POST-DISCHARGE FOLLOW-UP TELEPHONE CALLS FOR PATIENTS FOLLOWING ALLOGENEIC STEM CELL TRANSPLANT

By

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The DNP Project committee for Bailey Mars certifies that this is the approved version of the following DNP Project:

Post-Discharge Follow-up Telephone Calls for Patients Following Allogeneic Stem Cell Transplant

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Abstract

Background: Blood cancers affect thousands of people each year. Allogeneic stem cell transplantation is a potential cure for those diagnosed with leukemia or lymphoma. As part of this complicated treatment, patients are hospitalized for at least 30 days after their transplant. During those 30 days, the patient is being cared for by an entire team of health care professionals 24 hours a day, 7 days a week. Discharging from the hospital after this time can be a significant transition for many, as they adjust to the new changes and expectations of their post-transplant life. Currently there is not a standardized process to facilitate this transition. Ample research exists regarding discharge follow- up telephone appointments' impact on patient outcomes in an array of specialties. However, there is currently not a discharge follow-up telephone appointment for patients with allogenic transplants between discharge and outpatient clinic visit.

Purpose: The purpose of this quality improvement project was to implement an Advanced Practice Registered Nurse (APRN) delivered post-discharge follow- up telephone appointment for allogeneic stem cell transplant patients.

Methods: A post-discharge telephone-administered appointment was conducted with *patients who have received an allogeneic stem cell transplant*. The telephone script, developed and approved by the University of Kansas Health System (TUKHS) Cancer Center team, was used when making the calls. The project location was the outpatient Blood and Marrow Transplant clinic at TUKHS. Data were collected from chart audits for demographics, medical history, medications, and readmissions. The project outcomes were readmission rates and adherence to medication regimen.

Results: At the completion of project, a total of 10 telephone calls were made. The results of these calls were then reviewed and compared to patients who did not receive a telephone call,

using a retrospective chart review. The population of both the group who received the call and the retrospective chart review group were comparable, with the average age being 55.6 years and 52.8 years respectively. Both groups identified predominantly as Caucasian white (90% and 100%). The group receiving the phone call did not have any readmissions, whereas 20% of the retrospective chart review group was readmitted. Also, in the group that received the phone call, only 10% were found to have sub therapeutic tacrolimus drug levels needing intervention, whereas 20% of the group that did not receive the phone calls had documented sub therapeutic levels. Forty percent of both groups experienced procedural readmissions for issues such as fever, central line removal, and esophageal duodenoscopy (EGD)/ colonoscopy for graft versus host disease evaluation. Follow up phone calls give the provider an opportunity to not only monitor the patient more closely, but connect with them as well. By reaching out to patients after they have left the hospital the provider ensures the patient is safe and without complication, while also continuing to build a trusting relationship with each patient.

Keywords: follow-up phone call, discharge phone call, transitional care, APRN, and allogeneic stem cell transplant

Contents

According to the American Cancer Society, there are will be an estimated 60,300 new cases of leukemia (all sub-types) diagnosed in 2018. While the number of people diagnosed with myelodysplastic syndrome each year is not known for sure, estimates are as high as 10,000 cases or more (2018). At this time the only definitive cure for acute myeloid leukemia, acute lymphoid leukemia, and myelodysplastic syndrome is allogeneic stem cell transplant (Mayo Clinic, 2017). According to the most recent data available from the Center for International Blood and Marrow Transplant Research (CIBMTR), 8,539 allogeneic stem cell transplants were performed in the United States in 2016 (2016). Allogeneic stem cell transplantation is used to treat individuals who: 1) are at high risk of relapse, 2) do not respond fully to treatment, or 3) relapse after prior successful treatment (Leukemia and Lymphoma Society, 2017, pp 1-2). The process of allogeneic stem cell transplant includes transferring the stem cells from a healthy person (the donor) to the patient's body after high-intensity chemotherapy and at times radiation. The procedure is then followed by close monitoring in the hospital for up to 30 days or more, and frequent monitoring by a team of providers in a blood and marrow transplant (BMT) outpatient clinic (3-5 times a week; American Cancer Society, 2016). Many complications can occur in this intense and delicate process of transplantation. Because of their extended hospital stay as well as complex disease and recovery process, many patients are left with physical debilities and decreased quality of life (Grant, et. al., 2011). This patient population is at high risk for readmission as well as medical emergencies. According to Cooke, et. al. (2012), transplant patients are among the most complex patients. They face numerous complications, increased mortality, and extended rehabilitations. Immediately after transplant, and continuing for up to several months, patients may experience unplanned hospital admissions and complications. These readmissions and complications can cost hospitals millions of dollars each year (Ohio

