaluation. This can be performed using a pre and post study to measure the number of patients enrolled, the number of appointments made by the patients, follow-up appointment turn out, nature and number of concerns captured during the telephone follow-up calls, complication rate, re-admission rate, and cost of readmissions. A similar study may also be undertaken for other surgical areas to determine if this telephone follow-up intervention can benefit other patient populations.

Conclusion

The hospital re-admission among patients after cardiac surgery results in undesirable patient experience, sub-optimal surgical outcomes and poor health resource utilization. Based on the integrated literature review and stakeholder consultation, the development and implementation of a telephone follow-up intervention represents a beneficial strategy to prevent

hospital readmissions and post-operative complications but remains unexplored and under-investigated (Hanssen, Nordrehaug, Eide, & Hanesad, 2009; Harrison, Hara, Pope, Young, & Rula, 2011; Weaver & Doran, 2001). Thus, this practicum project have developed a telephone follow-up intervention for adult patients after cardiac surgery that involves a telephone call from an RN 10 days after being discharge from hospital. This project also included a Toolkit for Nurses and a Telephone Follow-up Intervention after Cardiac Surgery form that can assist nurses with this intervention. Once implemented, this intervention can potentially assist in smooth transitions of patients, decreasing the re-admission rates, complications, and minimizing healthcare expenditures in cardiac surgery.

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Appendix A

Integrated Literature Review: The development of a telephone follow-up intervention for adult patients after cardiac surgery

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May 5, 2016

Integrated Literature Review: The development of a telephone follow-up intervention for adult patients after cardiac surgery

Hospital re-admission among adult patients following coronary bypass grafting and/or cardiac valve replacement is one of the main preventable causes of poor patient experience, unsatisfactory quality of life, suboptimal cardiac surgery outcomes, unnecessary health resources utilization, and incremental healthcare cost expenditures (Canadian Institute for Health Information [CIHI], 2012b; CIHI, 2012c; Fredericks & Da Silva, 2010; Gardner, Elliot, Gill, Griffin, & Crawford, 2005; Theobald & Murray, 2004). While recognizing that most of the re-admissions are preventable and that there is an ongoing impetus to curtail the hospital length of stay for patients after cardiac surgery (Fredericks & Da Silva); there has been a recent focus in providing transitional care interventions to augment hospital care beyond acute care settings and to allow patients and their families have a smooth recovery period at home (Johnson, 2000; Weaver, & Doran, 2001). In an attempt to deliver comprehensive and patient-focused care after discharge, some hospital organizations have developed telephone follow-up interventions for their patients (Hanssen, Nordrehaug, Eide, & Hanesad, 2009; Harrison, Hara, Pope, Young, & Rula, 2011; Weaver & Doran, 2001). Although these interventions showed promising benefits in limiting re-admission rates, improving functional status of patients, and promoting positive post-discharge outcomes (Harrison et al.), its relevance and applicability to cardiac surgery population remain under investigated at the present time (Weaver & Doran). The two-fold aims of this literature review are to provide the current relevant research studies on the efficacy of telephone follow-up intervention in preventing hospital re-admission and to identify the predictors for hospital re-admission in cardiac surgery.

Background

Re-admission to acute care settings after hospitalization due to illness or surgery is one of the primary reasons of unnecessary health resource utilization, poor patient experience, low quality of life and incremental healthcare expenditure that threaten Canada's publicly funded healthcare system (Canadian Institute for Health Information [CIHI], 2012c). In a study of 2.1 million adult and pediatric hospitalizations in Canada, approximately one out of 12 patients is re-admitted to hospital within 30 days after discharge (CIHI, 2012a). Among the surgical population group, the 30-day readmission rate is about 10% with surgical site infections as the primary reason (CIHI, 2012a).

The problem in high hospital re-admission rates places additional compounding financial burden on the Canadian healthcare system (CIHI, 2012c). In 2010, the total costs associated with hospital re-admission has totaled to $1.8 billion, which is about 11% of the in-patient healthcare expenditure for that period (CIHI, 2012c). In the acute care medicine program, the government spends an additional $3,117 for each re-admission (CIHI, 2012c). Similarly, the emergency department visits after seven days following discharge summed up to $30.6 million, which is another preventable healthcare expenditure (CIHI, 2012c).

Since the re-admission rate among patients after cardiac surgery is excluded from mandatory performance indicators in Ontario, there is a paucity of accurate data for readmission rates in the CIHI and Cardiac Care Network [CCN] (2012) databases. However, the re-admission rates for cardiac surgery is estimated by Iribarne et al. (2014) in a multi-center prospective cohort study of cardiac surgery cases completed in 10 large cardiac surgery centers in Canada and the United States. In their study, the re-admission rate for all types of cardiac surgeries is about 18.7 percent. Eighty-one percent of the total re-admissions occurred during the first 30 days after discharge, while the remaining 19% occurred within 65 days post-hospitalization. According to

Irbarne et al., the most common causes of re-admission to hospital are surgical site infections, cardiac arrhythmias, fluid overload, and pleural effusions.

Although the advancement in surgical technology and cardiac surgical techniques have continued to evolve for example, shortening hospital length of stay for patients, over the last three decades: there has been minimal strategies developed towards complementing early hospital discharge with adequate home support for patients to ensure optimal recovery for patients at home (Sawatzky, Christie & Singal, 2012). Since patients after cardiac surgery are discharged sooner, patients and families leave the hospital with a feeling of insufficient post-operative teaching and preparation to take care of them at home (Sawatzky et al.; Theobald & Murray, 2004). As a result of this lack of healthcare professional support and limited post-discharge follow-up, patients after cardiac surgery report post-operative complications and re-admission to acute care settings (CIHI, 2012b; Theobald & Murray).

Most of the re-admissions are preventable by instituting a comprehensive, patient inclusive, effective discharge planning, and a streamlined mechanism in providing patient follow-up after their hospital visits (Harrison et al., 2011). Extending the acute care services through different modalities ensures the continuity of care and early identification and management of complications, in order to prevent the need for further hospital readmissions (Harrison et al.). One strategy that can potentially support the transitional care of patients after cardiac surgery is the development of a telephone follow-up intervention to extend the acute care services after discharge to their home (Courtney et al., 2010; Harrison et al.; Wakefield et al., 2009). Thus, this review of related literature will investigate the benefits of the telephone follow-up intervention in hospital re-admission especially among the cardiac surgery population.

Methodology

Three separate related literature searches were completed using the following databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL) database. The first search included the search terms readmission and telephone follow-up. The second search was completed using the search terms re-admission and cardiac surgery. Lastly, the third search used the search terms telephone follow-up and cardiac surgery. The database searches were limited to the following conditions: peer reviewed article and research study. The publication date was excluded as one of the filter fields, in order to search the entire database for all available related literature on telephone follow-up as a strategy to prevent hospital readmission after cardiac surgery.

In total, the searches retrieved 97 research studies: re-admission and telephone follow-up (39 studies), re-admission and cardiac surgery (54 studies), and telephone follow-up and cardiac surgery (four studies). All of the follow research studies are individually screened for relevance to the focus of this literature search, which is the telephone follow-up intervention as a strategy to prevent subsequent re-admissions. After further deliberating the research articles, a total of 13 studies were included in this literature review: one retrospective cohort study, six randomized control trial studies, and six prospective cohort studies. Although the telephone follow-up intervention had been investigated in other programs, there is notably very limited information in relation to the application of this intervention in cardiac surgery (one study)

Integrated Literature Review

Telephone Follow-up Intervention and Hospital Re-admissions

The provision of a telephone follow-up for patients after hospitalization has been proven effective in preventing hospital re-admissions. In a multi-center retrospective cohort study involving a total of 30, 272 patient discharges, Harrison et al. (2011) compared the 30-day re-

admission rates between patients who did not receive follow-up phone calls to patients who receive a call within 14 days after discharge and patients who received a call within 30 days after discharge. Although the participants are non-randomized with limited control over other interventions to prevent readmissions, the telephone follow-up within 14 days or within 30 days after discharge has been effective in preventing 30-day hospital re-admission (Harrison et al.). In fact, it showed that the risk for re-admission is decreased by 23.1% with the implementation of a telephone follow-up intervention (Harrison et al.). In addition, the 30-day re-admission rate among participants who did not receive a telephone follow-up within 14 days is 1.3 times at risk for re-admission (Harrison et al.).

The implementation of a telephone follow-up intervention for patients as a complement to post-discharge transitional care such as, post-discharge visits from a registered nurse (RN) and a physiotherapist as well as an individualized exercise package and follow-up care has demonstrated to be effective in preventing 30-day readmissions and promoting functional ability and mobility among elderly after hospitalization (Courtney et al., 2010). Courtney et al. have demonstrated this in a randomized controlled trial involving a group of 128 seniors aged 65 years and older after discharge from hospital in a single-centered randomized controlled trial. While the control group (N=64) received conventional care, the experimental group received a comprehensive 24-week transitional program that included a visit from a RN and a physiotherapist, an individualized follow-up care, and a telephone follow-up intervention (Courtney et al.). Although this study had a higher attrition rate of 16% and may have a self-report bias, the experimental group reported improvement in their functional ability and their mobility (Courtney et al.). Using the same sample group and research design, Courtney et al. (2009) demonstrated that the experimental group had lower re-admission rates compared to the

control group (22% versus 47%, p=0.007). In addition, this group also had fewer Emergency Department (ED) visits after discharge and a higher self-reported quality of life after six months of follow-up (Courtney et al.). Thus, the telephone follow-up as a complement of other post-discharge interventions can produce positive discharge outcomes and smooth hospital to home transitions for patients.

In designing a telephone follow-up, the designation of the health professional making the phone call may also play a critical factor in the success of this intervention. For example, in a single-centered randomized controlled trial involving 288 patients diagnosed with acute myocardial infarction who were discharged from hospital, the telephone follow-up did not contribute to quality of life and rate of re-admissions in this group (Hassen, Nordrehaug, Eide, & Hanestad, 2008). In this study, trained RNs' completed the series of telephone follow-up interventions, which consisted of a weekly call within four weeks, then after six weeks, 12 weeks, and 24 weeks after discharge (Hanssen et al.). In comparison, Hannan (2011) utilized a single center randomized trial with first time mothers (N=139) post-discharge from the hospital. A series of telephone follow-up calls by an advanced practitioner was completed for eight weeks for this sample. The results showed significant positive outcomes such as, decrease in healthcare cost ($14,333 versus $70, 834, $p<0.05$), alleviation in maternal stress ($p<0.0001$), and healthy weight gain for infants of less than 2lbs in one month (SD=1.63 versus SD=2.11) (Hannan, 2011). This observation was also evident on a single-centered randomized control trial involving 90 adult patients who were discharged after their cardiac surgery (Weaver & Doran, 2001). Although it is noteworthy that this study involved a small sample size and undetermined homogeneity between the experimental and control groups, the weekly RN led telephone follow-up intervention for one month also showed no improvement in the re-admission rates (Weaver &

Doran). Thus, the training and designation of the healthcare practitioner making the telephone follow-up may influence the outcome of the telephone follow-up.

The outcome of the telephone follow-up intervention may also be affected by a complementary intervention that is delivered with the telephone calls. In a randomized controlled trial involving 148 patients diagnosed with heart failure after hospital discharge, Wakefield et al. (2009) used both telephone and videophone follow-up in demonstrating that these interventions can improve the management of heart failure in the community and delay the re-admission in the control groups. Although the actual re-admission rates are not presented in the data, they linked the more frequent outpatient adjustment of medical management in the experimental group as a mean of delaying hospital re-admission. This observation is also similar to the strategy in the transitional program by Courtney et al. (2010) that included home visits from an RN and physiotherapist, telephone follow-up, and individually tailored follow-up care for patients. The successful outcome of telephone follow-up maybe attributed to the ability of the patient to set their own follow-up appointment as demonstrated by D'Amore et al. (2011). Patients who received a telephone follow-up call and had booked their follow-up visit with their family physician had significantly lower re-admission rate compare to other who just had the telephone follow-up (P=0.04) (D'Amore et al.).

