

Development and Usability Evaluation of Preoperative Teaching Materials

for CABG/Valve Surgery Patients

DNP Scholarly Project

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Abstract

Background: In the United States, coronary artery heart disease is the most common type of heart disease causing an individual to have a heart attack every 43 seconds. In 2010, 395,000 coronary artery bypass grafting (CABG) procedures were performed. Large academic teaching hospitals perform high volumes of CABG and/or valve surgery procedures. Patients are often transferred from outside hospitals with an acute myocardial infarction and/or valve dysfunction. Many patients and families experience anxiety and feel overwhelmed by the prospect of undergoing open-heart surgery. Randomized controlled trials (RCTs) have found that preoperative education materials and counseling reduce levels of patient anxiety, depression, and perioperative complications following CABG surgery. Yet, preoperative teaching materials may not be updated or routinely utilized by the health team.

Objective: The purposes of this performance improvement project were to: 1) develop preoperative teaching materials for CABG/Valve surgery inpatients; and 2) evaluate the usability of the teaching materials from the patient perspective.

Methods: Teaching materials were developed by the investigator and then validated by an expert panel review during the spring and fall of 2017. Before beginning the development phase, existing cardiac surgery teaching materials were evaluated, including those identified through literature review. Domain content was catalogued and a new booklet was developed through an iterative process. Fourteen experts reviewed the final draft using the Patient Education Materials Assessment Tool for Printable Materials (PEMAT-P). To test usability after implementing the teaching booklet, cardiac surgery inpatients were surveyed to assess usefulness and preparedness.

Results: The expert reviewer results for understandability and actionability were 99% and 100%, respectively, meaning that the CABG/valve teaching booklet was understandable and the reviewers were able to perform the instructions. Of 62 teaching booklets and patient preparedness questionnaires that were distributed to patients, 11 (17.7%) were returned. The majority of surveys were completed by the patients (81.8%), while the remainder were completed by families (18.2%). Of the respondents, 45.6% patients underwent CABG, 9.1% valve, and 27.3% underwent both surgeries. Nearly all respondents (90.9%) agreed or strongly agreed for questions related to how well the booklet prepared them for surgery. Likewise, 90.9% of respondents agreed or strongly agreed with statements about design and content of the booklet. In addition, the Hospital Consumer Assessment of Healthcare Providers and Systems Performance Reports (HCAHPS) from October 1, 2016 – December 31, 2016 showed improvement compared to the cumulative performance year 2016 for discharge information (96.2% from 92.2%), symptom/problems to look for (100% from 94.9%), and care transitions (66.2% from 54.3%).

Implications: The development and implementation of evidenced based preoperative teaching materials helps patients and families preparation for open heart-surgery and self-care after discharge. Processes to sustain the production, distribution, use and update of the teaching booklet are being developed.

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Overview

Background and Significance

Advances in medical and surgical technology have led to an expanding aging population with more cardiac surgery options available to them. In the United States, coronary artery disease is the most common type of heart disease causing someone to have a heart attack every 43 seconds (Centers for Disease Control and Prevention [CDC], 2015). In 2010, the total number of inpatient surgical procedures performed was 51.4 million; of those 395,000 coronary artery bypass procedures were performed (CDC, 2015). In large academic teaching hospitals, high volumes of coronary artery bypass grafting (CABG) and valve surgery procedures are performed daily. These procedures are crucial for restoring blood flow to the heart and repairing or replacing dysfunctional heart valves. Frequently, patients are transferred from outside hospitals with acute myocardial infarction and/or valve dysfunction, who may be experiencing anxiety and feeling overwhelmed by the prospect of undergoing open-heart surgery. Therefore, it is imperative that cardiac surgery inpatients receive updated and accurate teaching to be optimally prepared for heart surgery.

Several randomized controlled trials (RCTs) have found preoperative education materials and counseling reduce levels of patient anxiety, depression, and perioperative complications following CABG surgery (Guo, East, & Arthur, 2012; Zhang et al., 2012). Furthermore, the provisions of the Patient Protection and Affordable Care Act (2010), which seek to improve the quality of healthcare and sustain accountability, supports improving communication and educating individuals to make informed decisions about their medical and surgical healthcare.

The American College of Surgeons (ACS) and the Institute of Medicine (IOM) support preoperative teaching materials founded on the principles of surgical education and evidenced-based medicine, which meets the needs of individualized patient centered care (ACS, 2006).

Teaching materials can become outdated or structured in a way that they are not useful as teaching tools by the various care providers. In a cardiac surgery unit at a large mid-Atlantic teaching hospital, preoperative inpatient teaching materials are often a shared responsibility among nurses, nurse practitioners, physicians and other care providers. However, this diffusion may have been the reason why preoperative education materials were not routinely utilized and updated for CABG/valve surgery inpatients. Therefore, a gap analysis was conducted revealing outdated CABG and heart valve surgery preoperative teaching materials. The preoperative CABG/valve teaching booklet was viewed as irrelevant and outdated by the nursing staff, therefore the existing teaching materials were not utilized. Furthermore, some patients were receiving teaching materials in their preoperative visit while others were not.

Purpose/Significance of the Project

The purposes of this scholarly project were to develop preoperative teaching materials for CABG/Valve surgery inpatients, using an expert panel review, and evaluate the teaching materials for patient preparedness and usefulness. While the development and testing of the booklet was only part of the project, it was hoped that the hospital would support the production and use of the booklet after the project was completed. Furthermore, it was hoped that the updated teaching booklet would facilitate communication between the patient and health care team, and result in an overall increase in patient, nurses, and provider satisfaction with preoperative care.

Theoretical Framework

The Diffusion of Innovations Theory (DIT) by Rogers (2003) was the theoretical framework selected for supporting the design and methods (see Figure 1). The DIT is a social science theory, originally developed by Rogers in 1962 and last revised in 2003, organized around general diffusions research (Rogers, 2003). Overall, “*Diffusion* is the process in which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 2003, p. 5). Largely, communication is the vehicle in the diffusion process, acting as the change agent, and the innovation is the possible solution to the problem (Rogers, 2003). There are four central elements in diffusion theory including innovation, communication channels, time, and the social system (Rogers, 2003). The *innovations* element is the new idea, practice, object, or idea presented in a new way (Rogers, 2003). The second element, *communication channels*, is the means of communicating the new knowledge innovation (Rogers, 2003). Channels over *time* are the process the individual passes through from first knowledge of the innovation to its acceptance or rejection (Rogers, 2003). There are five sequential steps within the *innovation-decision process* including knowledge, persuasion, decision, implementation, and confirmation (see Figure 1; Rogers, 2003, p. 20). The decision process is the sequence by which the individual obtains information and gradually decreases the uncertainty of the innovation, thus leading to adaptation or rejection of the innovation (Rogers, 2003). The *social system* element may include individuals, organizations, and/or informal groups who are engaged in problem solving to accomplish the same goal; however, the same structure can facilitate or impede the innovation (Rogers, 2003).

Conceptually, Rogers DIT (2003) framework provided the structure and process for designing, implementing, and evaluating the revised preoperative teaching materials for CABG/valve surgery patients. The *innovation* is the design of the revised teaching materials and

the method for implementing the materials to the nurses, patients, and providers (Rogers, 2003). According to Rogers (2003), re-invented *innovations* are more quickly accepted. The revised teaching materials can be considered a re-invented *innovation* (Rogers, 2003). The *diffusion* is the decision process in the development and how the revised teaching materials were communicated to the nurses, care providers, and the patients (Rogers, 2003). The communication channels were the process of gaining buy-in and support from the nurses, nurse practitioners, surgeons, and hospital leadership for implementing the teaching materials.