Hospital Association, 2011). Reasons for readmissions vary but can include infection, gastrointestinal problems, dehydration, failure to thrive, graft-versus-host disease (an autoimmune disorder caused by the transplant, that can become life threatening (Leukemia and Lymphoma Society, 2017)), disease relapse, cardiac complications, hypotension, and organ failure (Grant, et. al., 2005). The cost of hospital readmissions for preventable causes is $17 billion of a total $26 billion per year. Readmissions are not only costly, but can lead to poor patient outcomes and a decrease in patient satisfaction (Mora, et. al., 2017). Hence, proper education as well as monitoring when transitioning from the hospital to home is imperative.

These complications may also lead to deviations from the strict protocols and treatment plans necessary for optimal outcomes, set forth by the transplant care team. Although unintentional in most cases, they may result in severe illnesses and poor outcomes. Patients and caregivers often become overwhelmed with their informational needs, leading to deviations from the treatment plan. Although they may be looking forward to leaving the hospital and returning home, patients' informational needs are extremely high at the time of discharge (Cooke, et. al., 2012). Literature about other patient populations suggests that patients perceive a lack of information upon hospital discharge, and because of their complexity, transplant patients may need more preparation and information than other patient populations (Cooke, et. al., 2012). Subsequently, readmission rates unrelated to disease progression or complications may occur.

In a study of 36 allogeneic stem cell transplant patients, the readmission rate was as high as 39.6% related to most prominently fever or acute graft versus host disease (McKenna, et.al, 2015). Although not all readmissions can be prevented, there is a possibility to significantly reduce this rate if patients are well informed and have the proper resources to answer their

questions or concerns. To reduce anxiety, deviation from the plan of care and ultimately improve patient outcomes, transitional care methods must be in place.

Transitional care is defined as a, "broad range of services and environments designed to promote the safe and timely passage of patients between levels of health care and across care settings" (Naylor & Keating, 2009, p.58). One such service is post-discharge follow-up phone calls. By remaining in close touch with patients following their departure from the hospital, providers can ensure compliance, catch mistakes, and provide further education where needed. This follow-up can be complicated, and although can be delegated to other health care workers, upon initiation should be performed by an Advanced Practice Registered Nurse (APRN). APRNs are "educated and practice at an advanced level to provide care, independently, in a range of settings. [APRNs] are responsible and accountable for health promotion, disease prevention, health education and counseling as well as the diagnosis and management of acute and chronic diseases" (National Council of State Boards of Nursing, 2017, paragraph 3). APRNs have the knowledge base to educate patients, correct potential errors, diagnose medical conditions, and treat based on the conversations had via the follow-up phone call. By providing this additional one-on-one time, adverse events are avoided, there is a decrease in hospital readmissions, and providers can avoid using valuable clinic time on managing transitional care (Naylor & Keating, 2009).

Purpose and Research Question

The purpose of this quality improvement project was to implement a post-discharge follow-up telephone call for allogeneic stem cell transplant patients. This project looked at the incidence and impact of medication errors, as well as 30-day hospital readmission rates. By decreasing readmission rates, patients are spared from "spending additional days in the hospital

each year, allowing patients to recover and return to their families and jobs more quickly" (Ohio Hospital Association, p.1, 2011).

Post-transplant precautions are given several times throughout the transplant process; however, this can often be overwhelming and things may be forgotten in the time the patient is hospitalized. This includes precautions to take at home and around other people regarding neutropenia, as well as when to call the provider or clinic. Thus, this project focused on transitional care from first hospital discharge to first clinic follow-up appointment, implementing a telephone call hospital follow-up. The two transitional care outcomes were medication adherence and hospital readmission rates. The telephone call consisted of a review of medications, what to expect at the first clinic visit, post-transplant precautions, and answering any questions or concerns the patient had. Medication non-adherence included not picking up all medications, missing prescriptions, medication lists not being updated at the time of discharge and confusion regarding medication administration instructions. Appointment expectations were reviewed due to patients' unawareness of the structure of clinic appointments after hospital discharge and how often they are expected to follow up.

