

Comparing the effect of Transitional Virtual Visits in Reducing Readmission Rates

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### Abstract

Hospital readmissions for palliative care patients are costly for patients, families, insurance providers, and palliative care organizations. The evidence shows that integrating virtual visits into palliative care is an innovative way to reduce hospital readmissions, preserve costs, and reduce geographical barriers. The purpose of this article is to evaluate how well transitional care virtual visits reduce future hospital readmissions for palliative care patients when compared to usual care of in-home nurse visits. Palliative care patients from a large palliative company in Arizona, who received a transitional care, post hospital discharge, virtual visit with traditional model care (intervention) were compared to randomly selected traditional model care patients (control). Data was collected through a retrospective chart review at 30 and 60 days post hospital discharge to evaluate for hospital readmissions and avoided readmissions. The Fishers Exact test was used to compare the results of the two groups to each other. There was no significant difference between the two groups. Virtual visits have an added cost to the agency without decreasing the risk of readmission. Implications for practice are to continue offering transitional care in-home nurse visits. Future research should evaluate if using virtual visits justify the increased costs of use.

**Keywords:** hospital readmissions; palliative care; virtual visits

### Comparing the effect of Transitional Virtual Visits in Reducing Readmission Rates

The focus of palliative medicine is to maximize a patient's comfort and quality of life (QOL) by managing symptoms. Reducing the number of times a patient must go to the hospital for more aggressive symptom management can impact both QOL and the illness burden while minimizing cost to both the patient and the healthcare system. Also, many palliative patients are not able to go to a doctor's office to see a provider because of the disease related limitations. Most provider office visits and hospitalizations could be avoided with increased or alternative ways to access care. The evidence supports that offering a virtual visit (VV) in conjunction with an in-home nurse visit (IHNV) to palliative patients, as part of the transition of care post hospital discharge, can improve their access to care further reducing the risk for re-hospitalization. The purpose of this paper is to evaluate the use of VVs to reduce hospital readmissions for palliative care patients.

### **Background and Significance**

Providing VVs to palliative patients improves their access to care and can help improve symptom control. Watanabe et al<sup>1</sup> found that rural palliative patients expressed decreased anxiety and increased appetite after participating in a palliative care (PC) program that offered VVs. Patients reported improved outcomes, increased satisfaction with care, ability to receive care in location of choice, and prolonged life during participation in a PC program compared to those who did not receive PC.<sup>2</sup> The use of home monitoring and VVs through technology was found to decrease needs for emergency services, improve management of symptoms, and increase family member confidence in care when provided with in-home nursing services for PC patients.<sup>3</sup> Using pre-existing technology to provide VVs is feasible, enhances communication and engagement between patients and providers, and increases patient satisfaction.<sup>4</sup> Husebø and Storm<sup>5</sup> found that

VVs in the home complement in-person visits in meeting the complex needs of older adults. Summerfelt et al<sup>6</sup> conducted a study that found that the use of VVs by physicians in conjunction with home licensed practical nurse visits efficaciously replaced the need for patients to go to the hospital for treatment of complications of COPD, heart failure, and pneumonia.

The reason PC VVs are offered in conjunction with usual care, which includes in-home nurse visits, is to prevent readmissions and improve QOL. Cassel et al<sup>7</sup> found that proactive admission to a PC program resulted in lower overall costs to both the patient and the payer, and decreased the risk of hospital readmission. An inverse proportion of readmission rates compared to PC utilization indicates that areas that have a higher proportion of palliative agencies see fewer readmissions.<sup>8</sup> Feltner et al<sup>9</sup> found that offering transitional care interventions, including home-visiting programs in combination with multidisciplinary heart failure interventions and structured telephone support, had a high level of significance in reducing readmissions of heart failure patients.