Another factor that might affect the efficacy of the telephone follow-up is the length and frequency of the intervention. Some of the telephone follow-up only includes a single telephone call after discharge from hospital (Harrison et al., 2011). Meanwhile, other program involves a series of scheduled telephone follow-up in a four week to 24 weeks period with planned intervals (Courtney et al., 2011; Courtney et al., 2012; Weaver & Daran, 2001). In other instances, other programs utilized proactive and reactive telephone follow-up calls. This allowed patients and

their families to contact the assigned personnel after they were discharged from home to ask their concerns (Hanssen et al., 2009). Although there are some limitations in the research design and sample size, the four-week telephone follow-up performed by nurses working in the cardiac surgery step-down unit demonstrated no benefit in limiting the re-admission rate for cardiac surgery (Weaver & Doran, 2001). Meanwhile, the intervention using the eight weeks and 24 weeks time frame for follow up have both significantly improved the quality of life and decrease the re-admission rates on the intervention group (Courtney et al.; Hanssen et al.). In contrast, the retrospective study by Harrison et al. (2011) involving a large population (N=30,272) showed that the provision of a single telephone call after discharge from the hospital could decrease the re-admission rate among participants.

In terms of economic benefits of the telephone follow-up intervention, its implementation resulted in a substantial decrease of unnecessary health expenditures and incremental healthcare cost savings. For example, for 6,773 participants in the retrospective cohort study by Harrison et al. (2011), the telephone call follow-up within 15 days or 30 days after hospital discharge over the course of one calendar year has contributed to a total of $1.4 million of total health expenditure savings. Similarly, in a study examining first time mothers (Hannan, 2011), and the implementation of the telephone call follow-up made by advanced nurse practitioner (ANPs), the findings showed a decrease in urgent care center visit costs of $211 compared to $1,068 in the control group ($P<0.0001$).

Re-admission and Cardiac Surgery

Since the focus of this telephone follow-up intervention is for individuals who are at risk for re-admission, it is important to identify the different risk factors or patient specific characteristics that are reliable predictors of hospital re-admission after cardiac surgery. The

available research studies that investigated cardiac surgery re-admissions identified co-morbidities, depression, anxiety, obesity and caregiver status as primary determinant for hospital readmission (Mochari-Greenberger, Mosca, Aggarwal, Umann, & Mosca, 2014; Redzek et al., 2015). Meanwhile, the most common causes of re-admission after cardiac surgery are heart failure, sternal dehiscence, cardiac dysrhythmias, recurrent chest pain, and pericardial effusion (Redzek et al., 2015). Therefore, focusing on patient population that is high-risk for re-admission promotes the appropriate allocation of the limited healthcare resources that are currently available.

The unplanned re-admission after cardiac surgery can be predicted by pre-operative co-morbidities such as, stroke, heart failure, and obesity. In a single center prospective cohort study involving 121 re-admitted patients within 12 months in 2012, Redzek et al. (2015) have correlated heart failure ($p<0.0005$) and stroke ($p=0.002$) as predictors for hospital re-admission within one year after their heart surgery. In another single center prospective cohort study involving 1, 310 consecutive adult patients following cardiac surgery, those who have a BMI of equal or greater than 30 are at risk for 30-day readmission (Rockx et al., 2004). Redzek et al. (2015) also identified post-operative pericardial effusion ($p=0.006$) as an independent risk factor for hospital re-admission after heart surgery.

The self-care ability of patients prior to their cardiac surgery is also an independent determinant for hospital re-admission. Patients who have caregivers prior to their surgeries are likely to be re-admitted to acute care settings. Mochari-Greenberger et al. (2014) in a single-centered prospective cohort study demonstrated the link between caregiver status before surgery and hospital re-admission when they studied 665 consecutive adult patients following cardiac surgery. Among the participants, 183 or 23 percent of them have paid or unpaid caregivers

within one year before their cardiac surgery (Mochari-Greenberger et al., 2014). This is associated with 1.86 times likelihood of an extended length of stay of more than seven days post-operatively. Having a caregiver within one year before their cardiac surgery increases the risk for re-admission by approximately 1.5 times (Mochari-Greenberger et al.).

Psychological health of patients prior to their cardiac surgery is also a determinant for re-admissions for example, patients who are diagnosed with depression and anxiety. In a single center prospective study of 222 adult patients following cardiac surgery, Tully, Baker, Turnbull, and Winefield (2008) have linked depressive symptoms and anxiety to hospital re-admission. Although the presence of depressive and anxiety symptoms are established using self-reported tools, this study concluded that the presence of anxiety during the pre-operative period increases the risk of readmission threefold (Tully et al.). Meanwhile, depressive symptoms are associated with twice the risk for re-admission. Perhaps, this might be related to a slow functional recovery after cardiac surgery among patients with depressive symptoms (Mallik et al., 2004). Thus, depressive and anxiety symptoms can be useful predictors for cardiac surgery readmission.

Theoretical Framework

The theoretical framework that will be used in guiding the development of the telephone follow-up intervention for adult patients after cardiac surgery is Meleis' Theory of Transitions (1994). This theory focuses on the premise that individuals, families, groups, and organizations undergo transitions or passages from one situation, place, or state to another (Meleis, Sawyer, Im, Messias, & Schumacher, 2000; Schumacher & Meleis, 1994). It explains that transitions can be classified into five categories: individual developmental, family developmental, situational, health/illness, and organizational (Meleis & Transgenstein, 1994). The individual and family developmental transitions occur throughout the developmental stages of an individual or a family

in their life cycle (Meleis et al., 2000). Situational transitions are a result of changes in current life condition of an individual or family that concerns their living arrangements, professional career, and educational pursuits (Meleis et al., 2000). Meanwhile, health/illness transitions happen when individuals or families are experiencing a shift in their health status against the health and illness continuum (Meleis et al.). Lastly, groups and community experience organizational transitions as a result of system changes from leadership, process, and policy restructuring (Meleis et al.).

The experiences of patients and their families throughout their journey during the different phases of cardiac surgery represent great examples of Health/Illness life transitions. Although cardiac surgery maybe a planned procedure or an urgent procedure, the changes in individuals' lives remain significant. Even the hospitalization can pose as a challenging situation that both patients and their families has to adapt while going through this cardiac surgery experience. In addition, the ongoing rehabilitation and recovery after cardiac surgery continues until the patients are discharge from the hospital. In order to be successful with these transitions, patients and their families are required to acquire a new set of skills and knowledge that can be provided with ongoing professional support from someone with cardiac surgery expertise. Thus, the transition theory is chosen to guide the development of this intervention.

During this transition, Meleis and Transgenstein (1994) have mentioned that the aim of nursing care is to assist the individual, family, groups, or communities in achieving smooth transitions by successfully assuming their new roles. In the context of cardiac surgery, post-operative health teaching, ongoing post-discharge telephone follow-up, and outpatient follow-up appointments are examples of different interventions that can assist patients and family towards a smooth Health/Illness transition. These nursing care activities will provide the patients and their

families the important skill sets, knowledge, and professional supervision during their recovery period outside of hospital care. Similarly, the aim of this telephone follow-up intervention is to assist patients and family through their transitions. For example, from being cared for in the hospital to independently managing their care at home after cardiac surgery, aligns with the aim of Transitions Theory.

Conclusion

The development and implementation of a telephone follow-up intervention for patients after a hospital stay is a cost-saving and effective strategy in preventing re-admission and in promoting positive patient outcomes at home (Hanssen, Nordrehaug, Eide, & Hanesad, 2009; Harrison, Hara, Pope, Young, & Rula, 2011; Weaver & Doran, 2001). Although this intervention is a demonstrated effective intervention in several patient populations (Harrison et al.), the benefit of a telephone follow-up intervention in cardiac surgery is poorly investigated. For this reason, the generalizability of this intervention can be a crucial variable in the application of this strategy in the cardiac surgery population. Recognizing the patient and family's situational transitions after cardiac surgery is a critical step in their recovery and a focus of nursing practice. The implementation of a telephone follow-up intervention may potentially offer a practical method of extending the care to patients who are at risk for re-admission following cardiac surgery.

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Appendix B

Literature Summary Table

Name, Author, Date, Study Objective	Sample/Groups (Size, Setting, Characteristics)	Design and Methodology	Key Results and Findings	Strengths and Limitation	Conclusion
Study: The impact of post-discharge telephonic follow-up on hospital readmissions Authors: Harrison, P., Hara, P., Pope, J., Young, M., and Rula, E. Date: February 2011	Sample: Patients who are discharged from being admitted to hospital Size: 30, 272 total Intervention group 6773 Comparison Group 23, 499	Descriptive – Retrospective Cohort Study (Ecologic Study) Methodology: Participants are grouped whether they receive a telephone follow up or not. Participants who received telephone follow up are further classified between discharge calls within 15 days or within 30 days. Then, they are classified based on 30 days readmissions. When a patient is readmitted, it is further classified whether the readmission happened before or after the	➢ The 30-day readmission of patients is associated with being elderly, male, and longer length of stay during initial admission. ➢ The median length of stay when readmitted is 11 days. ➢ Most readmission happened 2 to 3 days after discharge then gradually decreased incidence after day 4. ➢ A third of the readmission happened within 7 days after discharge. ➢ 50 percent of the readmissions occurred within 14 days after discharge. ➢ The 30-day hospital readmission is 1.3 times more likely on	Strengths ➢ Large Sample Size Limitation ➢ Participants are selected among individuals who can afford or qualify for private medical insurance. ➢ Weak study design – retrospective. ➢ Participants are not randomized. ➢ Participants might have received other interventions to prevent hospital readmission.	Telephone follow up is an effective method of preventing hospital readmission. Research Question: Strong Participants representative of population: Strong Data Collection Sources and Methods: Strong Data Collection Instruments: Moderate Ethics: Strong Statistics: Strong Summary: a. Strength of Study Design: Weak b. Quality of Study: Strong c. Directness of Evidence: Direct

		follow up phone call. Study Period: Calendar year of 2008	participants who did not receive a call within 14 days. ➢ The risk for readmission among the participants is decreased by 23.1 % with telephone follow up. ➢ The total healthcare expenditure savings is estimated to be approximately $1.4 million.		
Study: Outcomes of a home health telehealth intervention for patients with heart failure Authors: Wakefield,B., Holman, J., Ray, A., Scherubel, M., Burns, T., Kienzle, M., Rosenthal, G. Date: 2009	Sample: Patients who are discharged from being admitted to hospital due to heart failure exacerbation. Size: 148 total Intervention group Telephone: 47 Videophone: 52 Control group 49	Analytic Study – Randomized Controlled Trial Methodology: Participants who meet inclusion criteria are randomized into there main groups: usual care, telephone follow up, or videophone interventions. Then two trained registered nurses provide the follow up contacts in the intervention group. Study Period: 39	➢ The intervention group takes longer time before their next readmission to hospital. ➢ Participants in the intervention group have a better understanding about their medications. ➢ Changes in the medication are more common in the intervention group.	Strengths ➢ Design of the study – Randomized Control Trial Limitation ➢ Low sample size ➢ Done in one center ➢ Limited access to patients medication list after discharge	Conclusion The implementation of a telephone and videophone follow up can improve the management of heart failure patients by delaying readmission and facilitating medication changes. Study Design: Strong Research Question: Strong Participants: Moderate Adequacy of Control of Selection Bias: Strong Adequacy of control of misclassification: Moderate Adequacy of information bias: Strong Validity and reliability

		months			instruments: Strong Adequacy of retention and follow-up: Strong Comparability of control group and intervention group: Strong Adequacy of control of major confounders: Strong Adequacy of ethical conduct: Strong Adequacy and interpretation of statistical testing: Strong Power and Size: Weak Generalizability: Moderate Feasibility: Strong Summary: Study Design – Strong Quality of the Study – Medium Decision regarding directness of study - Direct
Study: Improved functional ability and independence in activities of daily living for older adults at high risk of hospital readmission: a randomized controlled trial Authors: Courtney, M., Edwards, H.,	Sample: Individuals who are discharge from hospital with at least 1 risk for hospital readmission and older than 65. Size: 128 participants Intervention	Analytic Study – Randomized Controlled Trial Methodology: Participants who qualify inclusion criteria are randomized between the control and intervention group. The intervention group receives a 24-	➢ Participants in the intervention group have a better improvement in their functional ability following discharge. ➢ The participants in the intervention group had the ability to walk faster and longer distances, and to climb greater number of stairs.	Strengths ➢ Experimental Design. ➢ Good sample size ➢ Use of valid and reliable questionnaires. Limitation ➢ High Attrition rate – 16%. ➢ 6.3% of the intervention group participants withdrew from the study.	Conclusion The provision of a 24-week individualized and comprehensive transitional package for patients who are high risk for readmission can improve functional ability and mobility. Study Design: Strong Research Question: Strong Participants: Moderate Adequacy of Control of