Conceptual Framework

This quality improvement project was designed to implement a transitional care telephone call to decrease 30-day readmission rates and increase medication adherence. For this reason, Meleis' transitions theory guided the project development and implementation. A transition is defined as "the experience during a passage from one state to another state" (Meleis, 2015, p.2). According to Meleis, there are many changes individuals experience to which they must adapt. Healthcare providers should be aware of this in order to help their patients cope with and adapt to these changes. Meleis proposes that there are two parts to any transition;

understanding the transition and intervening. The goal of the first part is the most important because it involves understanding what transitions mean to the patient and how the healthcare provider can play a role in getting the patient through this transitional time. The goal of the second part is to provide knowledge, skills and strategies to cope with change based on the clarification of what the person is experiencing and what they may experience because of this in the future. By intervening in a transition in a meaningful way, the healthcare provider can "facilitate a healthy transition process as well as a healthy outcome response" (pp.2). Transitions can be caused by many things, can be influenced by many things, and can have many different outcomes (See Figure 1). Healthcare providers need to assist patients in navigating transitions. By implementing follow-up telephone calls, the provider can facilitate the transition from hospitalization to home by providing education.

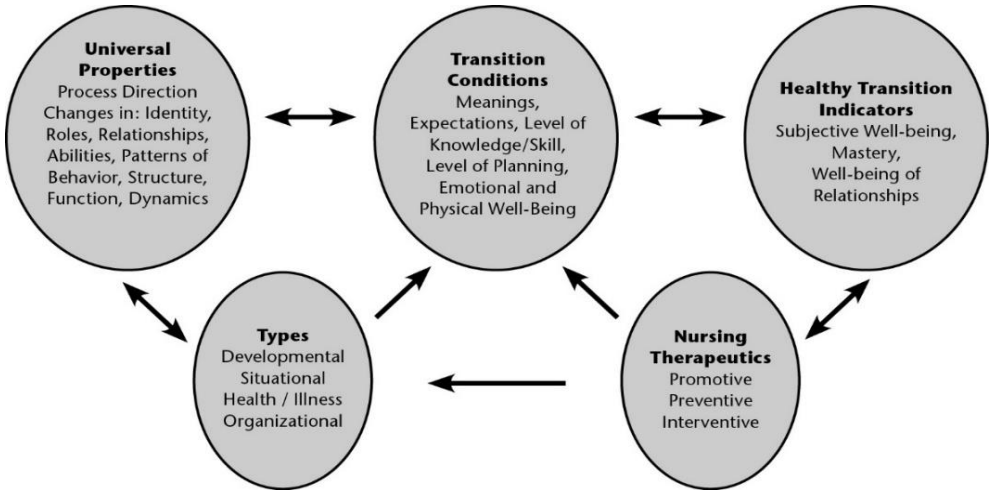

Figure 1. Meleis' Transitional Care Model. This figure is a pictorial guide to the transitional care theoretical framework. This figure represents transition types and their properties and conditions, healthy transition indicators, and nursing therapeutics. The arrows pictorially display the direction of the relationship between these constructs. Retrieved from http://www.adolescenciaesaude.com/imagebank/images/en_v9n3a04-fig01.jpg

Literature Review

A literature review was conducted to discover relevant research and supporting documentation regarding post-discharge follow-up phone calls for allogeneic stem cell transplant patients. The literature review was performed using Pub-Med and CINHAL. In order to incorporate the most up to date information, only peer-reviewed research articles in English from 2005 to 2018 were included. Keywords included in the search were “follow-up phone call,” “discharge phone call,” “transitional care,” “APRN,” and “allogeneic stem cell transplant.”

An abundance of research is available regarding follow-up phone calls for patients in other areas of health care involving intense treatments and close follow up, including stroke, cardiac events and emergency room visits. Because of the small amount of allogeneic stem cell transplant specific research, these articles were also included.

This review has been divided into two sections, transitional care and post-discharge follow-up telephone calls. Studies reviewed focus on several different patient populations; however, all use a common intervention of post hospital follow up. Some studies focused on the implementation of a program using the transitional care model, while others focused solely on a follow up phone call. Throughout the literature, all follow-up calls consisted of care components such as medication reconciliation, appointment reminders and scheduling, and symptom management.

Transitional Care

Several patient populations have been identified as benefitting from implementation of transitional care including some form of hospital discharge follow up. Puhr and Thompson (2015) as well as Condon, et. al., (2016) have evaluated the effect of a transitional care model on patient outcomes following an acute stroke. Puhr and Thompson describe this patient population as one who experiences an “acute assault to their health, lifestyle, and ability to function in their

societal roles" (p. 223). Following this event, patients are discharged home, where they are expected to resume their previous life, but now must live with the residual effects associated with a stroke. Their new life includes "rehabilitation goals, multiple new medications, altered diets, and… lasting physical effects" (pp. 223). Condon, et al., (2016) also noted that although patient care continues to improve, gaps remain in the quality of "post-acute" care in patients whose needs are "multifactorial and complex" (pp. 1599). Similar to this population, post-stem cell transplant patients have complex discharge needs requiring vital education.

