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Development and Evaluation of an Evidence-Based Educational Process to Reduce Post-Transplant Infections

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
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2017

Abstract

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MS, Walden University, 2012

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Project Submitted in Partial Fulfillment

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Doctor of Nursing Practice

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Abstract

The targeted transplant center's abdominal organ transplant unit had difficulty providing adequate education to patients prior to discharge, which had resulted in a 24% readmission rate within 30 days due to infections. Patients and caregivers were unavailable to receive education despite multiple attempts, which made it challenging for health care providers to complete this aspect of their job, resulting in a negative impact on patients' long-term outcomes. A more structured educational environment was needed to provide appropriate and effective patient and caregiver education to increase adherence and positive outcomes. The health promotion model served as a foundation for the development of the evidence-based educational process and materials. A panel of 6 experts was invited to review the evidence-based, theory-supported educational materials along with the staff and caregiver educational process developed for the unit. Five experts participated in the formative and summative evaluation of the educational process, materials, and the evaluation tool. Results of the evaluations demonstrated that a majority (83%) of the experts found the educational materials and process were essential, accurate, and provided a more structured environment that afforded health care providers the ability to maintain compliance with the targeted transplant center's education policy. The materials, process, and evaluation tool will be implemented at the site. Social change will result from increased patient engagement and confidence in self-care; improved caregiver ability to assist the patient; and reduced risk of noncompliance, readmissions, and poor outcomes.

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Dedication

This project is dedicated to my loving grandparents, Walter and Sarah Henderson and J.C. and Bertha Mae Smiley. “One generation shall commend your works to another, and shall declare your mighty acts” (Psalm 145:4).

Acknowledgments

Thank you to my parents (Henry and Marie Henderson), sister (April), and niece (Jaycee Vanessa) for your love and support throughout this journey. Maxine Brister, Shirley Henderson, Audrey Flowers, Pat Fleming, LaTanya Reeves, Satrina Hill, Rick Milam, Dawn Burroughs, Carolyn Holder, and the 7G nursing unit thank you for always supporting and motivating me to continue on! Briana Marie Lucido and Alicia Walker, thank you for always being willing to help and for offering "crash courses" in Excel and PowerPoint. I especially would like to thank my committee members, Dr. Marisa Wilson, Dr. Murielle Beene, and Dr. Jennie DeGagne, for your support and guidance throughout this journey. Your guidance has not only allowed me to develop professionally, but has also proven to me that I can become an effective leader, scholar, and a positive change agent for my community. Last but certainly not least, I would like to say "thank you" to my preceptor, mentor, and friend, Dr. Jennie Perryman, for your guidance and support and opening my mind to endless possibilities.

Table of Contents

List of Tables

List of Figures

Section 1: Nature of the Project

Fishman (2007) indicated that post-transplant patients were at an increased risk of acquiring an infection due to the antirejection medications required to maintain the newly transplanted organ. Although the development of improved antirejection medications decreased the risk of rejection, the susceptibility to opportunistic infections was still present (Fishman & AST Infectious Diseases Community of Practice, 2009). Other factors such as comorbidities, absence of vaccinations, and dosage of antirejection medications played a vital role in increasing the risk of infections (Fishman & AST Infectious Diseases Community of Practice, 2009). Consequently, patients were not only placed at risk for hospital readmissions as a result of infections, but also for loss of the transplanted organ and/or death.

The targeted transplant center has treated an average of 5,000 patients on a monthly basis in an outpatient setting. This population consists of abdominal and thoracic pre- and post-transplant patients. Both populations receive education pertaining to self-care and disease prevention throughout the transplant process. Due to distinct challenges between abdominal and thoracic transplant patients, the project focused on adult abdominal organ patients up to 1 year post-transplant.

During the beginning stages of this project, the abdominal organ transplant unit's leadership was developed into a team. I led the team in conducting a needs assessment of the educational process and materials and later developed a more efficient and appropriate educational process and materials to be implemented in the future. Discussions with team members revealed that this unit struggled to provide a

standardized educational method to the patients and their support system pertaining to self-care post-transplant. According to the director and nurse educator, staff members have verbalized concerns regarding the ability to provide adequate patient education prior to discharge. Many of the staff members believed that if some form of standardized education was provided, then the readmission rate would be drastically reduced. A significant number of patients had been readmitted for infections and other possibly avoidable complications. Additionally, the needs assessment of the educational materials and process revealed information such as susceptibility to sexually transmitted diseases post-transplant and routine self-care maintenance (e.g., prostate exams, pap smears, and self-breast exams) were not adequately addressed.

Problem Statement

To increase the possibility of post-transplant patients living a life free of infections and/or disease, adequate education should be provided. Post-transplant patients who are infection and/or disease free can positively impact the cost of health care, decrease the risk of graft failure and/or morbidity, and decrease the probability of hospital readmissions. Although abdominal organ post-transplant patients received education throughout the process, at least 24% of 1-year post-transplant patients were readmitted within 30 days to the target facility due to infections. *Figure 1* illustrates the 30-day readmission rate for abdominal organ 1-year post-transplant patients of the target facility.

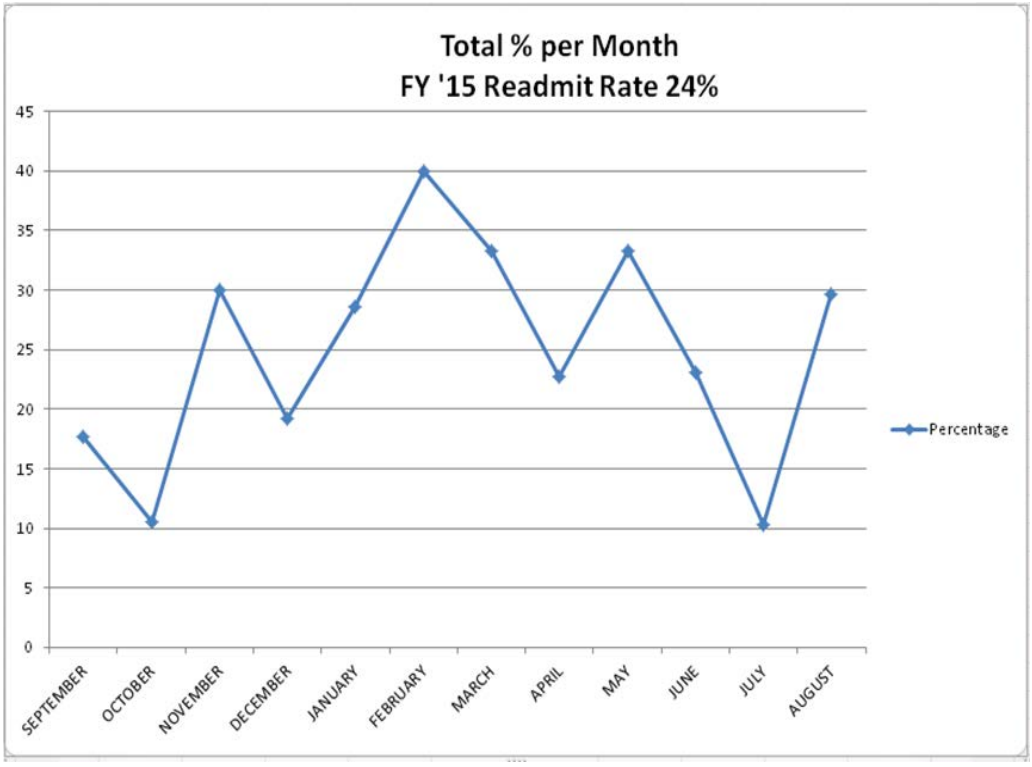

Figure 1. 30-day readmission rate for abdominal organ transplant unit.

Hospital readmissions placed patients at increased risk for hospital-acquired infections and other complications related to hospitalization (Paterno et al., 2014). As a result, concerns regarding the effectiveness of education provided to patients were raised. *Figure 2* demonstrates the causes that impacted post-transplant education.

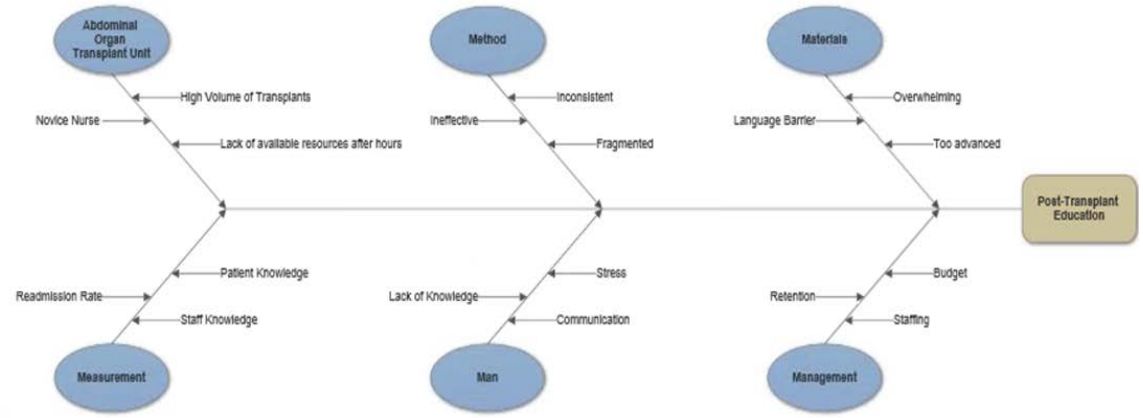

Figure 2. Cause and effect diagram.

Lastly, readmissions due to infections not only affected patient and graft survival, they also impacted the ability to receive Centers for Medicare & Medicaid Services reimbursement. Therefore, it was necessary to provide education that was effective in reducing the rate of infections within this population.

Purpose Statement and Objectives

The purpose of this project was to use evidence and theory to develop educational materials and a process that would be reviewed and acceptable by an expert panel to improve patient and caregiver knowledge. Although education was provided throughout the transplantation process, patients and families appeared to be overwhelmed immediately after receiving the newly transplanted organ. Not having a clear understanding of self-care or how to aid in the care of a newly transplanted patient caused many patients and families to become confused leading to poor decisions (Tamara-Lis, 2013). Offering educational material that is clear and concise while providing the opportunity for patients and families to ask questions and voice concerns may increase the likelihood of patients not acquiring an infection. Ghadami, Memarian, and Abdoli

(2012) indicated that patients tend to be more compliant with medical advice when provided with an adequate amount of education that is comprehended by patients and families.

The objectives of this project were to develop new educational materials and a process to

- increase the possibility of patients' ability to recall the signs and symptoms of infections prior to hospital discharge,
- increase the possibility of patients' ability to explain how to protect themselves from infections post-transplant prior to hospital discharge, and
- allow staff to evaluate the effectiveness of education provided to patients.

Significance/Relevance to Practice

Providing patient education and ensuring both patient and support systems fully comprehend policies is an essential factor in the nursing process. This involves documentation that education was provided, the delivery method, and whether the education was well received. Nurses are routinely faced with the challenges of providing adequate and appropriate education prior to hospital discharge while fulfilling the duties and responsibilities of nursing. Although nurses understand that patient education plays a significant role in patients' adherence to treatment and outcomes, many nurses struggle to incorporate teaching into the daily plan of care (Smith & Zsohar, 2013). According to Smith and Zsohar (2013), patients and their support systems often complained of feeling overwhelmed when receiving a vast amount of information on the day of discharge. Having a more structured process may significantly increase the probability of patient

engagement, presence and participation of support systems, and staff preparedness to provide education (Frank-Bader, Beltran, & Dojlidko, 2011). According to Lauziere, Chevarie, Poirier, and Belanger (2013), structured education promotes teamwork among disciplines. Having a multidisciplinary team (e.g., nurses, pharmacists, social workers, etc.) to educate patients on self-care post-transplant may lead to lifestyle modification positively affecting the rising cost of health care (Lauziere et al., 2013). Because nurses spend a significant amount of time with patients, nurses are in an exceptional position to serve as leaders in patient education while capitalizing on the strengths of other disciplines. Epstein (2014) indicated that an effective multidisciplinary team not only improves patient outcomes but also increases patient satisfaction and job satisfaction among employees.

Project Question

Will evidence and theory support the development of a program that will be acceptable to an expert panel which, when implemented will positively impact the long-term outcomes of transplant patients through reduction of postoperative infections?

Evidence Based Significance of the Project

Untreated infections acquired by post-transplant patients can lead to organ rejection and ultimately death of the patient (Green, 2013). In addition, infections can negatively impact the cost of health care, place emotional and financial burden on the patient and family, and affect patient satisfaction scores and statistical data regarding successful transplants for transplant centers. The developed educational process and materials included items such as the patient’s hobbies, work environment, traveling

schedule, caring for pets, recreational activities, and source of food and water because these elements play a role in increasing the risk of infections. Additionally, the developed educational process afforded health care providers the ability to provide a more structured environment to promote patient education.

Reduction of Gaps

Although transplantation is the treatment of choice for end-stage organ disease, it requires lifestyle modification. This involves monitoring for side effects of antirejection medications including susceptibility to infections, various forms of cancer, and other comorbidities associated with antirejection medications (Ghadami et al., 2012). According to Liang (2013), patients with a lower reading level tend to be at an increased risk of mismanaging their care. Providing educational materials that are compatible with patients' educational level may increase the probability of patients fully understanding how to prevent infections. Therefore, it was deemed appropriate by the project's panel of experts to have all materials written on an eighth-grade level.

Another common issue post-transplant patients face is the relationship between their primary care physician and transplant physicians. Post-transplant patients typically return to their primary care physician for care 1 year post-transplant, and seek the guidance of the transplant team for transplant-related issues. According to Hughes (2014), the survival rate of post-transplant patients and transplant-related complications have significantly increased, causing transplant physicians to request the help of primary care physicians to aid in the care of this population. Robben et al. (2012) revealed that

encouraging the transplant physician and the primary care physician to collaborate on the patient's care will increase the chances of patient satisfaction and positive outcomes.

Implications for Social Change

Patients are faced with infections that are becoming more challenging to treat. This is especially true when patients are immunocompromised. As the transplant world continues to develop new and improved antirejection medications, it also creates opportunities for new, more virulent pathogens to infect this highly sensitized population of patients. Also, it is not uncommon for immunocompromised patients to have more than one active infection. This could be due to a combination of receiving high doses of antirejection medications and the overall experience of being hospitalized (Jani, 2012). Because antirejection medications suppress the immune system by vastly reducing the T and B lymphocytes, health care providers must make every effort to monitor the status of these patients while treating opportunistic infections prophylactically (Fishman & Issa, 2010). Based on the sensitivity of these patients, it is critical that all disciplines collaborate to meet the needs of the patients.