Review of the Literature

The focus of this literature review is to synthesize the current evidence related to preoperative CABG/valve surgery patient teaching materials and their influence on patient satisfaction and preparedness for surgery. Three main themes were identified in the literature: 1) methods of delivery, 2) patient needs assessment, and 3) designing, implementing, and evaluating preoperative education materials. After each main topic is discussed, a synthesis of similarities and differences across the studies and how they are related is provided. Finally, this review concludes with the current evidence summarized to support implementing revised preoperative CABG/valve teaching materials. Table 1 is a synthesis table of the reviewed studies, and table 2 and 3 reflect the quality assessment of the reviewed studies.

Modes of Teaching Material Delivery

Several teaching strategies and methods of delivery are identified in the literature for preoperative patient education including teaching booklets, verbal teaching, audiotapes, videotapes, and web-based teaching materials. A systematic review was conducted to determine effective teaching strategies and the most common methods of delivery for patient education materials (Friedman, Cosby, Boyko, Bauer, & Turnbull, 2011). Included in this review were 23

systematic reviews and meta-analysis. Verbal teaching and discussions were found to be the least effective and audiotapes, videotapes, written materials, and lectures were the most effective teaching strategies. Targeted and structured interventions that provided patient-specific teaching materials were found to increase patient knowledge, satisfaction, and reduce anxiety ($p < 0.0001$). The assessment of the methodological quality of systematic reviews (AMSTAR) tool was utilized for the quality of this study, and moderate to large effect size ($ES = 0.50 - ES = 0.80$) was calculated for the meta-analysis adding strength to this review. Weaknesses of this review were the outcomes from some studies that were not clearly articulated and details of the interventions were unclear.

A cross-sectional study conducted by O'Brien, McKeough, and Abbasi (2013), discovered significant relationships between patients who recalled receiving teaching materials, understanding the teaching booklet, and felt prepared after CABG surgery. A limitation of this study was in the methodology, requiring participants to return surveys via mail, yielding a low response rate (31.4%) of 375 people who underwent CABG surgery. In a prospective study conducted by Nahm, Stevens, Scott, and Gorman (2012), an innovative web-based program to supplement preoperative patient education was implemented. The web-based group had higher scores for anesthesia knowledge and increased satisfaction than the usual care group (Nahm et al., 2012). The strengths of this study's findings were utilizing reliable and validated tools (the modified Standard Anesthesia Learning Test (mSALT), Preoperative Intrusive Thoughts Inventory (PITI) instrument, Pre-Admission Test Center Satisfaction Questionnaire (PATCSQ), Perceived Health Web Site Usability Questionnaire (PHWSUQ)), and having a sound theoretical framework. An area of weakness in this study was the small convenience sample ($N = 69$), which limits this study's generalizability. Overall, the common theme identified across these

studies is the need for patient-specific preoperative teaching materials including written booklets/pamphlets, web-based programs, audiotapes, and videotapes to be the most effective teaching strategy (Friedman et al., 2011; Nahm et al., 2012; O'Brien et al., 2013).

Preoperative Teaching Needs Assessment

Patients who undergo CABG/valve surgery need preoperative preparation in several domains and often receive information from multiple health care providers. Furthermore, it is essential for health care professionals (HCPs) to understand what information patients perceive is important. Prior to developing preoperative teaching materials, a needs assessment allows HCPs to determine what patients want to learn before undergoing surgery. Researchers conducted a qualitative study to uncover the preoperative educational needs of lung cancer patients undergoing surgery (King et al., 2014). Semi-structured interviews of 11 patients uncovered that the majority of patients liked receiving information directly from the health care provider and reading the printed teaching booklet on their own. Patient suggestions included having a doctor present for educational sessions, adding pictures to improve understanding teaching materials, and knowing more about the duration of postoperative pain. A strength of this study is in the qualitative design, utilizing interviews that uncovered patients' needs and suggestions for improving preoperative education such as pain control, exercises, role of the patient/family, diet, home care services, and discharge planning. This study's limitations included a small sample size and a focused surgical type, which may lack generalizability of the results.

A five-phase study conducted by Sousa and Turrini (2012), identified patients' needs by interacting through two virtual environments and six blogs, resulting in 1328 comments from preoperative and postoperative jaw/facial surgery patients. Comments were grouped into categories and content analysis uncovered patients concerns with fear, postoperative recovery,

changes in facial aesthetics, and regret for having surgery. Patients were readily able to express their fears and concerns in the virtual environment, thus allowing the researchers to incorporate them into the draft of the preoperative teaching booklet. Based on the results of these studies patient needs assessment, the CABG/valve teaching booklet content included pain control, activity after surgery, home care services, and discharge planning.

Barriers, Designing, and Evaluating

Prior to designing, implementing, and evaluating preoperative education materials, it is important to take into consideration barriers that exist. Lee and Lee (2012) explored consistency between nurses' perceptions and their actual practice of preoperative patient education and common barriers affecting teaching from the nurse's perspective. Nurses perceived that details of anesthesia were the most prominent aspect of preoperative teaching, however the actual practice was pertained to preoperative preparation (Lee & Lee, 2012). Barriers affecting preoperative patient teaching included discrepancies between nurses' perceptions and actual practice, nurse's time availability, patient's language, tight operating schedules, and the expectation that doctors were responsible for giving the preoperative education. Nurses found using simple plain language for teaching, and specifically asking the patient if they understood the material, facilitated patient understanding. A major strength of this study was using the preoperative teaching questionnaire, which had high internal consistency and reliability of findings. Understanding these barriers to implementing preoperative teaching materials aided in developing teaching materials that were written in clear plain language with illustrations to assist patient understanding.

In addition to the needs assessment conducted by Sousa and Turrini (2012), the preoperative teaching booklet was evaluated and revised by an expert panel using three rounds of

Delphi technique to appraise the content, language, illustrations, layout, motivation, and culture of the booklet. The multiple phases of this study's design and using the Delphi technique for revisions until a consensus was achieved contributed to the quality of the teaching materials.

In another study, investigators utilized current evidence in neuroscience education, an expert panel review, and a patient survey to evaluate and refine a teaching booklet for content, clarity, style, length, readability, and helpfulness for preoperative patients undergoing lumbar surgery (Louw, Butler, Diener, & Puentedura, 2013). Results from the expert panel strongly supported the teaching booklet with an overall rating of 8.2 out of 10, as well as 9 out of 10 rating by the patients surveyed. The majority found the booklet easy to read, interesting, easy to follow, and with adequate images. Importantly, using an expert panel review to evaluate teaching content and refine teaching materials added strength to this study's findings. Furthermore, understanding and addressing existing barriers, using evidence-based content, expert panel review, and printable teaching materials for the method of delivery to create and revise patient teaching materials are supported in recent literature (Lee & Lee, 2012; Louw et al., 2013; Sousa & Turrini, 2012).

Literature Synthesis

There were more similarities than differences among the studies examined in this literature review, in terms of methods of delivery for patient education. The majority of studies found teaching booklets and tailored evidenced-based leaflets to be the preferred method, to increase patient knowledge, preparedness, and satisfaction, thus decreasing anxiety and confusion (Friedman et al., 2011; King et al., 2014; Sousa & Turrini, 2012). Only one study, conducted by Nahm et al. (2012), implemented a web-based program to supplement preoperative patient education and found an increase in anesthesia knowledge and patient satisfaction.