Participation in a PC program can improve outcomes, increase satisfaction with care, and enhance QOL for terminally or chronically ill patients. There are steadily increasing numbers of patients participating in PC. Readmissions to the hospital decrease QOL and increase cost for patients and payor sources. Offering VVs as part of a transitional process from the hospital to home PC is a feasible and cost-effective way of improving access to care and reducing the risk of rehospitalization. Increased activity of PC program in an area, can reduce that areas readmission rate through use of VVs in collaboration with IHNVs. The clinical significance is that providers can enhance QOL for patients who have increased care needs and are at higher risk of readmission to the hospital while also reducing the cost burden of illness for both patients and payors.

### **Problem Statement**

Palliative care is an important aspect of improving QOL for people faced with a terminal illness or who have multiple chronic diseases that are difficult to manage. Dumanovsky<sup>10</sup> reported that the U.S. has seen continued steady growth of PC programs throughout the country. Unfortunately, providers are not always able to provide the care needed by palliative patients due to barriers. Some of the barriers for access to a PC program include geographic location, confusion about terminology, mistrust of health care professionals, uncertainty about their prognosis, poor referrals<sup>11</sup>, cultural views of PC, and poor staffing of PC agencies.<sup>12</sup> Providers can offer care solutions to palliative patients through the use of technology so patients can remain in their homes.

Palliative patients require frequent access to providers to manage the health concerns and symptoms related to their life limiting or chronic illnesses. The Worldwide Palliative Care Alliance (WPCA)<sup>13</sup> estimates that about 20.4 million patients need PC as they near end of life. R. Bruckner reports that Arizona Palliative Home Care (AZPHC) admitted 3,261 patients to palliative care in 2016, with an average daily census of 680 patients (personal communication, February 9, 2017). “The great majority of adults in need of PC died from cardiovascular diseases (38.5%) and cancer (34%), followed by chronic respiratory diseases (10.3%), HIV/AIDS (5.7%), and diabetes (4.5%)”<sup>13</sup>. Readmission to the hospital can decrease QOL for many patients.

Hospital readmission is a great concern for patients, providers, and insurance companies. The Health Services Advisory Group<sup>14</sup> reports that Arizona had about 25,000 all cause hospital readmissions of Medicare patients in one year. Hines et al<sup>15</sup> state that Medicare had the largest rate of hospital readmissions within 30 days of discharge in 2011 totaling 55.9% of readmissions followed by Medicaid’s at a 20.6%, private insurance at 18.6%, and the uninsured are only at 4.9%. AZPHC reports that they had 220 insurance contracted PC patients that were readmitted to the hospital within 30 days of hospital discharge in 2016 (R. Brueckner, personal communication,

February 15, 2017). Hines et al<sup>15</sup> state that the most common causes of readmission are congestive heart failure, septicemia, pneumonia, COPD, cardiac dysrhythmias, UTIs, renal failure, acute MIs, device and graft complications, and acute CVAs. A total of \$41.3 billion was spent on hospital readmissions within the first 30 days after discharge in 2011.<sup>15</sup> Edelman<sup>16</sup> states that the most common factors for hospital readmission are pre-mature discharge from the hospital, failure to report to outpatient providers, emergency department decision making, and that patients lack awareness on who to contact after initial hospital discharge.

Modern medicine integrates technology into patient care, including VVs. The American Academy of Family Physicians<sup>17</sup> defines a VV as “an evaluation and management service provided by a physician or other qualified health professional to an established patient using a web-based or similar electronic-based communication network for a single patient encounter”. Of the estimated 50 companies in Arizona that offer telemedicine (TM), only six of them offer hospice or palliative care services.<sup>18</sup> In 2014, there was an estimated 350,000 provider visits to all types of patients using phone and video, with an expected rise to seven million per year by 2018.<sup>19</sup> Iafolla<sup>19</sup> found that 74% of Americans said they are comfortable with and would use telemedicine. In 2003, the National Initiative for Telehealth<sup>20</sup> Framework of Guidelines was released to help guide providers and regulatory organizations in developing policies and procedures utilizing TM.

