



Case Study: Remote Patient Monitoring for Care Transition Intervention Program, utilizing Remote Patient Monitoring System (RPMS) from Vivify Health.

Location: CHRISTUS Health System, St. Michael Hospital, Texarkana TX

Purpose: Decrease Hospital Readmissions, Improve Patient Satisfaction

Results:

90% Reduction in overall cost of care

65% Reduction in hospital readmissions

95% patient adoption

95% overall patient satisfaction

ROI of \$2.44 return for every dollar invested was reached in month 5 and continued to improve

Technology: Vivify Health, Remote Patient Management Platform, Remote Patient Monitoring System (RPMS) including 10" Android tablet, and Bluetooth paired personal health devices: weight scale, blood pressure monitor, pulse oximeter

Pilot Duration: 1 year

Patient Group: 44 completed, average age 66 years, Congestive Heart Failure (CHF) primary diagnosis

Governance: Institutional Review Board, Pilot Research Team bi-monthly meetings

CHRISTUS Pilot leadership:

Luke Webster, MD, VP & CMIO (RPMS Principle Investigator)

Shannon Clifton, Director of Connected Care (RPMS Pilot Sub Investigator)

Ellen Ford, Clinical and Strategic Analyst (RPMS Pilot Study Coordinator)

Hank Fanberg, Technology Advocacy

The CHRISTUS Health Care Transition Program undertook this pilot project to reduce the hospital readmissions of high-risk patients diagnosed with specific chronic illnesses: Congestive Heart Failure (CHF), Coronary Artery Disease (CAD), Hypertension, Diabetes, Myocardial Infarction (MI), Pneumonia, and Chronic Obstructive Pulmonary Disease (COPD). Patients with these diseases commonly have complications that result in readmissions to the hospital within 30 days of discharge and are a targeted population for this community-based program.

The Care Transition Intervention Program mission is to teach patients to apply new skills that enable them to improve their ability to care for themselves when transitioning from the hospital and at home. This program relies on a trained and certified Care Transition Nurse (CTN) who identifies appropriate patients for the program, enrolls the patients, and begins their care cycle. Prior to discharge, the CTN visits the patient to begin the successful transition from hospital to home, including medication review and preparing the patient to begin self-management at home. Post discharge, the CTN makes an initial visit to the home to review medication orders, educates patients about their condition and warning signs, reviews the Personal Health Record, and communicates with family caregivers.

While successful, the Care Transitions program did have a few challenges. First, some patients did not want a CTN to come to their home and refused to consent to the CTN visit. This was the main reason patients declined to participate in the Care Transition Program. Second, some patients live up to 50 miles away from the hospital, requiring the CTN to spend approximately 500 hours annually traveling to and from patient homes, reducing the amount of time for actual patient care.. This reduces the number of patients for which the CTN can transition and deliver care. Third, the CTN has limited interaction time with patients enrolled in the program because of the time spent driving to and from the initial home visit, thus limiting patient engagement and satisfaction. CHRISTUS anticipated the pilot would have a positive effect on these challenges.

The RPMS is a cloud based (SaaS) Remote Care Management Platform utilizing consumer electronics, in this case an Android Tablet, and the following Bluetooth enabled personal health devices: weight scale, blood pressure monitor, and pulse oximeter. Patient protocols and care plans were easily customized for each patient, and the intuitive user interface was simple and easy for almost all patients to use. Patients could answer questions, send biometric

data, and view educational videos. With appropriate connectivity, patients could engage in real time interactive videoconferencing with caregivers. Wireless connectivity, provided by AT&T, sends data from personal health devices at the patient's home to a secure "cloud" where it can be securely logged into by authorized caregivers via any browser.

Initially, the Care Transition staff had reservations about implementing this solution for two reasons. First, they wanted to continue making the initial home visit to establish and strengthen a personal relationship with the patient and assess the patient in the home living environment. Second, the staff questioned whether patients would use and benefit from the RPMS system since the majority of patients enrolled were over the age of 65 and not technology savvy. To address these concerns, Vivify Health demonstrated the simple and intuitive process the patient would use with the tablet. After this demonstration, the Care Transition staff and hospital administrators thought the elderly population would not only be able to operate the equipment, but also highly benefit from it. In addition, they felt the number of patients they could impact would dramatically increase.

The patients selected for the study had an average age of 66 and were given a kit containing a tablet, weight scale, blood pressure cuff and a pulse oximeter. Upon completion of the program, analysis of return on investment and changes in costs of care were calculated. The average ROI for forty-four (44) patients who completed the program was \$2.44 for every \$1.00 spent. Additionally, prior to enrollment in the program, the average cost of care for the 44 patients was \$12,937; after participation, that figure dropped to \$1,231, thus reflecting an approximate 90% decrease in cost of care.

While one of the major outcomes of the Pilot was to reduce hospital readmissions, additional benefits were realized. Some of the Care Transition Intervention existing processes that contributed to less than ideal rates of patient participation (detailed in paragraph 3 above) were reduced or eliminated. With RPMS, the patient took the solution kit home with them from the hospital and began using it. The training and familiarization of the RPMS home kit given to the patients before they left the hospital eliminated the need for the initial CTN visit. While at home, the medical devices acquired and transmitted biometric data, the patient answered survey questions presented to them on the tablet, and viewed educational videos about their condition. For the CTN, the need for the initial in-home visit is greatly reduced, while the patient is monitored much more consistently. The CTN can effectively care for patients, maintain efficient workflow, and spend more time with each patient.

Due to the success of the project, CHRISTUS Health is expanding RPMS across the health system, which remains an important initiative for improving patient outcomes and satisfaction. Data integration into the CHRISTUS Electronic Medical Record is possible and is under consideration.

It must be noted that this Pilot occurred prior to Home Telemonitoring Reimbursement for Medicaid patients, available in Texas as of October 1, 2013. Home Telemonitoring is defined as a health service that requires scheduled remote monitoring of data related to a patient's health and transmission of the data to a licensed home health agency or a hospital. It has been calculated that ROI could approach \$40.00 (\$40 saved for every \$1 invested in RPM) with full utilization of possible reimbursement.

Authors:

Luke Webster, M.D., Chief Medical Information Officer

Shannon Clifton, Director Connected Care

Ellen Ford, Clinical & Strategic Analyst