Researchers posited that NP led transitional care programs could effectively address this gap in the discharge process of vulnerable populations (Condon et al., 2017; Mora et al., 2017) Condon, et. al. (2017) also developed an NP and nurse-led Transitional Stroke Clinic (TSC) including follow-up phone calls and a standardized patient exam, which includes the provider listening to the patient's heart, lungs, bowel sounds, and checking other pertinent anatomical areas, following discharge. The researchers evaluated two discharge processes that included NP-led phone calls and assessments and RN led phone calls. The addition of the RN allowed the phone calls to be made in a timely manner, within two days of hospital discharge, and allowed the NP more time in the TSC for patient care. Evidence from these studies shows the positive impact of comprehensive transitional care for patients with complex discharge needs in improving patient outcomes and patient satisfaction, and possibly reducing hospital readmission rates.

Mora and colleagues examined the causes of readmission as well as how an NP led transitional care program could impact readmission rates. This transitional care program was defined as a time-limited service that was patient-oriented to improve healthcare continuity, reduce the risk of readmission and facilitate safe transfers between healthcare settings (2017).

The possible causes of readmission were premature discharge, lack of follow-up, insufficient support and communication following discharge, and medication adverse effects. The researchers found that by implementing this transitional care intervention, there was a decrease in fragmented health care services, resources used, as well as increased patient satisfaction scores, and improved health care outcomes.

Researchers implemented a patient-centered transitional care program for patients following complex abdominal surgeries due to high readmission rates of patients after complex abdominal surgeries (Archer et al., 2017). They developed a phone-based Coordinated Transitional Care Program (C-TraC) to decrease readmission rates among medicine patients. This program included both an inpatient and outpatient aspect. Although no information was available regarding the impact of this intervention on readmission rates, the researchers discovered several positive impacts of this intervention including, low patient refusal rate with high patient engagement, as well as smooth and functional integration of a C-TraC nurse within the existing hospital infrastructure. Additionally, one of the biggest findings and concerns was, "46% medication discrepancies" with 34% of patients reporting at least one discrepancy when the initial call was made within 48 to 72 hours (pp. 262).

A specific C-TraC designated nurse was shown to be cost effective and provide an increase in patient satisfaction, the program was feasible with minimal changes to nursing staff, and lead to earlier recognition of complications, which when given early intervention, can lead to preventing avoidable hospital readmissions.

Post-Discharge Follow-Up Phone Calls

Research regarding the specific use of post-discharge follow-up phone calls as the main tool in the transitional care process has been widely conducted. Lushaj, et. al., (2016) evaluated the effect of a "structured post-discharge telephone follow-up" among patients following congenital heart surgery, on the time of their first postoperative clinic visit and unplanned hospital readmission rates. Biese, et. al. evaluated follow up phone calls in the primary care setting with older adults following emergency department visits (2014). Both studies showed an overall positive impact of the follow-up calls on patient outcomes and health care costs. Biese, et. al., (2014) add additional benefits of follow-up phone calls including cost effectiveness and practicality of a phone call that has been shown to increase care plan compliance. These articles bring specific light to the huge concern of medication management and reconciliation and timely follow-up. Although many facilities have structures in place for medication reconciliation as well as follow-up appointments, the findings of these studies point to the need for further investigation and interventions. This research adds to the evidence for implementation of follow-up phone calls to improve overall patient outcomes.

Discharge follow-up phone calls were added to patient care bundles in a research initiative at St Lucie Medical Center (SLMC; Eggenberger, et. al., 2013). In this project, Clinical nurse leaders were "accountable for patient outcomes by integrating and evaluation research and leading care" (pp.733). A review of clinical nurse leader documentation showed evidence of decreased readmissions, and an increase in patient satisfaction as well as the patient's perception of the care they received. Again, the authors provided compelling evidence for follow-up phone calls and the use of a designated role to take ownership of this intervention.

Although not abundant, scarce research regarding follow-up phone calls in stem cell transplant patients is available. Potter (2016) reported success regarding implementation of post-

discharge follow-up phone calls in stem cell transplant patients. The research showed provider satisfaction (as evidenced by survey responses after the implementation of discharge phone calls) as well as an increase in patient satisfaction, correction of medication errors, assisting with side effects and coordinating follow-up needs (Potter, 2016). The results of this study help to connect this intervention with the population of interest, stem cell transplant patients. The provider survey responses, as well as study concentrations validate the differing concerns in stem cell transplant patients.