## **PICO**

The inquiry on palliative patients and hospital readmissions has led to the clinically relevant PICOT question: For palliative patients discharged from the hospital (P), does offering a transitional care virtual visit with a provider combined with in-home nursing visits (I) compared to only providing transitional care in-home nursing visits (C) effect the number of hospital readmissions within 30 and 60 days of discharge (O).

### **Search Sources and Process**

An exhaustive literature search was performed to search for higher level of evidence (LOE) articles that discuss the use of VVs to reduce hospital readmissions for PC patients. The databases searched include PubMed, CINAHL, Cochrane Library, and ProQuest. The search terms used included various combinations, using the Boolean connector AND, of *palliative*, *telemedicine*, *virtual visits*, *readmission*, and *transitional*. Additional search limitations included only systematic reviews (SR) or randomized control trials (RCT). Gray literature was also searched but did not yield any additional references. There was very little evidence that included all three of the PICO keywords so most of the evaluated articles only included two of the PICO terms. Exclusion criteria for all databases included any articles published prior to 2011 except the most recent guidelines, and any use of TM that did not include video conferencing between patient and provider.

Inclusion criteria included higher LOE such as SRs and RCTs and addressed at least two of the search terms. The studies were included only if they described the SR or study enough to allow for reproducibility. Some cohort and qualitative studies were also selected because randomizing PC patients may not be ethical and PC follows a holistic approach best described using qualitative measures. A total of 12 studies were retained from the search for evidence. Most of the studies were systematic reviews (SRs) of randomized control trials (RCTs) that also included quantitative and qualitative studies. Only one of the retained studies falls outside the inclusion criteria of being published within the last five years.

### **Critical Appraisal**

Most of the studies did not include a significant description of the demographics of participants as the focus of the studies was based on PC patients of any type, although chronic disease did attribute to needing PC in the studies. Each study had a varying degree of desired



independent variables, dependent variables, and outcomes but every study addressed at least two sections of the PICO question. Multiple studies used the same evaluation tools increasing the reliability of the tools. The independent variable and outcome of greatest interest are video conferencing and hospital readmissions, respectively, which are included in at least half of the studies.

All the studies shared homogeneity in that all studies focused on care provided in the patient's home. The most common interventions are the use of telephone visits (n = 8) followed by video conferencing (n = 7), and three SRs and one RCT compared telephone visits with video conferencing. The most common dependent variables across the studies includes cost savings (n = 6), hospital readmissions (n = 5), unmet needs of patients (n = 4), and QOL (n = 4). Four studies addressed TM and home nurse visits but only one study combined the use of home nurse visits with video conferencing as the independent variable. The most common outcome reported across the studies was decreased readmissions (n = 5), cost effectiveness of TM (n = 4), followed by increased QOL (n = 3), and information needs of PC patients and their caregivers (n = 3).

### **Evidence Synthesis**

A review of the evidence suggests that using telephone interventions or video conferencing in transitional care can reduce hospital readmissions, lower costs, improve QOL, and address information needs of PC patients. Most patients, caregivers, and providers feel that TM is both an acceptable means of providing care to PC patients and is feasible in day to day practice. The most effective way to minimize the risk of readmissions is to use VVs to enhance the usual care of IHNVs. In home nursing visits, both individually or combined with TM, were found to reduce short term readmission and improve QOL but TM superseded in reducing overall cost. Implementation of VVs requires some coordination within an organization and training for staff

and patients on use of the video conferencing device. By using VVs during the transitional care process, patients recently released from the hospital can receive medication reviews, have their concerns addressed, and can be educated on signs and symptoms to monitor for and how to manage from the comfort of their home, reducing the risk of readmissions.

