The Role of Post-Acute Care in Readmissions for Preexisting Healthcare-Associated Infections

Running title: Readmissions and Preexisting Infections

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ABSTRACT

Background/Objectives: Although preventable, healthcare-associated infections (HAI) are commonly observed in post-acute care settings for at-risk older adults and are a leading cause of hospital readmissions. However, whether HAIs resulting in avoidable readmissions for preexisting HAIs (the same HAI as at the index admission) are more common for patients discharged to post-acute care as opposed to home is unknown. We examined the risk of preexisting HAI readmissions according to patient discharge disposition and comorbidity level.

Design: 2013-14 national hospital discharge data were used to estimate the likelihood of readmissions for preexisting HAIs according to patients' discharge disposition and whether the likelihood varies according to patient comorbidity level, across four common types of HAIs (not including respiratory infections).

Participants: 702,304 hospital discharges for Medicare beneficiaries ≥65 years.

Measurement: Our outcome was a 30-day preexisting, or "linked" HAI readmission (readmission involving the same HAI diagnosis as at the index admission). Patient discharge disposition was skilled nursing facility; home health care; home care without home health ("home").

Results: Of 702,304 index admissions involving HAI treatment, 353,073 (50%) were discharged to a skilled nursing facility, 179,490 (26%) to home health care, and 169,872 (24%) to home. Overall, 17,523 (2.5%) of preexisting HAIs resulted in linked HAI readmissions, which were

more common for *Clostroides difficile* infections (4.0%) and urinary tract infections (2.4%) than surgical site infections (1.1%) ($p<0.001$). Being discharged to a SNF compared to home or to home health care was associated with a 1.15 percentage-point (95% CI: -1.29, -1.00), or 38%, lower risk of a linked HAI readmission. This risk difference was observed to increase with greater patient comorbidity.

Conclusions: Skilled nursing facility discharges were associated with fewer avoidable readmissions for preexisting HAIs, compared to home discharges. Further research to identify modifiable mechanisms that improve post-hospital infection care at home is needed.

Key Words: infections, readmissions, post-acute care, skilled nursing, comorbidity

INTRODUCTION

Healthcare-associated infections (HAI) are preventable yet dangerous conditions with dire consequences, including death.[1-3] Septicemia, which can result from untreated HAIs, ranks first among all readmission diagnoses,[4] while pneumonia and other (e.g., post-operative and urinary tract) infections are also commonly observed reasons for readmission.[4, 5] Skilled nursing facilities (SNF) and home health care (HHC) are characterized as contributors to the "revolving door" of rehospitalization often due to infections and other preventable conditions.[1,6-8]

However, the role of post-acute care in preventing readmissions from *preexisting* infections (i.e., diagnosed and treated at the index hospitalization), particularly for at-risk older patients, is unknown. SNFs may be more protective against readmissions from these infections due to the supervisory care of physicians and nurses who are trained in the basics of infection prevention and can recognize warning signs and symptoms of infection; conversely, infection programs in HHC agencies are less common,[9, 10] while patients discharged home without HHC are more likely to encounter self-care challenges due to a lack of knowledge and limited, if any, supervision for prevention practices.[11, 12] On the other hand, patients discharged to SNFs, are likely to have greater rehabilitative needs and multimorbidity, exacerbating readmission risk.[13]

Previous work has established that the risk of any type of readmission increases for patients discharged from the hospital with HAIs,[14-16] and that new infections are routinely acquired in SNF and HHC settings.[6, 17] More generally, it has been reported that having the same diagnosis during both the admission and readmission (a "linked" readmission) is evidence for

preventability of the readmission,[18] an observation that has resulted in targeting specific patient populations (such as heart failure patients) with follow-up clinical care.[19] In this study, we examined 30-day readmissions for preexisting HAIs that were also diagnosed during the index admission ("linked HAIs") to identify potentially remediable failures to provide high-quality post-acute care for high-risk patients. Specifically, we assessed the risk of a linked HAI readmission for older patients discharged home versus to a SNF or to HHC. In addition, we assessed whether patient comorbidity modified the relationship between discharge disposition and linked HAI readmissions. We hypothesized that, after controlling for patient risk differences, SNFs, compared to HHC and home discharges, would be associated with reduced linked HAI readmission risk. Findings will provide insight into the adequacy of hospital discharges, patient disposition choice, and follow-up care for patients leaving the hospital with an existing HAI.