However, no significant differences in anxiety between the web-based group and the usual care group were found (Nahm et al., 2012). Based on the patients' needs assessment, researchers' conclusions incorporated recommending illustrations and figures to improve understanding teaching materials and increasing more information regarding postoperative pain control (King et al., 2014; Sousa & Turrini, 2012). A major difference between these two studies is King et al. (2014) interviewed 11 health care providers and identified several major topics discussed including pre- and post-operative care, medication education, pain control, exercises, role of the patient/family, preoperative procedures, diet, home care services, and discharge planning. Whereas Louw et al. (2013) and Sousa and Turrini (2012) similarly utilized an expert panel review in developing teaching content and evaluating preoperative teaching materials. In both studies, the booklets were evaluated based on content, readability, language, and adequate illustrations, which yielded positive results (Louw et al., 2013; Sousa & Turrini, 2012). The main difference between these two studies is Sousa and Turrini (2012) utilized the Delphi technique to revise the teaching booklet until a consensus on the teaching content was achieved. Overall, the summary of research findings overwhelmingly supports designing, implementing, and evaluating preoperative CABG/valve surgery patient education materials.

Methods

This section discusses the methodology for developing, implementing, and evaluating the revised preoperative CABG/valve surgery inpatient teaching materials. Topics in this section include the project design, subjects, setting, inclusion and exclusion criteria and human subjects considerations. A description of the procedures for designing and implementing the revised preoperative teaching materials, survey tools, and how the data were collected, analyzed, and evaluated are provided.

Design, Subjects, and Setting

The purpose of this quality improvement project was to develop, implement, and evaluate revised preoperative CABG/valve surgery inpatient teaching materials. The setting was in a large mid-Atlantic academic teaching hospital's cardiac surgery telemetry unit, as well as patients seen in CABG and/or valve surgery consultation from other inpatient units.

In phase 1, an expert panel of volunteers were solicited to review drafts of the teaching booklet. These included cardiac surgery nurse practitioners (N=9), senior nurses on the cardiac surgery telemetry unit (N=3), and cardiac surgeons (N=2). In phase 2, a convenience sample of patients who were undergoing conventional CABG and/or valve surgery while inpatient, or being discharged to home to return for surgery within 30 days were solicited to receive the new booklet and complete the questionnaire. Patients who were taken to the operating room emergently, or within 12-hours of admission were excluded, as sufficient time is needed to allow the patient and family members to review the preoperative teaching materials. The sample size of CABG/valve surgery patients was estimated at 60, based on the monthly average (n = 36) of inpatient CABG and/or valve surgeries performed at this medical center.

Phase One Procedures

During phase one, the evidenced based preoperative CABG/valve surgery patient teaching materials were developed and reviewed by the expert panel review, which occurred over the course of 10 weeks in Spring and Summer 2016. The CABG/valve preoperative teaching booklet was created using Microsoft Word. The content of the teaching booklet was compiled using several sources from the academic hospital's heart and vascular center's website, existing teaching materials from the medical centers affiliated hospitals, and findings from the literature (using PubMed, Medline, CINAHL, and EMBASE).

Licensure and permissions were obtained for the illustrations used in the teaching booklet (see Appendix H). The booklet was written in accordance to the U. S. Department of Health and Human Services Agency for Healthcare Research and Quality (AHRQ) “plain language” to provide written healthcare information that people can easily understand (AHRQ, 2016). Logical organization of teaching information, using short sentences and paragraphs, and the layout with margins, headings, and white space made the information easier to understand. Hospital and nursing administrators were approached to secure financial support to print the teaching booklets for this project. Not only did they agree, but they facilitated the production by referring to an outside vendor for printing the teaching booklets.

Upon completion of the first draft of the teaching booklet in MS Word, an email was sent to the expert panel of volunteer nurse practitioners, nurses, and surgeons to tell them about the revised preoperative teaching materials and soliciting their support in reviewing the materials. Explanation and solicitation of support was also provided during the cardiac surgery staff/faculty meeting including the distribution of the Patient Education Materials Assessment Tool for Printable Materials (PEMAT-P) (see Appendix B; Shoemaker, Wolf, & Brach, 2014). After 3 weeks, an email reminder with a request to complete and return the PEMAT-P tool to the nurse practitioners office was sent one week later. Based on the expert panel reviewer’s feedback, several revisions were suggested. These included using plain and clear language, when to start stool softeners, and using the generic name for pain medications. Final revisions were completed and the teaching booklet was professionally printed with full color and enhanced graphics.

Phase Two Procedures

Phase two included implementing the revised preoperative teaching materials to the nurses and patients on the cardiac surgery telemetry unit, which took place over the course of 12

weeks in the Fall 2016. Messages were emailed to the nursing staff notifying them about the revised preoperative patient teaching materials, the patient survey, implementation date, and educational sessions. In addition, a reminder was emailed to the nurse practitioners with the implementation date, along with the process for the consult nurse practitioner to distribute the preoperative patient teaching materials to patients seen while on other services.

The following week, educational sessions were provided at the 7 a.m. and 7 p.m. nursing huddles, to review the preoperative patient teaching materials and the process for distributing the materials to the appropriate patients. During nursing huddles, the process for collecting patient questionnaires and placing them in the provided locked drop-box on the cardiac surgery telemetry unit was explained. Each preoperative teaching booklet contained a patient questionnaire with an instruction sheet to give the completed survey to the nurse prior to discharge, or place it in the mail. Surveys delivered by the U.S. Postal Service were collected by the cardiac surgery inpatient administrative secretary and placed in a designated locked file cabinet in the nurse practitioner's office. The implementation phase concluded after all data were collected.

Data Collection and Instruments

The data collected during the first phase of this project was from the expert panel reviewer's evaluation of the preoperative patient teaching materials using the PEMAT-P tool (see Appendix B, Shoemaker et al., 2014). The PEMAT-P tool was designed to assess the understanding and actionability of printable teaching materials, meaning that patients can understand and identify what they need to do based on the materials provided. The PEMAT-P for printable teaching materials consists of two scales, 19-items for understandability and 7-items for actionability. The topics for understandability include content, word choice and style, use of

numbers, organization, layout and design, and use of visual aids. The actionability items evaluate the clarity of the teaching materials for actions the user can perform. All items are scored on a 2-point scale, Disagree = 0, Agree = 1, and N/A for not applicable. For each item, the percentage of respondents that agree were examined. The sum of all items were calculated for actionability and for understandability to determined and calculated as percentages. Thus the higher the percentage indicated that the teaching materials were understandable and actionable.

The PEMAT-P tools is considered to have good reliability and validity. After four rounds of reliability testing and refinement with 22 different raters, the expert panel deemed the PEMAT-P tool to have face/content validity, reporting average scores for all raters <1.5 (Shoemaker et al., 2014). For inter-rater reliability, the PEMAT-P tool showed moderate agreement per Kappa (Average $K = 0.57$) and strong agreement per Gwet's AC1 (Average = 0.75) for all items in both scales (Shoemaker et al., 2014). Internal consistency was strong for all items measured by Cronbach's alpha and items correlations ($\alpha = 0.71$; Average Item-Total Correlation = 0.62; Shoemaker et al., 2014). For construct validity with consumers, statistical significance was found for actionable and poorly actionable materials in comprehension scores (76% vs. 63%, $p < 0.05$) and ratings (8.9 vs. 7.7, $p < 0.05$; Shoemaker et al., 2014). Written permission to use the PEMAT-P tool was obtained from the author (see Appendix F).