Likewise, certain times of the year (such as influenza season) should prompt health care providers to emphasize the need for patients to receive vaccination with inactive viruses, practice hand washing, and wear masks in poorly ventilated areas. The significance of receiving the influenza vaccine should be thoroughly explained to the patient to resolve any fears or misconceptions the patient may have. Patient education should also include the effects that antirejection medications such as Cellcept and mammalian target of rapamycin inhibitors (mTOR) have on the influenza vaccine. For

example, patients receiving either of these medications may experience a higher risk of the influenza vaccine being less effective (Cordero & Manuel, 2012). As a result, patients may be more hesitant to receive the influenza vaccine. Patients must be made aware that not receiving the influenza vaccine places the patient at risk for acquiring not only influenza but also graft dysfunction, influenza-associated complications such as pneumonia, and possibly death (Cordero & Manuel, 2012). Providing effective education for patients and families can possibly prevent undesirable patient outcomes.

Definitions of Terms

Activated viruses: A weakened living microorganisms that is designed to imitate a natural virus. This vaccine is typically administered in one or two doses to provide lifelong immunity (Oberdan, Cunningham, & Stern, 2011).

Anti-rejection medication: Medication used to retain the newly transplanted organ by suppressing the immune system (De Arruda & Renovato, 2012).

Fecal microbiota transplantation: The process of collecting and preparing stool from an approved donor to be transferred to an individual via colonoscopy, endoscopy, sigmoidoscopy, or enema to replace good bacteria that has been suppressed or killed due to gastrointestinal complications such as Clostridium difficile or irritable bowel syndrome (Weill & Hohmann, 2015).

Immunocompromised: A change in the body's ability to fight off infections and other illnesses (Schreier, 2015).

Immunosuppression: The inability of the body to fight off infections and other illnesses. This change in fighting infections may be caused by either medications such as

antirejection medications or chemotherapy or disease such as AIDS (De Arruda & Renovato, 2012).

Inactivated viruses: Disease-causing microbes that have been intentionally destroyed (while maintaining the virus capsid proteins) through the use of chemicals, heat, or radiation to safely administer to individuals who have a weakened immune system (Oberdan et al., 2011).

Lean methodology: A quality improvement technique used for process improvement (Bledsoe, Little, Wilkinson, & Mick, 2013).

Net state of immunosuppression: A complex function to measure the combination of risk factors such as the dosage and duration of immunosuppressant medications, nutritional status, break in mucocutaneous barriers to infection, and the presence or absence of leukopenia (Fishman, 2013).

Teach-back method: A method to confirm that the patient fully understands the intended lesson delivered (Xu, 2012).

Vaccine-induced immunity: A specific immune reaction used to protect against infections and diseases (Oberdan et al., 2011).

Virulent: Severely harmful; causing rapid onset of serious illness; typically infectious in nature (Casadevall & Pirofski, 2001).

Assumptions

Assumptions are statements that have not been scientifically proven but are considered to be true (Grove, Burns, & Gray, 2013). While developing this project, I made the following assumptions:

1. Knowledge would lead to positive changes in behavior.
2. The developed educational process would be more efficient in allowing health care providers the opportunity to provide adequate patient education.

Limitations

Grove et al. (2013) defined limitations as restrictions in a study that may lead to decreasing the generalizability of findings. This project had the following limitations:

1. Time constraints limited the opportunity to evaluate the long-term effects in reducing the rate of infections.
2. The focus on abdominal organ transplant patients limited the ability to test the effectiveness of the educational process on other transplant populations (e.g., thoracic, tissue, and bone marrow).

Summary

Infections acquired by abdominal organ transplant patients can be detrimental. Patients may experience graft dysfunction or loss, hospital readmission(s), morbidity, and/or mortality. A combination of a needs assessment of the educational process and materials and a meeting with the abdominal organ transplant director, nurse educator, and transplant dietitian revealed challenges experienced by the staff in providing adequate patient education. Therefore, a new educational process and materials were developed. Section 2 provides an overview of the scholarly literature.

Section 2: Review of Scholarly Literature

Specific Literature

According to Kawecki et al. (2014), infections in post-transplant patients increased the risk of graft loss, morbidity, and mortality. Due to the required amount of immunosuppression administered and the surgical procedure used, abdominal organ transplant recipients became at risk of acquiring an opportunistic, nosocomial, or community-acquired infection (Clauss et al., 2013). As a result, transplant physicians were often challenged with maintaining therapeutic drug levels to prevent organ rejection and decreasing levels to prevent infection (Safdar et al., 2010). Because of the patient's high risk of acquiring an infection, health care providers closely assessed the epidemiological exposure and net state of immunosuppression (Fernandez-Ruiz, Kumar, & Humar, 2014). The net state of immunosuppression was described as all factors that contributed to the risk of a post-transplant patient acquiring an infection (Jani & Shapiro, 2014). Examples of these factors were the type and dose of immunosuppressant administered, cause of organ failure, and surgical complications (Fishman & Davis, n.d.).

Types of Infections

The literature revealed post-transplant patients were prone to specific infections at certain times post-transplant. For example, infections that occurred during the first month post-transplant were typically due to viral and/or fungal infections derived from the donor organ and/or related to technical complications of the surgery (Fishman & AST Infectious Diseases Community of Practice, 2009). Patients 2 to 6 months post-transplant were considered to have an increased risk of acquiring an opportunistic infection

(Fishman & AST Infectious Diseases Community of Practice, 2009). Vinnard and Blumberg (2008) indicated that the most common opportunistic infections during this time were cytomegalovirus (most common viral infection), *Aspergillus* and *Candida* (fungal), *Pneumocystis jiroveci*, and *Mycobacterium tuberculosis* (bacterial). Lastly, patients who were more than 6 months post-transplant tended to be more at risk for community-acquired infections versus opportunistic infections (Fishman & AST Infectious Diseases Community of Practice, 2009). Post-transplant patients experienced more severe symptoms of community-acquired infections when compared to immunocompetent individuals (Fishman & AST Infectious Diseases Community of Practice, 2009).

One infection commonly found in solid organ transplant (specifically abdominal organ transplant) is *Clostridium difficile* also known as C. difficile or C. diff. Dubberke, Burdette, and the AST Infectious Diseases Community of Practice (2013) defined *Clostridium difficile* as gram-positive spore-forming bacteria that possess the ability to tolerate extreme conditions causing inflammatory diarrhea and colonic mucosal injury. Because *Clostridium difficile* is easily spread, patients are required to be placed on contact isolation immediately. This specific isolation requires patients to be placed in private rooms that include personal bathrooms, use of specific equipment for the infected patient, health care workers and visitors to wear isolation gowns and gloves, and use of special cleaning agents to clean infected rooms (Macleod-Glover & Sadowski, 2010). In addition, health care workers and visitors are strongly encouraged to wash their hands after leaving the patient's room versus using the alcohol gel. Hand washing is preferred

due to the effectiveness of soap and water killing the spores of *Clostridium difficile* (Macleod-Glover & Sadowski, 2010). Patients who were

- at least 65 years of age experienced increasing severity of underlying illness;
- routinely took antacids;
- resided in nursing homes or long-term care facilities;
- increased length of stay;
- decreased renal function;
- took antibiotics for a prolonged period of time;
- immunocompromised;
- had abdominal surgery were considered high risk for acquiring *Clostridium difficile* (Vesta, Wells, Gentry, & Stipek, 2005).

Symptoms such as three or more episodes per day of watery diarrhea, abdominal cramping, fever, nausea, and weight loss were common (Raveh, Rabinowitz, Breur, Rudensky, & Yinnon, 2006). The diagnosis of *Clostridium difficile* was typically confirmed by collecting stool samples (Raveh et al., 2006).

Within the last 10 years, a more virulent strain of *Clostridium difficile*, BI/NAP1/027, surfaced causing treatment of this infection to be challenging (Warny et al., 2005). Abdominal organ transplant recipients had many of the risk factors for acquiring *Clostridium difficile*. The treatment of *Clostridium difficile* was based on the severity of the infection and consisted of administering one of the three antibiotics: metronidazole, vancomycin, or fidaxomicin (Aberra & Anand, 2014). Although patients

may have had a positive response to these antibiotics, the literature indicated a 13-50% recurrence rate (Zilberberg, Reske, Olsen, Yan, & Dubberke, 2014).

To resolve the issue of recurring *Clostridium difficile*, fecal microbiota transplantation became the treatment of choice. According to Agito, Atreja, and Rizk (2013), fecal microbiota transplantation had a success rate of 92% in treating recurrent *Clostridium difficile*. Aroniadis and Brandt (2013) defined fecal microbiota transplantation as infusing stool from a healthy individual to one who had been diagnosed with gastrointestinal diseases such as *Clostridium difficile*, irritable bowel syndrome, or constipation. The purpose of this treatment was to restore the colonic microflora. Aroniadis and Brandt further explained that after careful screening of the donor, microbiota transplantation may be delivered in one of three ways: (a) enema, (b) orogastric tube, or (c) a pill. Other treatment options consisted of reducing the dose of antacids or proton pump inhibitors and fluid and electrolyte replacement (Aberra & Anand, 2014).

Foodborne Diseases

Medeiros, Chen, Kendall, and Hillers (2004) emphasized the need to assess food-handling behavior because opportunistic infections included foodborne diseases. Lund and O'Brien (2011) identified foodborne diseases such as *Cryptosporidium* and *Giardia* as the most common parasitic infections among transplant patients. Cryptosporidium is considered to be life threatening due to the persistent watery diarrhea, malabsorption, nausea and vomiting, and difficulty in destroying the organism (Lund & O'Brien, 2011). Although *Giardia* is the culprit of bloating and diarrhea, it is more easily treated than

Cryptosporidium by prescribing Metronidazole (Lund & O'Brien, 2011). Both *Cryptosporidium* and *Giardia* are contracted through contaminated water and food, undercooked food, and person-to-person contact (Dreelin, Ives, Molloy, & Rose, 2014).

Other foodborne diseases such as *Listeria monocytogenes* have a low prevalence in the United States. However, the risks of mortality were reported as the highest by the Centers of Disease Control and Prevention (Guentert, Linton, Luchansky, & Cousin, 2005). Because of the possibility of death, Medeiros et al. (2004) strongly recommended that patients avoid foods such as unpasteurized milk, raw/undercooked meat, poultry, and/or seafood containing this pathogen. Also, the routinely prescribed trimethoprim-sulphamethoxazole (TMP-SMZ) to prevent *Pneumocystis jiroveci* pneumonia has also been proven to be effective against *Listeria monocytogens* (Lund & O'Brien, 2011). Despite the low prevalence of this foodborne disease, post-transplant patients are advised to avoid eating ready-to-eat foods (e.g. hot dogs, bologna, and other lunchmeats) because this population's risk of acquiring *Listeria monocytogenes* is 2,500 times higher than the immunocompetent population (Medeiros et al., 2004). Other pathogens of concern include Norovirus, *Shigella* spp., *Escherichia coli* 0157, *Salmonella* spp., *Campylobacter jejuni, Yersinia enerocolitica*, and *Vibrio* spp. (Medeiros et al., 2004).

Steps are taken to educate patients on the importance of food handling to prevent foodborne illnesses. According to Medeiros et al. (2004), patients were less accepting of avoiding fresh soft cheeses, smoked fish, or cold deli-style salads stating they were unfamiliar with the recommendations and that the changes would interfere with their lifestyle. Poor attitudes toward potential foodborne illnesses placed patients at risk for

acquiring life-threatening infections such as *Listeria monocytogenes* and *Cryptosporidium* (Medeiros et al., 2004). Furthermore, Byrd-Bredbenner, Berning, Martin-Biggers, and Quick (2013) indicated that foodborne illnesses contribute $50 to 80 billion annually in health care costs. This implied a need for providing a more effective method of educating patients.

According to Byrd-Brenner et al. (2013), there was a high prevalence of cross contamination in home-prepared foods via microorganisms from one food, object, or surface to another or lack of handwashing. Studies showed that household products such as sponges, dishcloths, cutting boards, and kitchen utensils served as vectors for microorganisms such as *E. coli* (Byrd-Bredbenner et al., 2013). Patient education included the benefits of changing dishcloths and sponges and thoroughly cleaning kitchen utensils and cutting boards to reduce the risk of cross-contamination (Byrd-Bredbenner et al., 2013). Studies also revealed that men younger than 30 or older than 64 who had some postsecondary education and/or did not prepare food often were most likely to inappropriately prepare food (Byrd-Bredbenner et al., 2013). These were indications to improve patient education.

Vaccinations

Vaccination prior to transplantation was also an important factor in reducing the risk of infection (McCool & Burdette, n.d.). Administering vaccines pre-transplant not only provided more options in the type of vaccination administered (activated versus inactivated viruses), but was more effective during the pre-transplant phase (McCool & Burdette, n.d.). For example, after a live virus vaccine, the replication of the virus became

significant and in some cases lasted 4 to 5 weeks (Chow & Golan, 2009). Based on the literature, patients who were not in immediate need for transplantation should have received live vaccines prior to transplantation. This was especially important in patients who had been diagnosed with either end-stage renal disease (ESRD) and/or end-stage liver disease (ESLD). Chow and Golan (2009) indicated the antibody titer response of ESRD and ESLD patients was lower after vaccination when compared to healthy individuals. As a result, health care providers assessed vaccine-induced immunity. Chow and Golan (2009) defined vaccine-induced immunity as a specific immune reaction used to protect against infections and diseases. Depending on the antibody titer response after vaccination, patients were required to receive booster doses (Chow & Golan, 2009).

Timing of vaccinations was also an important factor in preventing infections in this population. For example, high doses of antirejection medications were administered to immediate post-transplant patients placing them at increased risk for infection (Fishman, 2007). Vaccinating patients immediately post-transplant was proven to be not as effective and may have caused infection with possible graft loss and/or death (Chow & Golan, 2009). McCool and Burdette (n.d.)recommended that patients who were not vaccinated prior to transplantation should receive vaccination 3 to 6 months post-transplant. During the 3 to 6 month interval, the doses of anti-rejection medications were reduced to a maintenance level making it safer for patients to receive vaccination (Muntean & Lucan, 2013).

Chesi et al. (2009) revealed vaccination in the solid organ transplant population was underutilized. This was possibly due to the lack of understanding the specifics of

vaccinations on behalf of patients and primary care physicians, fear of vaccines being ineffective, or both (Chesi et al., 2009). Chesi et al. also indicated when patients were well informed regarding the need for vaccination, the number of patients who became vaccinated increased.

General Literature

According to Ortiz et al. (2014), transplantation not only improved the quality of life for patients diagnosed with ESRD and/or ESLD, it was also a life-altering event for both the patient and the family. The level of knowledge patients and families had regarding care post-transplant greatly impacted the outcome of this population (Myers & Pellino, 2009). This required health care workers assessing the learning styles and needs of the patients to provide effective teaching methods (Myers & Pellino, 2009). For example, patients typically received high doses of antirejection medications resulting in suppression of the immune system immediately post-transplant (Fishman, 2007). According to Myers and Pellino (2009), providing adequate patient education would allow patients the opportunity to take precautions to prevent the occurrence of illnesses.

Background Literature

Although antirejection medications have improved, post-transplant patients are still at risk of acquiring infections due to suppression of the immune system. Factors such as dosages of antirejection medications, underlying causes of organ failure, and hospitalization played an active role in increasing the risk of acquiring infections (Green, 2013). Immunosuppression caused common symptoms of infections to be masked making it difficult to diagnose and provide treatment in a timely manner (Green, 2013).

