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Conflict of Interest Checklist:

Elements of Financial/Personal Conflicts	*EEV		JGO		ASM		SPB	
	Yes	No	Yes	No	Yes	No	Yes	No
Employment or Affiliation		x	x			x		x
Grants/Funds	x		x		x		x	
Honoraria		x		X		x		x
Speaker Forum		x		X		x		x
Consultant		x		X		x		x
Stocks		x		X		x		x
Royalties		x		X		x		x
Expert Testimony		x		X		x		x
Board Member		x		X		x		x
Patents		x		X		x		x
Personal Relationship		x		X		x		x

Elements of Financial/Personal Conflicts	JMJ		AAS		DM		KS	
	Yes	No	Yes	No	Yes	No	Yes	No
Employment or Affiliation		x		X		x		x
Grants/Funds		x		X		x		x
Honoraria		x		X		x		x
Speaker Forum		x		X		x		x
Consultant		x		X		x		x
Stocks		x		X		x		x
Royalties		x		X		x		x
Expert Testimony		x		X		x		x
Board Member		x		X		x		x
Patents		x		X		x		x
Personal Relationship		x		X		x		x

Potentially Avoidable Readmissions of Patients Discharged to Post-Acute Care: Perspectives of Hospital and Skilled Nursing Facility Staff

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Elements of Financial/Personal Conflicts	JS		EL		SK		SFS	
	Yes	No	Yes	No	Yes	No	Yes	No
Employment or Affiliation		x		X		x		x
Grants/Funds		x		X		x	x	
Honoraria		x		X		x		x
Speaker Forum		x		X		x		x
Consultant	x			X		x		x
Stocks		x		X		x		x
Royalties		x		X		x		x
Expert Testimony		x		X		x		x
Board Member		x		X		x		x
Patents		x		X		x		x
Personal Relationship		x		X		x		x

Elements of Financial/Personal Conflicts	JFS	
	Yes	No
Employment or Affiliation		x
Grants/Funds	x	
Honoraria		x
Speaker Forum		x
Consultant		x
Stocks		x
Royalties		x
Expert Testimony		x
Board Member		x
Patents		x
Personal Relationship		x

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Abstract

Background—Hospital readmissions from skilled nursing facilities (SNFs) are common. Previous research has not examined how assessments of avoidable readmissions differ between hospital and SNF perspectives.

Objectives—To determine the percentage of readmissions from post-acute care that are considered potentially avoidable from hospital and SNF perspectives.

Design—Prospective cohort study

Setting—One academic medical center and 23 SNFs.

Participants—We included patients from a quality improvement trial aimed at reducing hospital readmissions among patients discharged to SNFs. We included Medicare patients who were discharged to one of 23 regional SNFs between January 2013 and January 2015, and readmitted to the hospital within 30 days.

Measurements—Hospital-based physicians and SNF-based staff performed structured root-cause analyses (RCA) on a sample of readmissions from a participating SNF to the index hospital. RCAs reported avoidability and factors contributing to readmissions.

Results—The 30-day unplanned readmission rate to the index hospital from SNFs was 14.5% (262 hospital readmissions of 1808 discharges). 120 readmissions had RCA from both the hospital and SNF. The percentage of readmissions rated as potentially avoidable was 30.0% and 13.3% according to hospital and SNF staff, respectively. Hospital and SNF ratings of potential avoidability agreed for 73.3% (88 of the 120 readmissions), but readmission factors varied between settings. Diagnostic problems and improved management of changes in conditions were the most common avoidable readmission factors by hospitals and SNFs, respectively.

Conclusions—A substantial percentage of hospital readmissions from SNFs are rated as potentially avoidable. The ratings and factors underlying avoidability differ between hospital and SNF staff. These data support the need for joint accountability and collaboration for future readmission reduction efforts between hospitals and their SNF partners.

Keywords

hospital readmissions; skilled nursing facility; transitions of care

INTRODUCTION

Patients, providers, and payers recognize unnecessary hospital admissions from skilled nursing facilities (SNFs) as a deficit in quality and value.[1] Hospitals discharge an increasing number of patients to SNFs with high rates of readmission.[2,3] The Office of the Inspector Generally reported that in 2011 one in five patients continue to be readmitted within 30 days of SNF admission[4]. Medicare patients discharged to SNFs may be especially vulnerable to readmission due to multiple comorbidities,[5] complex acute care needs, and deficits in interfacility communication[6] upon transition between hospitals and SNFs.