The data collected during the second phase of this project were from the patient preoperative preparedness questionnaire (see Appendix C). The patient preoperative preparedness for surgery survey is adapted from Kenton, Pham, Mueller, and Brubaker (2007) Preoperative Preparedness Questionnaire (PPQ), which was designed to measure patient readiness for surgery with postoperative improvement, complete satisfaction, and improved quality of life (see Appendix D). The PPQ consists of 11-items on a 5-point Likert scale, rating

from strongly agree to strongly disagree (see Appendix D; Kenton et al., 2007). During the development, Spearman's rank correlations were calculated to compare patient preparedness and preoperative understanding. Preparedness was highly correlated with patients understanding the purpose ($r = 0.73, p < 0.0005$), alternatives ($r = 0.70, p < 0.0005$), risks ($r = 0.75, p < 0.0005$), benefits ($r = 0.774, p < 0.0005$) and complications ($r = 0.73, p < 0.0005$) of surgery (Kenton et al., 2007). Other validity and reliability testing was not found, however the high Spearman's rank correlation strengthens the reliability of this tool. Kenton et al. (2007) PPQ was adapted to remove irrelevant questions pertaining to post-operative catheter care and include additional questions about patient satisfaction with the teaching booklet. The adapted patient questionnaire consists of 15-items on a Likert scale, rating from strongly disagree to strongly agree, which measured patient preparedness for CABG/valve surgery with the revised preoperative teaching materials and its usefulness (see Appendix C). Frequency scores were calculated to percentages for to agree and strongly agree versus disagree and strongly disagree. Conclusively, written permission to use Kenton et al. (2007) preoperative preparedness questionnaire for this scholarly project was obtained (see Appendix F).

Human Subjects Protection and Approval

The university hospital's IRB determined this quality improvement project to be Non-Human Subjects Research (NHSR). To protect human subjects and minimize patient risk, no personal patient identifiers were displayed on the patient preparedness for surgery survey tool (see Appendix C). Completed patient surveys were collected on the telemetry unit and placed in the designated locked collection box, or arrived via mail to the unit and kept in a locked file cabinet in the cardiac surgery nurse practitioner's office. Data were entered manually from the instruments and into an excel spreadsheet by the investigator. SPSS version 22.0 was used to

analyze the data. All electronic data files were stored on a password protected computer located in the nurse practitioner's office on the cardiac surgery telemetry unit.

Results

Phase One

Upon completion of the CABG/valve teaching booklet, fourteen copies of the prototype booklet and the PEMAT-P tool were distributed to the 14 expert panel reviewers. Instructions and reminders for completion were emailed to the reviewers and collected within the two-week timeframe. Of the 14 reviewers invited to participate, 10 responded (71.4% response rate).

Sums of individual PEMAT-P items were calculated for each category. All of the expert panel respondents rated the actionability items as Agree, resulting in 100% agreement (Table 4). Only one of the expert reviewers rated an understandability item with disagree, resulting in 99% agreement across the items. While the panel members had little variation in their agreement responses, open ended questions were provided. Additional comments from the reviewers were that the content was well written, the format easy to understand, and the illustrations were helpful. Suggestions for revising included consistent use of generic name for pain medications.

Table 4

Expert Panel Review PEMAT-P tool

Reviewer	n	Percent (%) Understandability	Percent (%) Actionability
Surgeon	1	100%	100%
NPs	7	100%	100%
RNs	2	99%	100%

Phase Two

Of the 62 CABG/valve preoperative teaching booklets and questionnaires distributed, 11 were returned, representing a 17.7% response rate. Ten were collected by the registered nurses

on the telemetry unit and one was returned via U.S. Postal Service. Summed scores for the 15 items could range from 15 to 75. Scores higher than 53, or 70%, indicate that the patients are prepared and satisfied with the preoperative teaching materials, as summarized in Table 5.

Patients scored item number 2 the lowest (63.6%) for receiving preoperative information regarding their procedure and questions answered timely, which may indicate that timeliness of information as an area for improvement. Responses to open-ended questions were evaluated and one family member commented they would like more information regarding the purpose of the valve and its function. One patient and family member reported they would want more information regarding after surgery care, discharge restrictions, and the ability of working from home.

Table 5

Patient Preoperative Preparedness Questionnaire

Item	Percent
1. The teaching booklet I received before surgery was helpful and adequate.	91%
2. Before my surgery, I received preoperative information regarding my procedure and my questions were answered timely.	64%
3. The teaching booklet helped prepare me for surgery.	88%
4. The teaching booklet was clear and easy to read.	100%
5. The pictures in the booklet helped me understand my surgery.	82%
6. Overall, I am satisfied with the preoperative teaching materials.	91%
7. I received my preoperative teaching materials within 24 hours prior to surgery.	91%
8. I understand the purpose and benefits of the planned surgery.	100%
9. Overall, I feel prepared for my upcoming surgery.	91%
10. I feel prepared for what to expect after surgery while I am in the hospital.	100%
11. I feel prepared for what to expect after surgery when I am at home.	91%
12. The alternatives to surgery were explained to me.	82%
13. I understand the purpose of the surgery.	100%
14. I understand the risks and benefits of having surgery.	80%
15. The teaching materials helped answering all my questions and were useful.	80%

Note. Missing data from one questionnaire was reported for item 13 -15.

Additionally, the academic medical center's Hospital Consumer Assessment of Healthcare Providers and Systems Performance Reports (HCAHPS) from October 1, 2106 – December 31, 2016 showed improvement in scores compared to the cumulative performance year 2016 for discharge information (96.2% from 92.2%), symptom/problems to look for (100% from 94.9%), and care transitions (66.2% from 54.3%) during the time this project was implemented (see Table 6). Other factors may have influenced these responses.

Table 6

HCAHPS Scores Cardiac Surgery - October 1, 2016 – December 31, 2106

Strategic Goal	PY 17 Goal	PY16 Q4	PY17 Q1
Discharge Information	88.5%	92.2%	96.2%
Staff talk about help you'll need when you leave		89.5%	92.3%
Info about symptom/problems to look for		94.9%	100%
Care Transition	57.7%	54.3%	66.2%
Good Understanding of Managing Own Health		51.0%	73.3%
Understood Purpose of Taking Meds		56.8%	78.6%

Note. Not all data from the HCAHPS scores for performance year (PY) 17 are reported.

Discussion

Summary of Findings

Phase one of this quality improvement project included developing and revising CABG/valve preoperative teaching materials using an expert panel review. The overwhelming positive results from the PEMAT-P tool demonstrated that the patients would be able to understand and act on the information in the teaching booklet. The feedback from the ten expert panel reviewers were positive and consistent throughout. Reviewers commented that the visual aids were great and the content was written in a format that was easy to understand. Involving key stakeholders as the expert panel in developing the preoperative teaching materials is consistent with Rogers DIT (2003) *innovation-decision process*.

The literature synthesis overwhelmingly supported designing, implementing, and evaluating preoperative CABG/valve surgery patient education materials (Louw et al., 2013; Sousa & Turrini, 2012). Similarly, phase two results, from the patient preoperative preparedness for surgery questionnaire, indicated that the teaching booklet was helpful, useful, clear and easy to read, and helped prepare patients for CABG/valve surgery. Overwhelmingly, patients were 90.9% satisfied with the teaching booklet and 100% understood the purpose and benefits of their upcoming surgery. Patients were 100% prepared for what to expect after surgery and 90.9% were prepared for what to expect after discharge to home. The implications of specific comments from patients and families requesting more information about valve function, working from home, and postoperative care will be reviewed for completeness and changes will be recommended for the next version. Furthermore, quarterly HCAHPS scores showed improvement for discharge information (96.2% from 92.2%) and care transitions (66.2% from 54.3%) since the CABG/valve teaching booklet was implemented.

Limitations

There were several limitations to this scholarly project. First, the low response rate (17.7%) from the 62 booklets and questionnaires that were given to patients may bias the survey results. Multiple factors may have contributed to the low patient response rate including the process for collecting the completed surveys, lack of tracking patients who were given the teaching booklets, and assisting patients and families with completing the survey. In addition, the length of the 15-item questionnaire and open-ended questions on the back of the survey may have caused patients to end prior to completion. Second, teaching booklets and questionnaires were taken home by the family when the patients went to the operating room since rooms may change. Some booklets were not returned for the remainder of the patient's hospital course,

therefore reminders to return the patient questionnaire were not done. It is possible that patients may have received more than one teaching booklet and questionnaire.