As a result, patients were not only placed at risk of losing the newly transplanted organ, they also faced an increased risk of death (Karuthu & Blumberg, 2012). The distinction between rejection and infection was difficult because both shared many of the same symptoms such as fever, pain at the incision site, and swelling (Karuthu & Blumberg, 2012). Concerns are often raised when patients begin to experience any type of complication post-transplant. Caring for this complex population challenges health care providers to maintain a balance between therapeutic antirejection medications and preventing infections (Jani, 2012).

Theoretical Frameworks

Pender's health promotion model (HPM) was chosen as the theoretical framework for this project. Galloway (2003) described HPM as the overall improvement of well-being including absence of disease. The purpose of this model was to serve as a guide in developing the educational process and materials. Incorporation of patients' frequently asked questions and concerns according to health care providers was necessary during the development of this project. HPM encompasses the patient's individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcomes (Pender, n.d.). HPM requires patients to change their mentality to successfully change their behavior. This typically involves setting goals that are attainable within a specified period to increase the likelihood of having more positive outcomes (Pender, n.d.). *Figure 3* is a depiction of the HPM.

Individual Characteristics And Experiences | Behavior Specific Cognitions and Effects | Behavioral Outcome

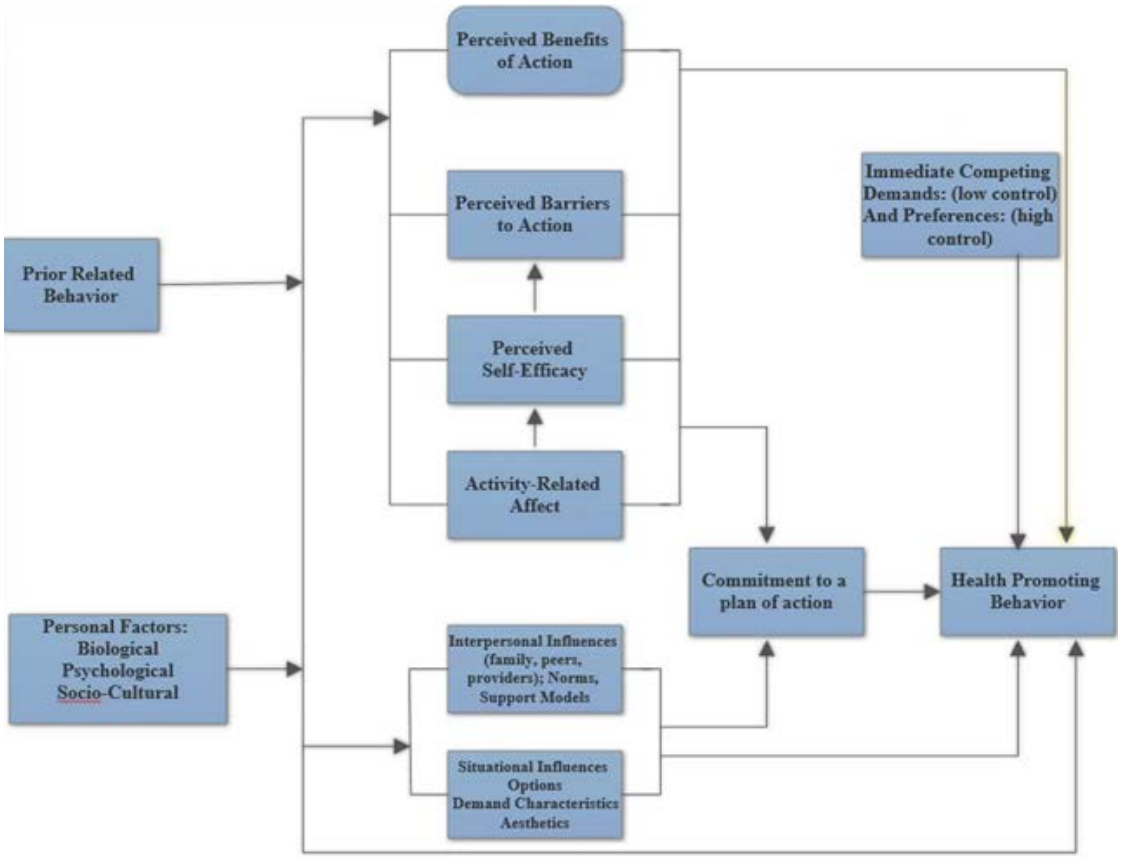

Figure 3. Health promotion model.

Section 3: Methodology

Project Design

The purpose of this quality improvement project was to develop an effective educational process and materials to reduce the risk of post-transplant infections in abdominal organ 1-year post-transplant patients. A project team of experts was established, and I assumed leadership of this project. I collaborated with the team of experts to develop an evidence-based educational process. The experts conducted formative and summative evaluations of the educational process and materials for validation, and a plan was developed for evaluation of the project.

Method

The literature review for evidence-based sources was conducted using online journals and articles. Searches were performed using nursing databases such as CINAHL, Cochrane, Medline, and Proquest. Terms used for the search were *patient education, self-care post-transplant*, *post-transplant complications, post-transplant infections, structured education, health literacy*, *self-care*, and *hospital discharge education.* Twenty-four articles were reviewed that met the following criteria: (a) supported the theoretical framework, (b) involved only adult (18 years or older) abdominal organ post-transplant recipients, and (c) written in English. Eighteen of the 24 articles focused on studies that occurred in the United States. Articles older than 10 years were excluded from the search to ensure updated information was used for this project. Other exclusion criteria included dissertations/theses and published abstracts. Walden University's institutional review

board (IRB) was solicited for approval prior to the development of this project. Walden University's IRB approval number was 12-27-16-0275216.

I met briefly with the abdominal organ transplant unit's administration to discuss the purpose of this project. A list of experts from various disciplines was obtained from the abdominal organ transplant unit's administration to request participation as experts on this project. An email stating the details of the project including the meeting time and location was sent to 14 experts from the list of disciplines inviting them to participate in this project. A consent form containing a detailed explanation of the project, Walden University's IRB number and expiration date, and my contact information was included in the email attachment. Both the email and consent form stated participation was completely voluntary and no form of payment would be offered. Six of the 14 experts attended the initial meeting and signed consent forms to participate in this project. The initial meeting consisted of providing details of the project such as the purpose, goal, expectations, and emphasis on the ability to withdraw from the project at any time without repercussions. Experts were also offered the opportunity to ask questions and voice concerns regarding the project prior to signing consent forms. Signed consent forms were scanned into the targeted transplant center's home drive and emailed to each expert to keep for his or her records.

Experts were asked to email a detailed description of their patient education process to me to be placed in a swim lane chart. Experts were also asked to provide a detailed description of how they were notified of newly abdominal organ transplanted recipients. I placed the experts' notifications of transplanted recipients into a workflow

chart. An email was then sent to the experts to obtain their availability for the upcoming meeting. The purpose of the second meeting was to discuss (a) accuracy of the swim lane chart as it related to their educational process, (b) the workflow chart as it related to the notification of newly transplanted recipients, (c) challenges the experts commonly faced, (d) targeted transplant center's educational policy, and (e) educational material given to patients. Experts responded within a week of receiving the email with their availability and the second meeting was scheduled.

During the second meeting, experts revealed that notifications of newly transplanted recipients were received via emails, phone calls, and text messages. After being admitted to the unit, patients were given a detailed explanation of their plan of care post-transplant. Education pertaining to self-care post-transplant took place after the patient returned to the unit from transplant surgery. According to the targeted transplant center's policy, dietitians had 48 hours to provide education; social workers, post-transplant coordinators, staff nurses, and pharmacists were required to provide education prior to discharge. Experts were also required to document that education had been provided and how well it was received by patients and their support systems.

During this meeting, at least two of the experts admitted that they were sometimes unable to fulfill the patient educational requirements stated in the transplant center's policy. For example, if the patient experienced no complications postoperatively, then the length of stay was approximately three to four days. Depending on the day of transplant, the patient was discharged home during the weekend when there was limited staff available; transplant dietitians, social workers, and post-transplant coordinators worked

Monday through Friday. Therefore, the opportunity to provide patient education was jeopardized. Other factors that prohibited the ability to provide education included the altered mental status of the patient due to medication such as narcotics, lack of social support present, the patient's request to delay the education due to having visitors, and the patient being off the unit. In addition, the time constraints of some experts to complete other job requirements sometimes prevented them from revisiting the patient. Figure 4 illustrates the workflow of the abdominal organ transplant unit. Figure 5 is a swim lane chart demonstrating the educational process of each expert.

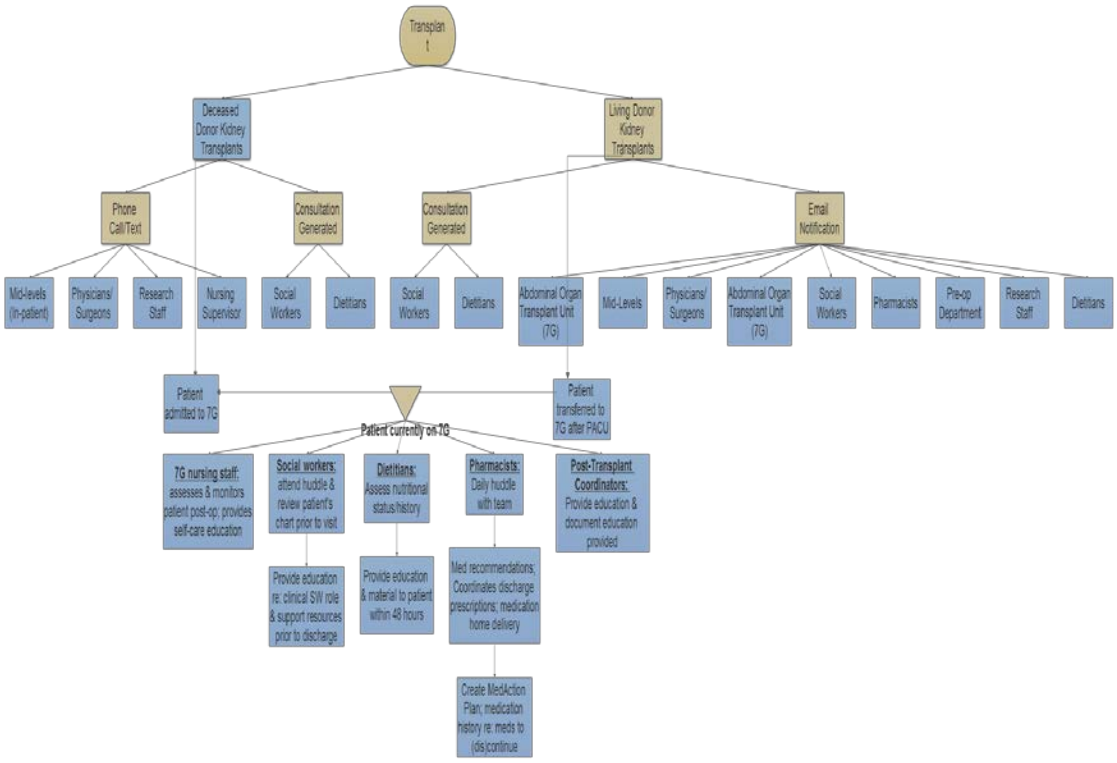

Figure 4. Abdominal organ transplant workflow.

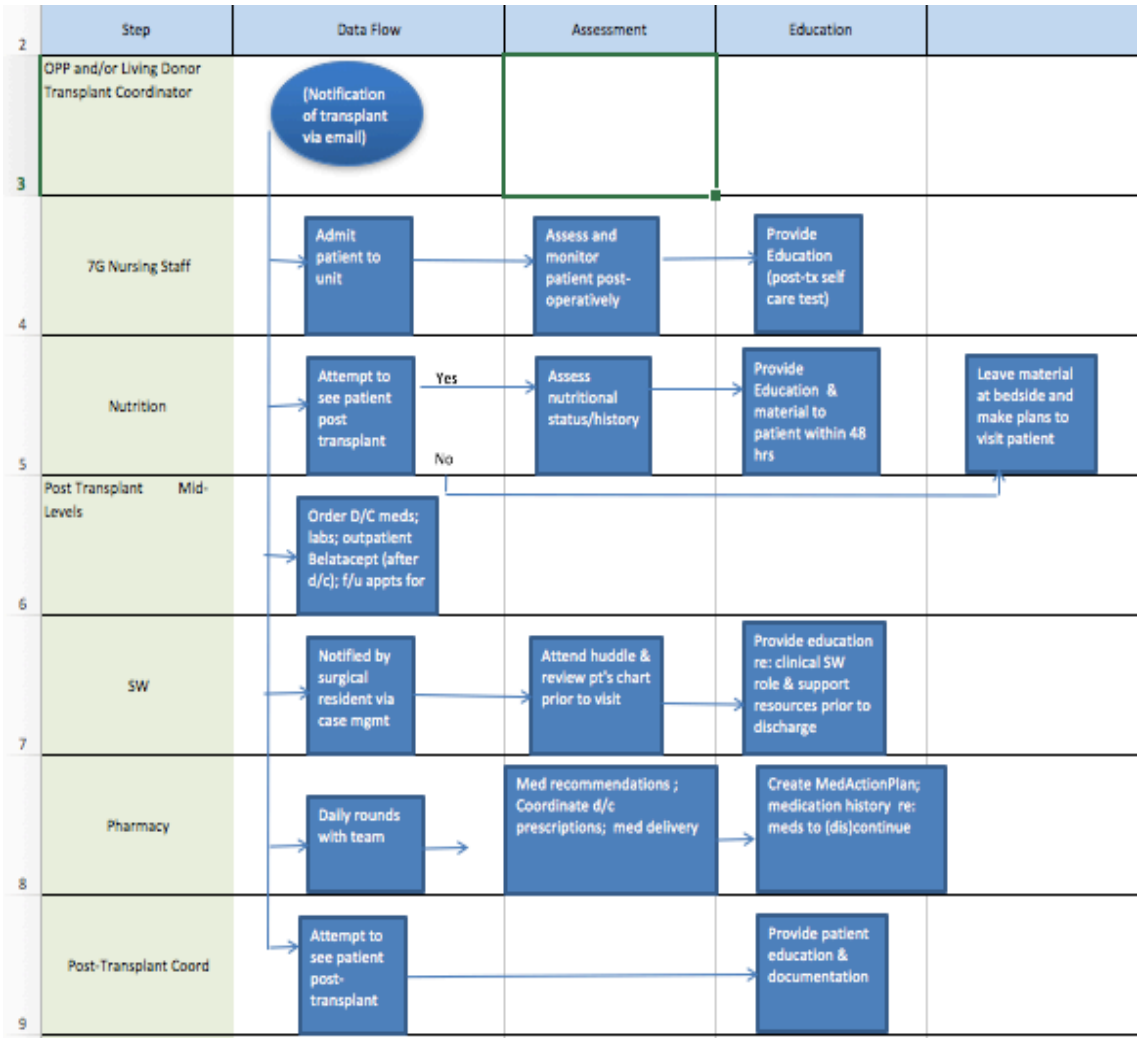

Figure 5. Swim lane chart.