### **Purpose of Project**

The purpose of this project is to measure the effectiveness of transitional care VVs compared to traditional model IHNVs in reducing hospital readmissions for palliative patients and to measure if VVs are a cost-effective way of reducing readmissions. If found to be valuable in reducing readmissions and is cost-effective, then transitional care VVs can be implemented as standard practice. Patients will benefit from improved QOL and decreased costs of care with decreased hospital readmissions. Providers and Payor sources will benefit from decreased costs related to hospital readmissions.

### **Contribution of Theory**

The theoretical framework that best describes the interaction between VVs combined with IHNVs and PC patients is Dorothea Orem's Self Care Theory. Orem's theory is a grand nursing theory that states that self-care behaviors are influenced by the interaction between patients and their provider's.<sup>21</sup> A patient's culture, socioeconomic status, environmental factors, and poor self-care knowledge affect a patient's ability to maintain and promote health through activities that reduce symptoms and disease complications.<sup>21</sup> The role of the provider, or nursing agency, in Orem's self-care theory is to promote self-care by educating patients and their caregivers about their disease status/needs, plan of self-care, and to encourage increased responsibility of management of their own health.<sup>21</sup> This education can be provided through VVs and IHNVs and will help enhance self-efficacy of the patients and caregivers to improve their ability to manage

their care with the tools provided from the provider and the nurse. The patient will be taught to recognize when symptoms begin, how to manage the symptoms, or to reach out to the PC agency when symptoms begin instead of allowing the symptoms to become unmanageable if they do not feel confident in managing symptoms.

### **Evidence Based Practice Model**

The Evidenced based practice (EBP) model that was chosen to guide the project is the model for change to evidence-based practice by Rosswurm and Larrabee.<sup>22</sup> This model provides a step by step guide that is laid out in a linear form and easy to understand. The problem of PC readmissions was chosen during the discussion with stakeholders and possible interventions were discussed including the use of transitional care VVs in combination with IHNVs. The first step to implementing a VV program to reduce hospital readmissions for PC patients is to discuss feasibility and implementation procedures with the companies' stakeholders, to get approval for the project, and to collect internal evidence about the problem. The organizational stakeholders involved in the project approval process and implementation include the PC administration staff, including the organizations institutional review board, education staff, the physician(s) implementing the VVs, and the physician's administrative assistant who will be collecting data and assisting the physician in implementation.

The next step was to perform an exhaustive literature search based on VVs provided during transitional care for PC pts to reduce readmissions. This step includes evaluating and synthesizing the evidence while assessing for feasibility in practice. The step after that was to design the data collection methods to evaluate the effectiveness of VVs after the agency implemented a transitional care pilot study. Data collected, via chart review, includes the type of visit received by the patient, PC admission and discharge dates, the number of hospital readmissions and avoided

hospitalizations that each patient had within 30 and 60 days of hospital discharge, and some demographics. Finally, the results of the study were statistically analyzed and disseminated to the stakeholders. If the stakeholders find the results of the project to be valuable, transitional care VVs will be implemented into practice while continual evaluation of effectiveness is completed.

### **Project Methods**

The Social Behavioral Human Subjects Institutions Review Board (IRB) application, Chart Review Questionnaire, and supporting documents were submitted to Arizona State University's IRB in July 2017 after receiving site approval to implement the project. Corrections were made based on IRB recommendations until final approval to proceed with the project from the IRB was received in August 2017. Based on the small number of patients who received a transitional VV in the originally approved review dates, May thru September 2017, a request for an extension to add chart reviews for patients discharged in the months of October thru December 2017 was submitted and approval to continue collecting data was received in November 2017. All charts of PC patients discharged from the hospital in the months of May thru December 2017 were reviewed for study appropriateness. All patients who received a transitional care VV combined with an IHNV were included in the study along with an equal number per month of randomly selected patients who only received a transitional care IHNV.