Chang. A., Parker, A., Finlayson, K., Bradbury, C., and Nielsen, Z. Date: 2012	group 64 participants Control Group 64 participants	week transitional care intervention, which includes an individualized exercise and follow up care prior to discharge, home visits from a physiotherapist and a registered nurse, and a regular telephone follow-up for 24 weeks after discharge. Meanwhile, the control group received usual care. Study Period 6 months	➢ Both improvements in functional ability and mobility were detected after the 4th week in the program.	➢ There might be response bias with the results since the data is collected from a self-report questionnaire.	Selection Bias: Strong Adequacy of control of misclassification: Strong Adequacy of information bias: Strong Validity and reliability instruments: Strong Adequacy of retention and follow-up: Moderate Comparability of control group and intervention group: Strong Adequacy of control of major confounders: Strong Adequacy of ethical conduct: Strong Adequacy and interpretation of statistical testing: Strong Power and Size: Weak Generalizability: Moderate Feasibility: Strong Summary: Study Design – Strong Quality of the Study – Medium Decision regarding directness of study - Direct
Study: Fewer emergency readmissions and better quality of life for older adults at risk of hospital readmission: A	Sample: Individuals who are discharge from hospital with at least 1 risk for hospital readmission and	Analytic Study – Randomized Controlled Trial Methodology: Participants who qualify inclusion	➢ Participants in the intervention group have lesser number of readmissions compared to the control group (22% versus 47%, P =	Strengths ➢ Experimental Design. ➢ Good sample size ➢ Use of valid and reliable questionnaires. Limitation	Conclusion The provision of a 24-week individualized and comprehensive transitional package for patients who are high risk for readmission can prevent readmission and

randomized controlled trial to determine the effectiveness of a 24-week exercise and telephone follow-up program Authors: Courtney, M., Edwards, H., Chang, A., Parker, A., Finlayson, K., and Hamilton, K. Date: 2009	older than 65. Size: 128 participants Intervention group 64 participants Control Group 64 participants	criteria are randomized between the control and intervention group. The intervention group receives a 24-week transitional care intervention, which includes an individualized exercise and follow up care prior to discharge, home visits from a physiotherapist and a registered nurse, and a regular telephone follow-up for 24 weeks after discharge. Meanwhile, the control group received usual care. Study Period 6 months	0.007) ➢ The intervention group also had less ED visits. The control group had 86 ED visits compared to the intervention group who had 13 (P = <0.001). ➢ The intervention group also reported an improvement in their quality of life (P = <0.001) and mental state (P = <0.001).	➢ High Attrition rate – 16%. ➢ 6.3% of the intervention group participants withdrew from the study. ➢ There might be response bias with the results since the data is collected from a self-report questionnaire.	improve quality of life. Study Design: Strong Research Question: Strong Participants: Moderate Adequacy of Control of Selection Bias: Strong Adequacy of control of misclassification: Strong Adequacy of information bias: Strong Validity and reliability instruments: Strong Adequacy of retention and follow-up: Moderate Comparability of control group and intervention group: Strong Adequacy of control of major confounders: Strong Adequacy of ethical conduct: Strong Adequacy and interpretation of statistical testing: Strong Power and Size: Weak Generalizability: Moderate Feasibility: Strong Summary: Study Design – Strong Quality of the Study – Medium Decision regarding directness of study - Direct
Study: Does	Sample:	Descriptive Study:	➢ Each nursing units	Strengths	Conclusion

telephone follow-up predict patient satisfaction and readmission? Authors: D'Amore, J., Murray, J., Powers, H., and Johnson, C. Date: 2011	The sample includes patients who are discharged from 11-hospital heath system from selected medical, surgical, orthopedic, obstetrics, and cardiology units who qualified to receive post-discharge telephone follow-up. Size: 10,599 discharges	Ecologic Study Methodology: The participants receive a phone call during the day 1 to 4 days after hospital discharge.	had spent 1 to 2 hours per week of telephone airtime to provide the telephone follow-up for all the discharged patients. ➢ 47% of all the patient discharges were successfully contacted. ➢ The mean telephone air-time per patient is about 3 minutes. ➢ The readmission rate for patients who received a telephone follow-up and had a reported scheduled family physician follow-up is significantly less than those who did not receive a phone call or those who received a phone call but had no reported scheduled physician follow-up (P=0.04).	➢ Large sample size. ➢ Multi-centre location Limitation ➢ The research design is weak. ➢ Sample is non-randomized. ➢ The control element is missing. ➢ The intervention only includes a short single phone call.	The implementation of a telephone follow up can decrease the readmission among patients who are able to book their follow-up appointments after discharge from hospital. Research Question: Strong Participants representative of population: Strong Data Collection Sources and Methods: Strong Data Collection Instruments: Moderate Ethics: Strong Statistics: Strong Summary: a. Strength of Study Design: Weak b. Quality of Study: Strong c. Directness of Evidence: Direct
Study: Does a telephone follow-up intervention for patients discharged with acute	Sample: Patients who are discharge from hospital after being admitted	Analytic Study – Prospective Controlled Randomized Trial	➢ Most of the patients received 6 phone calls during the 24 weeks of follow up. ➢ The average phone	Strengths ➢ Experimental research design ➢ Use of reliable and valid tool in order to	Conclusion The long-term proactive and reactive telephone follow-up intervention for patients who are discharged after acute

myocardial infarction have long-term effects on health-related quality of life? A randomized controlled trial. Authors: Hanssen, T., Nordrehaug, J., Eide, G., and Hanestad, B. Date: 2009	due to acute myocardial infarction and meet inclusion criteria. Size: 288 participants Intervention group 156 Control Group 132	Methodology: The intervention group receives a standardized proactive and reactive telephone follow-up: weekly for the first 4 weeks, then after six, eight, 12, and 24 weeks after discharge. The control group is managed according to current practice. Study Period: September 2001 to 2005	call lasted about 6.88 minutes. ➢ The telephone follow-up intervention did not show significant improvement in the quality of life of patients. ➢ There was no significant difference in readmission and smoking cessation for both groups.	measure quality of life. Limitation ➢ Small sample size ➢ The other factors that might affect the outcome of post-hospitalization period of participants such as diet, exercise, medication adherence, and lifestyle and risk factors knowledge are not measured in the study. ➢ There is lost of follow up for both intervention and control group (35% and 26% respectively). ➢ The study is completed in one centre.	myocardial infarction may not contribute to improvement of quality of life and readmission. Study Design: Strong Research Question: Strong Participants: Strong Adequacy of Control of Selection Bias: Strong Adequacy of control of misclassification: Moderate Adequacy of information bias: Strong Validity and reliability instruments: Strong Adequacy of retention and follow-up: Moderate Comparability of control group and intervention group: Strong Adequacy of control of major confounders: Strong Adequacy of ethical conduct: Strong Adequacy and interpretation of statistical testing: Strong Power and Size: Moderate Generalizability: Moderate Feasibility: Strong Summary: Study Design – Strong Quality of the Study – High Decision regarding directness of

					study - Direct
Study: APN telephone follow-up to low-income first time mothers Authors: Hannan, J. Date: 2011	Sample: The sample consists of first time low income mothers 18 years and older, who delivered a single infant. Size: 139 participants Intervention group 70 Control Group 69	Analytic Study – Prospective Randomized Controlled Trial Methodology: The intervention group received a series of telephone follow-up for 8 weeks from an advanced practice nurse. Meanwhile, the control group received usual care.	➢ The overall post-discharge stress among this group is lower in the intervention group. ➢ During the 1st and 2nd month follow-up, the participants in the intervention group perceived themselves healthier compared to the control group. ➢ The weight gain of the infants in the intervention group is healthier than the control group. ➢ The overall healthcare charge for urgent health services are significantly lower for the intervention group compared to the control group ($211 vs $1,068, P<0.0001).	Strengths ➢ Strong experimental research design. Limitation ➢ Small sample size. ➢ One center study	Conclusion The implementation of an 8-week scheduled telephone follow-up by an advanced nurse practitioners on first time low income mothers can decrease healthcare cost, relieve stress among mothers, and promote healthy weight gain among infants. Study Design: Strong Research Question: Strong Participants: Strong Adequacy of Control of Selection Bias: Strong Adequacy of control of misclassification: Moderate Adequacy of information bias: Strong Validity and reliability instruments: Strong Adequacy of retention and follow-up: Moderate Comparability of control group and intervention group: Strong Adequacy of control of major confounders: Strong Adequacy of ethical conduct: Strong Adequacy and interpretation of statistical testing: Strong

					Power and Size: Moderate Generalizability: Strong Feasibility: Strong Summary: Study Design – Strong Quality of the Study – High Decision regarding directness of study - Direct
Study: Predictors for hospital readmission after cardiac surgery Authors: Redzek, A., Mironicki, M., Gvozdenovic, A., Petrovic, M., Cemerlic-Adic, N., Ilic, A., and Velicki, L. Date: 2015	Sample: Patients who are readmitted in the calendar year of 2012 within 1 year after first cardiac surgery. Size: 121 participants	Descriptive Study – Ecologic Study Methodology: A prospective analysis of readmitted patients was performed for all patients that were readmitted 1 year after their cardiac surgery for the calendar year of 2012.	➢ The main reasons for readmission are heart failure (17.3%), sternal dehiscence (14.9%0, cardiac dysrhythmias (14.9%), recurrent chest pain (11.6%), and pericardial effusion (10.7%). ➢ The readmission rate is 9.54% (121 out of 1268 cardiac surgeries) for cardiac surgery. ➢ There is not significant correlation between the length of stay in hospital and intensive care unit (ICU) and hospital readmission. ➢ The independent predictors of	Strengths ➢ Good statistical measurements ➢ Inclusion of all cases for the year of 2012 ➢ Long follow up (1 year after surgery) Limitation ➢ Single center study ➢ Small sample size	Conclusion The unplanned readmission after cardiac surgery can be predicted with pre-operative heart failure and stroke, and with post-operative pericardial effusion. Research Question: Strong Participants representative of population: Strong Data Collection Sources and Methods: Strong Data Collection Instruments: Strong Ethics: Strong Statistics: Strong Summary: a. Strength of Study Design: Weak b. Quality of Study: Strong c. Directness of Evidence: Direct

			readmission are previous stroke (p = 0.002), heart failure (p<0.0005), and post-operative pericardial effusion (p = 0.006).		
Study: A simple marker to identify cardiac surgery patient at risk for longer postoperative length of stay, rehospitalization, or death Authors: Mochari-Greenberger, H., Mosca, M., Aggarwal, B., Umann, T., and Mosca, L. Date: 2014	Sample: The sample consists patients who are consecutively admitted for cardiac surgery who consented to be part of the study and met inclusion criteria. Size: 665 Intervention group Patients who had a paid or informal caregiver 1 year prior to surgery. 183 Control Group Patients without caregivers. 482	Descriptive Study – Ecologic Study Methodology: Study period: November 2009 to September 2011	➢ A total of 183 or 28% of the participants had a caregiver within the year before cardiac surgery. ➢ 54 participants or 8% have a paid caregiver. ➢ 129 participants or 20% had only informal caregiver. ➢ Having a caregiver (either paid or informal) increases the risk of staying longer than 7 days post-operatively by 1.86 times. ➢ Participants in the intervention group are 1.57 times most likely to be readmitted or to die within 1 year after cardiac surgery.	Strengths ➢ Large sample size ➢ Good recruitment rate (above 90% participated in the study) Limitation ➢ Self-reported caregiver status ➢ Single center study	Conclusion The involvement of a paid or informal caregiver with the care of patients within 1 year prior to cardiac surgery is an indicator of longer post-operative length of stay, readmission to hospital, and mortality within 1 year after cardiac surgery. Research Question: Strong Participants representative of population: Strong Data Collection Sources and Methods: Strong Data Collection Instruments: Strong Ethics: Strong Statistics: Strong Summary: a. Strength of Study Design: Weak b. Quality of Study: Strong c. Directness of Evidence: Direct

