DATA DRIVEN.POLICY FOCUSED

LDI ResearchBRIEF

Research to Improve the Nation's Health System

2018 . No. 9

THE EFFECT OF WORKFORCE ASSIGNMENT ON PERFORMANCE: EVIDENCE FROM HOME HEALTH CARE

Guy David and Kunhee Lucy Kim

Journal of Health Economics – May 2018

KEY**FINDINGS**

In this study of more than 43,000 home health episodes following a hospitalization, handoffs between skilled nursing providers—a marker of discontinuity of care—substantially increased hospital readmissions, and were more detrimental for sicker patients. The estimates imply that a single handoff increases the likelihood of 30-day hospital readmission by 16% and that one in four hospitalizations during home health care could be avoided if handoffs were eliminated.

THE QUESTION

Home health is an important and rapidly growing segment of the health care system. With the advent of readmission penalties and an emphasis on population health management, home health has emerged as an important setting for improving post-acute outcomes and preventing unnecessary readmissions.

Little is known about the optimal way to assign the skilled nursing workforce in home health. Efficient workforce assignment entails matching task and talent, managing planned and unplanned absences, negotiating distances, and allowing flexibility when demand changes. Beyond efficiency, other goals include employee satisfaction and retention, and delivering higher quality of care. A continuous relationship between a patient and a single health professional can ensure continuity of care, but may involve a costly deployment of resources. Having different nurses visit across one home health care episode may optimize flexibility, but its effect on outcomes is unknown. Using data from a large, for profit home health agency, the authors sought to answer the question, "Do handoffs between skilled nurses have an effect on hospital readmissions for Medicare patients"?

THE FINDINGS

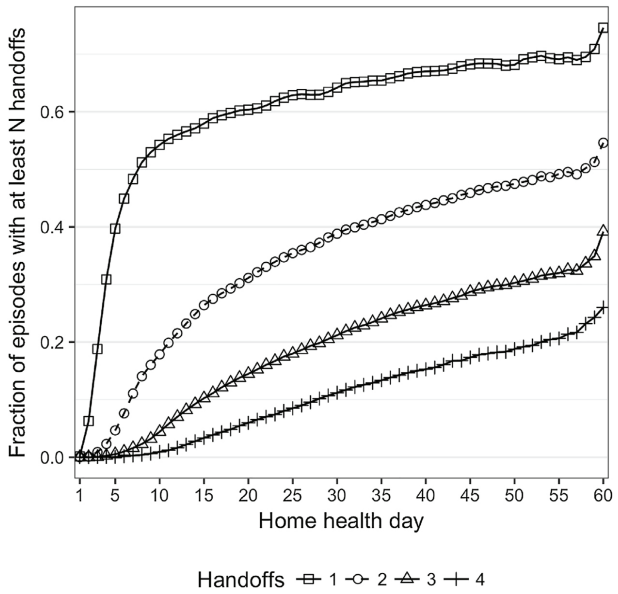
Of the more than 43,000 home health patient episodes in this study, 16.6% ended with a hospital readmission, and most of the readmissions occurred within 30 days of hospital discharge. The average home health episode involved six nurse visits over a period of 33 days, with 87% of home health episodes involving between three and 12 nurse visits. Only 38% of patients were seen by a single nurse throughout their episode of care. Handoffs are substantially more likely to occur early in the home health episode and then sharply decline with more home health days, as shown in **Figure 1**.

The authors controlled for a rich set of patients' health risk, demographic, and comorbidity factors, as well as for home health day, number of visits, spacing of visits, episode length, and various caseload and labor supply conditions in each office. They find that patients experiencing nurse handoffs are 24% more likely to have a hospital readmission, and 21% more likely to have a hospital readmission within 30 days (the basis for hospital readmission penalties). Their estimates imply that a single handoff increases the likelihood of 30-day hospital readmission by 16%.