The organization where the intervention took place is AZPHC, the largest PC company in Arizona. This organization uses a collaborative leadership approach that strives to constantly improve practice with the latest and best innovations along with contributing to evidence based practice. AZPHC has a strong focus on patient care with the goal to help patients achieve the highest QOL that is possible by helping to relieve suffering caused by pain and disease related symptoms through focusing on each patient's individual needs. Every patient is assigned an

interdisciplinary team of a physician, registered nurse, social worker, and chaplain to address every type of physical, psychosocial, and spiritual need that patient may have. Patients receive all the care they need in the comfort of their own home.

AZPHC was already utilizing VVs for routine follow ups with existing patients who had seen a provider previously in a face to face setting in their home. The intervention investigated for the project was to start utilizing VVs, preferably within three days of the patient returning home from hospital discharge, as part of the transitional care process, and combined with the traditional model of care of just a transitional IHNV. A chart review was performed within 60 days of hospital discharge to evaluate if the patient was readmitted to the hospital in 30 and 60 days, if they remained on PC services the entire 60 days and if not then why, if they received any visits from AZPHC staff that resulted in an avoided hospitalization within the 60 days, and the number of prior hospitalizations leading up to the hospitalization resulting in the transitional care visit. Demographic information collected included age, gender, ethnicity, language, marital status, type of habitation, and if they lived with a caregiver. The Chart Review Questionnaire was created by the project director so there are no prior studies to address the tools validity and reliability. In March 2018, data was entered into SPSS and was analyzed using the Fishers Exact test and descriptive statistics. The time spent for internal data gathering by AZPHC staff was not reimbursed by the project and all time used to gather data was by the project director and non-funded.

### **Project Results**

The transitional visit results of the VV intervention group (n = 14) were compared to the traditional model IHNV group (n = 15). A 30-day and 60-day chart review showed that there was no significant difference in reducing hospital readmissions within 30 and 60 days of hospital

discharge ( $p = 1.00$ , Fisher's Exact test). The average reimbursable rate from Medicare to AZPHC for a VV is \$65 (B. Volk, personal communication, February 5, 2018). Virtual visit patients are no less likely to experience a hospital readmission but do have added costs since there is no significance in the reduction of hospital readmissions between the groups.

The groups did show some varying factors that were studied but none of the results were significant either. About 36% of the VV group ( $n = 5$ ) compared to about 13% of the IHNV group ( $n = 2$ ) spent time in a rehab or skilled nursing facility post hospital and prior to transferring home where they received the VV. Patient attrition for both groups during the 60-day timeframe were from transferring off PC service ( $n = 4$ ), transferring to hospice ( $n = 5$ ), and death ( $n = 1$ ). All the VV patients ( $n = 7$ ) who experienced readmissions had their first readmission within the first 30 days after hospital discharge. The number of avoided hospitalizations were higher in the first 30 days for 50% of the VV group ( $n = 7$ ) compared to 26% of the IHNV group ( $n = 4$ ) but still not significant ( $p = 0.203$ , chi square test). The VV patients had closer to significant results for readmission cause related to the cause of the initial hospitalization ( $p = 0.119$ , Fisher's Exact test). Also, the VV group had more prior hospitalizations ( $\bar{x} = 1.64$  (std. dev. 1.45)) compared to the IHNV group ( $\bar{x} = 1$  (std. dev. 1.36)), and the IHNV group ( $n = 8$ ) had 73% more patients that had no documented prior hospitalizations in the first six months.

Almost 73% of the IHNV group ( $n = 11$ ) had slightly more patients still on service at the 60-day review point when compared to about 57% of the VV group ( $n = 8$ ). Length of stay days of the first hospital readmission was longer for the IHNV group ( $\bar{x} = 5.13$  (std. dev. 2.99)) compared to the shorter length of stays for the VV group ( $\bar{x} = 3$  (std. dev. 2.24)). The number of avoided hospitalizations within the 31 to 60-day timeframe was higher, at about 26%, in the IHNV group ( $n = 4$ ), whereas about 7% of the VV group ( $n = 1$ ) had less avoided hospitalizations.