Study: Is obesity a predictor of mortality, morbidity and readmission after cardiac surgery? Authors: Rockx, M, Fox, S., Stitt, L., Lehnhardt, K., McKenzie, N., Quantz, M., Menkis, A., and Novick, R. Date: 2004	Sample: The participants include consecutive cardiac surgery patients from London Health Sciences Center from July 1999 to April 2002. Size: 1310	Descriptive Study: Ecologic Study Methodology: The participants BMI are calculated and correlated to 10 major cardiac surgery complications including hospital readmission. The participants are grouped into 2 groups based from their BMI. The first group is participants with BMI of < or =30. The second group is participants with BMI >30.	➢ Participants with BMI greater than 30 have a greater risk for 30-day readmissions and sternal wound infection. ➢ An increased BMI does not increase the risk of mortality and complications.	Strengths ➢ Large sample size Limitation ➢ Weak study design ➢ Single center study ➢ The BMI are only stratified to two groups rather than having more groups of BMI.	Conclusion The participants with BMI of greater than 30 are at risk for sternal wound dehiscence and 30-day readmission. Research Question: Strong Participants representative of population: Strong Data Collection Sources and Methods: Strong Data Collection Instruments: Strong Ethics: Strong Statistics: Strong Summary: a. Strength of Study Design: Weak b. Quality of Study: Strong c. Directness of Evidence: Direct
Study: Patients with depressive symptoms have lower health status benefits after coronary artery bypass surgery	Sample: The participants consist of consecutive cardiac surgery patients who meet inclusion	Descriptive Study: Ecologic Study Methodology: From February 1999 to January 2001, patients are screened	➢ The presence of depressive symptoms among cardiac surgery patients is associated with slow improvement in functional status after	Strengths ➢ Large sample size ➢ Use of reliable measurement tool Limitation ➢ Single center study ➢ Weak design	Conclusion Depressive symptoms are associated with a slow functional status recovery after cardiac surgery. Research Question: Strong

Authors: Mallik, S., Krumholz, H., Lin, Z., Kasl, S., Mattera, J., Roumains, S., and Vaccarino, V. Date: October 2004	criteria from February 1999 to January 2001. Size: 1168	and enrolled for the study. Their depression is scored based from the Geriatric Depression Scale Short Form (GDS-S). Then the patients are grouped according to their GDS-S scores of <=5, 5 to 9, and >=10. Then, the participants' health status physical function, and clinical variables are compared.	6 months post-operatively. The patients with GDS-S score of =<5 shown 60.1% improvement, 5 to 9 of 48.9%, and 39.7% for >=10 (p=0.002).	➢ Self-report measurement tool	Participants representative of population: Strong Data Collection Sources and Methods: Strong Data Collection Instruments: Strong Ethics: Strong Statistics: Strong Summary: a. Strength of Study Design: Weak b. Quality of Study: Strong c. Directness of Evidence: Direct
Study: The role of depression and anxiety symptoms in hospital readmission after cardiac surgery Authors: Tully, P., Baker, R., Turnbull, D., and Winefield, H. Date: April 2008	Sample: The participants consist of cardiac surgery patients who meet inclusion criteria. Size: 222	Descriptive Study: Ecologic Study Methodology: The participants who meet inclusion criteria are asked to fill out the depression anxiety stress scale to measure their level of depression and anxiety prior to surgery. Then, the level of depressive symptoms and anxiety are tested for correlation to hospital	➢ The presence of anxiety during the pre-operative period increases the risk of readmission threefold. ➢ The presence of depression during the pre-operative phase increases the risk of readmission twice.	Strengths ➢ There is some degree of blinding in the OR and the surgeons. They don't know the DASS scores for patients. ➢ Use of a valid measurement tool ➢ The readmission is self-reported and validated in the electronic admission database for the region. Limitation ➢ Single center study	Conclusion Depression and anxiety during the pre-operative period of cardiac surgery are both independent risk factors for hospital readmission. Research Question: Strong Participants representative of population: Strong Data Collection Sources and Methods: Strong Data Collection Instruments: Strong Ethics: Strong Statistics: Strong

		readmission. Before period – After period –		➢ Small sample size ➢ Response bias from the measurement tool	Summary: a. Strength of Study Design: Weak b. Quality of Study: Strong c. Directness of Evidence: Direct
Study: Telephone follow-up after cardiac surgery: Facilitating the transition from hospital to home. Authors: Weaver, L. and Daran, K. Date: May 2001	Sample: The participants are cardiac surgery patients who are discharged and met inclusion criteria. Size: 90 Intervention group 44 Control Group 46	Analytic Study – Randomized Controlled Trial Methodology: The intervention group receive a phone call follow-up from a cardiovascular step-down nurse 2 days after discharge, once weekly for or based from the patients need for 1 month. The control group receives current care, which has no follow-up phone call. There is a standardized question that the nurse uses for each telephone follow-up. When a concern comes up, the nurse follows a protocol on how to address the concerns.	➢ There were 10 readmissions on the control group. Meanwhile, there were 8 readmissions in the intervention group. ➢ The most common causes of readmission is respiratory issues, dysrhythmias, and wound infection. ➢ The median length of stay after readmission is 3 days and the median cost is $4,500. ➢ There is no significant difference between the readmission rates for both groups.	Strengths ➢ Randomized ➢ Presence of a control group Limitation ➢ Homogeneity is not established for both groups. ➢ Small sample size ➢ Single Center Study	Conclusion The telephone follow-up based on these recommendations has no significant difference with the rate of readmission among post-operative cardiac surgery patients. Study Design: Strong Research Question: Strong Participants: Moderate Adequacy of Control of Selection Bias:Weak Adequacy of control of misclassification: Adequacy of information bias: Strong Validity and reliability instruments: Strong Adequacy of retention and follow-up: Moderate Comparability of control group and intervention group: Strong Adequacy of control of major confounders: Strong Adequacy of ethical conduct: Strong

					Adequacy and interpretation of statistical testing: Strong Power and Size: Moderate Generalizability: Strong Feasibility: Strong Summary: Study Design – Strong Quality of the Study – Medium Decision regarding directness of study - Direct

Appendix C

Stakeholder Consultation: The development of a telephone follow-up intervention for adult patients after cardiac surgery

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May 7, 2016

Stakeholder Consultation: The development of a telephone follow-up intervention for adult patients after cardiac surgery

Hospital re-admission among adult patients following coronary bypass grafting and/or cardiac valve replacement is one of the main preventable causes of poor patient experience, unsatisfactory quality of life, suboptimal cardiac surgery outcomes, unnecessary health resources utilization, and incremental healthcare cost expenditures (Canadian Institute for Health Information [CIHI], 2012b; CIHI, 2012c; Fredericks & Da Silva, 2010; Gardner, Elliot, Gill, Griffin, & Crawford, 2005; Theobald & Murray, 2004). Recognizing that most of the readmissions are preventable and that there is an ongoing impetus to curtail the hospital length of stay for patients after cardiac surgery (Fredericks & Da Silva), there has been a recent focus in providing transitional care interventions to augment hospital care beyond acute care settings and to allow patients and their families have a smooth recovery period at home (Johnson, 2000; Weaver & Doran, 2001). In an attempt to deliver comprehensive and patient-focused care after discharge, some hospital organizations have developed telephone follow-up interventions for their patients (Hanssen, Nordrehaug, Eide & Hanesad, 2009; Harrison, Hara, Pope, Young, & Rula, 2011; Weaver & Doran, 2001). Although these interventions showed promising benefits in limiting readmission rates, improving functional status of patients after discharge, and promoting positive post-discharge outcomes (Harrison et al.), its relevance and applicability to cardiac surgery population remain under investigated (Weaver & Doran). The aim of this report is to present the results of the consultations with the frontline staff, Cardiac Surgeon, and the management of Hamilton Health Sciences (HHS) regarding the development of a telephone follow-up intervention for adult patients after cardiac surgery.

Background

Re-admission to acute care settings after hospitalization due to illness or surgery is one of the primary reasons of unnecessary health resource utilization, poor patient experience, low quality of life and incremental healthcare expenditure that threaten Canada's publicly funded healthcare system (Canadian Institute for Health Information [CIHI], 2012c). In a study of 2.1 million adult and pediatric hospitalizations in Canada, about one out of 12 patients is re-admitted to hospital within 30days after discharge (CIHI, 2012a). Among the surgical population group, the 30-day re-admission rate is about 10% with surgical site infections as the primary reason (CIHI, 2012a).

The problem with high hospital re-admission rate places additional compounding financial burden to the Canadian healthcare system (CIHI, 2012c). In 2010, the total costs associated with hospital re-admission has totaled to $1.8 billion, which is about 11% of the in-patient healthcare expenditure for that period (CIHI, 2012c). In the acute care medicine program, the government spends an additional $3,117 for each readmission (CIHI, 2012c). Similarly, the emergency department visits after seven days after discharge totaled $30.6 million, which is another preventable healthcare expenditure (CIHI, 2012c).

Since the re-admission rate among patients after cardiac surgery is excluded from the mandatory performance indicators in Ontario, there is a paucity of accurate data for re-admission rates in the CIHI and Cardiac Care Network [CCN] (2012) databases. However, the re-admission rates for cardiac surgery is estimated by Iribarne et al. (2014) in a multi-center prospective cohort study of cardiac surgery cases completed in 10 large cardiac surgery centers in Canada and the United States. In their study, the readmission rate for all types of cardiac surgeries is about 18.7 percent. Eighty-one percent of the total re-admissions occurred during the first 30 days after discharge from hospital and the remaining 19% within 65 days after hospital discharge. Among

the re-admissions, the most common causes are surgical site infections, cardiac arrhythmias, fluid overload, and pleural effusions (Iribarne et al.).

Although the advancement in surgical technology and cardiac surgical techniques have continued to evolve for example, shortening hospital length of stay for patients, over the last three decades: there has been minimal strategies developed towards complementing early hospital discharge with adequate home support for patients to ensure optimal recovery for patients at home (Sawatzky, Christie, & Singal, 2012). Since patients after cardiac surgery are discharged sooner, patients and families leave the hospital with a feeling of insufficient post-operative teaching and preparation to take care of them at home (Sawatzky et al.; Theobald & Murray, 2004). As a result of lack of healthcare professional support and limited post-discharge follow-up, patients after cardiac surgery suffer from post-operative complications and re-admission to acute care settings (CIHI, 2012b; Theobald & Murray).

Most of the re-admissions are preventable by instituting a comprehensive, patient inclusive, and effective discharge planning and a streamlined mechanism in providing patient follow-up after their hospital visits (Harrison et al., 2011). Extending the acute care services through different modalities ensures the continuity of care and early identification and management of complications in order to prevent the need for further hospital readmissions (Harrison et al.). One strategy that can potentially support the transitional care of cardiac surgery patients is the development of a telephone follow up program to extend the acute care services after discharge to their home (Courtney et al., 2010; Harrison et al.; Winefield et al., 2008). Thus, this integrated review of related literature will investigate the benefits of the telephone follow-up intervention in hospital readmission especially among the cardiac surgery population.

Objectives

Consultation with several different key stakeholders was completed to assist with the development of this telephone follow-up intervention. These consultations were focused on the following three objectives: to identify the current follow-up process that exists in the cardiac surgery program; to gather the perspectives and suggestions of frontline staff and the management team of the Cardiac Surgery Program on the design and scope of the telephone follow-up intervention; and to perform an environmental scan of pre-existing telephone follow-up in other provincial and out of the province cardiac surgery centers.

Methodologies

Methods, Sample, and Setting

The setting of this project consultation is the Cardiac Surgery Unit of Hamilton Health Sciences (HHS) in Hamilton, Ontario. For the other cardiac surgery centers, the consultation was completed for three main cardiac surgery centers in Ontario, one in Newfoundland and Labrador, and one in British Columbia. The consultation in HHS was completed through two group discussions with frontline staff and expert interviews on four Cardiac Surgeons. The data were collected through two methodologies: key informant interview and focus group discussions. For both of these methodologies, semi-structured questionnaires were used to guide the discussions in the interview. The results of this interview were summarized through basic note taking.

Group Discussions

The first group discussion was completed during the monthly Unit Council Meeting to gather information related to the current follow-up process. It was also an opportunity to obtain their suggestions regarding the telephone follow-up intervention for adult patients after cardiac surgery. This group consisted of four registered nurses (RN), one physiotherapist (PT), one dietician (DT), one Nurse Practitioner (NP) and two Nurse Managers. Using as semi-structured

questionnaire, the group was asked about the current process, challenges, and suggestions for improvement on post-discharge follow-up for adult patients after cardiac surgery. The last part of the group discussions was pertaining to the suggestions for the content, structure, and implementation process of the telephone follow-up intervention.

Another group discussion was organized with the eight secretaries for the Cardiac Surgeons to understand the current process, challenges, and suggestions for improvement related to the post-discharge follow-up for adult patients after cardiac surgery. Out of the eight secretaries that were invited, a total of five of them attended the group discussion. Using a semi-structured questionnaire, they were asked for suggestions for the content, structure, and implementation process of the proposed telephone follow-up intervention.