After discussing each expert's educational process and his or her challenges, the experts verbally agreed that there was a need to improve the educational process. The experts felt that a significant number of patients may not have fully understood the education provided due to receiving an overwhelming amount of information in a seemingly rushed environment. MacLeod et al. (2017) revealed that patients who have a lower level of health literacy are more at risk for being noncompliant with medical advice and medication regimen, experiencing hospital readmissions, and having poorer

outcomes. Regarding the educational material given to patients, experts agreed that the material addressed important issues commonly faced by patients; however, experts felt the issue of infection prevention was somewhat lacking. Toward the end of the meeting, experts were asked to think of ideas to improve the educational process and materials to be discussed in the next meeting. Experts were also asked to provide their availability for the next meeting. Upon receiving this information, I sent a meeting invite via Outlook.

The third meeting lasted approximately one hour and focused on ideas to improve the educational process and materials. Several ideas were discussed such as creating an educational video to be shown to patients and their support system, a self-care post-transplant app to be downloaded by patients, a knowledge assessment survey to be completed by patients during hospital admission, and a mandatory self-care post-transplant class attended by patients and their support system. The experts did not agree on creating an educational video. Concerns such as cost, how individuals would be chosen to star in the video, who would be responsible for updating the video, how the video would make patients want to be more engaged in their care, and whether patients and their support systems would have access to the video only during hospital admissions resulted in experts deciding against creating an educational video. Regarding an educational app, the experts agreed that although a self-care post-transplant app would possibly appeal to patients who were technologically savvy, it could potentially be costly to develop and would limit the number of patients who would have access to the app because not all patients had smartphones and/or computers. Furthermore, the overall effectiveness of using an educational app was questionable because it would not promote

communication between the patient and health care provider (Dayer, Heldenbrand, Gubbins, & Martin, 2013). After a very engaged discussion, the experts decided it would be most beneficial to create a mandatory self-care post-transplant class that would be provided twice per week and a knowledge assessment survey that would be given on admission and again at the end of the self-care post-transplant class. Experts also agreed to attempt to meet once weekly until the project was completed.

I created a PowerPoint presentation and a knowledge assessment survey to be used in the mandatory self-care post-transplant class. The knowledge assessment survey consisted of 25 questions pertaining to antirejection medications, infections, diet, and follow-up appointments. According to Gallagher et al. (2013), the combination of administering a pretest to identify baseline knowledge and providing sufficient education increased the possibility of improved results on the posttest. Information used in the PowerPoint presentation and knowledge assessment survey in the current project was based on the literature review. Lean methodology was used to develop the educational process. According to Bledsoe et al. (2013), lean methodology was proven to effectively reduce financial expenses while improving the quality of care delivered. I created a process for the mandatory self-care post-transplant class. The process required patients to attend one of the self-care post-transplant classes scheduled to occur at the beginning and end of each week to capture all new abdominal organ transplant patients. Each class would last 2 hours and would take place in the abdominal organ transplant unit's conference room. This would allow all disciplines to become more compliant with the targeted transplant center's patient education policy, would reduce the amount of time

spent locating patients to provide education, and would provide opportunity for the patient and his or her support system to become more engaged in learning about post-transplant care. The PowerPoint presentation, knowledge assessment survey, and self-care post-transplant educational process were emailed to the experts for review and were also discussed in the next meeting. Experts were asked to rate the relevancy of each question of the knowledge assessment survey and to place their responses in the designated envelope on the abdominal organ transplant unit. In response to the experts' request, the health promotion model (HPM) was included in the email to ensure that the foundation of the model was used in the knowledge assessment survey. Experts were asked to provide their availability for the upcoming meeting. Upon receiving this information, I sent a meeting invite via Outlook.

The experts were asked and agreed to attend two more meetings in which the HPM, educational materials, knowledge assessment survey, and self-care post-transplant educational process were discussed. Each meeting lasted approximately one hour. Because the HPM focused on the overall well-being of the patient, it was imperative that the PowerPoint presentation, knowledge assessment survey, and self-care post-transplant educational process be created on the foundation of this model. Experts' recommendations to improve the educational materials, knowledge assessment survey, and self-care post-transplant educational process were addressed. Each revision as recommended by the experts was emailed to the experts for review. The last meeting involved presenting the completed PowerPoint presentation, knowledge assessment

survey, and self-care post-transplant educational process after final feedback from the experts had been received.

Population & Sampling

The population consisted of an expert panel of (a) 1 clinical nurse specialist, (b) 1 nurse educator, (c) 1 nurse scholar, (d) 1 social worker, and (e) 2 staff nurses. The years of experience of the expert panel ranged from 5 to 30 years. Three members of the expert panel possessed 4- year degrees while the remaining 3 possessed a Master's degree. An email invitation was sent to the expert panel explaining the details of the project such as the purpose, goals, and expectations. The email also explained that although no form of payment would be provided, their expertise in improving the educational process and material could positively impact patient outcomes. The email also contained the IRB number and expiration date and my contact information in the event experts had questions and/or concerns. Emphasis was placed on the ability to withdraw from the project at any time without repercussions.

Data Collection

Experts were asked to conduct a formative and summative evaluation of the knowledge assessment survey, PowerPoint presentation, and self-care post-transplant educational process that I created. Meetings were held to discuss clarification of the experts' recommendations and the materials and process I created. The formative evaluation was executed by emailing the knowledge assessment survey, PowerPoint presentation, and self-care post-transplant educational process to the experts for review. Two versions of the knowledge assessment survey were emailed: (a) survey to be given

to patients in the future that contained multiple-choice answers and (b) survey asking experts to rate the relevancy of each question. These surveys were emailed to the experts with the expectation that their responses would be received within 1 week. A copy of the knowledge assessment surveys has been included in Appendices A and B respectively.

Five of the 6 experts returned completed formative evaluations of the knowledge assessment surveys, PowerPoint presentation, and self-care post-transplant educational process within 1 week. A meeting was then scheduled with the experts to further discuss the evaluations. Only the 5 experts who completed the formative evaluation attended the meeting. Data was collected during the meeting in the form of directed interviews with the 5 experts. Detailed notes of the discussions were taken in the event the experts deemed revisions necessary. After the meeting, the experts' recommendations were applied and the revised items were emailed to the experts to perform a summative evaluation. Feedback from the experts was received within 1week. A follow-up meeting to discuss the summative evaluation of the knowledge assessment survey, PowerPoint presentation, and self-care post-transplant educational process that I created was conducted. Data was again collected in the form of directed interviews and detailed notes of the discussion were taken. A copy of the directed interview questions has been included in Appendix C.

Instrument

The knowledge assessment survey was created based on the literature review. The survey consisted of 25 questions related to (a) antirejection medications, (b) infections, and (c) diet and follow-up appointments. This survey was emailed to experts

to perform a formative evaluation by rating the relevancy of each question. Within 1 week I had received the completed evaluations from 5 of the 6 experts. A follow-up meeting was held to conduct directed interviews with the experts. The purpose of this meeting was to obtain (a) clarification of the completed evaluations and (b) more detailed feedback regarding the knowledge assessment survey, PowerPoint presentation, and self-care post-transplant educational process. The directed interviewing of this team of experts lasted approximately 1 hour. The directed interview questions have been included in Appendix C.

Data Analysis

The data collected was entered into the Statistical Package for the Social Sciences database (SPSS) for organization. According to Polit (2010), the SPSS is the statistical software of choice for many nurse researchers. In addition, the organization of this data was instrumental in assessing the need to improve the educational material given to patients and families. Per Shoemaker, Wolf, and Brach (2014) poor health literacy has been linked to decreased utilization of health care and undesirable outcomes.

Project Evaluation

Finalization of the educational materials and process was drafted once approval was received from the team of experts. Determining the relevancy and quality of the knowledge assessment survey, PowerPoint presentation, and self-care post-transplant educational process were critical factors throughout the evaluation process. Overall approval was achieved by conducting directed interviews with the team of experts and revising the items stated above per the experts' recommendations. The experts' approval

of the knowledge assessment survey, PowerPoint presentation, and self-care post-transplant educational process was also based on the foundations of the health promotion model.

Summary

The development of an improved educational process and materials enhanced healthcare providers' perceptions of providing adequate patient education. The involvement of the experts aiding in the development of the process and material also created a sense of ownership and enthusiasm for implementation. Both the team of experts and I agreed that the ultimate goal was to reduce patients' risk of acquiring infections post-transplant by ensuring the educational tools and process were adequate. This section addressed the steps taken to develop, implement, and evaluate this quality improvement project. Section 4 provides an overview of the findings and recommendations.

Section 4: Findings and Recommendations

Abdominal organ post-transplant patients are at an increased risk of acquiring infections due to anti-rejection medications. Although the targeted transplant center made a strong effort to provide education to both patients and their support systems, a significant number of up to 1 year post-transplant patients were still being diagnosed with infections. A needs assessment of the targeted transplant center's current educational materials and process was performed and revealed limited information pertaining to infections as well as a fallible patient education process. This project demonstrated the benefits of using the developed educational materials and process.

Findings and Implications

Experts were emailed a copy of the knowledge assessment survey to conduct a formative evaluation. The survey was completed by 5 of the 6 team members and returned to me within 1 week of completion. All of the surveys were correctly completed and were used in the analysis. There were three responses: not useful, useful, and essential. For each question the experts were asked to pick the response that they deemed was in line with their perspectives.

The experts were asked the relevance of the primary uses of Prograf (Tacrolimus), Cellcept (Mycophenolate Mofetil), and Prednisone, and all of them said they were essential in the process of transplant. The follow-up question concerning antirejection medications was in regards to educating patients on the significance of obtaining therapeutic drug levels. In the provided list, 80% of the experts said it was essential to include this question while 20% said that it was only useful. Nausea and vomiting can

happen when a patient is taking medicine. In this regard, all of the experts who took part said that it was essential to educate patients on what to do in the event they experience nausea and vomiting. In a similar trend, those who took part agreed that it was essential for patients to consult the transplant team prior to taking any new over-the counter (OTC) medication or new prescription not ordered by the transplant team.

Most of those who took part said that it was essential that when taking Prograf (Tacrolimus) or Gengraf (Cyclosporine), patients should not eat foods that may interact with antirejection immunosuppressant medications. Only 40% said that it was useful that when taking Prograf (Tacrolimus) or Gengraf (Cyclosporine), patients should not eat foods that may interact with antirejection immunosuppressant medications. All of those who took part in the formative evaluation said that it was essential that when patients miss a dose of their immunosuppressant medications they should seek medical advice on how to remedy the situation. Most (60%) who participated agreed that it was essential patients should keep in mind some aspects when taking medication. Only 40% said it was only useful to remember necessary information when taking medications. Notably there was no expert who said it was not useful to remember the necessary information when taking medication. Table 1 shows participant response regarding medications.

Table 1

Medications

	Not Useful	Use-ful	Essen-tial
Prograf (Tacrolimus), Cellcept (Mycophenolate Mofetil), and Prednisone are used to:	0%	0%	100%
Should wait to take which of the following medication(s) until blood is drawn	0%	20%	80%
Start to vomit and cannot keep my medication down, what do I do	0%	0%	100%
Before I take any new OTC medication or new prescription not ordered I should	0%	0%	100%
Should not eat the following foods which may interact with my medications	0%	40%	60%
If I miss a dose of my immunosuppressant medications, I should	0%	0%	100%
I should call the refill line to renew my prescription	0%	0%	100%
Should remember the following about taking my medications	0%	40%	60%

Most (60%) participants who took part believed it was useful that patients need to bring the listed items with them to their follow-up clinic appointments. Only 40% said that it was essential patients needed to bring the listed items with them to their follow-up clinic appointments. There was no expert who said that it was not useful to bring the listed items with them to their follow-up clinic appointments. In some cases, after transplant, patients acquire infections that could have been prevented. In this regard, I sought to capture the experts' opinions on whether the question addressed this issue. Most (60%) of those who took part agreed that it was essential to include the question pertaining to infection prevention followed by 40% who believed the question was useful. There was no expert who disagreed with this question. In some cases, post-transplant patients have acquired a fever. When asked what patients should do when they develop a fever, 80% of participants said that it was essential they seek medical attention

while 20% said it was useful to seek medical attention when they have a fever during the week of transplant.

I also sought to capture the experts' opinions of the question concerning patients' knowledge on symptoms that can cause infections. Most (80%) said it was essential to identify symptoms that can cause an infection. Only 20% said it was useful to recognize symptoms that point out an infection might be taking place. There was no expert who said it was not important to identify symptoms that can cause infections. In case of having flu, 60% of experts said it was useful to include the question of influenza vaccination while 40% believed it was essential to include this question. There was no expert who said that there was no need to include questions pertaining to the influenza vaccine. Regarding immunization, 60% of the experts said it was useful to follow the outlined guidelines while 40% said it was essential. It is vital to have a strong immune system after transplant that will help the body fight infections. In this regard, 80% of participants said that it was essential for patients to act accordingly to ensure that they guard their immune system to help them manage infections. Most of those who took part said that it was essential for patients to seek medical attention when they suspect that they have a sexually transmitted disease. In the same vein, 20% said it was useful to seek medical attention when they suspect that they have sexually transmitted diseases. There was no expert who said it was not useful for patients to seek medical attention when they think that they might be infected with a sexually transmitted disease. Table 2 show results regarding infection prevention.

Table 2

Infection Prevention

	Not Useful	Use-ful	Essen-tial
Bring the following items with me to my follow-up clinic appointments	0.00%	60%	40%
Many infections can be prevented by	0.00%	40%	60%
Develop a fever of 100 degrees F or greater during the week, what should I do	0.00%	20%	80%
Following symptoms might mean I have an infection	0.00%	20%	80%
I should get a flu shot	0.00%	60%	40%
When getting immunization shots, I should not	0.00%	60%	40%
If I suspect that I have a sexually transmitted disease I should	0.00%	20%	80%
I should not do the following after transplant because of my low immune system	0.00%	20%	80%

It is common to have pain after undergoing a transplant. In this regard, it was important to know how the team of experts rated the relevancy of including pain as one of the questions. Most believed it was useful that when patients had a headache or minor pain they could obtain some OTC medication. Only 40% believed it was essential to acquire some OTC medication to manage a minor headache or pain. There was no expert who said it was not useful to take OTC medicine to treat pain or a headache. The results showed that most (80%) of experts believed it was essential for patients to know what to do to minimize the risk of rejection while only 20% said it was useful to know how to minimize rejection. Most (60%) of those who took part believed it was essential to follow the recommendations from medical practitioners immediately after leaving the hospital. In addition, 40% agreed that it was useful for someone who had undergone a transplant to follow medical recommendations after leaving the hospital. There was no expert who

said that it was not essential or useful to adhere to stipulated recommendations upon leaving the hospital.