METHODS

Data Sources and Study Population

Data were obtained from the Nationwide Readmissions Database (NRD) of the Agency for Healthcare Research and Quality's (AHRQ) Hospital Cost and Utilization Project (HCUP). The NRD contains a sample of hospital discharges representing roughly half of U.S. hospitalizations.[20] The data include primary and secondary International Classification of Diseases, Ninth Revision (ICD-9) diagnosis codes, ICD-9 procedure codes, the time between patient hospitalizations, length of stay, and patient demographics, insurance type, and discharge

disposition. We used data from January to November from each of the 2013 and 2014 NRDs. December data were not used because the data are not linkable across years and at least 30 days of follow-up after the index discharge are required for observing readmissions.

Study Population

Following the Centers for Medicare and Medicaid Services' (CMS) criteria for its all-cause hospital-wide readmission (HWR) measure,[21] we created an eligible index cohort of older Medicare beneficiaries discharged alive. We excluded observations for patients discharged against medical advice (which does not allow for a complete course of care), psychiatric and rehabilitation diagnoses (which often lead to specialty care rather than acute care hospital admissions), and cancer diagnoses (which have different readmission profiles than other diagnoses).[21] See Supplemental Appendix (Table S1) for sample derivation. Further details of the HWR cohort criteria can be found elsewhere.[4]

Because we were interested in observing linked HAIs, we narrowed the cohort to only those discharges that involved any of four common infection diagnoses that are included in Medicare's pay-for-performance program (the Hospital-Acquired Condition Reduction Program, or HACRP)[22] that links payments to inpatient care quality—specifically, with penalties for hospital-acquired conditions: surgical site infections (SSI), *Clostroides difficile* (*C. diff.*), urinary tract infections (UTI), and central-line associated bloodstream infections (CLABSI). These infections are the highest-cost or highest-volume among all HAIs and are considered to be preventable.[23] UTIs, SSIs, and *C. diff.* are each high-volume conditions while CLABSIs and SSIs

are high-cost conditions.[24] This approach can highlight a potential gap in post-discharge quality of care for common and costly conditions targeted under Medicare's contested HACRP,[24] potentially identifying additional issues with how the program targets hospital-acquired conditions—specifically, effects that may result from HAIs if not properly treated.

HAI Identification at Index Hospitalization and Readmission

We used existing methodologies to identify HAIs (Table 1),[25-28] both at the index admission and the readmission. For the index admission, we first identified *any* infection diagnosis at the index admission (regardless of whether it was community-acquired or hospital-acquired). To do so, we used both primary and secondary diagnosis codes. However, at the readmission, we only wished to identify preexisting HAIs—that is, the same type of HAI as diagnosed at the index admission. While the NRD allows for the identification of infections, the data do not explicitly identify whether infections were acquired in the hospital or the community because there is no "present on admission" (POA) indicator. To address this issue, we employed existing methods[29, 30] for identifying infections that were already present at the readmission. Specifically, we only used primary diagnoses of infection, which are more likely to indicate an existing infection as opposed to one acquired in the hospital.[29, 31] We assessed the accuracy of this approach using a separate dataset that did contain POA indicators – the 2008-2014 Health and Retirement Study (HRS) and linked Medicare data (see Table S2). This showed that many, but not all POA HAIs were identified using only primary diagnoses, whereas the use of *both* primary *and* secondary diagnoses would result in a number of false positives.

Statistical analysis

To assess the prevalence of infections at index discharge with readmissions for the same infection (linked HAI readmissions), we divided the number of linked HAI readmissions by the number of index admissions for the same HAI, for each of the four HAIs. To assess the role of discharge disposition in linked HAI readmissions, we first compared characteristics of discharges for patients discharged routinely to (1) home without home health care (hereafter referred to as "home"), (2) home with home health care ("HHC"), and (3) a SNF or intermediate care facility (hereafter referred to as SNFs). Survey weights were employed in order to produce national estimates of descriptive characteristics. Chi-square tests were used to compare proportions and F-tests to compare means, with a two-tailed p-value <0.05 considered statistically significant. We then estimated a logistic regression model with cluster-robust standard errors (to account for clustering of patients within hospitals), controlling for patient demographics, a weighted comorbidity score, clinical cohort, and length of stay at the index admission, and a dummy variable indicating the year of the discharge. Because comparisons of odds ratios across multiple logistic regression models are inappropriate, we report predicted probabilities and risk differences with bootstrapped 95% bias-corrected confidence intervals (obtained using a bootstrapping procedure with 1,000 replications). Patient demographics included age, sex, and the quartile of the median household income in the patient's zip code. Patient clinical status was measured using the Elixhauser comorbidity index.[32] To control for the type of clinical care at the

index admission, we classified treatments during index hospitalizations into five cohorts: medicine, cardiorespiratory, cardiovascular, neurology, and surgery.[21]

Finally, we included an interaction term in a second regression model to allow the association between discharge disposition and linked HAI readmission to vary according to patient comorbidity level. Results of the interaction analysis are displayed graphically. We also conducted a sensitivity analysis examining whether the patient's severity of illness (the 4-level All Patient Refined Diagnosis Related Group, APR-DRG score, measured during the index hospitalization) modified the relationship between discharge disposition and readmission risk (Supplemental Appendix). This study was approved by the Institutional Review Board at the University of Michigan.