Previous research on potentially avoidable readmissions (PARs) among SNF patients has largely focused on the most common diagnoses based on administrative data.[7] Studies in which expert panels have reviewed SNF and hospital records have rated 40% - 68% as potentially avoidable.[8,9] Other studies using large administrative databases that defined PARs based on a list of diagnoses have found that 23% - 60% of hospitalizations from SNFs are associated with a condition that can often be managed outside of a hospital.[10–12] These latter studies are limited because they do not account for many factors that can contribute to decisions to transfer and admit to the hospital.[13,14]

Data from root cause analyses (RCAs) of close to 6,000 hospital transfers selected for review by SNF staff during implementation of the INTERACT (Interventions to Reduce Acute Care Transfers) quality improvement program indicate that, in retrospect, SNF staff considered approximately 23% of transfers potentially avoidable.[15–17] No prior studies have performed RCAs on readmissions among patients discharged to SNFs from the perspective of both hospital and SNF staff. Both perspectives may yield a more complete understanding of PARs and help guide future quality improvement efforts to reduce unnecessary hospital readmissions.[18] In addition, even if both sites agree about the frequency of PARs, the different viewpoints may identify unique opportunities for improvement. Thus, the goal of this study was to evaluate the frequency and factors associated with PARs among Medicare patients discharged to SNFs using structured RCAs performed on the same cases by both hospital physicians and SNF staff.

METHODS

Participants and Setting

We included patients at one tertiary academic medical center, who were part of a quality improvement trial aimed at reducing hospital readmissions among patients discharged to

SNFs. We included Medicare patients who were discharged to one of 23 regional SNFs between January 2013 and January 2015 and who were readmitted to the same hospital within 30 days of hospital discharge. To ensure that data were available from both the hospital and SNF perspectives, we excluded patients if they were readmitted to the hospital from a location other than the SNF. In addition, we excluded patients if they were readmitted from the SNF to a different acute care hospital. Finally, we excluded readmissions that occurred after January 2015 (project ended April 2015) due to limited resources for adjudication. The project was recognized by the university's Institutional Review Board as a quality improvement initiative, and informed consent was waived.

The IMPACT-INTERACT Intervention

Improving Post-Acute Care Transfers (IMPACT) is a multicomponent transitional care intervention focused on improving the care transition process from the hospital to SNF. As part of IMPACT, trained transition advocates (nurse-practitioners and registered nurses) assessed geriatric conditions using standardized instruments, provided assistance with advance care planning, and assisted in medication management. In addition, we employed strategies to improve communication between the hospital and SNF, including structured forms and a transition advocate-to-SNF nurse telephone call within 24-hours of SNF admission. We trained SNF staff and provided ongoing support to implement the INTERACT quality improvement program. This program included tools designed to improve the identification, evaluation, management, communication, and documentation of acute changes in condition in SNFs.[19–21] The INTERACT tools and related resources are on a publicly-accessible website (http://interact.fau.edu).[22]

Root-Cause Analyses of Readmissions

We used two structured RCAs to assess 30-day hospital readmissions, one designed for hospital physicians, and the other for SNF staff. Unique structured tools were chosen for the following reasons: a.) There is currently no single tool that assesses hospital readmissions from both the SNF and the hospital staff perspectives, b.) We chose tools that have been used in prior studies to enable direct comparisons with previously published research.

For the hospital-based RCA, seven physicians (5 hospitalists and 2 geriatricians) used a modified tool from a hospital-based readmission project (HOspital MEdicine Reengineering Network - HOMERuN).[23,24] Physician reviewers had previously been trained with the HOMERuN adjudication guides, including the performance of "test" reviews, weekly discussions of adjudication practices, and the use of a "FAQ" document to address common adjudicator queries[24]. Data sources included: a) all hospital records from the index admission and readmission, b) an advance care planning screening form, c) a standardized nurse transition summary, d) a pharmacist-generated medication management plan, e) an interview of the patient upon readmission, and f) the SNF medication administration record. Physicians completed reviews independently and were considered trained when agreement was reached as to the avoidability of the readmission.