The literature reviewed provides evidence to support the implementation of hospital discharge follow-up phone calls in a stem cell transplant setting. Although there is limited research with stem cell transplant settings, the literature regarding other severe and chronic conditions, is transferable to this patient population. Stem cell transplant patients are similar to other patient populations involved in previous research. These patients were acutely ill, requiring close monitoring and follow up to prevent or aid in the recovery of any complications. Most of the research focused on readmission rates. Condon and colleagues found that the implementation of an NP led transitional care program, including structured TSC visits, reduced 30-day hospital readmission rates by approximately 50% (2017). Although the researchers did find that the post-discharge call, without the TSC visit did not significantly reduce readmission rates, those patients who were called were more likely to show up for their TSC visit.

Research regarding follow-up phone calls in allogeneic stem cell transplant patients, specifically, is lacking. This may be due in part to the fact that, often, patients are scheduled for clinic follow-up the day after discharge. However, even with immediate follow-up, patients continue to present issues that can be serious if not addressed, even for 24 hours. With over 100 transplant centers across the country collectively performing 30,000 allogeneic stem cell

transplants per year in the United States (Grant, et. al., 2012), the need for comprehensive transitional care is essential. Providers for stem cell transplant patients can learn to eliminate errors and the ensuing anxiety and possible additional treatment, by implementing good follow-up care. Follow-up phone calls will help APRNs to practice to the full extent of their education and training through a holistic approach, from diagnosis to survivorship. Implementing and leading post-discharge follow-up phone calls, APRN's will improve patient outcomes, treatment plan compliance, patient comfort and patient satisfaction.

Methods

This study has been designed as a quality improvement project using a Plan Do Study Act (PDSA) cycle with pre- and post-intervention data collection. The study was divided into several parts on a six-month timeline. The proposal was reviewed by the Institutional Review Board (IRB) for QI determination prior to project initiation.

Sample, Setting and Inclusion/Exclusion Criteria

The project sample included allogeneic stem cell transplant patients following their initial discharge from the hospital after stem cell transplant. Because of the lower numbers of allogeneic stem cell transplants performed in a 30-day period, the project sample was limited to 10 patients. The project location was the outpatient Blood and Marrow Transplant clinic at The University of Kansas Health System (TUKHS). This clinic is where the patients were first seen after being discharged from the inpatient setting at TUKHS. Providers including nurses, medical assistants, pharmacists, pre- and post-transplant coordinators, physicians and nurse practitioners are all on site for immediate attention to all patients.

Inclusion and exclusion criteria were used to determine subject participation. Inclusion and exclusion criteria was based on the parameters of the study and information desired. Patients were included if they had an allogeneic transplant for acute myelogenous leukemia (AML), acute

lymphoid leukemia (ALL), or myelodysplastic syndrome (MDS). Other inclusion criteria included discharge from the hospital for the first time since transplant, and an established plan for follow up with the BMT outpatient clinic. Patients were excluded from the study if they were deceased prior to outpatient follow-up, and if they were discharged home with hospice or best supportive care.

Telephone Call

The University of Kansas Health System's BMT outpatient clinic was the site from which the data collection occurred. Approximately 2-3 post-allogeneic transplant patients, meeting inclusion criteria, were discharged per week. A telephone script (appendix A) developed and approved by TUKHS, and adjusted for this patient population, was used when making the follow- up calls. Questions included an assessment of the patient's health status, medication check, review of upcoming appointments, and reminders of reasons that warrant a call to the provider. Medication reconciliation during the phone calls was be completed. Patients were provided education as needed. Information was given to their providers if they needed immediate attention.

Data Collection and Telephone Call Intervention

Data including age, gender, education level, caregiver support, race, and ethnicity was collected on all patients prior to the intervention. These data were collected from the patient as well as the patient's chart. All data collected were kept confidential and stored on a secure computer provided by TUKHS.

The phone calls took place over a two-month time span. The project leader communicated with the BMT outpatient clinic to obtain notification of patient discharges. The patients were then called within 24 hours and the project leader recited the script provided (appendix A) and documented any medication reconciliation that was performed (appendix B),

as well as made a note in the patients chart (appendix C). A review of the patient's chart after 30 days indicated any early hospitalizations or adverse events, this information was then also recorded (appendix B). Data was collected from the clinic regarding medication errors and readmission rates prior to the intervention for comparison (appendix B). Once all this information was obtained, the project leader reviewed and analyzed the data.