Experts were also asked to evaluate the relevance of asking patients how they could prevent or minimize the risk of skin cancer after undergoing transplant. In this regard, 80% of experts believed it was essential to ask this question while 20% thought the question was useful. In regard to sexual activity, 60% of experts felt that it was essential to include this question while 40% found it useful. Patients do not always observe clinic appointments; therefore, 80% of experts felt that it was essential to inform patients of the appropriate process to cancel appointments.

All of the experts said that it was essential to follow medical recommendations in case of an emergency such as shortness of breath, chest pain, or excessive bleeding. Diet is an essential component of healing post-transplant. Most (60%) experts believed it was useful to adhere to medical suggestions on what to eat and what to avoid. Only 40% said that it was essential that a patient observes medical suggestions on what to eat and what to avoid. Most of the experts believed it was essential to identify the important information regarding antirejection medications for someone who had undergone a transplant. Table 3 shows the results regarding follow-up care.

Table 3

Follow-up Care

	Not Useful	Use-ful	Essen-tial
If I have a headache or minor pain, I can take the following over the counter (OTC) medication	0.00%	60%	40%
What can I do to help prevent rejection	0.00%	20%	80%
Which of the following are okay to do immediately after I leave the hospital	0.00%	40%	60%
Okay to do immediately after I leave the hospital reduce my chances of getting skin cancer	0.00%	20%	80%
I may return to sexual activity after my transplant. When I am sexually active, I must remember to	0.00%	40%	60%
I can't keep a clinic appointment because I don't feel well, I should	0.00%	20%	80%
What do I do in an emergency such as shortness of breath, chest pain, or excessive bleeding	0.00%	0%	100%
Which of the following are diet recommendations post-transplant	0.00%	60%	40%
When I receive a kidney transplant taking a medication which of the following are important to know	0.00%	20%	80%

The findings showed that in all the questions asked there were no responses of "not useful." This is an indication that the knowledge assessment survey was perceived to be a valuable tool in educating patients. This was also affirmed by the fact that in most questions most of the experts believed it was essential as opposed to being just useful. It is common practice for the medical practitioner to discuss with patients and inform them of how to handle their bodies to prevent infections and what to eat, among other recommendations. Participants believed that the questions of the knowledge assessment survey adequately addressed the issues of emergencies post-transplant. This is important because someone who has received an organ is at more risk of infections and other health concerns.

The formative evaluation also included a review of the PowerPoint presentation as well as the self-care post-transplant educational process. I conducted a directed

interview with the team of experts in which I took detailed notes of the experts' responses. Experts agreed that the PowerPoint presentation addressed questions patients frequently ask in a language that is comprehensible yet not insulting. The experts also agreed that the design of the PowerPoint presentation allowed those teaching it to incorporate teach-back methods. The ability to combine the PowerPoint presentation and teach-back method was an essential factor in determining how effective the information could be conveyed to the patients and their support system. Participants also deemed this an opportunity to serve as an ongoing evaluation of the presentation. The only recommendation made by the experts was to include information concerning diet post-transplant.

The self-care post-transplant educational process also received positive feedback from the experts' formative evaluation. The experts believed that having a scheduled educational class twice per week was more effective in ensuring education was provided to all patients as well as their support system. According to the experts, the developed process allowed disciplines to have a greater probability of being in compliance with the targeted transplant center's policy as well as CMS guidelines. Additionally, experts reported having a scheduled class twice per week would not only provide more structure to the system, but would also increase the probability of improved patient satisfaction. The only recommendation made by the experts was to include a checklist for patients to track each speaker.

Revisions were made to the PowerPoint presentation and a checklist was created as recommended by the team of experts. The revised PowerPoint presentation and

checklist were emailed to the experts for review and a meeting was scheduled to conduct a summative evaluation of all items (PowerPoint presentation, checklist, self-care post-transplant educational process, and knowledge assessment survey). The meeting was conducted in the form of directed interviewing. All experts agreed that no further changes were needed and that I was approved to finalize all items created. Statements from the experts during the formative and summative evaluations have been included in Appendix D. Final versions of the PowerPoint presentation, nutrition packet, educational checklist, and self-care post-transplant education class schedule have been included in Appendices E, F, G, and H respectively.

Project Strengths and Limitations

This project contained several strengths. Experts came from various medical backgrounds and had been required to provide some form of education to the patients regarding post-transplant self-care. The experts' experience in transplant afforded them the ability to use their expertise in helping to develop this project. This involved addressing questions and concerns patients routinely have concerning post-transplant care. Other strengths of this project included the promotion of multidisciplinary planning in regard to providing effective patient education, opportunity to display unison of the various disciplines, and a sense of ownership among the team of experts. Limitations of this project were the inability to address the process of educating nonEnglish speaking patients and evaluating the long-term effectiveness of this project due to the project's time constraints.

Section 5: Dissemination Plan

The targeted facility has a nursing research council (NRC) that meets once a month. All members of the NRC are doctorally prepared and provide opportunities for staff and students to discuss upcoming and current projects. In addition to presenting this project to the NRC, I will present the project at the targeted transplant center's quality improvement meeting that convenes quarterly. This meeting consists of administration, physicians, surgeons, transplant coordinators, staff nurses, and social workers. The purpose of this meeting is to discuss quality improvement initiatives that will improve the overall success of the program.

Analysis of Self

This project was a great learning experience personally and professionally. For example, it allowed me to grow as a leader by accepting constructive criticism, being more open-minded to alternative practices, and remaining unbiased throughout the project. I quickly realized by allowing others to verbalize their ideas of improved methods and materials, experts gained more respect and excitement for the project. I also strongly believed that as a leader it was critical for me to say "thank you" after every meeting because participation was voluntary. As a result of this project, I feel more confident in designing, implementing, and evaluating projects. My ability to apply what I have learned through relevant findings as well as using a theoretical framework as a guide has been greatly enhanced. Lastly, as a first time project developer, I feel as though I did a great job and look forward to taking on more quality improvement projects.

Summary

After conducting a thorough evaluation of the developed educational process and materials, the experts agreed that this project allowed disciplines more opportunities to educate patients prior to hospital discharge. Experts also believed that the proposed process and materials addressed questions that had been frequently asked by patients and their support systems. Consistency and standardization in providing self-care post-transplant education afforded health care providers the ability to maintain compliance with CMS and the targeted transplant center's educational policy. Lastly, experts agreed that implementation of the developed educational process and materials may play a significant role in patient satisfaction.

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Appendix A

Knowledge Assessment Survey

Post-Kidney/Pancreas/Transplant Assessment

1. **Prograf (Tacrolimus), Cellcept (Mycophenolate Mofetil), and Prednisone are primarily used to:**
    a. Prevent rejection
    b. Prevent infection
    c. Prevent weight gain
    d. Prevent high blood pressure
2. **I should wait to take which of the following medication(s) until after my blood is drawn:**
    a. Prograf (tacrolimus) or Gengraf (Cyclosporine)
    b. Bactrim (Sulfamethoxazole/Trimethoprim)
    c. Prednisone
    d. Blood pressure medication
3. **If I start to vomit and cannot keep my medication down, what do I do?**
    a. Wait until I am better and take a double dose of medication to catch up
    b. Call my primary care physician (PCP) and request for an appointment next week
    c. Do nothing, missing a dose won't hurt
    d. Call the post-transplant nurse coordinator or the on-call transplant physician team member for instructions

e. None of the above

4. **Before I take any new over-the counter (OTC) medication or new prescription not ordered by the transplant team, I should:**
    a. Start taking the new medication right away
    b. Call the post-transplant nurse coordinator for advice
    c. Go to the emergency room (ER)
    d. Have labs drawn
    e. None of the above
5. **If I am taking Prograf (Tacrolimus) or Gengraf (Cyclosporine) I should not eat the following foods which may interact with my anti-rejection immunosuppressant medications):**
    a. Pineapple
    b. Grapes
    c. Grapefruit, pomegranate
    d. Apples, oranges
6. **If I miss a dose of my immunosuppressant medications, I should…**
    a. Call the transplant physician team member immediately
    b. Take the missed dose and an extra dose right away
    c. Take the next dose at the next scheduled time
    d. If it is within 4 hours of my scheduled time to take the medication, take it as soon as I remember. If it is more than 4 hours from my scheduled time, skip the dose, and take the next dose at the usual scheduled time.

7. **If I have run out of refills on my prescription, I should call the refill line to renew my prescription ____ days before I am out of medication.**
    - **a.** 1 day before I am out of medication
    - **b.** 2 days before I am out of medication
    - **c.** 3 days before I am out of medication
    - **d.** A week or more before I am out of medication
8. **I should remember the following about taking my medications:**
    a. I will need to take medications the rest of my life
    b. Check with my post-transplant nurse coordinator before taking any new medication on my own
    c. Do not change my medications
    d. Take my medications at the same time, each and every day
    e. All of the above
9. **I need to bring the following items with me to my follow up clinic appointments:**
    a. A record of my daily blood pressure, temperature, and weight
    b. A list of current medications and/or your picture medication card (MedActionPlan)
    c. My updated contact telephone numbers, health insurance cards, and primary care provider (PCP) number
    d. A record of my daily blood sugar readings if I currently have to measure them

e. All of the above

10. Many infections can be prevented by:

a. Avoiding people who are sick

b. Washing hands frequently

c. Not sharing eating utensils, drinks, or toothbrushes with others

d. All of the above

11. If I develop a fever of 100 degrees F or greater during the week, what should I do?

a. Wait until my next scheduled clinic visit and tell my coordinator

b. Call the post-transplant coordinator contact line and talk directly to the post-transplant nurse coordinator during business hours or call the physician consultation and after hours/weekend line and talk to a physician team member (phone: 404-778-5000)

c. Call the coordinator contact line on Saturday and leave a message

d. Go to see my PCP (primary care physician) within the next two weeks

12. The following symptoms might mean I have an infection:

a. Flu-like symptoms (tired, weak, upset stomach, cough, generally not feeling well, body aches)

b. Redness and swelling around the site of where my skin was cut

c. Fever

d. Diarrhea

e. All of the above or some of the above may be present with an infection

13. I should get a flu shot:

a. Every year

b. Once every five years

c. Never

14. When getting immunization shots, I should not:

a. Have any immunizations for the first three months

b. Have a live virus vaccine

c. Allow my household contacts (siblings and/or children) to receive the oral polio vaccine or smallpox vaccine

d. All of the above

15. If I suspect that I have a sexually transmitted disease I should:

a. Tell my coordinator and/or doctor immediately

b. Wait until my next clinic visit to tell my doctor

c. Wait until symptoms get worst before I tell my doctor

d. Do not tell anyone

16. I should not do the following after transplant because of my low immune system:

a. Change the cat litter

b. Be exposed to bird droppings

c. Both A & B

d. It is ok to do A & B

17. If I have a headache or minor pain, I can take the following over the counter (OTC) medication(s):

a. Advil (Ibuprofen) or Aleve (Naproxen)

b. Acetaminophen (Tylenol or Tylenol ES) not to exceed 2000mg in 24 hours

c. Aspirin

d. I may not take anything over the counter for pain

18. What can I do to help prevent rejection?

a. Go to all clinic appointments as scheduled

b. Have my labs drawn as scheduled

c. Take all of my medications as prescribed

d. All of the above

19. Which of the following are okay to do immediately after I leave the hospital?

a. Walking

b. Doing activities which causes pain or pulling across my incision or back

c. Playing football. soccer, or other contact sports

d. Swimming in the ocean or sitting in a bath tub

e. Lifting items greater than 10 pounds

20. Now that I had my transplant I am at increased risk for skin cancer. I can reduce my chances of getting skin cancer by wearing sunscreen (SPF 30 or higher) during the following times:

a. Only during summer months

b. Only if I have been sunburned in the past

c. Whenever I go outside

d. Never

21. I may return to sexual activity after my transplant. When I am sexually active, I must remember to:

a. Only begin sexual activity once I feel ready

b. Use barrier forms (for example: condoms and foam) of birth control since some of my medications can make birth control less effective

c. Use condoms to help decrease the risk of sexually transmitted diseases (STDs)

d. All of the above

22. When I can't keep a clinic appointment because I don't feel well, I should

a. Call the outpatient transplant clinic as soon as possible to cancel or reschedule

b. Call the medication refill line

c. Call the post-transplant nurse coordinator contact line

d. Do nothing and hope no one will notice

23. What do I do in an emergency such as shortness of breath, chest pain, or excessive bleeding?

a. Call the physician team member on call

b. Call the post-transplant nurse coordinator

c. Call 911 and/or go to the closest emergency room (ER)

d. Drive to Emory University Hospital

24. Which of the following are diet recommendations post-transplant?

a. Drink of plenty of fluids, unless told to restrict fluids. Water is best.

b. Wash fresh fruits and vegetables thoroughly before eating

c. Do not eat raw seafood (fish or shellfish)

d. All of the above

25. If I received a kidney transplant and am taking a medication called Belatacept, which of the following are important to know?

a. Report changes in mood or behavior, memory function, walking, talking, vision or strength to my doctor immediately

b. I will have to receive Belatacept treatment as an infusion

c. Ask my doctor before taking any new medications or receiving any vaccines

d. All of the above

Appendix B

Formative Evaluation of the Knowledge Assessment Survey

Please rate the relevance of each question using the scale below and email completed forms to Erica.henderson@emoryhealthcare.org.

Post-Kidney/Pancreas/Transplant Assessment

1. **Prograf (Tacrolimus), Cellcept (Mycophenolate Mofetil), and Prednisone are primarily used to:**

   (0) Not useful (1) Useful (3) Essential

2. **I should wait to take which of the following medication(s) until after my blood is drawn:**

   (0) Not useful (1) Useful (3) Essential

3. **If I start to vomit and cannot keep my medication down, what do I do?**

   (0) Not useful (1) Useful (3) Essential

4. **Before I take any new over-the counter (OTC) medication or new prescription not ordered by the transplant team, I should:**

   (0) Not useful (1) Useful (3) Essential

5. **If I am taking Prograf (Tacrolimus) or Gengraf (Cyclosporine) I should not eat the following foods which may interact with my anti-rejection immunosuppressant medications):**

   (0) Not useful (1) Useful (3) Essential

6. **If I miss a dose of my immunosuppressant medications, I should…**

(0) Not useful (1) Useful (3) Essential

7. **If I have run out of refills on my prescription, I should call the refill line to renew my prescription ____ days before I am out of medication.**

   (0) Not useful (1) Useful (3) Essential

8. **I should remember the following about taking my medications:**

   (0) Not useful (1) Useful (3) Essential

9. **I need to bring the following items with me to my follow up clinic appointments:**

   (0) Not useful (1) Useful (3) Essential

10. **Many infections can be prevented by:**

    (0) Not useful (1) Useful (3) Essential

11. **If I develop a fever of 100 degrees F or greater during the week, what should I do?**

    (0) Not useful (1) Useful (3) Essential

12. **The following symptoms might mean I have an infection:**

    (0) Not useful (1) Useful (3) Essential

13. **I should get a flu shot:**

    (0) Not useful (1) Useful (3) Essential

14. **When getting immunization shots, I should not:**

    (0) Not useful (1) Useful (3) Essential

15. **If I suspect that I have a sexually transmitted disease I should:**

    (0) Not useful (1) Useful (3) Essential

16. I should not do the following after transplant because of my low immune system:

(0) Not useful (1) Useful (3) Essential

17. If I have a headache or minor pain, I can take the following over the counter (OTC) medication(s):

(0) Not useful (1) Useful (3) Essential

18. What can I do to help prevent rejection?

(0) Not useful (1) Useful (3) Essential

19. Which of the following are okay to do immediately after I leave the hospital?

(0) Not useful (1) Useful (3) Essential

20. Now that I had my transplant I am at increased risk for skin cancer. I can reduce my chances of getting skin cancer by wearing sunscreen (SPF 30 or higher) during the following times:

(0) Not useful (1) Useful (3) Essential

21. I may return to sexual activity after my transplant. When I am sexually active, I must remember to:

(0) Not useful (1) Useful (3) Essential

22. When I can't keep a clinic appointment because I don't feel well, I should

(0) Not useful (1) Useful (3) Essential

23. What do I do in an emergency such as shortness of breath, chest pain, or excessive bleeding?

(0) Not useful (1) Useful (3) Essential

24. Which of the following are diet recommendations post-transplant?

(0) Not useful (1) Useful (3) Essential

25. If I received a kidney transplant and am taking a medication called Belatacept, which of the following are important to know?