Sustainability Plan

The implications and recommendations for clinical practice are to continue utilizing preoperative teaching materials to improve patient satisfaction, preparedness, and usefulness. Sustained funding for the CABG/valve teaching booklet was secured from division of cardiac surgery. This is a crucial component of the *innovation-decision process* (Rogers, 2003). For continued sustainability, initiating a unit based patient education committee to update and expand the teaching booklet to include outpatient clinics is recommended. Future recommendations include reviewing the teaching booklet every two years for accuracy, obtaining preoperative teaching folders for the booklets, identify a designated preoperative teaching materials location on the unit, and develop ongoing preoperative training and awareness for nurses. In addition, gathering data on how the booklet is being used over the next year would uncover barriers and facilitators for maintaining the teaching materials.

Conclusion

The results of this quality improvement project indicate that evidence-based CABG/valve preoperative teaching materials can assist patients in being adequately prepared for open-heart surgery. The teaching booklet successfully demonstrates usefulness in providing clear communication in preparation for CABG/Valve surgery, preparation for home, post-operative symptoms to monitor, and a notes section for asking questions to better understand their health. Findings are consistent with the literature in that individualized teaching instructions are an effective and useful strategy for preparing patients for surgery, thus meeting the needs for individualized patient centered care.

Dissemination of Findings

Dissemination of this scholarly project findings will be communicated through meetings with the Associate Chief Nursing Officer/Vice-President of Patient Care Services and the Chief of Cardiac Surgery. Additional meetings and presentations will be given at the unit level. Further dissemination will be at forums as requested, such as Advanced Practice Nursing Grand rounds. Furthermore, dissemination is planned through publication in a peer-reviewed journal.

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Table 1

Evidence Rating Table for Research Studies

Author, year	Study objective/intervention or exposures compared	Design	Sample (N)	Outcomes studied (how measured)	Results	*Level and Quality Rating
Friedman et al., 2011	To determine effective teaching strategies and methods of delivery for patient education.	Systematic Review	<i>N</i> = 23 systematic reviews and meta-analysis	Calculated effect size of meta-analysis for traditional lectures, discussions, simulated games, computer technology, written materials, audiovisual, verbal recall, demonstration, and role-playing.	Traditional lectures compared to routine care on patient outcomes had a moderate effect size (95% CI, 0.29 – 0.67). Discussions small to moderate effect size (95% CI, 0.29 – 0.67). No data was found on simulated games. Computer technology for educating patients on heart disease found significant improvement in patient's knowledge. Booklets improved patient knowledge and reduced confusion. Tailored and evidenced-based leaflets were found to increase knowledge. Seven reviews found audiotapes increased knowledge in the short term. Videotapes increased knowledge and	1-A

					<p>patient greater satisfaction. One review found written and verbal teaching was significantly better than verbal alone with respect to knowledge.</p> <p>Demonstrations had a large effect size of 0.79 (95% CI, 0.55 – 1.03) on patient outcomes. No data was found on role-playing. Nine reviews discussed methods of delivery and reported targeted interventions increase knowledge, satisfaction, and decreased anxiety.</p>	
King et al., 2014	To determine what information patients undergoing lung surgery wanted to learn before and after surgery and to uncover information currently provided.	Qualitative semi-structured interviews	<i>N</i> = 10 patients <i>N</i> = 11 health care professionals (HCP)	Interviews were analyzed by qualitative naturalistic inquiry approach. Inductive analysis to identify themes. For HCPs a descriptive narrative of information and resources they used for teaching patients was developed.	The majority of patients reported they liked receiving information directly from the HCPs and reading on their own pre and postoperatively. The printed booklet was most helpful in answering questions out of all the printed materials given to them. All patients reported feeling satisfied and very prepared for surgery. Patient suggestions	6-C

					included having a doctor present for education session, adding pictures to improve understanding material, and to know more about the length of time of postoperative pain prior to surgery. HCPs main topics uncovered were pre and postoperative care, education information regarding medications, pain control, exercises, role of the patient/family, preoperative procedures, diet, home care services, and discharge planning.	
Lee & Lee, 2012	To explore the consistency between the perceptions and actual practice of preoperative patient teaching and factors affecting teaching from the nurses perspective.	Cross-sectional descriptive survey design	$N = 100$ nurses	Self-reported preoperative teaching questionnaire of 73 items on a 5 point Likert-type scale covering significance of preoperative teaching, sufficiency of nurses teaching to patients, preoperative teaching methods, factors affecting nurses delivery of education, and the satisfaction of	Nurse response rate 86%. Wilcoxon test found statistically significant differences ($p < 0.05$) between perceived areas of preoperative teaching and actual practice in patient education. Most (89.5%) nurses found using simple language in teaching facilitated patient understanding. Time constraint was found to influence the ability of preoperative teaching. The	4-B

				nurses towards preoperative teaching.	three most prominent areas of preoperative teaching were details about anesthesia, details about the operation, and postoperative expectations. The majority (75%) of nurses were satisfied with preoperative patient teaching.	
Louw et al., 2013	Utilize the current best evidence for neuroscience education for musculoskeletal disorders to develop a preoperative neuroscience educational program for lumbar radiculopathy.	Expert panel review and patient survey	<i>N</i> = 12 expert panel <i>N</i> = 5 patients <i>N</i> = 5 general population	Expert panel questionnaire on readability, style, information level, believability, length, content, and helpfulness. Part 2 contained open-ended questions. Sample of five patients and five from general population completed a questionnaire evaluating the teaching booklet.	Expert panel strongly supported the need of the booklet. Overall rating 8.2 out of 10. Patients and general public found the booklet easy to read, interesting, learned new things, easy to follow, and with adequate images. Rating for the booklet was 9 out of 10 by the patients.	7-C
Nahm et al., 2012	To implement an innovative web-based program to supplement preoperative patient education.	Prospective two-group comparison with two data-collection points	<i>N</i> = 69 <i>n</i> = 28 Emmi Plus <i>n</i> = 41 Usual care	Anesthesia knowledge evaluated by the modified Standard Anesthesia Learning Test (mSALT). The Preoperative Intrusive Thoughts Inventory (PITI) measured	Emmi Plus web-based group had higher scores for anesthesia knowledge ($t = 2.15, p = 0.04$) and was more satisfied with the teaching experience ($t = 2.13, p = 0.04$) at the end of the intervention.	4-B

				preoperative anxiety. Satisfaction was measured using the Pre-Admission Test Center Satisfaction Questionnaire (PATCSQ). Emmi program was evaluated using Perceived Health Web Site Usability Questionnaire (PHWSUQ).	There was no significant difference in anxiety between the groups.	
O'Brien et al., 2013	To evaluate cardiac surgery patients perception on the effectiveness and timing of education by occupational therapy staff.	Cross-sectional written survey study design	<i>N</i> = 375	Recall and understanding preoperative written materials and adherence with postoperative precautions. Patient evaluation of written materials prepared them for six weeks postoperative. Stress or anxiety regarding postoperative expectations. Patient perception of quality and timing of therapy services and rehabilitation.	Patients recalled receiving written materials 89%. Fisher's exact test found significant relationship between understanding the booklet and feeling prepared for the postoperative experience ($p < 0.0001$) and adherence with postoperative precautions ($p < 0.0001$). Most patients (88%) felt adequately prepared, 12% did not. No statistically significant relationship was found between the booklet and stress/anxiety ($p = 0.41$). Patients confirmed being seen by occupational therapy	4-B/C