To determine the significance of the intervention on medication errors, the project leader evaluated the first tacrolimus blood level drawn following hospital discharge. The oral tacrolimus dose is calculated using a preset algorithm, and is adjusted based on several factors such as initiation or discontinuation of certain medications that could potentiate the tacrolimus effect (antifungals for example). Separately the team pharmacist and nurse practitioner evaluate the patient, their medications, and their transplant status, and then following the algorithm, calculate the tacrolimus dose. If the patient was taking the correct dosage, in the correct manner, as many times as prescribed daily, their serum tacrolimus level should reflect this and be within the therapeutic range. If the patient was not within the therapeutic range, it was anticipated that there was an error in the medication administration, and there was a need to intervene. When presented with a sub therapeutic tacrolimus level, the assigned Nurse Practitioner will follow the above mentioned protocol and the patient will then be notified of the needed change. Lastly, 30-day readmission rates recorded during the data collection period were compared to previous months 30-day readmission rates for allogeneic stem cell transplant patients, this information was provided by the clinic.

Data Analysis

All data were compiled and then compared to determine the overall impact of the post-discharge follow-up phone calls. Descriptive statistics such as mean, percentages, and ranges were used to define demographics, education, transplant type, transplant source, insurance type,

caregiver, discharge disposition, and readmissions. Data was compared using pre- intervention and post-intervention groups.

Results

Data were collected from 10 patients who received the post-discharge telephone call and 10 charts, using a retrospective chart review. Both samples were predominantly White, male, and middle-aged (see Table 1). For both groups, diagnoses were AML, ALL, or MDS; transplant types consisted of MUD (matched unrelated donor), MSD (matched sibling donor) or haploidentical, and source was either bone marrow or peripheral stem cell (see Table 1). Readmissions were monitored and noted if they happened within 30 days of the patient's discharge from the hospital, or if they were admitted for procedural interventions including EGD, colonoscopy as well as blood culture and antibiotic dosing. The observation stays were less than 24 hours. (see Table 2). Notes were made during the phone calls regarding any medication changes, and then reviewed at the completion of the study for comparison and implication of the impact of the phone call on medication adherence.

Table 1

Sample Demographics, Disease and Transplant Type

	Post-intervention	Pre-intervention
Age	55.6 years (25-69)	52.8 years (25-71)
Gender	60% male	70% male
Race	90% European/white	100% European/white
Education	15.1 years (n=7)	13.6 years (n=6)

	Post-intervention	Pre-intervention
AML	80%	30%
ALL	10%	20%
MDS	10%	50%
Bone Marrow Source	80%	60%
Peripheral Blood Source	20%	40%
MUD	60%	80%
MSD	20%	10%
Haploidentical	10%	10%

Caregivers were classified as spouse, family, or other. Caregivers in the pre-intervention group included spouse 90%, family 0%, and other 10%. Compared to the post-intervention group where 40% used their spouse as their primary caregiver, 50% used a family member, and one person (10%) used a friend/other. Insurance was classified as Medicare, Medicaid, or private. Seventy percent of the patients in the post-intervention group had private insurance, 20% had Medicare and 10% had Medicaid. Thirty percent of the pre-intervention group had Medicare, 20% Medicaid, and 50% private. Disposition after discharge was classified as home, hope lodge (free housing available in the downtown area for those patients who live farther than 30 minutes from the hospital, they MUST have a 24-hour caregiver with them to stay), or other. Of the post-intervention group, 60% went home and 40% stayed at Hope Lodge, whereas in the pre-intervention group, 50% were discharged home, 40% to Hope Lodge, and 10% elsewhere.

While looking at medication compliance via tacrolimus serum levels, it is important to note that the post-intervention group, for unknown reasons, had a higher rate of discharging on IV tacrolimus (40%) therefore their compliance was not monitored. Ten percent were not on

tacrolimus as part of their transplant protocol. Of the remaining five, four had two therapeutic serum tacrolimus levels after discharge, one patient had a sub therapeutic level on the first check after discharge and was placed on IV treatment. In the pre-intervention group, 20% of patients had sub therapeutic serum levels, which required initiating IV medication. Of note, one of these patients had a documented miss dose of tacrolimus. Of the remaining 8 patients, 2 were discharged from the hospital on IV tacrolimus, therefore compliance was not monitored. One patient was not on tacrolimus as part of the post-transplant protocol. Five of the group had therapeutic serum tacrolimus levels.

Table 2

Project Results

	Post-intervention	Pre-intervention
Readmissions within 30 days	0%	20%
Procedural Readmissions	40%	40%
Medication Non-adherence	10%	20%

Discussion

This quality improvement project evaluated a post-transplant discharge telephone call to reduce readmission rates and increase medication adherence to transplant medications. The phone calls took place over a 2-month timeframe. Comparatively, patients in post-intervention group had no readmissions, where 20% of the pre-intervention group patients required readmission. The groups did show the same percent of procedural admissions (40%) for issues such as fevers requiring antibiotics, blood cultures, EGD, colonoscopy, or line removal.