RESULTS

As shown in Table 2, we identified 318,134 eligible index admissions involving HAI treatment which, using survey weights, generalized to 702,304 national HAI admissions during 2013-2014. Reporting survey-weighted results, of those 702,304 HAI admissions, 169,872 (24.2%) had home discharges, 353,073 (50.3%) had discharges to a SNF, and 179,490 (25.6%) had discharges to HHC. When compared with SNF discharges, patients discharged home were younger (75.9 vs. 79.6, $p<0.001$) and less often female (53.3% vs. 55.9%, $p<0.001$). The mean hospital length of stay was 6.3 days for home discharges compared to 9.3 and 11.4 for HHC and

SNF discharges, respectively (p<0.001). Patients discharged to home had lower comorbidity scores – 21.4 compared to 25.3 and 27.8 for HHC and SNF (p<0.001) respectively.

Weighted analyses indicated that 17,523 (2.5%) of index admissions involving treatment for an HAI resulted in a linked HAI readmission (i.e., the same HAI type at readmission that was diagnosed at the index hospitalization) (Figure 1). Overall, HAI readmissions were more common for *C. diff.* (n=12,279 readmissions, or 4.0% of 305,679 index *C. diff.* diagnoses) and UTI (n=3,717 readmissions, or 2.4% of 157,347 index UTI diagnoses) than for CLABSI (n=311, or 1.6% of 19,182 index CLABSI diagnoses), or SSI (n=1,122, or 1.1% of 101,968 index SSI diagnoses) (p<0.001).

Although patients discharged to SNF had significantly higher mean (SD) comorbidity scores than those discharged home and to HHC, respectively [27.8 (0.1) vs. 21.4 (0.1) and 25.3 (0.2)], of 702,434 index HAI diagnoses, linked HAI readmissions were more common for routine home (n=5,369, or 3.2%) and HHC (n=5,448 , or 3.0%) discharges, compared to SNF discharges (n=6,705 , or 1.9%) (p<0.001). Among 305,679 index *C. diff.* diagnoses, *C. diff.* readmissions were nearly twice as common for home (n=4,445; 5.3%) and HHC (n=3,631; 5.4%) compared to SNF discharges (n=4,203; 2.7%). Similarly, among 157,347 index UTI diagnoses, UTI readmissions were more common for home (n=648; 2.2%) and HHC (n=1,345; 3.3%) compared to SNF discharges (n=1,724; 2.0%).

In adjusted results illustrated in Figure 2, being discharged to a SNF compared to home or HHC was associated with decreased risk of a linked HAI readmission. Overall, the risk was

1.15 percentage-points lower (95% CI: -1.29, -1.00). The risk of a linked *C. diff.* readmission was 2.15 percentage-points lower (95% CI: -2.43, -1.87) for a SNF compared to a routine home discharge. Conversely, the risk of a linked SSI readmission was 0.52 percentage points greater (95% CI: 0.25, 0.76) for a SNF compared to a routine home discharge. Compared to home discharges, the risks of linked readmissions for HHC discharges were also greater for *C. diff.* (risk difference, RD: 0.44 absolute percentage points; 95% CI: 0.13, 0.80) and for UTI (RD: 1.06 absolute percentage points, 95% CI: 0.71, 1.39). There were no differences in readmission risk, by patient discharge disposition, for CLABSIs.

As shown in Figure 3, the multivariable analysis showed a significant interaction between patient comorbidity and patient discharge disposition in predicting linked HAI readmission risk. The overall risk difference for a linked HAI readmission was observed to increase with greater patient comorbidity scores for each of home and HHC discharges, but not for SNF discharges. At a comorbidity score of 25, the risk of a linked HAI readmission was 1.9 (95% CI: 1.8-2.0) for SNF versus 3.1 (95% CI: 2.9-3.2) and 3.0 (95% CI: 2.9-3.2) for home and HHC discharges, respectively, while at a comorbidity score of 75, the respective risks at the three discharge dispositions were 2.0 (95% CI: 1.8-4.1), 4.1 (95% CI: 3.5-4.6), and 3.5 (95% CI: 3.0-3.9).

In a sensitivity analysis, there was reduced readmission risk for patients with moderate levels of severity of illness for patients discharged to SNFs relative to those discharged home or to HHC (Figure S1 in Supplemental Appendix).