					while inpatient was 84.5%. No significant associations between wanting earlier information and feeling adequately prepared for surgery ($p = 0.33$), stress/anxiety ($p = 0.23$), or adherence with precautions ($p = 0.22$) were found in terms of timing of occupational therapy.	
Sousa & Turrini, 2012	To create and validate educational materials for patients undergoing orthognathic surgery.	A five-phase study including a focus group (qualitative) and expert opinions	$N = 9$ focus group $N = 20$ patients evaluation phase	Comprehensive review of surgical complications. Researcher interactions within virtual environments and blogs to identify patient needs grouping into categories. Focus group of postoperative patients were recorded, transcribed, and analyzed. Expert opinion using Delphi technique, revisions, and evaluation. Likert type survey for patient evaluation of the booklet.	Comprehensive review of 23 studies found pain, lack of bone fusion, changes in sensitivity, bruising, and infection were identified for content in the booklet. Needs assessment from eight virtual communities of 204 comments identified patient concerns of fear during perioperative period, recovery, changes in facial aesthetics, and regret for having surgery. Comments from the focus group were analyzed and content was developed to answer patients concerns, only 44% of patients	7-B/C

					<p>participated. Three rounds of using Delphi technique, including revisions to the booklet were performed on content, language, illustrations, layout, motivation, and culture. Survey of 20 patients found they strongly agreed with the booklet. Researchers found the booklet met the patients general needs.</p>	
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Note. The level of evidence rating system for the hierarchy of evidence is from Melnyk & Fineout-Overholt (2011). The quality rating for research studies is from Newhouse et al. (2006) quality rating scheme.

Table 2

Evidence Review Appraisal for Quality of Research Studies

Author, year	Study objective/intervention or exposures compared	Strengths	Weaknesses	Quality Rating
Friedman et al., 2011	To determine effective teaching strategies and methods of delivery for patient education.	Systematic review design yielded 23 systematic reviews and meta-analysis. Inclusion/exclusion criteria stated. Effect size was calculated for each study. The AMSTAR tool was utilized for quality of study. Consistency in the findings and across different diseases promotes generalizability.	Statistically significant data from each of the reviews were not displayed in a clear table and were selectively mentioned in the text. Specific outcomes were imprecise in the individual studies within the reviews and may vary considerably. Tools were not always validated. Outcomes were not clearly articulated. Details of the interventions were unclear.	A/B
King et al., 2014	To determine what information patients undergoing lung surgery wanted to learn before and after surgery and to uncover information currently provided.	Qualitative study design identified patient's needs and suggestions. Implications for future research to better understand how to address preoperative pain education needs were identified.	Limited sample size and limited to lung cancer patients undergoing surgery. Limited generalizability.	C
Lee & Lee, 2012	To explore the consistency between the perceptions and actual practice of	Implication for further research was identified in this cross-sectional study design. The questionnaire's internal consistency and reliability was high	Convenience sample and small sample size limits this study's generalizability.	B

	preoperative patient teaching and factors affecting teaching from the nurses perspective.	(0.8, 0.88) measured by Cronbach's alpha, respectively. Study was well conceptualized. Clearly presented results in tables.		
Louw et al., 2013	Utilize the current best evidence for neuroscience education for musculoskeletal disorders to develop a preoperative neuroscience educational program for lumbar radiculopathy.	Expert panel evaluated and refined the teaching booklets content, clarity, and readability. Booklet was developed based on established evidence-based principles.	Convenience sample and small sample size. Limited generalizability.	C
Nahm et al., 2012	To implement an innovative web-based program to supplement preoperative patient education.	mSALT calculated Content Validity Index = 1.0. Face validity was assessed. Calculated alpha coefficient for the mSALT was 0.54 for knowledge variables. Good internal consistency ($\alpha = 0.91$) and construct validity through factor analysis for the PITI instrument. Reliability of the satisfaction questionnaire alpha coefficient was good (0.95), and validity measured by factor analysis. Emmi program PHWSUQ internal consistency was good ($\alpha = 0.95$), and validity measured by usability experts.	Convenience sample and small size limits generalizability. Only 50% of patients returned the follow-up survey.	B

O'Brien et al., 2013	To evaluate cardiac surgery patients perception on the effectiveness and timing of education by occupational therapy staff.	Cross-sectional study with statistical significances finding patient satisfaction with the cardiac surgery teaching booklet and with their preoperative cardiac surgery education.	Low response rate (31.4%) of 375 patients returned surveys indicates low power and sampling bias. Method requiring respondents to return surveys by mail limited this study.	B/C
Sousa & Turrini, 2012	To create and validate educational materials for patients undergoing orthognathic surgery.	Multiple phases in this study's design contributed to the development and evaluation of this booklet. Using the Delphi technique was repeated until convergence of responses was achieved.	Small sample for focus group and absenteeism indicates low power in this study and limits generalizability.	B/C

Table 3

Summary Evidence Rating Table

Level of Evidence	Number of Studies	Summary of Findings	Overall Quality (you may expand further)
1	1	Friedman et al. (2011) systematic review found teaching booklets, tailored evidence-based pamphlets, and targeted interventions increased patient knowledge and satisfaction, and decreased anxiety and confusion. Verbal and written teaching was significantly better than verbal alone.	A/B. The limitations from several studies were the low sample size and power. However, the well-designed systematic review study design increases the overall quality of this review. The AMSTAR tool was utilized for the quality of this study.
4	3	Simple language used in preoperative teaching facilitated patient understanding, and the most prominent teaching areas were details about anesthesia, surgery, and postoperative expectations (Lee & Lee, 2012). Nahm et al. (2012) found using the Emmi Plus web-based preoperative teaching group to have higher scores for anesthesia knowledge and increased satisfaction with the teaching approach. O'Brien et al. (2013) found written materials improved patient recall and utilizing a teaching booklet increased patient understanding and preparedness.	B. Low response rates, sample size, and convenience sample limits these studies findings generalizability. The questionnaires from two of the studies had high reliability (Lee & Lee, 2012; Nahm et al., 2012). Nahm et al. (2012) utilized the mSALT and PITI tool, which were validated instruments.
6	1	King et al. (2014) qualitative study found patients preferred reading on their own and receiving pre and postoperative information from the HCP. Overall, patients were satisfied and felt prepared for surgery using the teaching booklet	C. A limitation of this study is the qualitative design, small sample size, and lack of generalizability. However, important information was obtained from patient's suggestions to incorporate in teaching materials and methods.

