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Original Study

Investing in Post-Acute Care Transitions: Electronic Information Exchange Between Hospitals and Long-Term Care Facilities

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A B S T R A C T

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Background: Electronic health information exchange (HIE) is expected to help improve care transitions from hospitals to long-term care (LTC) facilities. We know little about the prevalence of hospital LTC HIE in the United States and what contextual factors may motivate or constrain this activity.

Research design: Cross-sectional analysis of U.S. acute-care hospitals responding to the 2014 AHA IT Supplement survey and with available readmissions data ($n = 1,991$). We conducted multivariate logistic regression to explore the relationship between hospital LTC HIE and selected IT and policy characteristics.

Results: Over half of the hospitals in our study (57.2%) reported engaging in some form of HIE with LTC providers: 33.9% send-only, 0.5% receive-only, and 22.8% send and receive. Hospitals that engaged in some form of LTC HIE were more likely than those that did not engage to have attested to meaningful use (odds ratio [OR], 1.87; $P = .01$ for stage 1 and OR, 2.05; $P < .01$ for stage 2), participate in a regional HIE effort (OR, 1.34; $P = .021$), and exchange information electronically with other hospitals or ambulatory providers (OR, 4.54; $P < .01$). Organizational affiliation with a skilled nursing facility (OR, 1.29; $P = .041$) and higher 30-day readmission rates (OR, 1.19; $P = .016$) were also associated with LTC HIE, but not accountable care organization nor bundled payment participation.

Conclusions: As payment to LTC providers and hospitals increasingly emphasizes total patient care and paying for value, those leading these organizations have new incentives to pursue collaborative relationships. Hospitals appear to be investing in electronic information exchange with LTCs as part of a general strategy to adopt EHRs and engage in HIE, but also potentially to strengthen ties to LTC providers and to reduce readmissions. To achieve widespread connectivity, continued focus on adoption of related health IT infrastructure and greater emphasis on aligning incentives for hospital-LTC care transitions would be valuable.

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Care transitions between hospitals and long-term care (LTC) providers involve vulnerable patients with complex care needs, high utilization, and often diminished ability to actively participate in the transfer of their health information and care plan.^{1–3} Poor transitions to LTC providers increase the risk of rehospitalization and result in negative long-term health outcomes.^{1,3–9} However, hospitals and LTC providers lack strong incentives and infrastructure to improve information transfer during transitions.^{10,11}

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Recent policy initiatives have sought to improve transitions by encouraging stronger relationships between hospitals and LTC providers in two ways: through aligning incentives for better coordination and by promoting adoption of information technology (IT) to improve information sharing. Policies aimed at aligning incentives include bundled payment initiatives, updates to the skilled nursing facility (SNF) prospective payment system, and a value-based purchasing program for nursing homes intended to reduce readmissions.^{11–13} Stages 2 and 3 of the Medicare and Medicaid EHR Incentive Programs, commonly referred to as Meaningful Use, explicitly require electronic information sharing (health information exchange, or HIE) with other provider organizations during care transitions; while LTC providers were not eligible for Meaningful Use incentives and lag behind hospitals in both EHR and HIE adoption,^{14–16} there may be spillover effects in which hospital investment in EHRs

and HIE spurs adoption in LTC settings. Thus, both types of policy efforts may drive hospitals and LTCs to improve care transitions by investing in HIE.

However, little is known about hospital-LTC HIE across the nation. Understanding the extent to which such exchange is happening today, as well as what types of hospitals are making this investment, offer insight into how hospitals may view the value of investing in HIE with LTC providers. Such results are also useful for policymakers to inform future efforts to increase connectivity between hospitals and LTCs in support of improved care transitions. This is particularly timely given recently updated guidance from the Centers for Medicare and Medicaid Services (CMS) detailing the allowed use of 90% Federal matching funds to state Medicaid agencies to invest in increasing HIE with Medicaid providers—including long-term care providers—that are ineligible for Meaningful Use incentives.¹⁷ We therefore use the most recent national data on health IT adoption in U.S. hospitals to answer the following research questions: (1) What proportion of U.S. hospitals engage in electronic health information exchange with LTC providers? (2) What are the IT and policy characteristics associated with hospital engagement in HIE with LTC providers? And, (3) Are there characteristics that differentiate hospitals that only send information electronically to LTC providers versus those that engage in bidirectional exchange (ie, sending and receiving)?