DISCUSSION

From this study of older Medicare beneficiaries, we report three main findings. First, older Medicare beneficiaries with infections are experiencing potentially preventable HAI readmissions – with 2.5% of patients experiencing a linked HAI readmission. For *C. diff.*, these preventable readmissions were more common – 4% overall, and >5% for those discharged to home or home health care. Second, these preventable HAI readmissions were less likely for patients discharged to SNFs compared to home and HHC discharges. They were also less likely for routine home compared to HHC discharges for *C. diff.* and UTIs. Third, the reduced risk of these linked HAI readmissions for SNF discharges increased with greater patient comorbidity. Together, these findings suggest that HAI treatment and follow-up may not be adequately addressed at discharge, with particular risk for sicker patients discharged to home.

Previous research has observed associations between readmissions and HAIs, but has not explored whether increased risks represented host factors associated with infections or the infections themselves.[16, 33, 34] Our study suggests that beyond simply being a marker for risks such as functional and cognitive vulnerabilities correlated with infections and readmissions,[9, 35] initial HAIs are *explicitly* linked to readmitted HAIs, the presence of which signals potential treatment failures involving transitional and post-acute care – in particular for UTIs and *C. diff.* infections. These failures may reflect inpatient issues, such as inappropriate or inadequate antibiotic treatment during the index admission.[36, 37] They might reflect transitional care problems, such as poor handoffs from the hospital team to the patient or caregiver regarding

adherence to antibiotic treatments, insufficient post-discharge wound care,[38] or inadequate communication.[12, 39] They may also reflect high out-of-pocket costs of HAI care (such as dressing supplies for wound care), post-discharge injuries,[4, 38] and limited support to help patients and caregivers decide when to pursue readmission.[40]

Earlier work suggests that skilled caregiver support, including a structured infection prevention program, personnel, and monitoring, may be needed to ensure successful management of wound care, and the safe use of feeding tubes and administration of antibiotics to treat infection.[10, 41, 42] Earlier findings also suggest that SNFs may be able to compensate for an infection recurrence.[10] Our findings are consistent with these earlier findings as well as recent work illustrating a reduced readmission risk for SNF compared to home health patients.[13] In all, it may be that nursing facilities have the capacity to diagnose and provide adequate management and supervision for patients with recurrent *C. diff.* infection, including early evaluation by clinical providers, appropriate antibiotics and rehydration, and thus avoid rehospitalization. Conversely, while home health agencies have staff trained to identify early signs of infections, which helps with monitoring compliance, some agencies may struggle with infection control[7] due to a lack of standardized guidelines for infection prevention efforts.[43] SNF protectiveness against readmissions for *preexisting* infections counters earlier reporting of SNFs as high-risk sites for the acquisition and transmission of infections.[9, 10] Even though patients may *arrive* with infections, SNFs may successfully prevent infections from *leaving* the facility—avoiding a revolving door of infection-related readmissions.

Addressing vulnerable patient populations, such as those with multimorbidity, poses challenges for hospitals and post-acute care providers, including readmission prevention, with risks often increased for patients discharged to SNFs.[1, 44] However, our findings show that patients with more comorbidities had a greater HAI readmission risk when discharged to home or to home health care compared to a SNF. Patient-specific risks associated with greater comorbidity, such as compromised immune system, or the complexity of the antibiotic regimen prescribed, may affect the likelihood of success of treatment provided at the hospital or after discharge,[45] heightening the need for high-quality infection control practices in non-SNF settings. To address these needs, targeting of high-risk patients for increased surveillance outside SNFs – for example, instructions to notify the home health nurse and/or primary care provider office for specific symptoms of disease relapse among patients discharged home or to HHC – may be needed. Additionally, support from community health workers may provide an avenue for addressing these preventable reutilization experiences of at-risk older patients with infections.[46]

Limitations

Our work has several limitations. First, whereas Medicare's readmission policy applies to Medicare fee-for-service (FFS) beneficiaries, the NRD data include Medicare Advantage (MA) beneficiaries. However, MA enrollees represent one-third of all Medicare beneficiaries[47] and can also benefit from improvements in transitional HAI prevention. Second, while Medicare's program targeting hospital-acquired conditions identifies HAIs using diagnosis codes, they

imperfectly correspond to clinical conditions. There is evidence of both over- and under-estimation of HAI point-in-time prevalence in administrative data,[48, 49] although these concerns are mitigated when – as in the present study – examining HAIs over time (which can still provide consistent estimates).[48]

Third, our approach for identifying HAIs present on readmission avoided false positives (as validated in our separate analysis of the method using HRS-Medicare data) at the expense of undercounting true positives, resulting in a conservative count of linked HAI readmissions. Finally, our results regarding the association of SNF care with reductions in linked HAI readmissions may be conservative due to patient compositional differences across post-acute care settings. Although we adjusted for patient demographics and clinical factors, there may be residual confounding due to greater unmeasured clinical risk for patients discharged to SNFs compared to home and HHC settings. Recent work by Werner et al.[13] illustrated the importance of residual confounding by showing reduced risk for SNF compared to HHC care, when switching from a linear regression to an instrumental variables analysis, to ultimately find that SNFs were associated with fewer readmissions. Specifically, when they estimated a least squares regression model, patients discharged to HHC care had lower predicted readmission risks than those treated at a SNF; but when they controlled for confounding using the instrumental variables analysis, the results switched, and patients discharged to SNFs had lower predicted readmission risks than those discharged to HHCs.