For the SNF-based readmission RCA, SNF staff (registered nurses or licensed practical nurses) utilized the INTERACT Quality Improvement (QI) tool.[16,17] This tool allowed SNF

staff to retrospectively review acute care transfers and identify opportunities to reduce the frequency of transfers. The QI tool included factors that contributed to the transfer. The INTERACT QI tool is available online (http://interact.fau.edu/).[22]

PAR Determination

The RCAs included a determination of the potential avoidability of the readmission. Hospital physicians used a 6-point Likert scale (ranging from "no evidence" to "virtually certain evidence"), while SNF staff responded with yes or no responses. For the primary analysis, we determined PARs with a hospital-based rating of 4 (avoidability greater than 50-50, but close call) or greater, and a "yes" answer to the SNF-based rating. In light of the different response options of avoidability of the hospital and SNF we additionally chose a more stringent hospital avoidability cut-off value of 5 or more as a sensitivity analysis.

Factors Contributing to Avoidable Readmissions

In addition to avoidability, hospital and SNF-based staff indicated factors that contributed to hospital readmissions. The hospital RCA included factors based upon the HOMERUN readmission tool that mapped to six domains. For each factor, hospital physicians indicated whether there was a more than 50% probability of a specific factor contributing to the readmission. Only one factor was required to count toward a domain, and multiple factors within and across domains could be selected as contributing to each readmission.

SNF-based staff selected any of the factors listed on the INTERACT QI tool that contributed to their determination of avoidability: a) earlier detection of a sign or symptoms, b) changes in patient's condition might have been communicated better among SNF staff, c) the condition might have been managed safely in the SNF with available resources, d) specific resources were not available to manage the change in condition safely or effectively, e) patient and family preferences for hospitalization might have been discussed earlier, and f) advance directives and/or palliative or hospice care might have been put in place earlier. As with the hospital tool, SNF staff could select multiple factors for each readmission. Although there are similar themes between the two tools (e.g. advance care planning), we have not aligned them due to differences in tool language, development, and perspective.

We additionally examined, using Chi-square analysis, whether the timing of readmission on a weekend or weekday was related to the avoidability rating from either the hospital or the SNF perspectives.

Health Care Site Where Interventions May Have Been Avoided

Using all of the data sources from the hospital and SNF, hospital physicians indicated the location (acute care hospital, SNF, emergency department, outpatient clinic) where a future intervention may have the greatest impact for preventing each readmission. This was assessed overall for each readmission, and not for each readmission factor.

Statistical Analyses

We used descriptive statistics to summarize demographic and clinical characteristics, including means and standard deviations or medians and interquartile ranges, where

appropriate. For the first study aim, we calculated the percentage of cases determined to be potentially avoidable from the hospital-based and the SNF-based RCAs. Next, we compared hospital and SNF-based assessments by calculating the frequency of one of four assessment pairings: hospital avoidable – SNF avoidable; hospital avoidable – SNF not avoidable; hospital not avoidable – SNF avoidable; and hospital not avoidable – SNF not avoidable. We also calculated a Cohen's Kappa statistic as an additional test of agreement. Next, we calculated the frequency of the factors associated with readmissions and the specific sites of care considered as the most promising location for future readmission reduction interventions. We performed all analyses with SPSS Statistical Package (IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY).

RESULTS

Sample

Among 1,808 hospital discharges included in the IMPACT-INTERACT intervention, 262 (14.5%) experienced a 30-day unplanned hospital visit from the SNF. Of these, 204 were inpatient readmissions and the remaining were emergency room visits (N = 45) and observations stays (N = 13). Finally, 181 of the inpatient readmissions occurred through January of 2015. Of these, we performed RCAs for 134 (74%) eligible inpatient readmissions. The most common reason for missing paired adjudications was a missing SNF RCA tool completion, N = 24 (13.3%), whereas there was no hospital adjudication for 14 cases (7.7%). The remaining 9 patients (5.0%) did not receive the IMPACT-INTERACT intervention, and therefore adjudications were not performed. The characteristics of the sample are shown in **Table 1**. This sample was similar to the remaining 47 inpatient readmissions without RCA data except that missing patients were less likely to have a DNR status.

