

A Nurse Practitioner–Led Intervention to Reduce Hospital Readmissions

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ABSTRACT

A readmission risk prediction tool was used to identify high-readmission-risk medical patients. A total of 676 patients were identified as high risk. Five hundred thirty-two patients received a single nurse practitioner–led postdischarge home visit. One hundred forty-four patients were included in the study as controls. The home visit average age was 75.4 years, and control group average age was 70.7 years. The control group readmission rate was 23.61%, while patients receiving home visits had a readmission rate of 12.22% (48.2% relative reduction). Acute care return rates (including emergency room, observation, and inpatient admissions within 30 days) were monitored. The control group rate of acute care return was 61.1%. Patients receiving home visits had an acute care return rate of 28.2% (53.9% relative reduction).

Keywords: care transition, home visit, readmission, risk stratification

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INTRODUCTION

Medicare 30-day readmission rates are on the order of 20%.¹⁻³ However, when these data are further evaluated by readmission risk groups, the high-risk groups can have readmission rates as high as 40%–50% within 30 days of discharge. As a result of these high readmission rates, there has been considerable interest in the development of strategies to reduce avoidable readmissions after hospital discharge.⁴⁻⁶ Indeed, readmission reduction is part of the Affordable Care Act, which established the Hospital Readmissions Reduction Program.⁷ Previous studies have shown that home visits or telephonic visits after discharge can result in readmission reduction, improved patient satisfaction, increased understanding of health issues, and better compliance with care plans.⁸⁻¹⁰ Although well-structured home visits have been shown to reduce readmissions, these interventions are resource intensive and may not be appropriate for all patients discharged from a hospital. A typical Medicare readmission can cost between approximately \$9,000 and \$15,000, depending on diagnosis,¹¹ substantially higher than the cost associated with a single nurse practitioner visit (approximately \$180 per visit). By targeting a home visit intervention program to these high-risk patients, formidable reductions in readmission rates can be achieved.

METHODS

Design and Setting

This case-control study was approved by the institutional review board and conducted at a 192-bed community hospital located in suburban Denver, Colorado. Of note, an advanced practice nurse (APN) in Colorado may practice independently. All adult patients discharged from the medical/surgical unit of the program hospital were scored on the day of discharge using a readmission/mortality prediction tool known by the acronym LACE.¹²

Tools

The LACE tool *quantifiably* identifies members who are at risk for rehospitalization and allows for the stratification of every patient at the time of hospital discharge using a standardized evidence-based tool. The LACE tool was developed by van Walvaren et al. using data from approximately 1,000,000 Canadian patient records. They found the LACE index to be discriminative (C statistic = 0.684) and highly accurate (Hosmer-Lemeshow goodness-of-fit statistic = 14.1, $P = .59$) for prediction of outcome risk. The LACE tool evaluated 48 clinical and demographic variables and found 4 of these variables to be the most powerful predictors of 30-day risk of readmission or death. The 4 variables used in this model include: Length of stay; Acuity of visit;

a modified Charlson comorbidity index; and number of Emergency room visits in the 6 months before the index admission (LACE). These variables are used to calculate a patient-specific risk of readmission score. Scores range from 0 to 19, with a higher score indicating a higher probability of 30-day readmission/mortality. On the day of discharge, a LACE score was calculated and then patients were placed into 1 of 4 LACE risk pools. The pools were generated based on baseline 30-day readmission rates (Table 1).

A LACE score of 0-6 was considered low risk for readmission, 7-10 was intermediate risk for readmission, 11-15 was high risk of readmission, and > 15 was considered very high risk. Patients with the highest risk of mortality or readmission (ie, LACE score > 15) at the time of discharge were considered to have needs beyond the scope of this study (eg, palliative care needs or placement needs). Patients with scores of < 10 were also excluded from the present study intervention as these patients had lower risks of readmission and thus fewer postdischarge needs.

Participants

LACE scores were calculated on the day of discharge for patients discharging from surgical, medical, or telemetry units. To be included in the study, patients had to have a LACE score of 11-15, with discharge to home. In addition, they were not receiving active chemotherapy, radiation therapy or hospice care, and resided within the service area. Patients with scores in the high readmission risk category (LACE 11-15) were then automatically referred to the post-acute care program through the referral process within the electronic medical record (EMR). Five hundred thirty-two patients met these criteria and received a post-acute care transition (PACT) home visit

Table 1. Baseline 30-day Readmission Rates for LACE Score Quartiles

LACE Score	Readmission Rate
0-6	5.7%
7-10	15.35%
11-15	21.48%
> 15	32.58%

($n = 532$). Control patients were those patients eligible for the PACT program who had accepted a PACT visit, but were not seen by the PACT program due to staffing or scheduling constraints. One hundred forty-four patients met these criteria and served as controls in this study ($n = 144$). Home visits occurred within 72 hours of discharge from the hospital. All patients who were eligible for inclusion were followed for readmission events for 30 days, irrespective of PACT visit status. The average age of PACT participants was 75.4 years, whereas the control group averaged 70.7 years. LACE scores and gender distribution were similar in both the intervention and control groups (Table 2).

Study Intervention

PACT home visit. The highly structured, single PACT home visit was designed to assess continuing clinical improvement; ensure post-hospitalization medication understanding and compliance; resolve medication discrepancies and misconceptions; provide referral to ongoing, supportive resources; and provide adjustments to the clinical care plan if required.

All PACT visits were performed by an APN with access to the inpatient and outpatient EMR as well as electronic discharge instructions. APNs can provide extensive education, independent medical assessment, and adjustment of the clinical care as needed in response to developing clinical situations. PACT visits were scheduled to occur between 48 and 72 hours of the hospital discharge, as earlier investigations suggest that time immediately after discharge is the most vulnerable period for readmission.¹⁰ During the home visit, the APN performed a focused clinical examination and discussed the events that led up to and during the hospitalization. The APN also discussed the post-hospitalization clinical progress with the patient, family, and other caregivers. Further, the APN performed disease education and addressed any concerns that may have developed since discharge. Medications were adjusted if required during the home visit, as patients may have developed clinical symptoms that required modification or titration of the discharge medication regimen. Follow-up labs were also ordered in anticipation of specialty or primary care follow-up. Proper use of medical assistive devices

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