Expert Interviews

A content expert interview was completed with the four out of the eight Cardiac Surgeons in HHS to understand the current process, challenges, and suggestions for improvement related to the telephone follow-up for cardiac surgery patients after discharge. During the interview, the concept of the telephone follow-up intervention was presented to the Surgeons. Using the semi-structured questionnaire, they were asked for suggestions for the content, structure, and implementation process of the telephone follow-up intervention. Telephone interview or email correspondence were completed, in order to gather information regarding the development and implementation of pre-existing telephone follow-up interventions in two provincial and two out of the province cardiac surgery centers.

Data Management and Ethical Considerations

The summary of the discussions was encoded using MS Word processor in a password-protected server used by HHS. A content analysis was completed for the summary to identify categories

and common themes. Since this project is quality improvement, a formal ethical review and approval process is unnecessary. However, in order to maintain confidentiality and privacy, the data collected during this consultation will be kept in a password-protected server used by HHS.

Results and Discussions

Current Follow-Up after Cardiac Surgery

The current follow-up process for adult patients in the Cardiac Surgery Department of HHS involves a four-step process. The first appointment is with the patient's family doctor within seven days after discharge. Secondly, the patients see their Cardiologist within three to four weeks after discharge. This is followed by the appointment with the Cardiac Surgeon after four to eight weeks after discharge. Lastly, all of the patients are invited to attend the Cardiac Rehabilitation Program after six to eight weeks after discharge.

Sometimes when the Cardiac Surgeons are concerned that the patients may develop complications post-discharge, the appointment to see them again maybe scheduled sooner than four to eight weeks after their discharge. Although this option allows the Cardiac Surgeons to closely monitor patients who are high risk for complications and re-admission, this practice is variable and only Cardiac Surgeon specific. There is a lack of a standardized process to automatically book an earlier appointment with the Cardiac Surgeon when a patient has an identified risk for re-admission or complication(s). In addition, there is no existing process to identify the risk for re-admission and complications in this unit.

In consultation with the other five cardiac surgery centers, it revealed that only one of the centers have a telephone follow-up for patients after discharge from hospital. However, the center was not able to release the details pertaining to the telephone follow-up because a third

party service provider is delivering this service.

Challenges of Current Process

The first challenge of the current process is the vesting of all the responsibilities regarding the attendance and scheduling the post-discharge follow-up of patients and their families. The success of the recovery and rehabilitation period at home depends on the functional ability of the patients to attend the follow-up and the interest on making follow-up appointments. Once the patient is discharged from the Cardiac Surgery Unit, there is very little participation from the Cardiac Surgery Department. The only interaction they have with their patients is only when these individuals make a telephone call to the unit with their questions regarding their post-discharge instructions immediately after discharge from hospital. The other time the inpatient unit see these patients is when they get re-admitted for complications. From the time of discharge or re-admission, the in-patient unit has no way to contact or monitor the patients' progress in the community.

Another challenge with the process is that there is difficulty in ensuring that the appropriate post-discharge follow-up appointments are scheduled for patients who are transferred back to their home hospitals. The appointments are only followed up when the Cardiac Surgeons' offices receive the discharge summaries through facsimile from the in-patient unit. This remains problematic, since sometimes discharge summaries are not completed for this particular group of patients. Although the instructions for appointments are completed in the transfer records that are sent to the other hospitals, some of the follow-up appointments are not completed for these patients when they are discharged to a different hospital.

Another weakness of the current follow-up design is the time before the patient sees the Cardiac Surgeon is too long. For some patients, they have already developed complications and

have been re-admitted to the hospital before they are seen because most of these patients develop complications within three to six weeks before the Cardiac Surgeon sees them. During this time, the patients and their families have no contact person in the Cardiac Surgery Unit for questions regarding their recovery. Most of the time, they call the Cardiac Surgeons' offices and speak to the secretaries, who have minimal knowledge and medical terminology training, for their questions regarding their recovery.

Advantage of this Current Process

The flexibility to book an earlier appointment when necessary for some patients is the main strength of this current follow-up process. However, this process remains variable and dependent on the discretion of the patient's Cardiac Surgeon. This allows early detection and prompt management of developing complications, in order to promote optimal recovery and to prevent subsequent hospitalizations. This process is particularly important among patients who are at risk for re-admissions and complications.

Nature Telephone Follow-up

During the consultation, the telephone follow-up is viewed to come in two forms. First, the early post-operative telephone follow-up, which is completed one to two weeks after discharge, is geared towards the prevention of complications, monitoring the recovery of patients at home, and to manage symptoms. During this type of follow-up, the common topics that need to be part of the early telephone follow-up intervention should include: current vital signs, activity tolerance, wound healing, breathing patterns, heart beat patterns, fluid status, signs of infection, current medications, and symptoms of depression. The second type of telephone follow-up is the long-term follow-up, which is normally completed about six months to one year after surgery. Its focus is geared towards surgical outcomes such as, quality of life and

recurrence of symptoms. Since the purpose of this telephone follow-up is on the early follow-up, this type is has not been thoroughly investigated in the literature.

There have been several suggestions from the consultations in relation to the scope of the telephone follow-up. Some suggested that all patients should be called after their cardiac surgery. Meanwhile, some participants have cited that patients who are at risk for complications and re-admissions should be the only eligible patients for this intervention given that there are financial constraints with implementing this intervention. Yet the majority of the participants emphasized the importance of all patients receiving one telephone follow-up call and subsequent telephone calls if there are concerns during the initial contact.

Although there is an argument regarding universal patient inclusion, all of the participants have agreed that there are benefits for patients who are high risk for complications and re-admissions are called by a healthcare professional after discharge from hospital. One Cardiac Surgeon has described that patients maybe “off-track” or “on-track” with their surgical journey. A patient is considered on-track if the patient is achieving the cardiac surgery milestones in the expected time frame and has not developed complications from the surgery. On the other hand, a patient is classified as off-track if there are complications after surgery and has an extended length of stay in the hospital. Another Cardiac Surgeon has commented that the following reasons might indicate referral to telephone follow-up after discharge: patients who had complications during hospitalizations; extended length of stay or more than two weeks in the hospital post-operatively; patients with a mechanical valve; type A dissection surgery; patient who had surgical wound infection; and patients who are going home with vacuum assisted therapy for wound healing.

Timing and Frequency

In terms of the timing for telephone follow-up, there were several suggestions that were presented during the consultations. They have suggested that the telephone follow-up should occur at least once or twice within one week to four weeks after discharge. In addition, the frequency should vary depending on the complexity of the patient's status post-discharge. If the telephone follow-up is completed one week after discharge and before 30 days, it will ensure that the patients are not experiencing post-operative issues during this critical time when complications commonly develop. This will also provide an opportunity to check that they have seen their family doctors and their Cardiologist.

The implementation of a telephone follow-up intervention is seen as a beneficial to the Cardiac Surgery Program of HHS during the consultation. It is perceived to prevent hospital re-admissions, to improve health promotion, and monitor and prompt early management of complications for patients after their cardiac surgery. Since there will be a designated healthcare professional making the telephone calls for patients, it will ensure that the patients' concerns are screened and managed during this follow-up. This will also promote continuity of care, which is often reported by other healthcare professionals as lacking in the Cardiac Surgery Program of HHS. Patients are considered 'left alone' after being discharge from hospital and are given the sole responsibility to schedule and to attend their follow-up appointments.

Based on the consultations, the most common causes of re-admissions to hospital among the cardiac surgery population group are the following: pleural effusion requiring thoracentesis, cardiac arrhythmias such as atrial fibrillation, and deep surgical wound infection. The secretaries have mentioned that often times, they will book earlier appointments for patients when they receive telephone calls with complaints of shortness of breath, discharge from the incisional wound, and palpitations. They also cited that depressive symptoms especially among men are

very common. Most of the patients who call and cry reported that they become upset about themselves due to the restrictions in mobility and activities and due to inability to meet their own personal recovery expectations.

Staff Designations

The participants also have agreed that the designation of the healthcare professional making the telephone calls is an important aspect of this project. The majority of the participants have suggested that a Nurse Practitioner (NP) or a Clinical Nurse Specialist (CNS) should be the individual making the telephone follow-up, because of their depth of their clinical expertise and theoretical knowledge in cardiac surgery. In addition, the NP will have the ability to initiate diagnostic tests and re-assess the patients' medications without a direct order from the Cardiac Surgeon. Due to financial constraints, some individuals have suggested that a trained registered nurse (RN) is suitable to make the telephone calls as long as he/she has the proper training.

Challenges of a Telephone Follow-up

One of the concerns that arose during the consultations is the lack of ability to perform a physical assessment. Since there is no face-to-face consultation with the patients, it might be difficult even with Nurse Practitioners to diagnose and to treat symptoms remotely without asking the patients to come to the Cardiac Surgeon's office. However, if relevant selected questions are used, there is still a great benefit of screening patients periodically after discharge through a telephone follow-up format

Some patients also might not participate with this telephone follow-up such as, not answering their calls or returning the calls. Although some patients are very organized with their post-discharge appointments, others have limited support from family and motivation to do the same. This may remain problematic even if a telephone follow-up is in place. There are also a

group of patients that will not report any symptoms for example, shortness of breath, because they think that what they are currently feeling is part of the normal recovery process.

Protocols and Medical Directives

In order to keep that telephone follow-up systematic, the participants of this consultation have highlighted the importance of using standardized questionnaire for activities of daily living (ADLs), emotional state, and physiological symptoms during the phone calls. The use of these questionnaires will also encourage the patients to report any related symptoms of complications during their recovery. Depending on the designation of the healthcare professional making the calls, the type of questions may also vary. For example, an NP or CNS, can ask more open-ended questions because they have a deeper understanding of cardiac surgery and have the ability to synthesize patient responses. Meanwhile, with other healthcare professionals with minimal training, it would be necessary to have more close-ended questions.

The participants have also mentioned the use of protocols and medical directives in this telephone follow-up. The protocols will dictate the next best action depending on the outcome of their conversation with the patients. For example, if there are concerns with the wound, a document can be followed regarding the different recommended steps to follow to address that concerns. Except for the NP-led telephone follow-up, the development of medical directives may also be necessary, in order to provide autonomy to CNS and RNs to provide orders for treatments and tests.

Conclusion

The development and implementation of a telephone follow-up intervention in the cardiac surgery adult population represents a beneficial strategy to prevent hospital re-admissions and post-operative complications Hanssen, Nordrehaug, Eide, & Hanesad, 2009;

Harrison, Hara, Pope, Young, & Rula, 2011; Weaver & Doran, 2001). In order to understand the current process of post-discharge follow-up for adult patients after cardiac surgery, consultations were completed with several different relevant stakeholders, who included: the frontline staff and the management team of the Cardiac Surgery Program, four out of the eight secretaries for the Cardiac Surgeons and five cardiac surgery centers in Canada. The result of theses consultations have demonstrated that this intervention is viewed as beneficial for patients and the Cardiac Surgery Department in preventing post-operative complications, hospital re-admission, and promoting optimal recovery. The majority of the participants have recommended a telephone follow-up within the first to second week after discharge, which is followed by subsequent calls if required. An emphasis was highlighted regarding the importance of clinical and theoretical expertise of the healthcare professional making the telephone calls, the use of standardized questionnaires, and the implementation of protocols and medical directives in the development of this telephone follow-up intervention for this patient population.

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Appendix D
Questionnaires

Date: TBD
Room: TBD
Interview Questions for Key Informant Interview and Group Discussions

Attendees: **Regrets:**	

Meeting objectives:

1. To identify the current follow-up process that exists in the cardiac surgery program; and
2. To gather the perspectives and suggestions of frontline staff and the management team of the cardiac surgery program on the design and scope of the telephone follow-up intervention;

Agenda topic	Discussion	Themes
1. What is the current process of post-discharge follow-up for adult patients after cardiac surgery?		
2. What are the current challenges of the current follow-up process?		
3. What are the current strengths of the current follow-up process?		
4. How do you see a telephone follow-up benefiting adult patients after cardiac surgery?		