It is difficult to discern if the project had any impact on medication compliance. As noted, a larger number of patients who received the phone call had been discharged on IV tacrolimus therapy, therefore their compliance was not monitored. However, prior to the implementation of the phone calls, 20% of the patients in the pre-intervention group had documented missed doses of medications, and required intervention.

Overall, results from this project are comparable to outcomes found in the literature. In a study by Schuller, et. al., 2015, the authors state that if patients needs are not met, and questions answered during "post-discharge" care, there is a significantly higher rate of "negative health outcomes, care complications and readmission rates" (p. 163). The authors also state that follow up phone calls help to "improve the complex discharge planning process involved in the transitional period" (p. 170), when patients are leaving the hospital and returning to life at home. In another study by Harrison, et. al., 2014, the authors found that readmission rates decreased after implementing a post-discharge follow up phone call. In this study, approximately 20% had issues with medication reconciliation, and with the phone call intervention, these issues were addressed. These findings are similar to the outcomes of this project in which we found a lower readmission rate among the post-intervention group.

Medication adherence can be difficult to evaluate. In a study by Chisholm, et. al., the authors investigated immunosuppressant medication compliance in the renal transplant population. They evaluated serum blood levels of the prescribed immunosuppressant as an objective measure of medication adherence. Patients were deemed adherent if their serum levels were within a therapeutic range. Tacrolimus has been shown to have high "inter- and intra-individual variability" and a "narrow therapeutic index, necessitating therapeutic drug monitoring" for greatest effects of treatment (Scott, et. al., 2003, p. 1257). Tacrolimus has also

been proven to be an effective preventative immunosuppressant in BMT patients when given prophylactically for graft versus host disease, which makes it an important treatment component post-transplant (Scott, et. al., 2003). Because of the narrow therapeutic window of tacrolimus, if the patient is shown to be outside of the therapeutic range, IV tacrolimus is initiated with serial serum drug levels monitored until the patient achieves a therapeutic level two days in a row. It is important to note that there are anecdotal findings that suggest that some patients, despite completely accurate medication adherence, continue to have sub therapeutic drug levels. However, in this project, the patients found to have sub therapeutic blood levels also had documented non-adherence with their oral tacrolimus.

Anecdotally, several patients, as mentioned above, expressed gratitude for the phone call, stating that it was helpful to them. Several Advanced Practice Providers (APPs) working both inpatient and outpatient in the clinic, also expressed their appreciation of the phone calls. The APPs stated that they felt some relief knowing that someone had spoken with the patient and assured that they were settled in at home, Hope Lodge. They also valued the feedback the project leader could give regarding the learning deficits of the patients and what questions the patients had after discharge.

Limitations

One limitation of this project is the small sample size. Although the data suggests that the phone call was beneficial in regard to readmission rates, meaningful conclusions cannot be made. Another limitation was available resources. Originally, a form explaining the QI project was to be given to the patient. Staff were unavailable to provide the information to patients regarding the follow up phone call. Thus, it appeared that several patients showed some skepticism at the start of the call. They were often confused as to why they were receiving the call, since they had just been discharged. However, after an explanation of the call as given

(which was part of the telephone script), the patients were more apt to discuss their health since discharge, and many voiced an appreciation for the phone call and clarification of questions. During five weeks of the project, the project leader rounded with the inpatient BMT team one day per week. During these weeks, if a patient was to be discharged that day, or later in the week, the project leader introduced herself and discussed the project with the patient. The patients that were familiar with the upcoming call and awaiting it were more likely to discuss things that had changed or not changed since discharge and ask questions.

Implications

Although this sample was small, and the results cannot be assumed for the entire transplant population, the results support implementation of a post-discharge follow-up phone call as a standard of care in the program. With continued implementation, the clinic team could also collect data about patient and provider satisfaction, and use that data to modify the phone call as needed. An APP is the most appropriate provider to make the phone call. APPs can intervene with changing medication regimens based on the assessment during the telephone call, streamlining the transition from hospital to home.

To initiate this project in the BMT program, there needs to be an identified APP(s) to make the phone calls. A separate role, specifically to make phone calls does not seem necessary assuming the average discharge rate is 1-5 patients per day. This is also assuming that the phone calls are only being made to patients who are leaving the hospital for the first time. Further study would be needed to determine if calls should be made to those patients who are being discharged after admissions for other reasons. At this time the APPs who work inpatient are typically finished rounding on their patients by early to mid-afternoon. Generally, there are 2 to 4 APPs working on the inpatient side on any given day. This role could easily be assimilated into their work flow by assigning one APP per day, based on the schedule, to discharge phone calls. These

phone calls typically take no more than 5 minutes, with an additional 3-5 minutes of chart review and documentation.