(0) Not useful (1) Useful (3) Essential

Appendix C

Directed Interview Questions

Formative evaluation:

1. Is the overall knowledge assessment survey conducive in providing adequate patient education?
2. Does the knowledge assessment survey address issues such as infection prevention?
3. Are there any questions that should be worded differently? If so, which question(s) and why?
4. How should the question(s) be worded?
5. Are there any question(s) that should be eliminated? If so, which question(s) and why?
6. Is the PowerPoint presentation conducive in providing adequate patient education?
7. Does the PowerPoint presentation promote patient engagement?
8. Are there any slides that need to be changed? If so, why?
9. What changes should be made?
10. Are there any slides that should be eliminated? If so, why?
11. Does the developed self-care post-transplant educational process promote staff compliance with the transplant center's patient educational policy?
12. Are there any recommendations to change the self-care post-transplant educational process? If so, why and what changes do you recommend?

13. Do the items created by the DNP student (knowledge assessment survey, PowerPoint presentation, and self-care post-transplant educational process) reflect the foundations of the Health Promotion Model? If not, what should be changed to reflect this model?

Summative evaluation:

1. Were the recommendations appropriately captured? If not, what changes should be made?
2. Do the changes promote patient education? If not, what changes should be made?
3. Do the recommended changes appropriately address infection prevention? If not, what changes should be made?
4. Do the revised items created by the DNP student appropriately reflect the foundations of the Health Promotion Model?
5. If there are no recommendations, is it appropriate to finalize the patient educational material and process created by the DNP student?

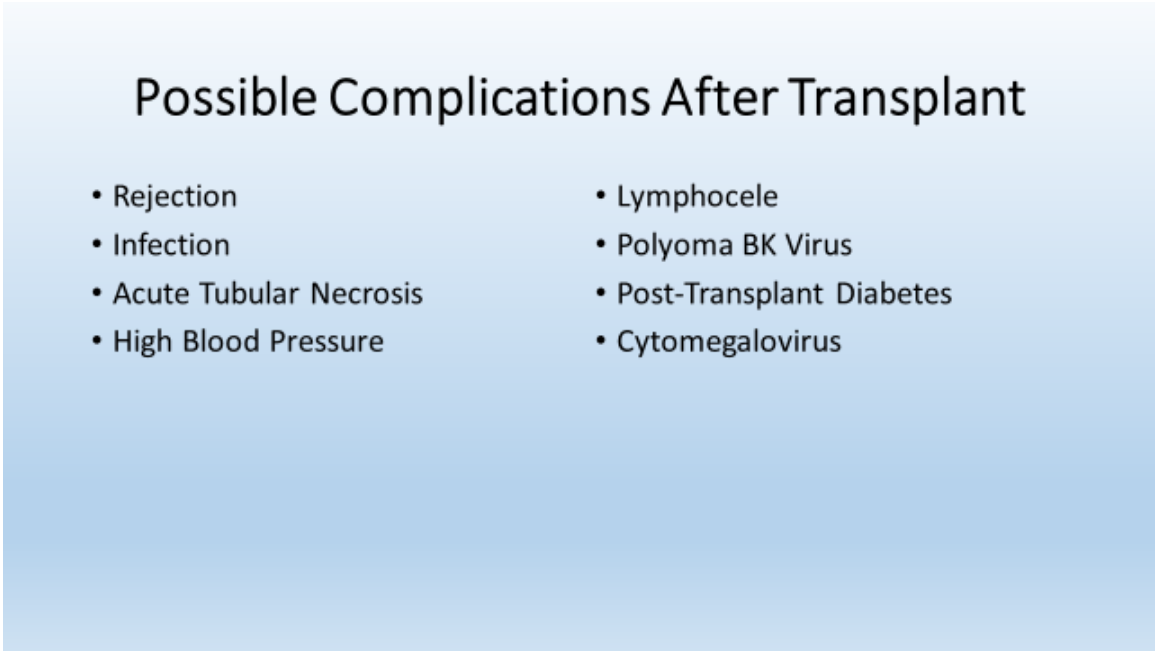
Appendix D

Experts' Statements

Formative Evaluation	Summative Evaluation
"The questions on the knowledge assessment survey are in plain easy to understand language for the patients."	"Since the revisions have been made, I don't see a reason to make any further changes."
"The PowerPoint presentation's format is ideal for implementing teach-back for all speakers to use while teaching."	"In my opinion it's ok to finalize all of the documents."
"I would like to see more information pertaining to diet post-transplant since a large number of our patients seem to struggle with this."	"I don't see a need to make any changes at this point."
Is it possible to include a checklist for the patients to keep track of the speakers?"	"I agree no need to make any changes."
"I like the idea of having a mandatory class offered twice a week for the patients. It's really challenging when you're trying to educate the patients and they're either not in the room or just doesn't want to be bothered and you have to make an attempt to re-visit the patient."	I agree with the group, no changes necessary. I think we should move forward."
"I think using the teach-back method during the class may help promote patient engagement."	
"I think the PowerPoint presentation and the knowledge assessment survey reflect the foundations of the Health Promotion Model appropriately."	

Appendix E

Self-Care Post-Transplant Education PowerPoint Presentations



Anti-Rejection/Immunosuppressant Medications

- Suppress or "weaken" your immune system to prevent rejection
- Will have to take medication for as long as you have transplanted organ
- Your doctor will prescribe which anti-rejection medication is best for you
- Different anti-rejection medications work in different ways
- Dosages of anti-rejection medications will reduce over time
- Overall risks of taking anti-rejection medications

Immunosuppressants to Prevent Rejection

- Belatacept
- Tacrolimus (Prograf)
- Cyclosporin (Neoral, Genfraf, Sandimmune)
- Mycophenolate Mofetil (Cellcept or Myfortic)
- Azathioprine (Imuran)
- Everlimus (Zortress)
- Prednisone

Immunosuppressants at the time of transplant

- Methylprednisolone (Solu-Medrol)
- Basiliximab (Simulect)
- Anti-thymocyte Globulin (Thymoglobulin)

Medications

Medications and Bacterial Infections

- Sulfamethoxazole/trimethoprim (SMZ/TMP, Bactrim, or Septra)
- Atovaquone (Mepron)
- Dapsone (Aczone)

Medications and Viral Infections

- Valganciclovir (Valcyte)
- Valacyclovir (Valtrex)

Other Medications

- Stomach acid reducing medications
- Constipation medications
- Pain medications
- Blood Pressure medications
- Supplements
- Low dose aspirin

Going home from hospital

- Vital signs
- Follow-up care
- Daily weight
- Medical alert identification

When to Call the Transplant Team

- Temperature of 100 degrees Fahrenheit or greater
- Blood pressure greater than 170/100 for two readings in a row
- Weight gain of more than 3lbs in a day or 5-7 lbs in a week
- Cough, shortness of breath, sore throat, chills
- Nausea, vomiting, or stomach pain
- Diarrhea
- Decreased appetite
- Blood in urine or bowel movements, painful urination

When to Call the Transplant Team

- Increased pain, redness, or pus-like drainage at the incision
- Pain, tenderness or swelling in the area of the new kidney
- Feeling unusually tired
- Persistent headache or flu-like symptoms
- Any unexplained rash, sores, or bruising
- Swelling of the hands, feet, or ankles
- Unable to take medications for any reason
- Anything that concerns you about your health

Going for Check-Ups

- Clinic visits and lab tests
- Routine blood tests
  - Cyclosporine
  - Creatinine
  - Potassium
  - Hematocrit
  - White Blood Cell count
  - Cholesterol
  - Amylase/Lipase
- Ureteral stent removal

Staying Healthy –Your Daily Routine

- Bathing
- Driving
- Exercise
- Nutrition and Diet
- Smoking

Staying Healthy

- Returning to work
- Travel tips
- Routine medical care
- Dental care
- Vision screening
- Healthy skin
- Bone density screening
- Colon cancer screening

Sexual Activity

You may resume sexual activity when you feel ready. This will not harm your new organ. Some positions may be more comfortable than others, so adjust accordingly. You may find that relaxation, a sense of humor, and using pillows or different positions may help you. If you experience any difficulties with enjoying sexual activity, please let someone on the transplant team know.

Sexual Activity

- Long-Standing Diabetes
- Blood Pressure Medications

May experience:

- Different degrees of sexual difficulties
- Low desire
- Erectile difficulties
- Problems achieving orgasm

Sexual Activity

Because your immune system is suppressed, you can be easily infected with sexually transmitted diseases. Unless you are in a long-term, monogamous relationship, **ALWAYS** use condoms to protect yourself and your partner. If you suspect that you have been exposed to a sexually transmitted disease, tell your coordinator or doctor so that treatment can be started as soon as possible!

Pregnancy and Transplant

- Pregnancy may be possible
- Men and women should discuss birth control methods and potential pregnancy with transplant physician
- Women are advised to wait 2 years after transplant before becoming pregnant
- IUDs (intrauterine devices) should not be used

Protecting Yourself from Infection

- Wash your hands thoroughly and frequently
- Avoid sharing eating utensils, glasses, and/or cups
- Avoid visitors who are ill
- Small children may expose you to colds and other illnesses
- Avoid large crowds for the first 6-8 weeks after transplant
- Keep cuts and sores clean and dry
- Inspect cuts and sores regularly and notify team of redness, tenderness, swelling or drainage

Protecting Yourself from Infection

- Notify team of any signs of infection such as fever, shortness of breath, cough, sore throat, fatigue, nausea, vomiting, headache, or flu-like symptoms
- Use caution when handling any animals or pets
- If possible have a family member dispose of cat litter
- Avoid exposure to bird droppings

Protecting Yourself from Infection

- It is recommended to not bring a new bird into your home after transplant
- Avoid exposure to dust from old dry wall or plaster during renovation projects
- Wear a mask if you come into contact with molds, dust, or decaying matter

Immunizations

All transplant candidates should receive a pneumococcal vaccine to protect against pneumonia. It is recommended that all transplant recipients and their family members receive yearly flu shots (unless allergic to eggs), and all recipients should also receive a diphtheria and a tetanus booster shot every 10 years.

Vaccines

Live Vaccines to Avoid

- Measles
- Mumps
- Rubella
- Oral polio
- Varicella
- Smallpox

Household contacts should not receive

- Oral polio vaccine
- Smallpox vaccine

Vaccines

Household contacts may receive the MMR vaccine, and children of transplant recipients can safely receive the chicken pox vaccine because person-to-person transmission does not occur.

Preventive Care

Women

- Pap Smears
- Breast Self Exam
- Mammography
- Pregnancy

Men

- Testicular Exam
- Prostate Exam

Helpful Websites

- American Academy of Family Physicians: www.aafp.org/patientinfo
- Health Answers: www.healthanswers.com
- Healthfinder (U.S. Government site): www.healthfinder.gov
- InteliHealth: www.intelihealth.com
- JumpStart: www.gatransplant.org/jumpstart
- National Library of Medicine (health info for consumers): www.nlm.nih.gov
- Wellness Web: www.wellweb.com
- United Network of Organ Sharing (UNOS): www.unos.org

Helpful Websites

- Coalition on Donation: www.donatelife.net
- National Kidney Foundation of Georgia: www.nkfg.org
- Georgia Transplant Foundation: www.gatransplant.org
- Medicare Transplant Coverage information: www.medicare.gov/coverage/transplant-adults.html
- National Kidney Foundation: www.kidney.org
- Healthwell Foundation: www.healthwellfoundation.org/
- Needy Meds: www.needymeds.org/

Eating Healthy After Your Transplant

Nutrition-related side effects that could be caused by your anti-rejection medicines:

- High blood sugar, high cholesterol levels, high blood pressure
- An increase in appetite and possible weight gain
- Loss of calcium from the bone (can lead to osteoporosis)
- Nausea or vomiting
- Taste changes, which may lead to decreased appetite
- Toxicity if taken with grapefruit or pomegranate juice
- Increased potassium level
- Problems with digestion, including diarrhea

Protein

Lean meats (chicken, turkey, fish, pork, beef) low-fat milk and yogurt, low fat/low sodium cheese, eggs or low cholesterol egg substitutes, dried beans and peas, peanut butter, soy, nuts and seeds

- At least **8** oz per day protein for the1st month
- At least **6** oz per day protein long-term
- **3 oz** = the size of 1 deck of cards
- **1 oz** =1 egg, ½ cup beans, ¼ cup nuts, 2 Tbsp peanut butter, dairy products

Nutrition Post-Transplant

Carbohydrates

Foods to limit or avoid: added sugar, pastries and desserts, candy, sweetened fruit juices and other sweetened beverages (such as sweet tea, lemonade, punch and regular sodas). It is OK to use sugar substitutes (such as Splenda and NutraSweet) in **moderation**

Sodium

- **Sodium Free:** Serving contains <5 mg sodium
- **Very Low Sodium:** Serving contains 35 mg sodium or less
- **Low Sodium:** Serving contains 140 mg sodium or less
- **Reduced or Less Sodium:** Sodium content decreased by at least 25% from the regular version
- **Light in Sodium:** Sodium content decreased by at least 50% from the regular product.
- **Unsalted, No Salt Added or Without Added Salt:** Made without salt. This product may contain naturally occurring sodium. Read labels!

Calcium

Choose at least 3 calcium-rich, low fat foods to consume daily. High calcium foods are noted with an asterisk (*) in the heart-healthy list.

If you do not like dairy products, you may need to take a "Calcium plus vitamin D" supplement to help prevent osteoporosis. Talk with your doctor before taking any calcium supplements because it may not be recommended in conjunction with other prescribed medications.

Yogurt

Choose yogurt that contains live active cultures on a regular basis. This can help you prevent diarrhea while taking antibiotics.