7	2	Patient preoperative teaching booklet was developed through five study phases and validated in Sousa et al. (2012) study. Expert panel and patient surveys supported the teaching booklet and found materials easy to read in the Louw et al. (2013) study.	C. The small sample size, absenteeism rate, and convenience sample limits these studies generalizability. The multiple phases and Delphi technique to develop a comprehensive teaching booklet adds quality to Sousa et al. (2012) study.
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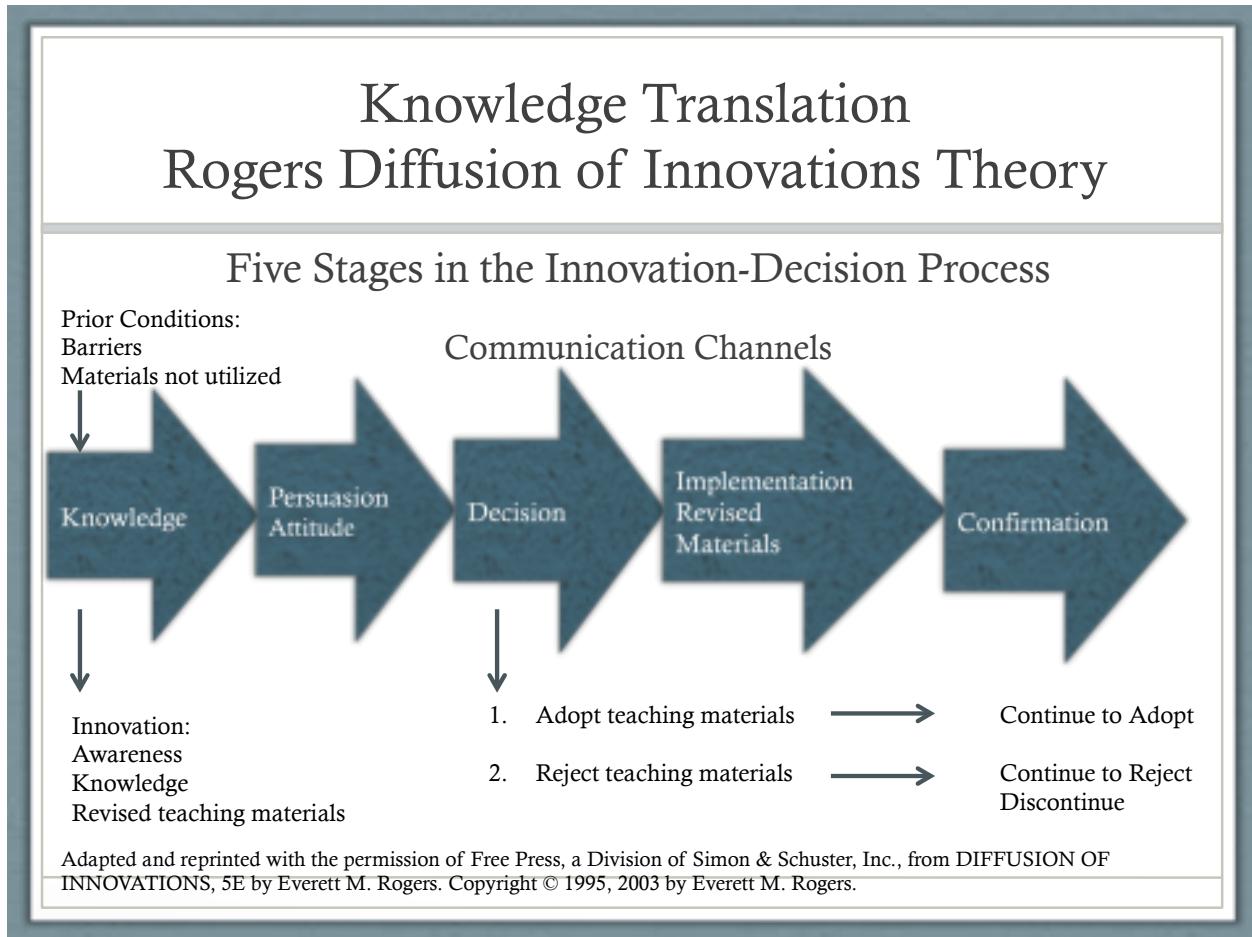


Figure 1. Adapted and reprinted with the permission of Free Press, a Division of Simon & Schuster, Inc., from DIFFUSION OF INNOVATIONS, 5E by Everett M. Rogers (see Appendix H). Copyright © 1995, 2003 by Everett M. Rogers. Copyright © 1962, 1971, 1983, by Free Press, a Division of Simon & Schuster, Inc. All rights reserved.

Appendix B

Patient Education Materials Assessment Tool for Printable Materials (PEMAT-P)

Title of Material: _____ Date Reviewed: _____
 Name of Reviewer: _____

UNDERSTANDABILITY

Item #	Item	Response Options	Rating
Topic: Content			
1	The material makes its purpose completely evident. Comments/Suggestions:	Disagree=0, Agree=1	
2	The material does not include information or content that distracts from its purpose. Comments/Suggestions:	Disagree=0, Agree=1	
Topic: Word Choice & Style			
3	The material uses common, every day language. Comments/Suggestions:	Disagree=0, Agree=1	
4	Medical terms are used only to familiarize audience with the terms. When used, medical terms are defined. Comments/Suggestions:	Disagree=0, Agree=1	
5	The material uses the active voice. Comments/Suggestions:	Disagree=0, Agree=1	
Topic: Use of Numbers			
6	Numbers appearing in the material are clear and easy to understand. Comments/Suggestions:	Disagree=0, Agree=1, No numbers=N/A	
7	The material does not expect the user to perform calculations Comments/Suggestions:	Disagree=0, Agree=1	

Topic: Organization			
8	The material breaks or “chunks” information into short sections. Comments/Suggestions:	Disagree=0, Agree=1, Very short material*=N/A	
9	The material’s sections have informative headers. Comments/Suggestions:	Disagree=0, Agree=1, Very short material*=N/A	
10	The material presents information in a logical sequence. Comments/Suggestions:	Disagree=0, Agree=1	
11	The material provides a summary. Comments/Suggestions:	Disagree=0, Agree=1, Very short material*=N/A	

Topic: Layout & Design			
11	The material provides a summary. Comments/Suggestions:	Disagree=0, Agree=1, Very short material*=N/A	
12	The material uses visual cues (e.g., arrows, boxes, bullets, bold, larger font, highlighting) to draw attention to key points. Comments/Suggestions:	Disagree=0, Agree=1 Video=N/A	

Item #	Item	Response Options	Rating
Topic: Use of Visual Aids			
15	The material uses visual aids whenever they could make content more easily understood (e.g., illustration of healthy portion size). Comments/Suggestions:	Disagree=0, Agree=1	
16	The material’s visual aids reinforce rather than distract from the content. Comments/Suggestions:	Disagree=0, Agree=1, No visual aids=N/A	
17	The material’s visual aids have clear titles or captions. Comments/Suggestions:	Disagree=0, Agree=1, No visual aids=N/A	
18	The material uses illustrations and photographs that are clear and uncluttered.	Disagree=0, Agree=1,	

	Comments/Suggestions:	No visual aids=N/A	
19	The material uses simple tables with short and clear row and column headings. Comments/Suggestions:	Disagree=0, Agree=1, No tables=N/A	

* A very short print material is defined as a material with two or fewer paragraphs and no more than 1 page in length.

Total Points: _____ Total Possible Points: _____

Understandability Score (%): _____

(Total Points / Total Possible Points) 100

ACTIONABILITY

Item #	Item	Response Options	Rating
20	The material clearly identifies at least one action the user can take. Comments/Suggestions:	Disagree=0, Agree=1	
21	The material addresses the user directly when describing actions. Comments/Suggestions:	Disagree=0, Agree=1	
22	The material breaks down any action into manageable, explicit steps. Comments/Suggestions:	Disagree=0, Agree=1	
23	The material provides a tangible tool (e.g., menu planners, checklists) whenever it could help the user take action. Comments/Suggestions:	Disagree=0, Agree=1	
24	The material provides simple instructions or examples of how to perform calculations. Comments/Suggestions:	Disagree=0, Agree=1, No calculations=NA	
25	The material explains how to use the charts, graphs, tables, or diagrams to take actions. Comments/Suggestions:	Disagree=0, Agree=1, No charts, graphs, tables, or diagrams=N/A	
26	The material uses visual aids whenever they could make it easier to act on the	Disagree=0, Agree=1	

	instructions. Comments/Suggestions:		
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Total Points: _____ Total Possible Points: _____

Actionability Score (%): _____

(Total Points / Total Possible Points) \times 100

Note. The PEMAT-P tool developed by Shoemaker, Wolf, and Brach (2014).