Demographically, there was no statistical difference between the groups leading to homogeneity for both groups. The mean age for the VV group was 76.43 (std. dev. 11.05) with a median of 77 and the IHNV group had a mean age of 71.93 (std. dev. 17.26) with a median of 74. The IHNV group had one outlier at the age of 28. Since there was no statistical significance between the demographics of each group the total of both groups (n = 29) are presented here: male about 55% (n = 16), Caucasian approximately 66% (n = 19), married about 31% (n = 9), English speaking is 97% (n = 28), lives in a traditional home about 90% (n = 26), and lives with someone in the caregiver role nearly 72% (n = 21). The most common primary diagnoses for the VV group, in descending order, are cancer (43%), COPD (29%), and heart failure (14%) with the most common top five secondary diagnoses for each patient being hypertension (57%), type 2 diabetes (36%), heart failure (29%), and an equal amount (21% ea.) for anemia, cancer, heart disease, hyperlipidemia, and renal disease. The IHNV group had the most common primary diagnoses of COPD (27%), heart failure (27%), type 2 diabetes (20%) and Cancer (13%) with each patients' top five most common secondary diagnoses as hypertension (60%), heart disease (40%), renal disease (40%), type 2 diabetes (33%), depression (27%), and COPD (20%).

### **Discussion**

Although there was no added benefit of reducing hospital readmissions among the VV group, the literature supports that when VVs are used to supplement IHNVs, there is increased communication between providers and patients and improved satisfaction with care received.<sup>4</sup> The literature also supports that VV are effective way to improve access to care. The company may choose to continue to provide transitional care virtual visits, with schedule permitting, to maximize quality of care and improve communication with patients. The agency may decide that the

increased cost associated with virtual visits is worth the added benefit found in the literature associated with VVs.

Strengths of the project included good communication with the project director and the project site teams. Staff was also receptive, open, and inviting to project implementation and were willing to do what was necessary for successful project completion. Limitations include that the level of accuracy of documentation is based on the individual charting, that the agency changed electronic charting systems in the middle of the project changing the focus from completing VV with patients to learning a new charting system, and the limited number of virtual visits that were performed in the eight-month timeframe that data was being collected. Sustainability of a VV program can be achieved by improving scheduling practices or integrating a full time VV provider to allow for greater availability of VVs.

Some of the research literature found that using VV to provide care reduces hospital readmissions but none of the literature addressed transitional care based VVs. Future research can evaluate why transitional care VV do not affect readmission rates compared to non-transitional VV that have been shown to reduce readmissions, the other added benefits of VV, and do these benefits outweigh the cost of the VV. Researchers can focus research on how VV can best be integrated into PC practice. A similar project can evaluate if VV reduce the number of hospital readmissions for the hospice and pediatric palliative populations. Additional research can evaluate how offering VVs to PC patients affects length of stay on PC services.

## **Conclusion**

Hospital readmission for PC patients are costly to patients, payors, and PC agencies, and can decrease quality of life for the patient. The purpose of this project was to evaluate if transitional care VVs combined with IHNVs reduced the number of hospital readmissions within 30 and 60



days after initial hospital discharge and if VVs are a cost-effective way to reduce readmissions. A comprehensive literature search found 12 articles that support the use of VV in PC. Critical analysis of the literature showed that benefits of VVs include improved communication, access to care, and satisfaction with care. Dorothy Orem's Self Care Theory integrates providers teaching patients about how to recognize and address symptoms before those symptoms lead to hospitalization, which can be applied to VVs. Rosswurm and Larrabee's<sup>22</sup> evidence based practice model guided the project initial from communications with stakeholders to disseminating evidence. Although, the literature found that VVs have been found to be an effective way at reducing hospital readmissions for PC patients, the project showed that VVs combined with an IHNV, during the transitional care phase, are not effective at reducing hospital readmissions within 30 and 60 days. Transitional care VVs have added costs to the agency without reducing readmissions. Future research should focus on the benefits of VVs and when the most appropriate time is to provide them.

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