Fourth, we did not include other potentially important conditions present on hospital discharge, such as lower respiratory infections including pneumonia, which can have critical health implications for vulnerable patients.[5] However, we were interested in examining four high-cost and high-volume HAIs included in Medicare's incentive program targeting inpatient care quality in order to provide clinical and policy-relevant results that can identify areas to help improve care for vulnerable older patients.

These limitations notwithstanding, our findings indicate potential opportunities for improvements in infection control for recently discharged older Medicare beneficiaries. HAIs appear to merit greater attention in policy efforts. While Medicare's hospital-acquired conditions policy addresses *inpatient* infections, *post-discharge* HAI control may also reduce hospitals' exposure to costly Medicare penalties for excess readmissions.[50] The findings further suggest that an incentive program targeting acquisition of inpatient conditions may not adequately address inpatient quality of care if it neglects to penalize post-discharge care lapses—specifically, hospitals that fail to fully treat dangerous infections that were either acquired in the hospital or already present-on-admission at the time of the hospitalization. At the same time, it is concerning that more than half of patients discharged with an HAI are sent to SNFs, given that patients entering nursing homes on antibiotics can lead to a proliferation of multi-drug resistant organisms in this setting.[42]

The findings may also have implications for care delivered under the incentives of Medicare's bundled care payment models. To improve patient outcomes while reducing costs

across acute and post-acute settings, systems need to consider buttressing post-discharge support for HAI patients discharged home. They might additionally consider whether very high-risk HAI discharges (*C. diff.* with multiple chronic conditions) warrant higher priority for post-acute SNF recommendation. Other targets for improvement include developing training modules for patients' and informal family caregivers, or improving training for HHC nurses to coordinate care of HAI relapses, staving off the need for rehospitalization. Integrating efforts for infection prevention and control, health care systems might improve overall surveillance and care outcomes for at-risk older adults.[17]

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Author Contributions:

Conception of study: Hoffman, Min, Mody

Data coding/analysis: Hoffman, Liu

Interpretation of findings: Hoffman, Min, Mody

Drafting of manuscript: Hoffman, Min, Mody, Marciniak

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LEGENDS

Figure 1. Survey weights were used to estimate the number of individuals readmitted and the percentage that were readmitted with a linked HAI. A linked HAI readmission is an unplanned readmission for the same HAI observed at the index admission. For instance, a patient who is discharged from the index (first) hospitalization with an SSI and who is then readmitted with an SSI would have a linked SSI readmission; if that same patient were readmitted with a CLABSI infection but not an SSI, then the patient would not have any linked HAI readmission. The percent difference is how different SNF and home health linked HAI readmission rates are, respectively, compared to routine home discharge linked HAI readmission rates. Differences in linked HAI readmission rates were statistically significantly different across discharge dispositions when considering any HAI or the specific HAIs *C. Diff.*, and UTIs ($p<0.001$), but not for SSIs ($p=0.06$) and CLABSI ($p=0.23$). SNF = Skilled nursing facility (which in this analysis additionally includes intermediate care facilities); SSI – Surgical site infection; *C. Diff. = Clostroides difficile*; UTI = Urinary tract infection; CLABSI = Central-line associated bloodstream infection.

Figure 2. Risk differences in linked HAIs were estimated using predicted probabilities obtained from logistic regression models that were adjusted for patient age, sex, income (quartile of median household income of the patient's zip code), Elixhauser comorbidity index, and

clinical cohort and length of stay at the index admission. A bootstrapping procedure with 1,000 replications was used to obtain 95% bias-corrected confidence intervals for the risk differences. SSI = surgical site infection; UTI = urinary tract infection; CLABSI = central line-associated blood stream infection; *C. Diff.* = *Clostroides difficile*.

Figure 3. Predicted risks of linked HAIs were estimated using predicted probabilities obtained from logistic regression models that were adjusted for patient age, sex, income (quartile of median household income of the patient's zip code), Elixhauser (weighted) comorbidity index, and clinical cohort and length of stay at the index admission. A bootstrapping procedure with 1,000 replications was used to obtain 95% bias-corrected confidence intervals for the risk differences.