Fluids

- Water, Sodium-free Seltzer water-flavored or plain
- Diet, caffeine-free soft drinks
- Sugar-free powdered lemonade, iced tea, fruity drinks and other beverages
- Sugar-free Kool-Aid
- Skim or 1% milk
- Apple, cranberry and grape juices (limit to 4 oz. per meal)
- Decaffeinated coffee or tea

Fat and Cholesterol

- Lowers risk of heart disease
- Can maintain or achieve desirable body weight after transplant

Your Guide for Heart-Healthy Eating

FOOD GROUP	FOODS TO CHOOSE	FOODS TO LIMIT
Milk (3 cups per day) 1 serving = 120 mg sodium 1 cup milk 1 cup yogurt (all are good **calcium** sources)	• Skim, ½ % and 1% milk • Evaporated or powdered skim milk • Low fat or fat free yogurt • Chocolate milk with less than 1% fat • Low sodium buttermilk • Fat-free cream or fat-free half & half	• Whole and 2% milk; buttermilk • Eggnog, malted milk • Milkshakes • Instant milk mixes • Chocolate whole milk • Evaporated whole milk • Sweetened condensed milk • Cream, half and half • Sour cream
Meat (4-6 oz per day) 1 serving = 25 mg sodium 1oz meat (all types) ¼ cup canned fish 1 oz cheese 2 tbsp peanut butter 1 egg ¼ cup egg substitute (80-120 mg sodium)	• Lean, fresh or frozen meats like sirloin steak, London broil, ground round, pork tenderloin, skinless chicken or turkey breast, fish or seafood (not fried or breaded) • Low sodium canned fish in water • Natural peanut butter (1-2 tbsp/day), preferably with no salt added • *Low fat or fat free, low sodium cheese • Egg whites or egg substitute • Frozen dinners with less than 30% of calories from fat and less than 600 mg sodium per serving • *Tofu, *dried beans and peas	• Fatty meats such as prime rib, T-bone, pot roast, spare ribs, ground beef, ground chuck, chicken wings, liver, brain or any organ meats, duck, goose, fish roe, caviar • Cured, salted, canned or smoked meats like bacon, sausage, ham, corned beef, salt pork, bologna, hot dogs, dried beef, potted meat • Regular canned or pouched tuna, salmon, anchovies and sardines • Fried or breaded meats • Deli meats • Regular peanut butter • Regular cheese • Meats with gravies and sauces • More than 3 egg yolks per week • Highly processed foods • Convenience foods such as regular frozen dinners
Fruits (2 or more servings per day) 1 serving = <10 mg sodium 1 medium piece of fruit ¼ cup canned ¼ cup juice ¼ cup dried	• All fruits and fruit juices • *Calcium fortified orange juice	• Fried fruits • Fruit pie (If diabetic, avoid syrups and sweetened fruits)

*** = good calcium source**

FOOD GROUP	FOODS TO CHOOSE	FOODS TO LIMIT
Vegetables (3 or more servings per day) 1 serving = <25 mg sodium ½ cup cooked 1 cup raw ½ cup juice ✓ **Note: by rinsing canned vegetables, you will only lose ¼ of the salt they contain.**	• Fresh vegetables prepared without salt • Low sodium frozen or canned vegetables • Low sodium tomato or vegetable juice • *Broccoli	• Vegetables prepared with salt, bacon or ham hock, butter, bacon grease, fat back, or cream sauce. • Regular canned vegetables • Fried vegetables • Sauerkraut • Pickles or vegetables prepared in brine • Regular tomato or vegetable juice • Frozen vegetables in sauce
Breads, Cereals & Starches (6 or more servings per day) 1 Serving = 1 slice bread 1 small dinner roll ½ cup cooked cereal 1 cup dry cereal ½ cup pasta potatoes, corn, peas, beans 1/3 cup rice 1 small baked potato 3 cups popcorn	• Pasta, rice and potatoes • Homemade cooked cereals • Dried beans and peas • Unsalted crackers • Melba toast • Dry cereals (<3g fat) • Low sodium instant cooked cereals • *Calcium fortified products	• Croissants and biscuits • Sweet rolls, Danish, donuts • Quick breads • Instant mixes • Instant cooked cereal • Pasta/ rice prepared with butter, cream, cheese sauce or fats • Salted crackers, pretzels, popcorn • Self rising flour, regular baking soda, baking powder
Fat (Limit to 3-6 tsp. per day) 1serving = 50 mg sodium ✓ **Read labels carefully on low fat products. Sometimes they are higher in sodium or carbohydrate than the regular products.**	• Margarine (tub or liquid) with sodium less than 50 mg per serving and no hydrogenated oils in the ingredients list • Butter blended with canola/olive oil • Low sodium, low fat salad dressings • Vegetables oils except palm and coconut oil • Low sodium, low fat mayonnaise • Low fat or fat free sour cream • Low sodium, low fat gravy • Unsalted nuts or seeds	• Salted stick margarine or butter • Regular salad dressings • Bacon fat, salt pork, lard, shortening, fat back, streak-o-lean, ham hock • Snack dips made with cheese, bacon, buttermilk • Regular sour cream • Regular gravy (packaged or canned) • Chitterlings • Olives • Salted nuts or seeds

*** = good calcium source**

FOOD GROUP	FOODS TO CHOOSE	FOODS TO LIMIT
Soups 1 cup regular soup = 700 – 1200 mg sodium 1 cup low sodium soup = 140 mg sodium ✓ **"Reduced" or "Lower" or "Less" sodium does not mean the product is low in sodium!**	• Low sodium bouillon, broth or consommé • Low sodium, low fat commercial canned or dehydrated soups • Homemade soup prepared without salt or high fat ingredients	• Regular bouillon, broth or consommé • Regular commercial canned or dehydrated soups • "1/3 less salt" or "reduced sodium" canned soups • Regular creamed soups • Instant soup mixes
Snacks and Desserts ✓ **Limit if weight loss is desired.**	• Fruit ice, sorbet, sherbet, flavored gelatin • Fat free frozen yogurt, pudding, ice cream • Homemade bakery items made with low sodium and low fat ingredients like angel-food cake, fat free pound cake, ginger-bread • Jellybeans, gumdrops, marshmallows, hard candies • Snack foods without hydrogenated oils in the ingredients list	• Desserts made with salt, baking powder, baking soda and self-rising flour (limit to 2 per week) • Desserts made with whole milk or butter/shortening • Instant pudding, ice cream, gourmet frozen yogurt • Commercial cake mixes • Coconut • Packaged peanut butter or cheese crackers • Snack foods with hydrogenated oils in the ingredients list
Sugar ✓ **Limit if weight loss is desired.** ✓ **If diabetic, avoid high sugar foods.**	• Sugar, honey • Pure maple syrup • Jams, and jellies • Sugar substitutes	• Blackstrap molasses • Commercial pancake syrup • Light and dark corn syrup
Beverage ✓ **In accordance with fluid restriction if recommended by doctor** ✓ **If weight loss desired or if diabetic, use sugar free beverages**	• Most beverages in moderation including water, soft drinks, juice, tea, coffee	• Commercially softened water • Sport drinks • Alcoholic beverages in excess

*** = good calcium source**

Food Safety

Shopping for Foods

- Buy only "pasteurized" milk and cheese products
- Avoid products with a "SELL BY" or "BEST USED BY" date that has already passed
- Put packaged raw meat, poultry and fish in a plastic bag before placing it in the shopping cart (this prevents drippings from coming in contact with other foods, and lowers the risk of bacteria from the meat contaminating another food)
- Avoid buying food products in a damaged package (i.e. dented, rusted, and swollen cans)
- After shopping, place chilled and frozen foods into a refrigerator or freezer as soon as possible
- Do not buy cracked eggs

At Home

- Keep the temperature of your refrigerator less than **40° F (4°C)**
- Thaw food in refrigerator or microwave, never at room temperature
- Wash fresh fruits and vegetables prior to eating
- Keep shelves, counter tops, refrigerators, freezers, utensils, sponges and towels clean (Wash with a solution of 1 tsp bleach in 1 qt of water)
- Clean kitchen sponges in dishwasher and replace once a week
- Replace dishtowels daily or use paper towels
- Wash hands and utensils with soap and hot water after handling one food and before handling another
- Do not use wooden cutting boards for cutting raw meat, poultry or fish; use plastic boards instead because they are easier to clean and sanitize

Food Safety

At Home

- If a cutting board is used to cut raw meat, wash it with hot and soapy water, then rinse it with a sanitizing solution before cutting another food on it
- Follow instructions for correct cooking times and temperatures to safeguard against food poisoning; use a meat thermometer to ensure complete cooking
- Follow the listed "standing time" after the cooking period, as noted in microwave recipes to ensure that proper temperature is reached
- Date and refrigerate leftovers right away; heat leftovers fully before eating, throw out leftovers after 48 hours
- Wash top of cans before opening
- Keep foods out of danger zone: **45°F to 140°F** provides growth for bacteria

Eating Out

- Order cooked foods and well done meat and fish
- Order fried eggs well done on both sides, not sunny side up; avoid runny scrambled eggs
- Avoid all raw oysters, fish, clams, sushi and sashimi
- Use caution with salad bars and buffets

Conclusion

The following guidelines are to be used **immediately** (for the first 6 weeks) after your transplant:

- High protein intake
- Limit concentrated sweets (if diabetic, follow the diabetic diet guidelines)
- Drink plenty of fluids, at least 8 glasses per day

The following guidelines are to be used **long-term after your transplant**:

- Heart Healthy meal plan (low fat, low cholesterol, <2,300 mg sodium/day)
- Drink plenty of fluids, at least 8 glasses per day

Resources

Websites:

www.americanheart.org (American Heart Association)

www.deliciousdecisions.org (American Heart Association cookbook)

www.kidneytimes.com (Nutritional information following transplantation)

www.megaheart.com (Ways to decrease fat and cholesterol in diet)

www.transplantliving.org (general transplant information)

www.transplantawareness.org/resources.html (Nutritional information following

Resources

Cookbooks:

"501 Delicious Heart Healthy Recipes"
"AHA Around the World Cookbook"
"AHA Low Fat and Luscious Desserts"
"AHA Low Fat, Low Cholesterol Cookbook"
"AHA Meals in Minutes Cookbook"
"AHA Quick and Easy Cookbook"
"George Foreman's Big Book of Grilling, BBQ & Rotisserie"
"The New AHA Cookbook" 6th edition

Appendix F

Nutrition Packet

Eating Healthy After Your Transplant

Provided by: _____ Phone: _____

After having a transplant, it is very important to adopt a lifestyle that includes healthy eating habits and a regular exercise program. Your new diet is necessary to help **manage or prevent** possible side effects of transplant medications. It is designed to help you regain strength, aid in healing after surgery, and most importantly, to promote long-term health.

Here are some nutrition-related side effects that could be caused by your anti-rejection medicines:

- High blood sugar, high cholesterol levels, high blood pressure
- An increase in appetite and possible weight gain
- Loss of calcium from the bone (can lead to osteoporosis)
- Nausea or vomiting
- Taste changes, which may lead to decreased appetite
- Toxicity if taken with grapefruit or pomegranate juice
- Increased potassium level
- Problems with digestion, including diarrhea

Protein:

It is important for you to **eat an adequate amount of protein.** During the first month after transplant, you need extra protein to prevent muscle breakdown and to provide the building blocks to recover from surgery. Be sure to eat a protein source at each meal, and if you experience a decreased

appetite after your transplant, focus on eating protein-rich foods during meal time.

Good sources of protein include: lean meats (chicken, turkey, fish, pork, beef) low-fat milk and yogurt, low fat/low sodium cheese, eggs or low cholesterol egg substitutes, dried beans and peas, peanut butter, soy, nuts and seeds.

Protein Goal: At least **8** oz per day protein for the1st month
At least **6** oz per day protein long-term

3 oz = the size of 1 deck of cards
1 oz =1 egg, ½ cup beans, ¼ cup nuts, 2 Tbsp peanut butter, dairy products

Carbohydrates (sugars and starches):
A common side effect of some of your medications is increased blood sugar levels. If you have a strong family history of diabetes or if you are overweight, you are more likely to have high blood sugar levels, especially for the first few months after transplant. In some patients, Prednisone can cause "steroid-induced diabetes". If this occurs, it is important for you to **limit your sugar intake.** If you have diabetes at the time of transplant, continue to follow your diabetic diet.

Foods to limit or avoid include: added sugar, pastries and desserts, candy, sweetened fruit juices and other sweetened beverages (such as sweet tea, lemonade, punch and regular sodas). It is OK to use sugar substitutes (such as Splenda and NutraSweet) in **moderation**.

Sodium:

According to the 2010 Dietary Guidelines for Americans, sodium intake should be limited to **< 2,300 mg per day**. After transplant, many people experience edema or swelling in the body, which is another reason to follow a diet low in sodium. Water and sodium retention are also common side effects of some of your medications. Eating too much salt when you take these medications can result in fluid build up in your body and increase your risk of high blood pressure.

The majority of the sodium in our diet comes from various “convenience” foods: processed, packaged and “fast foods” are usually very salty. You may use a small amount of salt (1/4 tsp/day) in cooking or at the table if your blood pressure is under good control and you do not have edema (swelling). Buy foods with less than 200 mg of sodium per serving. Choose foods labeled “low sodium” and be suspicious of claims stating “lower in sodium”, as these can still be high in sodium. **Read labels!**

- **Sodium Free:** Serving contains <5 mg sodium
- **Very Low Sodium:** Serving contains 35 mg sodium or less
- **Low Sodium:** Serving contains 140 mg sodium or less
- **Reduced or Less Sodium:** Sodium content decreased by at least 25% from the regular version
- **Light in Sodium:** Sodium content decreased by at least 50% from the regular product.
- **Unsalted, No Salt Added or Without Added Salt:** Made without salt. This product may contain naturally occurring sodium. Read labels!

Calcium:

Choose at least 3 calcium-rich, low fat foods to consume daily.
High calcium foods are noted with an asterisk (*) in the heart-healthy list.

If you do not like dairy products, you may need to take a "Calcium plus vitamin D" supplement to help prevent osteoporosis. Talk with your doctor before taking any calcium supplements because it may not be recommended in conjunction with other prescribed medications.

Yogurt:

Choose yogurt that contains live active cultures on a regular basis. This can help you prevent diarrhea while taking antibiotics.

Fluids:

You need **at least eight (8oz) glasses per day**. It is important to drink plenty of fluids after a transplant to prevent dehydration. Most fluid intake should not contain sugar, caffeine or alcohol. Caffeine intake should be limited to **1 – 2 cups per day**.

Good Fluid Choices:

- Water, Sodium-free Seltzer water- flavored or plain
- Diet, caffeine-free soft drinks
- Sugar-free powdered lemonade, iced tea, fruity drinks and other beverages
- Sugar-free Kool-Aid
- Skim or 1% milk
- Apple, cranberry and grape juices (limit to 4 oz. per meal)
- Decaffeinated coffee or tea

Fat and Cholesterol:

A low fat, low cholesterol diet is important because it can lower your risk of heart disease. It can also help you maintain or achieve a desirable body weight after your transplant.