Methods

Setting and Data

Our dataset comprises non-federal, acute-care hospitals in the 50 states and the District of Columbia. We combined five sources of data. First, we used the 2014 American Hospital Association (AHA) IT Supplement Survey to capture hospital HIE with LTC providers (our outcome of interest) and other hospital IT capabilities. 2014 was the first year in which the AHA IT Supplement Survey asked hospitals about HIE with LTC providers. Second, we used the 2014 American Hospital Association Annual Survey to capture additional hospital characteristics, including some measures of hospital incentives to engage in HIE with LTC providers (eg, accountable care organization [ACO] participation). Finally, we used three types of data from the Center for Medicare and Medicaid Services (CMS) to capture (1) hospital Meaningful Use attestation status under the Medicare EHR Incentive Program, (2) all-cause, 30-day readmission rates by hospital, and (3) presence of Medicare bundled payment initiatives in the hospital service area that include post-acute care in the payment episode. Our final sample size was 1,991 hospitals.¹⁸ (For comparison of our analytic sample to those who did not respond to the IT supplement, see [Appendix Table 1](#)).

Measures

Hospital-LTC HIE

We used responses from the IT Supplement Survey to create three binary indicators for hospital engagement in LTC HIE: (1) whether or not each hospital exclusively sends structured summary of care records (SCRs) to LTC providers *routinely* (“send-only”)¹⁹; (2) whether or not each hospital exclusively receives structured SCRs from LTC providers *routinely* (“receive-only”); and (3) whether or not each hospital sends as well as receive structured SCRs with LTC providers *routinely* (“bidirectional” exchange). We used these indicators to create two variables to distinguish how our characteristics of interest related to: (1) “any hospital-LTC HIE” (ie, hospitals that engage in send-only or bidirectional, compared to those that do neither) and (2) “bidirectional HIE” (ie, hospitals that engage in bidirectional exchange compared to those that use send-only). We exclude “receive-only” hospitals from analysis because there were only ten.

IT capabilities to support hospital-LTC HIE

We created three measures to capture hospital-level HIT capabilities under the hypothesis that these capabilities would increase a hospital’s ability to create and transmit an SCR electronically during a care transition. First, we included a categorical measure for whether, as of May 2015, a hospital had (1) not attested to Meaningful Use, (2) attested to stage 1 Meaningful Use only, or (3) attested up through stage 2 of Meaningful Use. We also included an indicator for whether a hospital participates in a health information organization (HIO) in their market²⁰ and whether the hospital sends and/or receives SCRs with unaffiliated hospitals and/or ambulatory care providers.

Policy motivators to support hospital-LTC HIE

We created four hospital-level variables that capture engagement with concurrent reforms and policy changes that we hypothesized would directly affect a hospital’s financial motivation to invest in LTC HIE. First, we included each hospital’s fiscal year 2013-2014 score for 30-day, all-cause readmissions, under the assumption that hospitals struggling with managing care transitions (for which they get financially penalized) may be more proactively seeking HIE with LTCs as an improvement strategy. Second, we included an indicator for presence of specific Medicare bundled payment initiatives in a hospital’s market that encompass post-acute care as part of the care episode (using Dartmouth Atlas Hospital Service Areas as the definition of a market). We hypothesized that hospitals in these markets would be more likely to invest in LTC HIE to manage quality and cost for patients transitioning between these two settings. Following a similar logic, our third measure captures whether or not the hospital reported participating in an ACO. Finally, we created an indicator for whether or not the hospital owns, is affiliated with, or is engaged in a joint venture with an SNF. We focused on SNFs (excluding other LTC providers such as rehab facilities and long-term acute care hospitals) because (1) a greater volume of patients transition between hospitals and SNFs relative to other LTC providers and (2) current policy efforts to improve care transitions and readmissions from post-acute care focus on SNFs.

Hospital demographic controls

We included measures of hospital characteristics that we expected might relate to both our focal characteristics and whether or not hospitals engage in HIE with LTC providers. These measures included size, ownership, teaching status, and urban/rural location.

Analytic Approach

We first calculated the proportion of hospitals engaging in the different types of SCR exchange with LTC providers—none, send-only, receive-only, or send and receive. We report weighted proportions using nonresponse weights to produce nationally representative estimates. We next examined the bivariate relationships between hospital characteristics and any hospital-LTC HIE and then bidirectional HIE to assess whether there were systematic differences between hospitals that engaged in bidirectional exchange versus send-only. We used chi-squared tests to assess statistical significance across categorical characteristics and *t*-tests to assess differences in means for continuous characteristics.

Finally, we used multivariate logistic regression models to examine the independent relationships between hospital characteristics and the same two dependent variables: any hospital-LTC HIE and bidirectional HIE. In our models, standard errors were adjusted for hospital clustering within markets (using Dartmouth Atlas hospital referral regions [HRRs]), and we included nonresponse weights.

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