Title for Supplementary Appendix:

'Supplemental Materials: Inclusion/Exclusion Criteria, Accuracy of Present-on-Admission Indicators, and Sensitivity Analysis Results.'

Table S1. Inclusion and Exclusion Criteria for Older (≥ 65) Medicare Beneficiaries with an Index Admission with a Healthcare-Acquired Infection (HAI) Diagnosis, 2013-2014

Table S2. Test of Accuracy of Identification of Present-on-Admission Healthcare-Associated Infections (HAIs), Using a Reference Standard in Health and Retirement Study and Linked Medicare Data (2008-2014)

Figure S1. Predicted Risks of Linked Healthcare-Associated Infections (HAI) Readmissions for Skilled Nursing Facilities (SNF), Routine Home, and Home Health Discharges, by Beneficiary Severity of Illness Score, 2013-2014

Table 1. ICD-9 Diagnosis Codes to Identify Infections, 2013-2014 HCUP Data

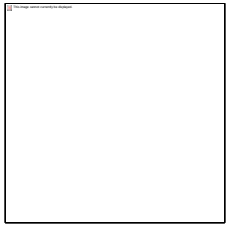
Infection	Diagnosis codes and other identifiers
SSI	998.5, 998.51, 998.59, 996.69, 567.2, 567.21, 567.22, 567.23, 567.29, 567.9, 567.3, 567.31, 567.38, 567.39 among surgical discharges
C. diff.	8.45
UTI	996.64, or a combination of one of 112.2, 590.1, 590.11, 590.2, 590.3, 590.80, 590.81, 595.0, 597.0, 599.0 along with a procedure code for a catheterization (57.94, 57.95)
CLABSI	999.32 and a hospital length of stay of greater than 2 days

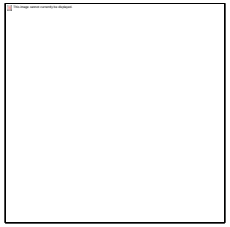
Abbreviations: SSI = Surgical site infection; *C. diff. = Clostroides difficile*; UTI = Urinary tract infection; CLABSI = Central-line associated bloodstream infection.
Note: For infection identification at the index hospitalization, both primary and secondary diagnosis codes were used. For linked HAI readmissions, in order to identify infections that were present-on-readmission, only primary diagnosis codes were used.

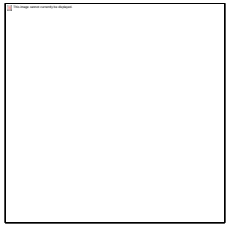
Table 2. Sociodemographic and Clinical Characteristics of Older (≥65) Medicare Beneficiaries Overall and by Discharge Disposition for U.S. Hospital Discharges, 2013-2014

		Discharge Disposition			
	Overall	**SNF**	**Home health**	**Routine**	
	N =702,434	**N = 353,073**	**N = 179,490**	**N = 169,872**	***p*** *
Mean age (SE)	78.2 (0.1)	79.6 (0.1)	77.6 (0.1)	75.9 (0.1)	
Female, No. (%)	383,678 (54.6)	197,462 (55.9)	95,716 (53.3)	90,500 (53.28)	
Median household income, No. (%)					<.001
1st quartile (lowest)	176,019 (25.4)	88,426 (25.4)	45,609 (25.7)	41,985 (25.1)	<.001
2nd quartile	188,811 (27.3)	95,623 (27.5)	46,315 (26.1)	46,873 (28.0)	
3rd quartile	167,105 (24.1)	83,837 (24.1)	42,036 (23.7)	41,233 (24.6)	<.001
4th quartile (highest)	160,884 (23.2)	80,287 (23.1)	43,355 (24.5)	37,242 (22.3)	
Mean length of stay (SE)	9.65 (0.1)	11.44 (0.1)	9.31 (0.1)	6.31 (0.0)	
Cohort, No. (%)					
Surgery	173,816 (24.7)	91,266 (25.9)	48,639 (27.1)	33,911 (20.0)	<.001

			12,998		
Cardiorespiratory	50,251 (7.2)	26,856 (7.6)	(7.2)	10,398 (6.1)	
Cardiovascular	17,323 (2.5)	8,476 (2.4)	4,276 (2.4)	4,570 (2.7)	<.001
Neurology	14,882 (2.1)	10,152 (2.9)	2,878 (1.6)	1,852 (1.1)	
	446,162	216,323	110,699	119,140	
Medicine	(63.5)	(61.3)	(61.7)	(70.1)	
Mean comorbidity score, (SE)	25.59 (0.1)	27.75 (0.1)	25.27 (0.2)	21.44 (0.1)	
Year, No. (%)					
	353,715	178,234	91,210	84,271	
2013	(50.4)	(50.5)	(50.8)	(49.6)	<.001
	348,719	174,838	88,280	85,601	
2014	(49.6)	(49.5)	(49.2)	(50.4)	