Handoffs were more detrimental to sicker patients. Fragile patients and patients taking multiple medications were 59% and 57% more likely to be readmitted after experiencing handoffs, respectively. The frequency and sequencing of handoffs also affect the likelihood of rehospitalization, with the first handoff having the strongest effect on increasing hospital readmissions.

Penn LDI
Leonard Davis Institute of Health Economics

Figure 1. Fraction of patient episodes with at least one, two, three, or four handoffs by home health day.



THE IMPLICATIONS

This study is the first to link workforce assignment decisions in the post-acute care setting to hospital readmissions. Most of the research on care continuity has focused on transitions of care across settings, especially on transitions from hospitals to post-acute care facilities.

Why would handoffs lead to hospital readmissions? It could be a function of incomplete transmission of information between providers, which could lead to inappropriate care. It could also be because handoffs depreciate the relationship stock built between providers and patients, which has been shown to improve patient outcomes. Finally, it could be because patients experiencing a handoff lose access to providers most familiar with their case.

In home health care, handoffs can often be avoided through coordinated scheduling, given that providers typically visit patients with several days in between. In this study, 38% of patients are seen consistently by a single nurse throughout their episode of care. But prioritizing continuity of care may be costly in that it may come at the expense of flexibility in scheduling, employee satisfaction, and ultimately retention. By quantifying the effect of discontinuous home health care on an important health care outcome, this study can help home health agencies more accurately assess how to balance care continuity with other goals typically achieved through the organization and scheduling of visiting nurses.

THE STUDY

The authors developed a rich dataset of home health visits, patient health status assessment, and provider work logs. They obtained data on all home health stays for Medicare patients with a prior hospitalization in the past 14 days from a large for-profit freestanding home health company, with 89 offices in 16 states. The study period covers 44 months between January 2012 and August 2015.

They excluded episodes consisting of a single visit, as well as patients who had multiple subsequent home health episodes, as these home health stays may have different patterns of visit schedules and provider handoffs. The final sample includes 43,740 unique home health episodes and 1,031,904 patient days under home health.

The authors used detailed information from visit logs for all Medicare patients, work logs and human resources data for all home health providers, as well as all patient demographic and health risks collected as part of the Medicare's Outcome and Assessment Information Set (OASIS). Home health episodes can end by either a discharge or a hospitalization. The exact dates of these outcomes for each episode were obtained from OASIS. They merged the patient-day level data with provider-day level work log data to identify handoffs and link them with hospital readmissions.

To uncover the mechanisms underlying the effect of handoffs, they also examined whether handoffs affect hospital readmissions differently by underlying patient severity and by the frequency and sequencing of handoffs, and whether handoffs affect time to readmission.

David G, Kim KL. The effect of workforce assignment on performance: Evidence from home health care. *Journal of health economics*. 2018 May 1;59:26-45. DOI: 10.1016/j.jhealeco.2018.03.003

AUTHORS

DR. GUY DAVID

Guy David, PhD is the Gilbert and Shelley Harrison Associate Professor of Health Care Management at Penn's Wharton School. His research on emergency medical services, home health care, primary care, specialty hospitals, and ambulatory surgery centers has yielded insights into how individuals, firms, and regulators interact across the continuum of care. He is the director of the doctoral program in Health Care Management and Economics at Wharton, as well as Director of Education at Penn LDI, where he leads graduate and executive education programs. He received his BA and MA in Economics from Tel Aviv University, and his PhD in Business Economics from the University of Chicago.

DR. KUNHEE LUCY KIM

Kunhee Lucy Kim, PhD is a Postdoctoral Training Fellow at the Center for Healthcare Innovation and Delivery Science at NYU Langone Health. Her research focuses on examining health care provider incentives in response to policy, regulations, and technological advancement, and investigating their broader impacts on managerial strategy, organizational structure, treatment patterns, and patient outcomes. Dr. Kim completed her PhD in health care management and economics at Penn's Wharton School.