Hospital and SNF-based Avoidability Data

Hospital avoidability data were available for all 134 patients, whereas SNF-based avoidability assessments were available for 89.6% of these patients (N = 120). Patients with missing SNF avoidability ratings were more likely to be female, but were otherwise similar across characteristics shown in Table 1. **Table 2** displays the frequency with which the hospital physicians and SNF staff rated readmissions as potentially avoidable, for readmissions that included both hospital and SNF RCAs. Overall, 42 readmissions (35.0%) were determined to be PARs from either the hospital or the SNF perspective. Hospital physicians were more likely to rate readmissions as potentially avoidable (N = 36, 30.0%) compared to the SNF staff (N = 16, 13.3%), P= 0.002. Hospital and SNF-based determinations agreed for 73.3% (N = 88) of the readmissions. The most common source of disagreement (N = 26, 21.7%) reflected readmissions where the hospital assessed a readmission as avoidable whereas the SNF deemed it non-avoidable. The calculated Kappa statistic was 0.245 indicating fair agreement between hospital and SNF reviewers. With a more stringent hospital-based avoidability criterion (rating > 5) there would be 31 (25.8%) cases determined to be PAR from either the hospital or SNF perspective, with a Kappa of 0.204.

Factors Contributing to Hospital Readmission

Among the 134 hospital-based ratings, 42 (31.3%) were determined to be avoidable. Hospital physicians identified diagnostic and therapeutic problems as the most common domain contributing to the readmission (N = 21, 50%) (**Table 3**). Among these 21 patients, 7 and 16 of them were assessed to have a missed diagnosis or inadequate treatment of a medical condition during the index hospitalization, respectively. The latter was the most common single factor identified as contributing to readmissions.

Among the 120 SNF-based RCAs, 16 (13.3%) of the readmissions were determined to be avoidable. SNF staff identified improved management of a change in condition using existing resources (N = 6, 37.5%), improved communication (N = 5, 31.3%) and earlier advance care planning (N = 4, 25.0%) as areas for improvement in avoiding readmissions (**Table 4**). Even when there was agreement on the ratings of avoidability, the factors identified as contributing to the readmissions often differed between hospital and SNF reviewers.

The timing of hospital readmission, weekend vs. weekday, was not related to avoidability ratings for either the Hospital (P = .16) or the SNF (P = 0.54).

Health Care Site that May Have Prevented Readmission

Among the 42 readmissions identified as avoidable by hospital physicians, the hospital and the SNF were cited as the primary site of prevention in 64.3% (N = 27) and 35.7% (N = 15) cases, respectively.

DISCUSSION

Several studies have reported estimates of the proportion of hospitalizations of SNF patients that are potentially avoidable using varying definitions.[7–12,15–17,24–26] The data presented in this study are the first to examine detailed RCA findings on readmissions for SNF patients from the perspectives of both hospital and SNF staff. The findings have important implications for improving transitions of care, strategies to reduce PARs from SNFs, and health policy as Medicare shifts reimbursement from fee-for-service to value-based strategies.

Over one-third (35%) of the 120 readmissions reviewed were determined to be PARs by the hospital, SNF, or both. This is lower than the rate reported in prior studies that involved detailed record reviews by expert clinicians of all hospitalizations as opposed to just readmissions (40% - 68%).[8,9] However, it is considerably higher than hospitalizations determined to be potentially avoidable in two prior studies in which SNF staff used the INTERACT QI tool to review approximately 6,000 hospital transfers while implementing INTERACT (23-24%).[15–17] The difference from previous studies in the SNF setting would have been even greater, but the percent of readmissions rated as avoidable by SNF staff in the current study was substantially lower (13%) than in prior studies. This may have been due to the fact that prior studies focused on all-cause admissions, not just readmissions; differing SNF cultures and INTERACT implementation processes; and/or differences in the

patient populations. In addition, ratings were performed in the context of a trial that spanned the continuum of care intended to reduce readmissions.