Date: TBD
Room: TBD

Telephone Interview Questions for other Cardiac Surgery Centres and Programs

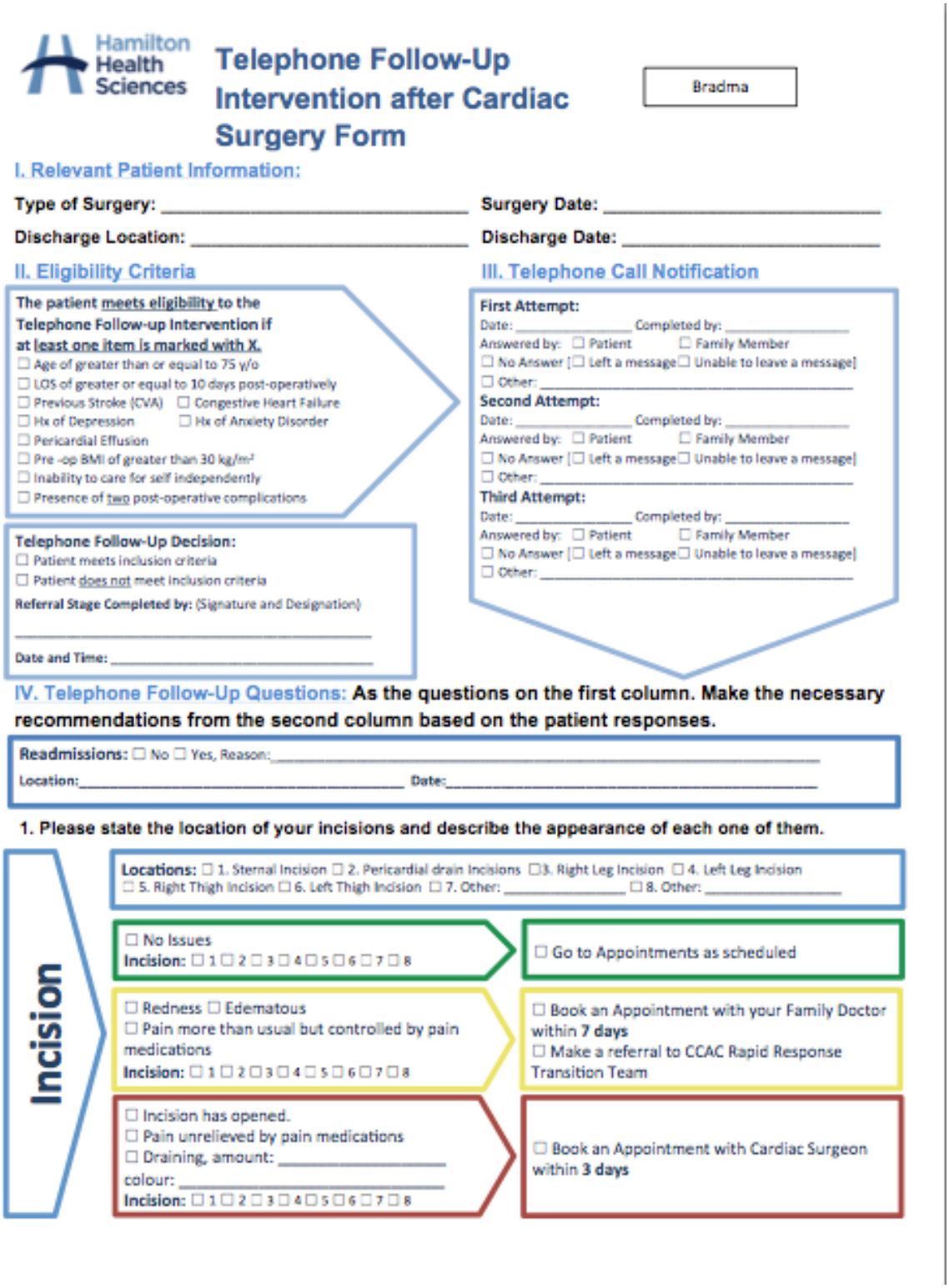
Attendees: **Regrets:**	

Meeting objective: To perform an environmental scan of pre-existing telephone follow-up in other provincial and out of the province cardiac surgery centers

Agenda topic	Discussion	Themes
1. Do you have a post-discharge telephone follow-up intervention?		
2. What is the current process of your telephone follow-up intervention?		
3. What are the current challenges of this process?		
4. What are the current strengths of this process?		
5. What are the reasons for developing your current telephone follow-up intervention?		

Appendix E

Telephone Follow-up after Cardiac Surgery Form



Hamilton Health Sciences

Telephone Follow-Up Intervention after Cardiac Surgery Form

Bradma

I. Relevant Patient Information:

Type of Surgery: _____ **Surgery Date:** _____

Discharge Location: _____ **Discharge Date:** _____

II. Eligibility Criteria

The patient meets eligibility to the Telephone Follow-up Intervention if at least one item is marked with X.

- ☐ Age of greater than or equal to 75 y/o
- ☐ LOS of greater or equal to 10 days post-operatively
- ☐ Previous Stroke (CVA) ☐ Congestive Heart Failure
- ☐ Hx of Depression ☐ Hx of Anxiety Disorder
- ☐ Pericardial Effusion
- ☐ Pre -op BMI of greater than 30 kg/m²
- ☐ Inability to care for self independently
- ☐ Presence of two post-operative complications

Telephone Follow-Up Decision:

- ☐ Patient meets inclusion criteria
- ☐ Patient does not meet inclusion criteria

Referral Stage Completed by: (Signature and Designation)

_____

Date and Time: _____

III. Telephone Call Notification

First Attempt:
Date: _____ Completed by: _____
Answered by: ☐ Patient ☐ Family Member
☐ No Answer [☐ Left a message ☐ Unable to leave a message]
☐ Other: _____

Second Attempt:
Date: _____ Completed by: _____
Answered by: ☐ Patient ☐ Family Member
☐ No Answer [☐ Left a message ☐ Unable to leave a message]
☐ Other: _____

Third Attempt:
Date: _____ Completed by: _____
Answered by: ☐ Patient ☐ Family Member
☐ No Answer [☐ Left a message ☐ Unable to leave a message]
☐ Other: _____

IV. Telephone Follow-Up Questions: As the questions on the first column. Make the necessary recommendations from the second column based on the patient responses.

Readmissions: ☐ No ☐ Yes, Reason: _____
Location: _____ **Date:** _____

1. Please state the location of your incisions and describe the appearance of each one of them.

Incision

Locations: ☐ 1. Sternal Incision ☐ 2. Pericardial drain Incisions ☐ 3. Right Leg Incision ☐ 4. Left Leg Incision ☐ 5. Right Thigh Incision ☐ 6. Left Thigh Incision ☐ 7. Other: _____ ☐ 8. Other: _____

☐ No Issues **Incision:** ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8	☐ Go to Appointments as scheduled
☐ Redness ☐ Edematous ☐ Pain more than usual but controlled by pain medications **Incision:** ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8	☐ Book an Appointment with your Family Doctor within **7 days** ☐ Make a referral to CCAC Rapid Response Transition Team
☐ Incision has opened. ☐ Pain unrelieved by pain medications ☐ Draining, amount: _____ colour: _____ **Incision:** ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8	☐ Book an Appointment with Cardiac Surgeon within **3 days**

2. Please describe your effort of breathing.

Breathing

☐ No Issues	☐ Go to Appointments as scheduled
☐ Shortness of Breath (SOB) with activity that is relieved by rest ☐ Increase in Weight of 1 to 2 kg in 1 or 2 days	☐ Book a chest X-ray for the patient ☐ Book an Appointment with Cardiac Surgeon within **3 days** ☐ Make a referral to CCAC Rapid Response Transition Team
☐ Shortness of Breath that is unrelieved by rest	☐ Notify the Cardiac Surgeon and advise the patient to call 911 and go to the nearest Emergency Department

3. Do you have any of the following symptoms?

Other Symtoms

☐ No Issues	☐ Go to Appointments as scheduled
☐ Feeling of low motivation ☐ Excessive Tiredness ☐ Low Appetite ☐ Poor Sleeping Patterns ☐ Pain unrelieved by current analgesia Describe: _____	☐ Book an Appointment with your Family Doctor within **7 days** ☐ Make a referral to CCAC Rapid Response Transition Team
☐ Unrelieved Chest Pain ☐ Temperature of 38 degrees Celsius or greater ☐ Palpitations ☐ Dizziness ☐ Syncope	☐ Notify the Cardiac Surgeon and advise the patient to call 911 and go to the nearest Emergency Department

V. Health Teaching

- ☐ Continue to perform walking and deep breathing exercises
- ☐ Report to Cardiac Surgeon any signs of wound infection
- ☐ Try to maintain a healthy lifestyle (eating healthy and sleeping and taking rest regularly)
- ☐ Weigh everyday and watch for an increase of 1 to 2 kg over 1 to 2 days
- ☐ For patients who have diabetes, advise to monitor blood glucose regularly
- ☐ For patients who smoke, mention the Smoking Cessation Program

Initials	Signature and Designation

Can make appointments: ☐ Yes ☐ No

Transportation: ☐ Yes ☐ No

To Be Accompanied By: _____

Telephone Follow-up Completed by :

_____

Date and Time: _____

VI. Additional Notes

_____

_____

_____

_____

Question Guide for Section IV

1. Post-operative Incisions

a. How many incisions did you have when you had your heart operation?

b. What are the locations of your incisions?

c. In any of your incisions, can you see any redness along or around the incision?

d. Is any of your incisions swollen?

e. Is the pain in your incision getting worst? When you take your pain medications, does the pain get relieved? Please describe the type of pain.

f. Has the wound re-opened?

g. Is there any drainage from the incision? Please describe the colour and the amount.

h. If needed, can you book your own appointment?

i. How are you getting to your appointment?

j. If needed, do you have someone to take you to your appointment?

2. Breathing Patterns

a. Please describe your breathing.

b. Do you feel short of breath after regular daily activities (i.e. walking around the house, getting dress, or taking a shower)? If yes, is it relieved by rest?

c. Over the last 10 days, have you noticed an increase in your weight? If yes, has there been an increase in your weight of 1 to 2kg (2.2 to 4.4lbs) in 1 to 2 days?

d. If needed, can you book your own appointment?

e. How are you getting to your appointment?

f. If needed, do you have someone to take you to your appointment?

3. Other Symptoms

a. Over the last 10 days, have you felt that you have no desire to do the same activities that you use to enjoy?

b. Do you find yourself overly tired to do anything?

c. How is your food intake? Is your appetite poor?

d. Do you have a fever or a temperature of more than 37.9 degrees Celsius?

e. Do you feel that sometimes your heart is skipping beats or racing?

f. Do you feel dizzy?

g. Have you had any episodes of losing consciousness?

h. If needed, can you book your own appointment?

i. How are you getting to your appointment?

j. If needed, do you have someone to take you to your appointment?

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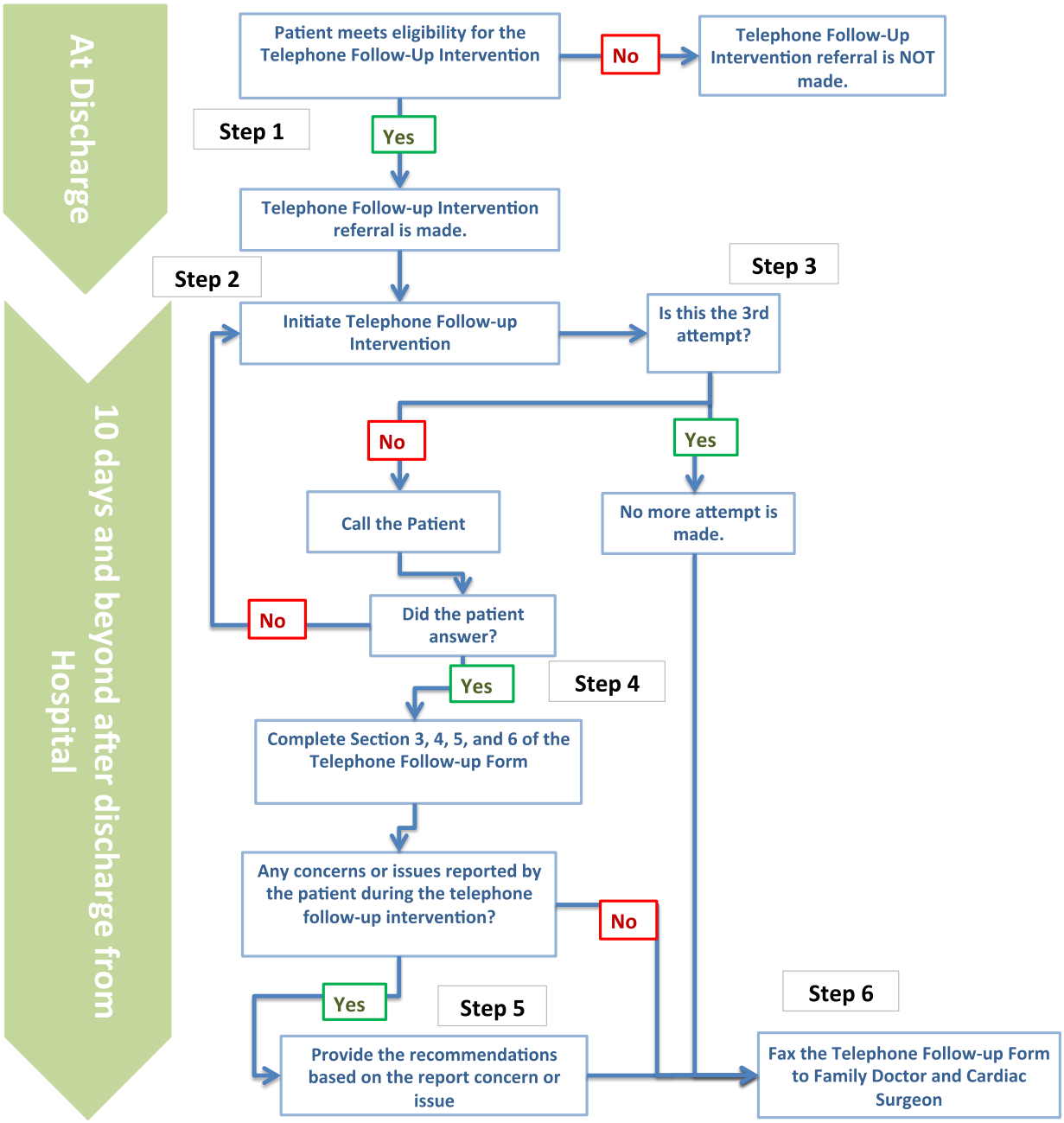
Appendix F