Appendix C

Patient Preoperative Preparedness Questionnaire

Please rate the following:	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
1. The teaching booklet I received before surgery was helpful and adequate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Before my surgery, I received preoperative information regarding my procedure and my questions were answered timely.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The teaching booklet helped prepare me for surgery.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The teaching booklet was clear and easy to read.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. The pictures in the booklet helped me understand my surgery.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Overall, I am satisfied with the preoperative teaching materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I received my preoperative teaching materials within 24 hours prior to surgery.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I understand the purpose and benefits of the planned surgery.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Overall, I feel prepared for my upcoming surgery.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. I feel prepared for what to expect after surgery while I am in the hospital.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. I feel prepared for what to expect after surgery when I am at home.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I know about the alternatives to surgery.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I understand the purpose of the surgery.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I understand the risks and benefits of having surgery.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. The teaching materials helped answering my questions and were useful.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note. Modified from the original preoperative preparedness questionnaire by Kenton et al. (2007).

I would have liked MORE information about:

I would have liked LESS information about:

What changes would you make in this book to make it better, or what other comments do you have?

I am: ____ a patient ____ a family member Please select surgery performed: ____ CABG ____ Valve ____ Both

Please place the evaluation form in the self-addressed stamped envelope and give to your nurse before discharge, or place it in the mail. Thank you for your participation.

Appendix D

Preoperative Preparedness Questionnaire

Please circle your level of agreement with the following statements regarding your upcoming surgery:

Strongly Agree Agree Somewhat Agree Somewhat Disagree Disagree Strongly Disagree

- I know about the *alternatives* to the planned surgery.
- I understand the *purpose* of the planned surgery (what this surgery can accomplish).
- I understand the *benefits* of the planned surgery (how this surgery should help me).
- I understand the *risks* of the planned surgery (what the chances are of something not going the way my doctor and I want it to go).
- I understand the *complications* of the planned surgery (what problems can come from this surgery).
- I feel prepared about what to expect after surgery *while I am in the hospital*.
- I feel prepared about what to expect after surgery *when I am at home*.
- I feel prepared to cope with a catheter after the surgery *while I am in the hospital*.
- I feel prepared to cope with a catheter after the surgery *when I am at home*.
- My doctors and nurses have spent enough time preparing me for my upcoming surgery.
- Overall, I feel prepared for my upcoming surgery.

Kenton et al. (2007) patient preoperative preparedness questionnaire.

Appendix E

From: Sarah Shoemaker <Sarah_Shoemaker@abtassoc.com>
Subject: RE: Copyright for PEMAT
Date: March 21, 2016 at 11:56:05 AM EDT
To: Patricia Freeman <pattifreern.acnp@gmail.com>

Patricia –

Thank you for reaching out. The PEMAT is free and publicly available so you do not need permission to use it; however, please cite the instrument and the manuscript on the PEMAT development, validation and reliability. As you know, I'm sure, it's available at:

<http://www.ahrq.gov/professionals/prevention-chronic-care/improve/self-mgmt/pemat/index.html>

1. **Shoemaker SJ**, Wolf MS, Brach C. [Development of the Patient Education Materials Assessment Tool \(PEMAT\): A New Measure of Understandability and Actionability for Print and Audiovisual Patient Information](#). *Patient Ed and Couns*. 2014 Sep;96(3):395-403.
2. Shoemaker SJ, Wolf MS, Brach C. The Patient Education Materials Assessment Tool (PEMAT) and User's Guide. (Prepared by Abt Associates, Inc. under Contract No. HHS A290200900012I, TO 4). Rockville, MD: Agency for Healthcare Research and Quality; November 2013. AHRQ Publication No. 14-0002-EF.

We would love to hear about what you think of the instrument once you're using it AND see the results of your work.

Best,
Sarah

From: Patricia Freeman [mailto:pattifreern.acnp@gmail.com] **Sent:** Saturday, March 19, 2016 5:20 PM **To:** Sarah Shoemaker **Subject:** Copyright for PEMAT

Hello,

I am requesting written permission to use and reprint the PEMAT assessment tool for my doctoral scholarly project "Implementation and Evaluation: Revised Preoperative Teaching Materials for CABG/Valve Surgery Patients."

Thank you,

Patricia Freeman, MS, RN, ACNP-BC
pattifreern.acnp@gmail.com

Appendix F

From: "Kenton, Kimberly" <Kimberly.Kenton@nm.org>
Subject: Re: Patient Preparedness Questionnaire
Date: March 30, 2016 at 9:28:00 PM EDT
To: Patricia Freeman <pattifreern.acnp@gmail.com>

Of course! Good luck!

Kimberly Kenton MD, MS
Professor, Obstetrics & Gynecology and Urology
Division Chief & Fellowship Program Director, Female Pelvic Medicine & Reconstructive
Surgery
Medical Director, Women's Integrated Pelvic Health Program
Northwestern Medicine/Northwestern University Feinberg School of Medicine
kkenton@nm.org
From: Patricia Freeman <pattifreern.acnp@gmail.com>
Sent: Wednesday, March 30, 2016 12:00 PM
To: Kenton, Kimberly (NU)
Subject: Patient Preparedness Questionnaire

Dr. Kenton,

I am requesting written permission to use the Preoperative Preparedness Questionnaire - Table 2 in the research article **Patient preparedness: an important predictor of surgical outcome**. I plan to use the tool for my doctoral scholarly project "Implementation and Evaluation: Revised Preoperative Teaching Materials for CABG/Valve Surgery Patients." This quality improvement project will take place at University of Maryland Medical Center 2016/2017. I plan to publish my manuscript 2017.

Thank you,

Patricia A. Freeman, CRNP-AC

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Appendix G

From: "Lee, Christine" <Christine.Lee@simonandschuster.com>
 Subject: RE: Copyright permission for Roger's Diffusion of Innovations Model (2003)
 Date: April 13, 2016 at 4:00:13 PM EDT
 To: "pattifreern.acnp@gmail.com" <pattifreern.acnp@gmail.com>

Dear Patti,

You have our permission to include an adaptation of Figure 5-1 from *The Diffusion of Innovations 5e* in your dissertation for the purposes of completing your degree requirements. You must include the following acknowledgment in all copies of your dissertation:

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All Best,
 Christine

Christine J. Lee
 Permissions Supervisor
 Simon & Schuster, Inc.

From: S&S Permissions **Sent:** Wednesday, April 13, 2016 11:01 AM **To:** Lee, Christine **Subject:** FW: Copyright permission for Roger's Diffusion of Innovations Model (2003)

From: Patti [<mailto:pattifreern.acnp@gmail.com>] **Sent:** Wednesday, April 13, 2016 6:03 AM **To:** S&S Permissions **Subject:** RE: Copyright permission for Roger's Diffusion of Innovations Model (2003)

Hello,

I am requesting written permission to use Everett M. Roger's (2003) Diffusion of Innovations Model (5th ed), by the Free Press.

I would like to adapt Figure 5-1, on page 170 - A Model of Five Stages in the Innovation-

Decision Process to use as the structural framework for my doctoral scholarly project "Implementation and Evaluation: Revised Preoperative Teaching Materials for CABG/Valve Surgery Patients." I plan to submit my DNP scholarly project to the Institutional Review Board at University of Maryland Medical Center and University of Maryland School of Nursing in May, 2016. Completion of this project and submission for publication is projected to be in May, 2017.

Sincerely,

Patricia Freeman, MS, RN, CRNP-AC

519 Koch Road
Linthicum Heights, MD 21090
443-570-9731
email: pattifreern.acnp@gmail.com
Fax: 410-609-0182

Appendix H

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Thank you for your cooperation in connection with this matter.

Best,
Jazmine