From the hospital perspective, the factors are diverse. Diagnostic errors, decisions regarding the need for readmission, and deficits in advance care planning were areas of concern. Interestingly, diagnostic and treatment errors were cited as the most common hospital-based factor leading to subsequent avoidable readmission. This includes both mis-diagnosis and incomplete treatment of an ongoing medical condition. This finding substantiates concerns voiced by quality and safety experts regarding the importance of diagnostic accuracy in the delivery of safe medical care.[27,28] Improving diagnosis will depend upon improvements in the measurement of diagnostic errors and systematic efforts to overcome misdiagnosis.[29] Previously developed discharge checklists have not included prompts to consider accurate diagnosis and treatment.[30] RCAs on readmissions can serve as an important first step to recognize common diagnostic errors and provide feedback. Additional strategies may include decision-support algorithms and additional independent reviews of test results and treatments at the time of discharge.

From the SNF perspective, the factors identified as contributing to hospital readmission are also diverse. Similar to previous research,[8,9,15–17] common factors cited include recognition that the condition could have been detected earlier and/or could have been managed safely in the SNF and earlier advance care planning discussions with patients and families about preferences for care. Interestingly, communication deficits between the hospital and SNF were infrequently cited as readmission factors; however, this may be related to the increased focus on hospital to SNF communication as part of the IMPACT-INTERACT intervention. The breadth of readmission-related factors support previous research and suggest that the most effective readmission reduction efforts are high-intensity and multicomponent in nature, including interventions prior to, bridging, and following discharge.[31–33] Although most of this research has focused on discharges to home, it is likely that collaborative approaches that begin in the hospital and span the care transition from hospital to SNF will be required for populations discharged to SNF.[34]

Hospitals and SNFs often disagreed upon the avoidability of a readmission. In fact, the Kappa value of 0.245 demonstrated only fair agreement. Similar levels of agreement were found by Herzig et al. when readmissions were compared from the inpatient versus the primary care perspective.[35] Importantly, this may not reflect that either the hospital or the SNF reviewers were unreliable, but rather demonstrate the complementary nature of the RCA information obtained by both hospital and SNF staff for the same patients and hospitalization events. Each of the review tools was independently developed. This approach is limited in that both tools, thus, cannot be directly compared with each other. However, a strength of this approach is that each method yields information about the readmission from a unique lens that may be missed with a single perspective. The information gained from the two methods demonstrates the multifactorial nature of the factors underlying hospital readmissions. In addition, even when there was agreement that an admission was avoidable, the domains and factors identified by hospital and SNF RCAs were often different.

The data suggest at least three strategies to reduce PARs from SNFs. These strategies will be essential as hospitals develop networks of SNFs to participate in bundled payment initiatives, accountable care organizations, and other evolving federal and state programs.[1,36,37] A first strategy is to encourage hospitals and their local SNFs to conduct joint RCAs on hospital readmissions and discuss the results as a component of quality improvement activities. Our study demonstrates that these two perspectives are complementary, and that unique views of avoidability and factors associated with PARs will help identify strategies that might not have been otherwise identified by unilateral RCAs. In addition, for avoidable readmissions, both health care settings were frequently identified as targets for quality improvement.

Increasing access to high quality transitional clinical care is a second strategy that will enhance SNF capabilities to evaluate and manage acute changes in condition. This can be accomplished in a number of ways. For example, a subacute service associated with an academic medical center has been recently described.[38] In addition, some hospitals are using hospitalists to provide care in their partner SNFs. Further, the use of teams of physicians and nurse practitioners (or physician assistants) has consistently been associated with reductions in hospitalizations.[39–41] Evidence also suggests that physicians and nurse practitioners who spend a majority of their time in SNFs are associated with lower readmission rates.[42] Combining an enhanced transitional care and SNF clinician workforce and tools such as those in the INTERACT Program with telemedicine[43] may be an especially effective strategy to reduce PARs and should be studied.