Telephone Follow-up after Cardiac Surgery Process Map



Appendix G

Toolkit for Nursing Staff:

A Telephone Follow-up Intervention for Adult Patients After Cardiac Surgery

Prepared by: Nick Anthony Millar, RN, BScN

August 2016

Table of Contents

What is the telephone follow-up intervention?

The telephone follow-up is an intervention whereby a registered nurse (RN) will call patients at risk for re-admission after cardiac surgery 10 days of being discharged from the hospital. During this telephone follow-up call, the RN will ask the patients or their caregivers, if patients are unable to access the telephone, structured questions in relation to their recovery at home. Examples include several screening questions pertaining to the most common complications that are encountered during the first 30 days following cardiac surgery. The telephone follow-up intervention has been developed to assist in decreasing the re-admission rate for adult patients after cardiac surgery in the Cardiac Surgery Department of Hamilton Health Sciences.

All of the patients are screened for ***inclusion criteria*** to determine their eligibility in the intervention prior to their discharge using the first and second sections of the Telephone Follow-up Form (see Appendix A). The patients that meet the inclusion criteria will be included in the patient list that the RN will call for a telephone follow-up intervention. During the telephone call, the RN will use the remaining sections of the Telephone Follow-up Form as a guide for screening questions, recommendations, and health teaching for the patients.

Why is a telephone follow-up intervention for patients needed in the Cardiac Surgery Department?

Hospital re-admission among adult patients after coronary bypass grafting and/or cardiac valve replacement is one of the main preventable causes of poor patient experience, unsatisfactory quality of life, suboptimal cardiac surgery outcomes, unnecessary health resources utilization, and incremental healthcare cost expenditures (Canadian Institute for Health Information [CIHI], 2012a; CIHI, 2012b; Fredericks & Da Silva, 2010; Gardner, Elliot, Gill,

Griffin, & Crawford, 2005; Theobald & Murray, 2004). It is estimated that the re-admission rate for patients after all types of cardiac surgery is about 18.5 percent in the United States and in Canada (Iribarne, 2014). Therefore, in an effort to decrease the re-admission rate for this patient population at HHS, this telephone follow-up intervention was developed to improve patient outcomes.

Who will need this telephone follow-up intervention?

Patients and Families

This telephone follow-up is an intervention provided to patients who are discharged from hospital after cardiac surgery and have a predisposition for re-admission to hospital. There are 10 criteria to qualify for this intervention. These criteria are described on the Telephone Follow-up Form (see Appendix A).

Nursing Staff in the Cardiac Surgery Department

An RN or a registered practical nurse (RPN), in the Cardiac Surgery Department of HHS who have cared for the patient may fill-out the Telephone Follow-up Form to enrol patients into the intervention. However, the RN/RPN discharging the patient is responsible for ensuring that the patient is screened for this intervention.

When are patients enrolled to the telephone follow-up intervention?

Patients may be enrolled at any point during their in-patient stay for their cardiac surgery. For example, patients maybe enrolled before their surgery or during the recovery period. Since some of the eligibility criteria are pre-existing co-morbidities, patients may be referred during the pre-operative phase. However, all of the referrals should be completed on the day of the patient's discharge from the hospital.

How to use the Telephone Follow-up Intervention After Cardiac Surgery Form?

There are three main purposes of this form in the implementation of the telephone follow-up intervention: (a) screening and eligibility, (b) guide the telephone follow-up process, (c) documentation. The RN or RPN, who is taking care of the patients on the day of discharge, will use the first and second section of the form to screen the patient for inclusion criteria into the telephone follow-up intervention. The RN calling the patient will use the remaining sections (Section 3 to 6) to ask the screening questions, give recommendations, and provide health teaching. Lastly, this form will be used for the documentation for both the referral and actual telephone follow-up.

First Section

The first section of the Telephone Follow-up Form is dedicated with basic information pertaining to the patient's cardiac surgery. It has data fields that ask the following: the type of cardiac surgery, surgery date, and discharge location and date. Since a discharge summary is also prepared for the patient and easily accessible during the telephone follow-up, only limited information is required in the follow-up form.

Second Section

The second section of this form acts as the screening tool for the patient's eligibility for the telephone follow-up intervention. Based on the integrated related literature review and consultations with key stakeholders, 10 criteria were created for inclusion in the intervention. However, a patient only needs to fulfill one criterion, in order to qualify for the telephone follow-up intervention.

The 10 inclusion criteria are defined below to enhance consistency of the information.

1. **Age of greater or equal to 75 year old** – Any patient whose age is more than or equal to 75 years.

2. **Length of Stay of Greater than or Equal to 10 days** – A patient who had spent 10 or more days in the hospital from the cardiac surgery date.
3. **Congestive Heart Failure (CHF)** – Patient who had a diagnosis of congestive heart failure before or after cardiac surgery.
4. **Previous Stroke or CVA** – The patient who has a history of cerebrovascular accident (CVA) before or after cardiac surgery that is documented in the history and physical and/or progress notes.
5. **Pericardial Effusion after Surgery** – This means that the patient had developed a pericardial effusion after cardiac surgery that is documented in the progress notes or in an echocardiogram report if one has been done post-operatively.
6. **BMI of greater than 30 kg/m^2** – Patient with a body mass index of equal or greater than 30 kg/m^2 before their surgery. It is important to note that the pre-operative weight will be used in the computation of the patient's BMI, in order to avoid the effect of residual post-operative fluid retention.
7. **History of Depression** – A diagnosis of depression during pre-operative or post-operative period that is documented in the history and physical and/or progress notes.
8. **Diagnosed Anxiety Disorder** – A diagnosis of generalized anxiety disorder during pre-operative phase or post-operative period that is documented in the history and physical and/or progress notes.
9. **Inability to Care for Self Independently** – A patient who is unable to perform basic activities of daily living (ADLs) such as bathing, toileting, dressing, and eating independently before and after cardiac surgery.
10. **Presence of Two Post-operative Complications** – This means that the patient has

developed two complications related to cardiac surgery. Some of the examples are: cardiac dysrhythmias, wound infection, pleural effusion, post-operative pneumonia, and acute kidney injury/failure. This will exclude **congestive heart failure and pericardial effusion,** since both of them are separate inclusion criteria.

Third Section

This section will record the telephone call attempts that were initiated to contact the patients during the telephone follow-up intervention. In total, **three** attempts will be completed to reach the patient. If the third attempt remains unsuccessful, the patient's Cardiac Surgeon and Family Physician will be notified by sending the Telephone Follow-up Form via facsimile. This section will also include a record of the patient's re-admission to hospital from the time of discharge to the telephone follow-up.

Fourth Section

This section contains the screening questions that the RN asks the patient during the telephone follow-up intervention. It includes questions related to the patient's surgical incision, respiratory status, and presence of the most common complications such as fever, palpitation, syncope, depression, and chest or generalized pain following cardiac surgery. The column margins on this section are colour-coded to indicate the nature of the patient concern.

- For green, it means that the patient is progressing well during the recovery period at home.
- For yellow, it indicates that the reported concerns require close monitoring but do not require immediate attention.
- For red, it signifies that the concerns are significant and should be addressed immediately.

Based on the answers from the screening questions, there will be corresponding recommendations that the RN will provide to the patient. The recommendations vary from having an appointment with a Family Doctor or Cardiac Surgeon, going for chest x-ray, or calling emergency services to visit to the nearest Emergency Room. These recommendations are based from the consultations with the Cardiac Surgeons, the *Pathway to Recovery After Cardiac Surgery Booklet (2011)* and my knowledge of common clinical practices from being a cardiac surgery nurse on the unit.

Fifth Section

The fifth section includes the health teaching that is required for patients after cardiac surgery while they are recovering at home. These recommendations are based from the *Pathway to Recovery after Heart Surgery (2011)* that is used by the Cardiac Surgery Department of Hamilton Health Sciences in providing health teaching to patients.

Sixth Section

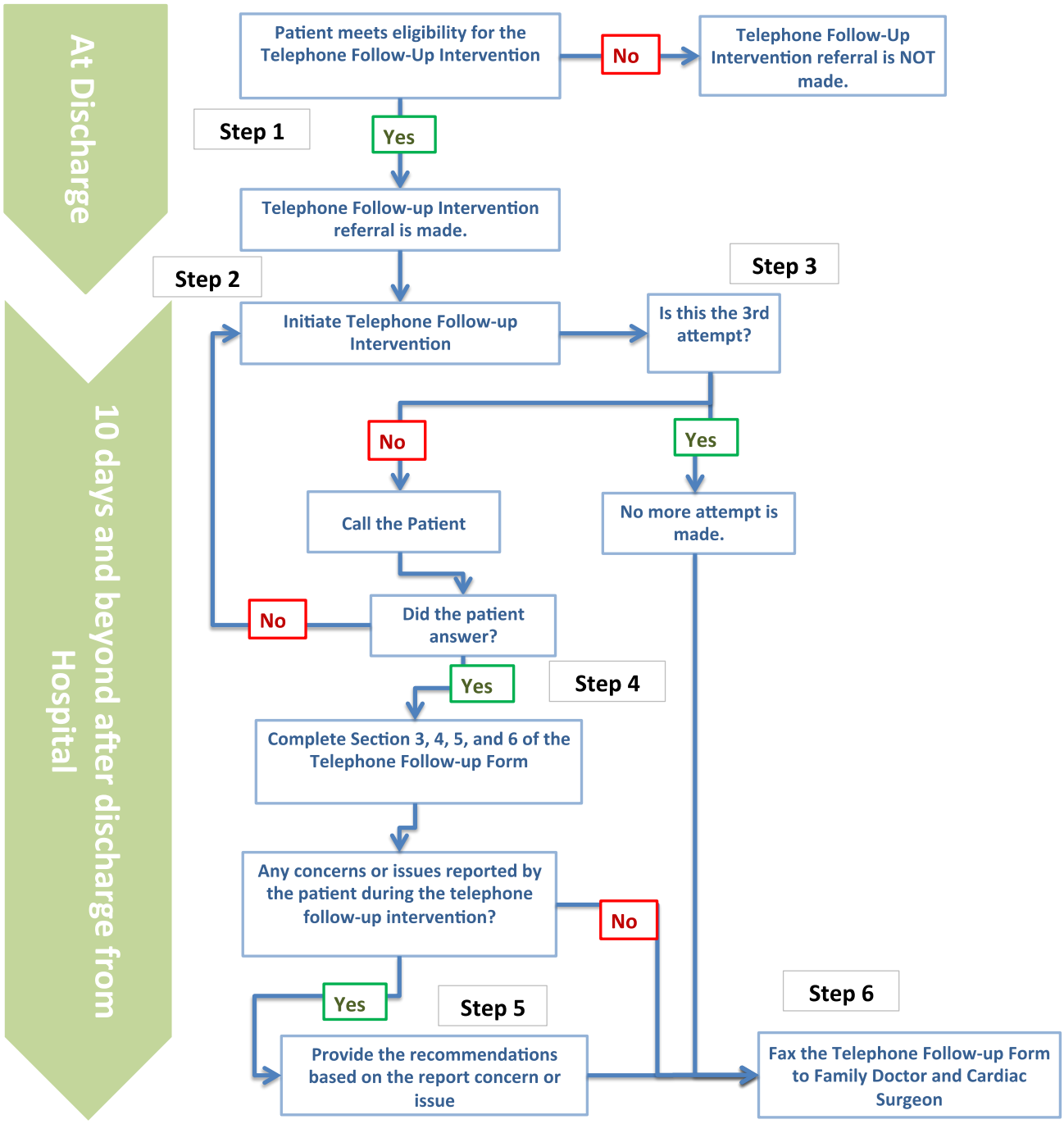
This section is allotted for any additional notes to be written by the nursing staff who are involved in the telephone follow-up intervention.