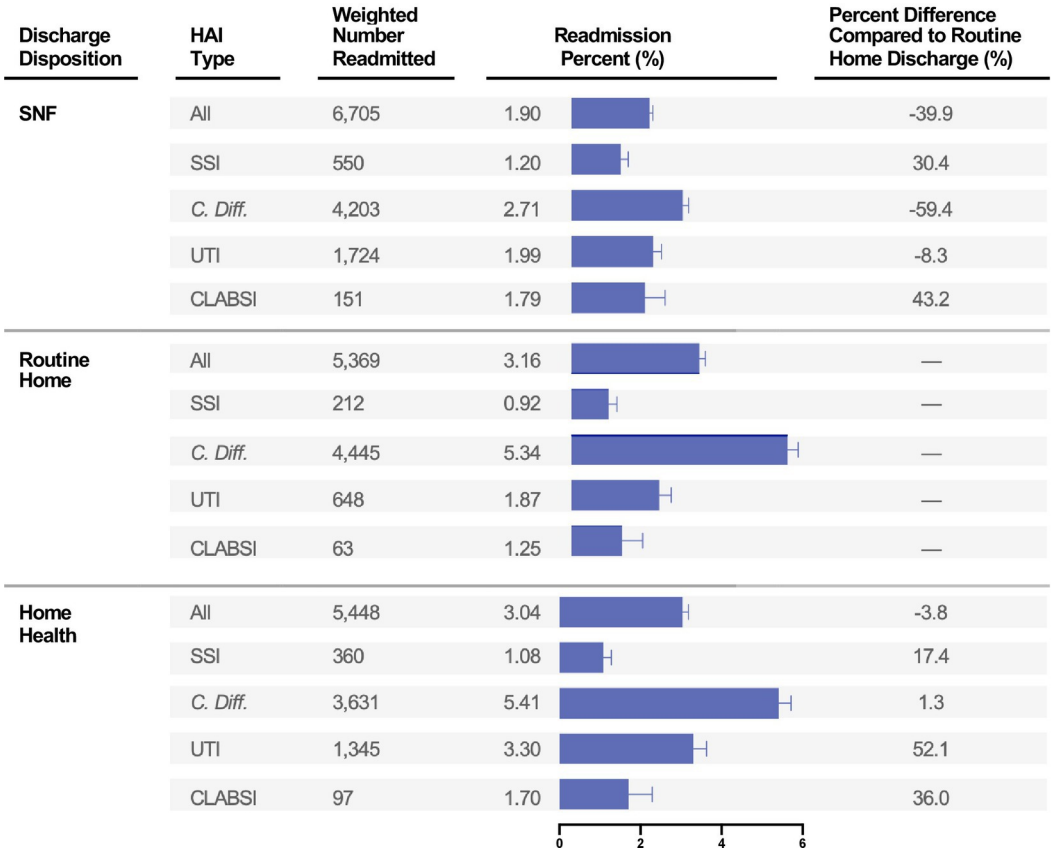




Editor's Note on JAGS-1128-CI-Aug-19.R1

I like this article because it highlights three important points. First, it reminds us that for the last several decades the VA has been a leader in developing and evaluating innovative geriatric care programs, training a variety of health professionals to care for older people, and supporting a wide variety of research and junior and mid-career investigators focused on aging and Geriatrics. Second, it provides a "look under the hood" on how VA Home Based Primary Care (HBPC) teams function to successfully maintain Veterans with complex medical, functional, and psychosocial problems in their homes when safe and feasible. They identified four strategies that should serve as lessons for all of us who care for older people: frequent communication between interdisciplinary team (IDT) members, Veterans, and their caregivers; longitudinal trusting relationships between IDT members, Veterans and their caregivers; consistent education among these groups; and collaboration both within and outside the IDTs. Third, this article nicely illustrates how clearly and effectively a qualitative analysis can be presented. I must admit that complicated factor analyses can sometimes make me shudder. In this article, the investigative team synthesized their interviews and identified four specific strategies and provide quotations from participants that illustrate each one in separate tables, as well as a very nice figure that clearly illustrates the strategies identified. ***Joseph G. Ouslander MD***

Unadjusted Differences in Rates of Linked Healthcare-Associated Infections (HAI) Readmissions for Skilled Nursing Facilities and Home Health Agency Care Compared to Routine Home Discharges, 2013-2014