A final strategy to reduce PARs emerges from the RCA data – enhancing advance care planning. This is consistent with previous studies, in which more timely advance care planning and discussions about the risks and benefits of hospital transfer have been a common factor identified underlying potentially avoidable hospitalizations.[8,9,15–17] Readmissions commonly involve uncomfortable, expensive, and futile care for patients with end-stage illness.[44] While these decisions to limit hospital care are complicated, they are often made,[45] and advance care planning has been shown to be effective in improving care in SNFs in a randomized trial.[46] Many educational and documentation tools are available that can assist patients, families, and clinicians in implementing better advance care planning and making informed decisions about rehospitalization versus palliative care options.[47–49]

Several limitations should be noted when interpreting these findings. First, the data are derived from one university medical center and 23 area SNFs, and therefore may not be generalizable to other hospitals throughout the U.S. Importantly, these admissions occurred within the context of a quality improvement effort aimed at reducing readmissions, and may under-represent the frequency and avoidability of readmissions. Second, only readmissions directly from SNFs were analyzed, even though patients were at risk for 30-day readmissions if they were discharged from the SNF before the 30-day risk period ended. Third, although we queried from a substantial list of well-established readmission factors that have been previously applied in readmission preventability research[9,24], the list may not be comprehensive and could have led to different conclusions had reviewers alternatively provided free text responses. In addition, although our review process is comprehensive, we cannot discount the possibility of bias from the subjective nature of rating avoidability, the

retrospective review process, and the lack of hospital provider interview data. However, we tried to limit the potential for bias through extensive training of reviewers and choosing a higher threshold for avoidability in sensitivity analyses. Fourth, a relatively small number of cases were available that were rated as PARs by the SNFs. Although they may have rated these cases differently than SNFs in other studies, the factors identified were similar prior studies. Finally, inter-rater agreement was not monitored after initial training of the hospital physicians and SNF nurses even though all judgments of avoidability were supported by specific documentation.

Despite these limitations, the findings have important implications for improving care transitions, reducing PARs, and informing health policy. The data strongly support the need for joint accountability and collaboration in future readmission reduction efforts between hospitals and their SNF partners.

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Table 1

Baseline Characteristics of Patients Who Had a Hospital or SNF Root Cause Analysis (N=134)

Characteristic	Mean (SD) Median (IQR) or Frequency (Percent)
Age in Years, Mean (SD)	73.7 (11.8)
Female, n (Percent)	69 (51.5)
Race, n (Percent)	
White	108 (80.6)
African American	22 (16.4)
American India/Alaskan Native	2 (1.5)
Other race	2 (1.5)
Discharge Service (Index Admission), n (Percent)	
Medicine	71 (53.0)
Non-Orthopedic Surgery	29 (21.6)
Orthopedic Surgery	10 (7.5)
Geriatrics	22 (16.4)
Other	2 (1.5)
Top 4 Diagnosis at Index Admission, n (Percent)	
Falls, Fracture, Trauma, Osteoarthritis	26 (19.4)
Heart Disease (Coronary Artery Disease, Stroke, Valvular Heart Disease, Heart Failure)	24 (17.9)
Pneumonia	12 (9.0)
Sepsis/Infection	12 (9.0)
Number of Medications at Discharge, Mean (SD)	16.2 (5.1)
Advance Directive Status (Resuscitation) at Index Admission, n (Percent)	
Cardiopulmonary Resuscitation (CPR)	65 (48.5)
Do Not Resuscitate	34 (25.4)
Default CPR (Missing Advance Directive)	35 (26.1)
Length of index hospital stay in Days, Median (IQR)	7.5 (5 to 13)
Number of days to readmission, Median (IQR)	10 (4 to 16)
Length of readmission hospital stay in Days, Median (IQR)	6 (3 to 9)
Weekend Readmissions, n (Percent)	46 (34.3)

IQR – Interquartile Range, SD – Standard Deviation, SNF – Skilled Nursing Facility

Table 2

Hospital and SNF-based Ratings of Avoidable Readmissions (N = 120)

| Hospital Rating [*] | Skilled Nursing Facility Rating [*] Frequency (Percent) | | Total (%) |
	Avoidable	Not Avoidable	
Avoidable	10 (8.3%)	26 (21.7%)	**36 (30.0%)**
Not-avoidable	6 (5.0%)	78 (65.0%)	**84 (70.0%)**
Total (%)	**16 (13.3%)**	**103 (86.7%)**	**120 (100%)**

SNF – Skilled Nursing Facility

[*] Hospital determinations were based on a 6-point Likert scale with ratings of 4 considered avoidable. SNF staff determinations were based on a yes/no question after completion of the root-cause analysis (See text for details).