Summary of the Telephone Follow-Up Intervention Process

The telephone follow-up intervention process for patients after cardiac surgery has two main stages: the initial stage or the referral stage and second stage or the follow-up stage. During the referral stage, the nursing staff taking care of the patient will do the screening for eligibility for the telephone follow-up intervention. On the day of discharge, the nurse taking care of the patient will ensure that the completion of the screening tool is completed. Once the patient meets the inclusion criteria, the patient will be referred to the telephone follow-up intervention.

The Telephone Follow-up stage starts 10 days after discharge when the RN calls the patient for the follow-up. The RN will make a total of three attempts to contact the patient or the family members. If the third attempt remains unsuccessful, the RN will notify the Cardiac Surgeon and Family Doctor by faxing the incomplete Telephone Follow-up Intervention after Cardiac Surgery Form. During the telephone call, the RN will use the screening questions in the Telephone Follow-up Intervention after Cardiac Surgery Form. When an issue or concern is reported, the RN will provide the corresponding recommendation based on the nature of the concern or issue. The completed Telephone Follow-up Intervention after Cardiac Surgery Form will be faxed to the Cardiac Surgeon and the patient's Family Physician. For an illustrated description, please review the Telephone Follow-up Process map below.

Telephone Follow-up Process Map



Developed by: N. Millar (2016)

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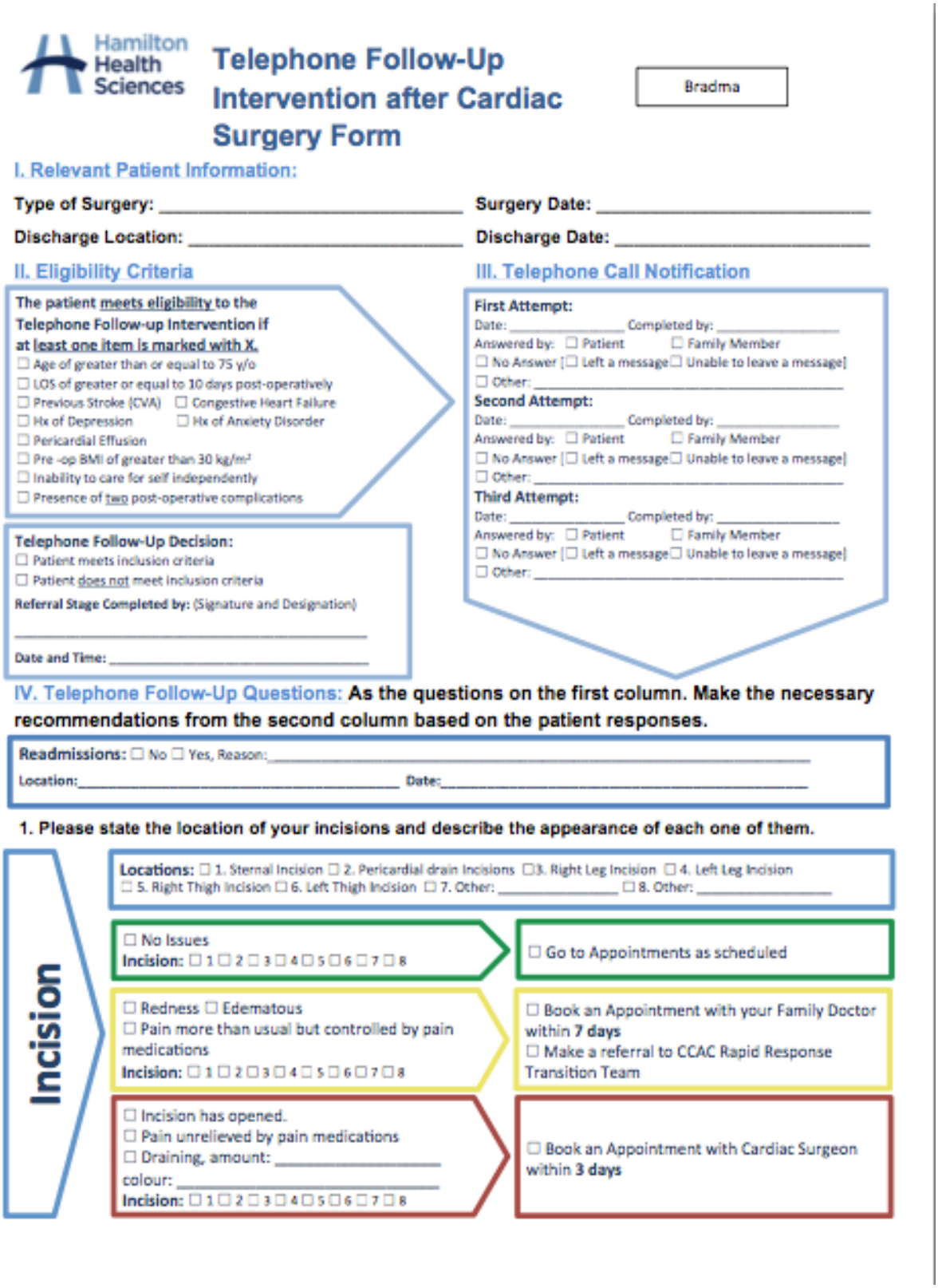
Appendix A



Hamilton Health Sciences

Telephone Follow-Up Intervention after Cardiac Surgery Form

Bradma

I. Relevant Patient Information:

Type of Surgery: _____ **Surgery Date:** _____

Discharge Location: _____ **Discharge Date:** _____

II. Eligibility Criteria

The patient meets eligibility to the Telephone Follow-up Intervention if at least one item is marked with X.

- ☐ Age of greater than or equal to 75 y/o
- ☐ LOS of greater or equal to 10 days post-operatively
- ☐ Previous Stroke (CVA) ☐ Congestive Heart Failure
- ☐ Hx of Depression ☐ Hx of Anxiety Disorder
- ☐ Pericardial Effusion
- ☐ Pre -op BMI of greater than 30 kg/m²
- ☐ Inability to care for self independently
- ☐ Presence of two post-operative complications

Telephone Follow-Up Decision:

- ☐ Patient meets inclusion criteria
- ☐ Patient does not meet inclusion criteria

Referral Stage Completed by: (Signature and Designation)

_____

Date and Time: _____

III. Telephone Call Notification

First Attempt:
Date: _____ Completed by: _____
Answered by: ☐ Patient ☐ Family Member
☐ No Answer [☐ Left a message ☐ Unable to leave a message]
☐ Other: _____

Second Attempt:
Date: _____ Completed by: _____
Answered by: ☐ Patient ☐ Family Member
☐ No Answer [☐ Left a message ☐ Unable to leave a message]
☐ Other: _____

Third Attempt:
Date: _____ Completed by: _____
Answered by: ☐ Patient ☐ Family Member
☐ No Answer [☐ Left a message ☐ Unable to leave a message]
☐ Other: _____

IV. Telephone Follow-Up Questions: As the questions on the first column. Make the necessary recommendations from the second column based on the patient responses.

Readmissions: ☐ No ☐ Yes, Reason: _____

Location: _____ **Date:** _____

1. Please state the location of your incisions and describe the appearance of each one of them.

Incision

Locations: ☐ 1. Sternal Incision ☐ 2. Pericardial drain Incisions ☐ 3. Right Leg Incision ☐ 4. Left Leg Incision ☐ 5. Right Thigh Incision ☐ 6. Left Thigh Incision ☐ 7. Other: _____ ☐ 8. Other: _____

☐ No Issues **Incision:** ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8	☐ Go to Appointments as scheduled
☐ Redness ☐ Edematous ☐ Pain more than usual but controlled by pain medications **Incision:** ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8	☐ Book an Appointment with your Family Doctor within **7 days** ☐ Make a referral to CCAC Rapid Response Transition Team
☐ Incision has opened. ☐ Pain unrelieved by pain medications ☐ Draining, amount: _____ colour: _____ **Incision:** ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8	☐ Book an Appointment with Cardiac Surgeon within **3 days**

2. Please describe your effort of breathing.

Breathing

☐ No Issues	☐ Go to Appointments as scheduled
☐ Shortness of Breath (SOB) with activity that is relieved by rest ☐ Increase in Weight of 1 to 2 kg in 1 or 2 days	☐ Book a chest X-ray for the patient ☐ Book an Appointment with Cardiac Surgeon within **3 days** ☐ Make a referral to CCAC Rapid Response Transition Team
☐ Shortness of Breath that is unrelieved by rest	☐ Notify the Cardiac Surgeon and advise the patient to call 911 and go to the nearest Emergency Department

3. Do you have any of the following symptoms?

Other Symtoms

☐ No Issues	☐ Go to Appointments as scheduled
☐ Feeling of low motivation ☐ Excessive Tiredness ☐ Low Appetite ☐ Poor Sleeping Patterns ☐ Pain unrelieved by current analgesia Describe: _____	☐ Book an Appointment with your Family Doctor within **7 days** ☐ Make a referral to CCAC Rapid Response Transition Team
☐ Unrelieved Chest Pain ☐ Temperature of 38 degrees Celsius or greater ☐ Palpitations ☐ Dizziness ☐ Syncope	☐ Notify the Cardiac Surgeon and advise the patient to call 911 and go to the nearest Emergency Department

V. Health Teaching

- ☐ Continue to perform walking and deep breathing exercises
- ☐ Report to Cardiac Surgeon any signs of wound infection
- ☐ Try to maintain a healthy lifestyle (eating healthy and sleeping and taking rest regularly)
- ☐ Weigh everyday and watch for an increase of 1 to 2 kg over 1 to 2 days
- ☐ For patients who have diabetes, advise to monitor blood glucose regularly
- ☐ For patients who smoke, mention the Smoking Cessation Program

Initials	Signature and Designation

Can make appointments: ☐Yes ☐ No

Transportation: ☐Yes ☐ No

To Be Accompanied By: _____

Telephone Follow-up Completed by :

_____

Date and Time:_____

VI. Additional Notes

_____

_____

_____

_____

Question Guide for Section IV

1. Post-operative Incisions

a. How many incisions did you have when you had your heart operation?

b. What are the locations of your incisions?

c. In any of your incisions, can you see any redness along or around the incision?

d. Is any of your incisions swollen?

e. Is the pain in your incision getting worst? When you take your pain medications, does the pain get relieved? Please describe the type of pain.

f. Has the wound re-opened?

g. Is there any drainage from the incision? Please describe the colour and the amount.

h. If needed, can you book your own appointment?

i. How are you getting to your appointment?

j. If needed, do you have someone to take you to your appointment?

2. Breathing Patterns

a. Please describe your breathing.

b. Do you feel short of breath after regular daily activities (i.e. walking around the house, getting dress, or taking a shower)? If yes, is it relieved by rest?

c. Over the last 10 days, have you noticed an increase in your weight? If yes, has there been an increase in your weight of 1 to 2kg (2.2 to 4.4lbs) in 1 to 2 days?

d. If needed, can you book your own appointment?

e. How are you getting to your appointment?

f. If needed, do you have someone to take you to your appointment?

3. Other Symptoms

a. Over the last 10 days, have you felt that you have no desire to do the same activities that you use to enjoy?

b. Do you find yourself overly tired to do anything?

c. How is your food intake? Is your appetite poor?

d. Do you have a fever or a temperature of more than 37.9 degrees Celsius?

e. Do you feel that sometimes your heart is skipping beats or racing?

f. Do you feel dizzy?

g. Have you had any episodes of losing consciousness?

h. If needed, can you book your own appointment?

i. How are you getting to your appointment?

j. If needed, do you have someone to take you to your appointment?

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