The table on the next few pages is a good place to start learning about a **"heart-healthy"** way of eating that is important for long-term health after a transplant.

FOOD GROUP	FOODS TO CHOOSE	FOODS TO LIMIT
MILK (3 Cups per day) serving = 120mg Sodium 1 cup milk 1 cup yogurt (all are good calcium sources)	• Skim, ½% and 1% milk • Evaporated or powdered skim milk • Low fat or fat free yogurt • Chocolate milk with less than 1% fat • Low sodium buttermilk • Fat-free cream or fat-free half & half	• Whole and 2% milk; buttermilk • Eggnot, malted milk • Milkshakes • Instant milk mixes • Chocolate whole milk • Evaporated whole milk • Sweetened condensed milk • Cream, half & half • Sour cream
MEAT (4-6 oz per day) 1 serving = 25mg sodium 1oz meat (all types) ¼ cup canned fish 1oz cheese 2 tbsp peanut butter 1 egg ¼ cup egg substitute (80-120mg sodium)	• Lean, fresh or frozen meats like sirloin steak, London broil, ground round, pork tenderloin, skinless chicken or turkey breast, fish or seafood (not fried or breaded) • Low sodium canned fish in water • Natural peanut butter (1-2 tbsp/day), preferably with no salt added • *Low fat or fat free, low sodium cheese • Egg whites or egg substitute	• Fatty meats such as prime rib, T-bone, pot roast, spare ribs, ground beef, ground chuck, chicken wings, liver, brain or any organic meats, duck, goose, fist roe, caviar • Cured, salted, canned or smoked meats like bacon, sausage, ham, corned beef, salt pork, bologna, hot dogs, dried beef, potted meat • Regular canned or pouched tuna, salmon, anchovies, and sardines

	• Frozen dinners with less than 30% of calories from fat and less than 600mg sodium per serving • *Tofu , *dried beans and peas	• Fried or breaded meats • Deli meats • Regular peanut butter • Regular cheese • Meats with gravies and sauces • More than 3 egg yolks per week • Highly processed foods • Convenience foods such as regular frozen dinners
FRUITS (2 or more servings per day) **1 serving = < 10mg sodium 1 medium piece of fruit ½ cup canned ½ cup juice ¼ cup dried**	• All fruits and fruit juices • *Calcium fortified orange juice	• Fried fruits • Fruit pie (If diabetic, avoid syrups and sweetened fruits)

* = good calcium source

FOOD GROUP	FOODS TO CHOOSE	FOODS TO LIMIT
Vegetables (3 or more servings per day) **1 serving = <25 mg sodium** **½ cup cooked** **1 cup raw** **½ cup juice** ✓ **Note: by rinsing canned vegetables, you will only lose ¼ of the salt they contain.**	● Fresh vegetables prepared without salt ● Low sodium frozen or canned vegetables ● Low sodium tomato or vegetable juice ● *Broccoli	● Vegetables prepared with salt, bacon or ham hock, butter, bacon grease, fat back, or cream sauce. ● Regular canned vegetables ● Fried vegetables ● Sauerkraut ● Pickles or vegetables prepared in brine ● Regular tomato or vegetable juice ● Frozen vegetables in sauce
Breads, Cereals & Starches **(6 or more servings per day)** **1 Serving =** **1 slice bread** **1 small dinner roll** **½ cup cooked cereal** **1 cup dry cereal** **½ cup pasta potatoes, corn, peas, beans** **1/3 cup rice** **1 small baked potato** **3 cups popcorn**	● Pasta, rice and potatoes ● Homemade cooked cereals ● Dried beans and peas ● Unsalted crackers ● Melba toast ● Dry cereals (<3g fat) ● Low sodium instant cooked cereals ● *Calcium fortified products	● Croissants and biscuits ● Sweet rolls, Danish, donuts ● Quick breads ● Instant mixes ● Instant cooked cereal ● Pasta/ rice prepared with butter, cream, cheese sauce or fats ● Salted crackers, pretzels, popcorn ● Self rising flour, regular baking soda, baking powder

Fat (Limit to 3-6 tsp. per day) **1serving = 50 mg sodium** ✓ **Read labels carefully on low fat products. Sometimes they are higher in sodium or carbohydrate than the regular products.**	● Margarine (tub or liquid) with sodium less than 50 mg per serving and no hydrogenated oils in the ingredients list ● Butter blended with canola/olive oil ● Low sodium, low fat salad dressings ● Vegetables oils except palm and coconut oil ● Low sodium, low fat mayonnaise ● Low fat or fat free sour cream ● Low sodium, low fat gravy ● Unsalted nuts or seeds	● Salted stick margarine or butter ● Regular salad dressings ● Bacon fat, salt pork, lard, shortening, fat back, streak-o-lean, ham hock ● Snack dips made with cheese, bacon, buttermilk ● Regular sour cream ● Regular gravy (packaged or canned) ● Chitterlings ● Olives ● Salted nuts or seeds

* = good calcium source

FOOD GROUP	FOODS TO CHOOSE	FOODS TO LIMIT
Soups **1 cup regular soup = 700 – 1200 mg sodium** **1 cup low sodium soup = 140 mg sodium** ✓ **"Reduced" or "Lower" or "Less" sodium does not mean the product is low in sodium!**	● Low sodium bouillon, broth or consommé ● Low sodium, low fat commercial canned or dehydrated soups ● Homemade soup prepared without salt or high fat ingredients	● Regular bouillon, broth or consommé ● Regular commercial canned or dehydrated soups ● "1/3 less salt" or "reduced sodium" canned soups ● Regular creamed soups ● Instant soup mixes
Snacks and Desserts ✓ **Limit if weight loss is desired.**	● Fruit ice, sorbet, sherbet, flavored gelatin ● Fat free frozen yogurt, pudding, ice cream ● Homemade bakery items made with low sodium and low fat ingredients like angel-food cake, fat free pound cake, ginger-bread ● Jellybeans, gumdrops, marshmallows, hard candies ● Snack foods without hydrogenated oils in the ingredients list	● Desserts made with salt, baking powder, baking soda and self-rising flour (limit to 2 per week) ● Desserts made with whole milk or butter/shortening ● Instant pudding, ice cream, gourmet frozen yogurt ● Commercial cake mixes ● Coconut ● Packaged peanut butter or cheese crackers ● Snack foods with hydrogenated oils in the ingredients list

Sugar ✓ **Limit if weight loss is desired.** ✓ **If diabetic, avoid high sugar foods.**	● Sugar, honey ● Pure maple syrup ● Jams, and jellies ● Sugar substitutes	● Blackstrap molasses ● Commercial pancake syrup ● Light and dark corn syrup
Beverage ✓ **In accordance with fluid restriction if recommended by doctor** ✓ **If weight loss desired or if diabetic, use sugar free beverages** ✓	● Most beverages in moderation including water, soft drinks, juice, tea, coffee	● Commercially softened water ● Sport drinks ● Alcoholic beverages in excess

* = good calcium source

Food Safety

The immunosuppressive medications commonly prescribed after a transplant can also increase a person's risk for infection, including food borne illness. These infections can be serious, difficult to treat and weaken the immune system even further. Since poor handling of food causes most food borne illnesses, patients with a low immune system can follow these basic food guidelines:

Shopping for Foods

- Buy only "pasteurized" milk and cheese products
- Avoid products with a "SELL BY" or "BEST USED BY" date that has already passed
- Put packaged raw meat, poultry and fish in a plastic bag before placing it in the shopping cart (this prevents drippings from coming in contact with other foods, and lowers the risk of bacteria from the meat contaminating another food)
- Avoid buying food products in a damaged package (i.e. dented, rusted, and swollen cans)
- After shopping, place chilled and frozen foods into a refrigerator or freezer as soon as possible
- Do not buy cracked eggs

At Home

- Keep the temperature of your refrigerator less than **40° F (4°C)**
- Thaw food in refrigerator or microwave, never at room temperature
- Wash fresh fruits and vegetables prior to eating
- Keep shelves, counter tops, refrigerators, freezers, utensils, sponges and towels clean (Wash with a solution of 1 tsp bleach in 1 qt of water)
- Clean kitchen sponges in dishwasher and replace once a week
- Replace dishtowels daily or use paper towels
- Wash hands and utensils with soap and hot water after handling one food and before handling another

- Do not use wooden cutting boards for cutting raw meat, poultry or fish; use plastic boards instead because they are easier to clean and sanitize
- If a cutting board is used to cut raw meat, wash it with hot and soapy water, then rinse it with a sanitizing solution before cutting another food on it
- Follow instructions for correct cooking times and temperatures to safeguard against food poisoning; use a meat thermometer to ensure complete cooking
- Follow the listed "standing time" after the cooking period, as noted in microwave recipes to ensure that proper temperature is reached
- Date and refrigerate leftovers right away; heat leftovers fully before eating, throw out leftovers after 48 hours
- Wash top of cans before opening
- Keep foods out of danger zone: **45°F to 140°F** provides growth for bacteria

Eating Out

- Order cooked foods and well done meat and fish
- Order fried eggs well done on both sides, not sunny side up; avoid runny scrambled eggs
- Avoid all raw oysters, fish, clams, sushi and sashimi
- Use caution with salad bars and buffets

Conclusion

Following the transplant team's advice after transplantation is necessary to ensure the best outcome. In addition to taking your medications, it is also important to follow your new eating and exercise plan. Your new diet is designed to manage or decrease the risks from side effects of your new medications.

The following guidelines are to be used **immediately** (for the first 6 weeks) after your transplant:

- High protein intake
- Limit concentrated sweets (if diabetic, follow the diabetic diet guidelines)
- Drink plenty of fluids, at least 8 glasses per day

The following guidelines are to be used **long-term after your transplant:**

- Heart Healthy meal plan (low fat, low cholesterol, <2,300 mg sodium/day)
- Drink plenty of fluids, at least 8 glasses per day

RESOURCES

Websites:

www.americanheart.org (American Heart Association)

www.deliciousdecisions.org (American Heart Association cookbook)

www.kidneytimes.com (Nutritional information following transplantation)

www.megaheart.com (Ways to decrease fat and cholesterol in diet)

www.transplantliving.org (general transplant information)

www.transplantawareness.org/resources.html (Nutritional information following transplantation)

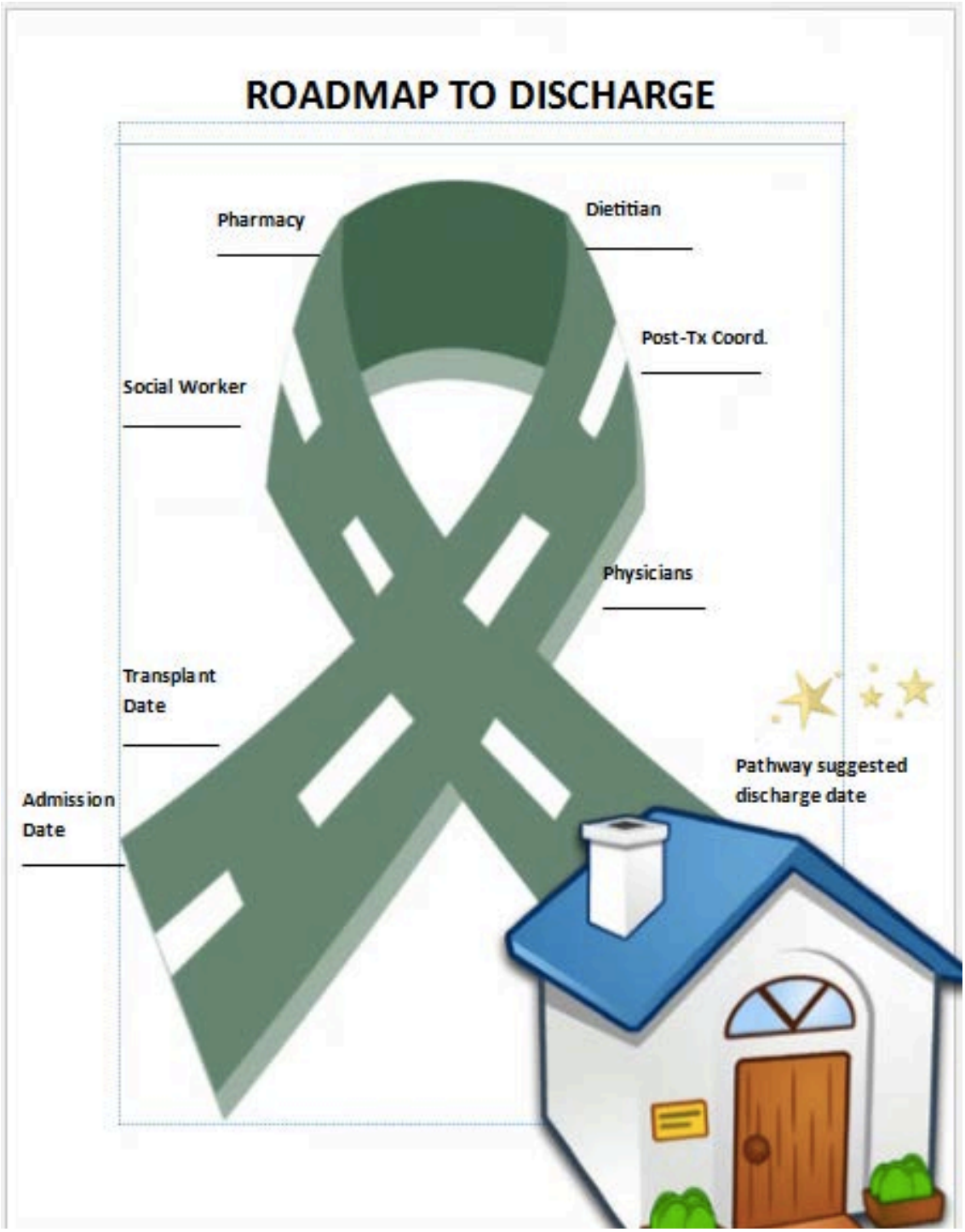
Cookbooks:

"501 Delicious Heart Healthy Recipes"
"AHA Around the World Cookbook"
"AHA Low Fat and Luscious Desserts"
"AHA Low Fat, Low Cholesterol Cookbook"
"AHA Meals in Minutes Cookbook"
"AHA Quick and Easy Cookbook"
"George Foreman's Big Book of Grilling, BBQ & Rotisserie"
"The New AHA Cookbook" 6th edition

My goals:

Appendix G

Education Checklist



Appendix H

Self-Care Post-Transplant Education Class Schedule

Self-Care Post-Transplant Class

When: Mondays & Thursdays 2PM-4:00PM

Location: 7th Floor G Wing Conference Room G7200

Shift Nurse Manager/Charge Nurse Introduction to class	2PM-2:05PM
Social Workers – Available resources post-transplant	2:05PM- 2:30PM
Pharmacists – Post-transplant medications: dosages, therapeutic levels, & side effects	2:30PM- 3:00PM
Dietitians – Post-transplant diet	3:00PM- 3:30PM
Post-Transplant Coordinator – Follow-up post-transplant & Knowledge Assessment Survey	3:30PM- 4:00PM