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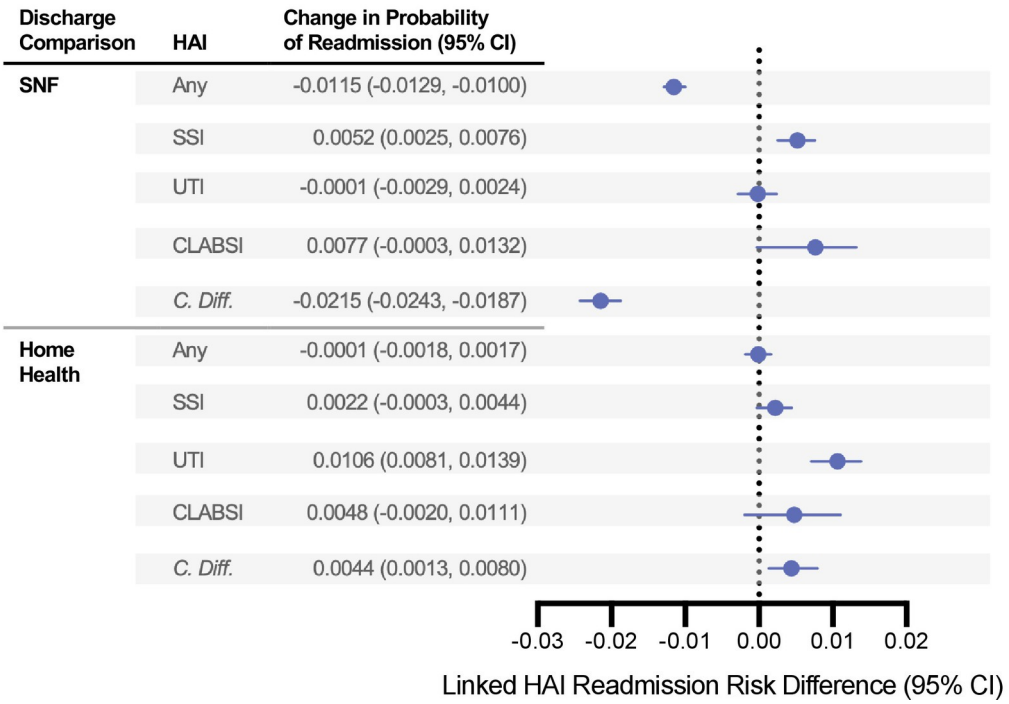
Predicted Risk Differences in Linked Healthcare-Associated Infections (HAI) Readmissions for Skilled Nursing Facilities and Home Health Agency Care Versus Routine Home Discharges, 2013-2014



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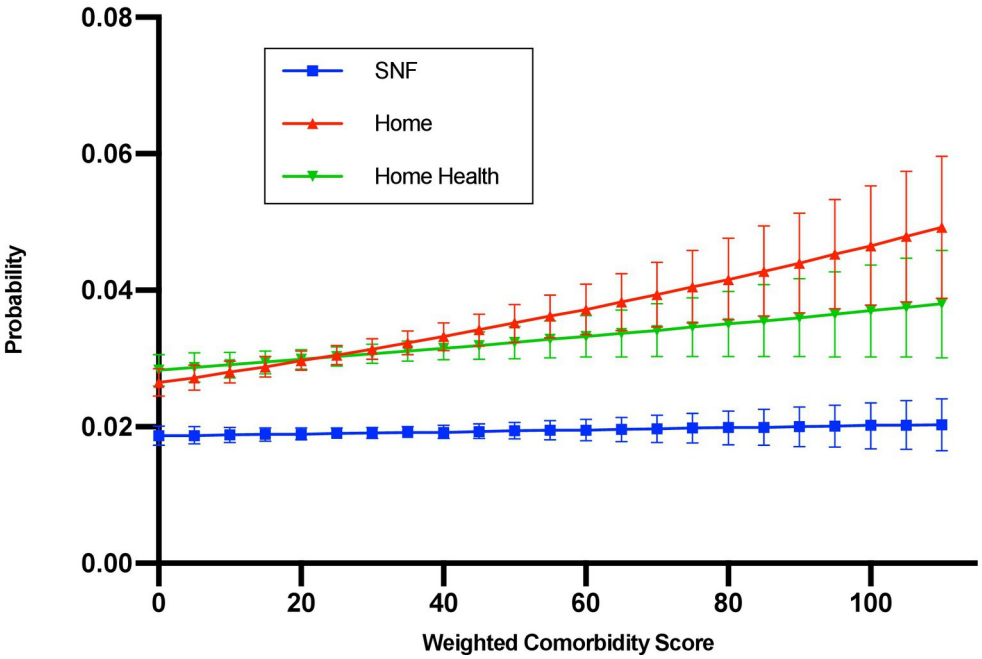
Predicted Risks of Linked Healthcare-Associated Infections (HAI) Readmissions for Skilled Nursing Facilities (SNF), Routine Home, and Home Health Discharges, by Beneficiary Comorbidity Score, 2013-2014



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