Table 3

Factors Identified as Contributing to Readmissions Rated as Avoidable by Hospital Root-Cause Analysis (N = 42)

Domains and Factors Contributing to Readmissions[*]	Frequency (Percent) Domain	Frequency (Percent) Factor
Monitoring and Managing Symptoms after Discharge	13 (31.0)	
Inappropriate choice of discharge location (e.g. SNF vs. home)		1 (2.4)
Lack of disease monitoring (e.g. following daily weights, etc...)		3 (7.1)
Discharged without needed procedure		1 (2.4)
Lack of clear plan at discharge for chronic medical problem		10 (23.8)
Diagnostic or Therapeutic Problems	21 (50.0)	
Missed diagnosis during the index admission		7 (16.7)
Inadequate treatment of medical conditions during the admission		16 (38.1)
Inadequate treatment of pain during index admission		0 (0.0)
Inadequate treatment of medical conditions at the SNF		4 (9.5)
Inadequate treatment of pain at the SNF facility		1 (2.4)
Decision-Making Concerning Readmission	14 (33.3)	
Inadequate effort to manage the readmitting problem at the SNF		7 (16.7)
Patient inappropriately sent from SNF to Emergency Department		2 (4.8)
ED inappropriately decided to admit patient		1 (2.4)
Patient discharged too soon from index hospitalization		6 (14.3)
Medication Problem or Adverse Drug Event	12 (28.6)	
Errors in taking the preadmission medication history		0 (0.0)
Errors in discharge orders		0 (0.0)
Discrepancy between discharge summary and/or transfer orders		0 (0.0)
Drug-drug or drug-disease interactions		5 (11.9)
Inadequate monitoring for side effects or non-adherence		10 (23.8)
Inadequate steps to ensure medications available at the SNF		0 (0.0)
End of Life/Advanced Care Planning	9 (21.4)	
Patient nearing end of life but still wants full treatment measures		6 (14.3)
Patient nearing end of life but refuses to discuss		1 (2.4)
SNF unable to manage symptoms in hospice patient		0 (0.0)
End-stage illness but palliative care not consulted during index hospitalization		4 (9.5)
End-stage illness but palliative care not consulted while at SNF		2 (4.8)
Patient with end-stage illness and goals of care not documented		2 (4.8)
Continuity of Care	3 (7.1)	
Team did not relay important information to accepting physician		2 (4.8)
Follow-up appointments were not scheduled prior to discharge		0 (0.0)
Follow-up appointments were not sufficiently soon after discharge		0 (0.0)
Hospital test results were not followed up on appropriately		1 (2.4)

SNF – Skilled Nursing Facility

*
More than one domain and more than one factor per domain could be identified for a potentially avoidable readmission

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Table 4

Factors Identified as Contributing to Readmissions Rated as Avoidable by SNF Root-Cause Analysis

Domains and Factors Contributing to Readmissions [*]	Frequency (Percent) Domain Identified N = 16	Frequency (Percent) Factor Identified N = 16
Earlier detection of sign, symptom, or change	2 (12.5)	N/A
Better communication of condition between SNF and hospital, ED, outpatient providers	5 (31.3)	N/A
Improved management of condition in SNF with existing resources	6 (37.5)	N/A
Improved management of condition in SNF with additional resources	4 (25.0)	N/A
On site availability of primary clinician		0 (0.0)
Pharmacy service availability		1 (6.3)
SNF staffing		0 (0.0)
Lab or diagnostic test availability		0 (0.0)
Other (e.g. consultation services)		3 (18.8)
Earlier discussion of patient and family preferences for hospitalization	2 (12.5)	N/A
Earlier discussion of advance directives and/or palliative care services	4 (25.0)	N/A

ED – Emergency Department, SNF – Skilled Nursing Facility

[*] More than one domain and more than one factor per domain could be identified