The inpatient APP would be preferred over an APP in the outpatient setting because they would be familiar with the patients they are calling. The APP would be able to discuss any concerns or follow up needed with their colleagues prior to the patient arriving for their first outpatient appointment the next day. This would likely lead to an increase in provider satisfaction as they would be more prepared to handle any complications the patient may be experiencing. Building a trusting relationship through prompt follow up may also lead to increased patient satisfaction. Generally, this project would be easy to implement, with minimal training and no additional staff.

There is also a need to evaluate cost effectiveness of this project. Although the call itself typically took less than five minutes, there is additional time needed for documentation and discussion with other providers if warranted. Also, if the patient is experiencing complications, additional time and resources would be needed in order to facilitate a resolution of their concerns. The cost of paying an APP for this time is an important consideration when deciding on the implementation of this project.

Conclusion

BMT patients have complex diseases and treatment regimens, requiring vigorous treatment and close monitoring by competent, compassionate professionals. All additional resources that are available to improve outcomes for transplant patients should be used. By implementing hospital discharge follow-up phone calls, not only are patients at less risk for readmissions and complications, the phone call provides the opportunity to improve other outcomes. Most of all, it gives the provider the chance to show they care and are invested in their

patients. It is an extra few minutes, which could save many in the coming days by catching mistakes, answering questions, or simply calming apprehensions.

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Appendix A

Phone Call Components

Prior to phone call:

- Review patient's discharge summary
- Review discharge medications, instructions and follow-up
- Confirm that follow-up appointments are scheduled
- Review nursing discharge education

Phone call components:

1. Introduction
2. Assessment of health status
3. Medication check
4. Clarification of appointments
5. Review of when to call

Introduction:

- "Hello, _____, my name is _____. I am an RN at The University of Kansas Health Systems and a doctoral student at the University of Kansas School of Nursing. I am calling to follow up with you after your discharge from the hospital on _____. I will only take about 5-10 minutes of your times to discuss how things have been going since you arrived home. I would also like to review your discharge and follow up plans and find out if there is anything else I can help you with now that you are home. Sometimes there is a lot of information that can be missed when patients are discharged from the hospital. Do you mind if I ask you a few questions?

Assessment of Health Status

- Patient perception of any health changes since discharge
    - "How have you been feeling since you arrived home?"
    - "Since you left the hospital have you experienced any fevers, nausea, vomiting, constipation, diarrhea, sores in your mouth, falls, weakness, fatigue, or trouble with balance?"
- Symptom/SE management
    - Patient education as needed
    - May make recommendations for expected side effects
    - If more serious complications, direct them to the patient's healthcare team via the inBasket

Medication Check

- Review discharge medication list and schedule
    - "Have you had any concerns or problems taking your medications? Do you think you are experiencing any side effects from these medications?"
    - "Are you taking any other medications that we haven't discussed, like over the counter or herbal medications?"

Clarification of Appointments

- Confirm follow up appointment dates
    - "Now I would like to make sure that you and I have the same information about your next appointments. I have _____ for your next appointment, do you have the same? Are you going to be able to make your appointments?"
    - If patient is receiving home health infusions, etc, verify that everything has been delivered, set up and started.

Review of when to call

- "Lastly, before we hang up I want to make sure that if a medical problem arises you know what to do."
- "If you begin to experience fevers, rashes, uncontrolled nausea/vomiting, severe pain, please call the BMT on call (913-588-9821). If it is after hours, call the same number and ask for the BMT on call physician."

"Thank you for your time. Is there anything else I can help you with today? I hope that this phone call was helpful for you and your family. We look forward to seeing you on _____."

Appendix B

Data Collection and Associated Theoretical Concept

Age	Demographic data
Gender	Demographic data
Education Level	Transition conditions
Household Income	Transition conditions
Caregiver support	Transition conditions
Hospitalization admission and discharge dates	Health/Illness
Medication changes	Health/Illness
Medication levels	Outcome Indicator
Readmission within 30 days	Outcome Indicator

Appendix C

D/C date:

Discharged from:

Discharged to:

Issues since discharge:

New equipment:

New treatment:

New medications, medication changes:

Received all discharge medications:

Issues with discharge planning:

Reviewed next appointment:

Triage number given: