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Original Study

Root Cause Analyses of Transfers of Skilled Nursing Facility Patients to Acute Hospitals: Lessons Learned for Reducing Unnecessary Hospitalizations



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A B S T R A C T

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Background: Performing root cause analyses (RCA) on transfers of skilled nursing facility (SNF) patients to acute hospitals can help identify opportunities for care process improvements and education that may help prevent unnecessary emergency department (ED) visits, hospitalizations, and hospital readmissions. **Objectives:** To describe the results of structured, retrospective RCAs performed by SNF staff on hospital transfers to identify lessons learned for reducing these transfers.

Design: SNFs enrolled in a randomized, controlled implementation trial of the INTERACT (Interventions to Reduce Acute Care Transfers) quality improvement program submitted RCAs on hospital transfers during a 12-month implementation period.

Setting: SNFs from across the United States that volunteered and met the enrollment criteria for the implementation trial.

Participants: Sixty-four of 88 SNFs randomized to the intervention group performed and submitted retrospective RCAs on hospital transfers.

Interventions: SNFs received education and technical assistance in INTERACT implementation.

Measures: Data were summarized from the INTERACT Quality Improvement (QI) tool, a structured, retrospective RCA on hospital transfers.

Results: A total of 4856 QI tools were submitted during the 12-month implementation period. Most transfers were precipitated by multiple symptoms and signs, many of them nonspecific. Patient and/or family preference or insistence was noted to have played a role in 16% of the transfers. Hospital transfers were relatively equally distributed among days of the week, and 29% occurred on the night or evening shift. Approximately 1 in 5 transfers occurred within 6 days of SNF admission from a hospital, and 1 in 10 occurred within 2 days of SNF admission. After completing the RCA, SNF staff identified 1044 (23%) of the transfers as potentially preventable. Common reasons for these ratings included recognition that the condition could have been detected earlier and/or could have been managed safely in the SNF, and that earlier advance care planning and discussions with patients and families about preferences for care may have prevented some transfers.

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Conclusion: Summarizing findings from RCAs of transfers of SNF patients to acute hospitals can provide important insights into areas of focus for care process improvements and related education that may help prevent unnecessary ED visits, hospital admissions, and readmissions.

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Reducing unnecessary hospital transfers from skilled nursing facilities (SNFs) that result in emergency department (ED) visits, hospital admissions, readmissions, and observation stays is a national priority.¹ Unnecessary ED visits and hospital stays can result in numerous diagnostic tests and therapeutic interventions that may not be indicated, a high incidence of adverse events, and excess health expenditures.^{2,3} They can also result in physical and emotional discomfort for vulnerable SNF patients and their families.

A variety of programs and tools are available to assist health professionals in the SNF setting in reducing unnecessary and potentially avoidable hospital transfers.^{4–9} To be effective, these programs and tools must be implemented in an overall quality improvement (QI) framework.¹⁰ Root cause analysis (RCA) is essential for effective QI to identify opportunities for care process improvements and education within individual organizations and in health systems.¹⁰ RCA is a key component of the Interventions to Reduce Acute Care Transfers (INTERACT) QI Program. The INTERACT QI tool is a structured, retrospective evaluation of hospital transfers designed to be performed by SNF staff ([Supplemental Figure 1](#)). The tool consists of checkboxes with specific items to facilitate summarizing the data, as well as spaces for narrative text. Summaries of data from multiple QI tools representing multiple transfers may identify common patterns and themes that can be addressed by changes in care processes, related education, and other QI interventions.

This article describes data and lessons learned from more than 4800 hospital transfers from 64 SNFs that participated in a randomized, controlled, implementation trial of the INTERACT QI Program. Future analyses will examine specific aspects of these transfers, including transfers that were identified as potentially preventable vs. not preventable by SNF staff, transfers that resulted in ED visits without hospital admission, and transfers that occurred shortly after SNF admission.

Methods

SNFs were recruited for the implementation trial via contacts from national organizations and corporations that expressed an interest in participating. A total of 613 SNFs were screened for eligibility via online and telephone surveys. Criteria for participation were (1) evidence of support from corporate and facility leadership; (2) ability to manage acute changes in condition safely within the facility as evidenced by availability of laboratory, pharmacy, and medical care resources; and (3) availability of technical support to conduct online staff training and report data electronically. SNFs were excluded if they were (1) a hospital-based facility, (2) participating in another project designed specifically to reduce acute care transfers or hospitalization rates that might influence the intervention or control conditions, or (3) conducting more than one other major quality improvement or research project during the project period. The project was approved by the Florida Atlantic University Institutional Review Board as a QI project.

The 264 SNFs that fulfilled the previously described criteria and signed participation agreements were randomized into 3 groups of 88 (immediate intervention, contact comparison group, and usual care comparison group). This article reports data obtained from the immediate intervention group, which received education, INTERACT resources, and technical support to implement the full INTERACT QI

Program from April 2013 through March 2014. Seventeen of the 88 SNFs randomized to this group withdrew or dropped out before or during INTERACT implementation, mainly due to staff turnover and/or competing priorities (eg, implementation of a new electronic record). The 71 participating SNFs were asked to select experienced individuals as project champions and co-champions who were responsible for staff training and for leading INTERACT implementation. The INTERACT QI Program includes clinical practice tools, communication and documentation tools, decision support tools, QI tools, and advance care planning tools.^{6–8} Each SNF had the opportunity to take part in a 2-phase webinar training program consisting of twenty 45-minute webinars designed to offer organizational personnel the opportunity to learn about the multifaceted operational aspects of the INTERACT program. SNFs were characterized using Medicare claims and Minimum Data Set data, and publicly reported quality data.

Participating SNFs were asked to initiate INTERACT implementation by tracking hospital transfer rates monthly and performing RCA on as many hospital transfers as they could using the INTERACT QI tool ([Supplemental Figure 1](#)); a minimum of 4 QI tools per week was requested (assuming they had this many transfers). In general, facility-based project champions and co-champions completed the QI tools, and they were encouraged to discuss the results with their QI team. Champions copied, de-identified, and mailed the QI tools to the project team in stamped, prepaid envelopes at intervals of 3 to 4 months. Trained research assistants entered the QI tool data into a Microsoft Excel database that was designed to summarize the results graphically. The graphical summaries for individual SNFs and the group of SNFs as a whole, with an interpretation, were shared with each SNF via e-mail and during follow-up webinars (see [Figure 1](#) for a representative sample of the summaries). At the end of the 12-month implementation period, SNFs were eligible for a payment of up to \$1500 to compensate them for that additional time needed to complete the QI tools and other data reports.

Results

During the 12-month implementation period, 4856 QI tools were received from 64 of the 71 SNFs that were randomized to the immediate implementation group. The mean and median numbers of QI tools submitted were 76 and 49, respectively, with an interquartile range of 30 to 106. Among the 64 SNFs, 56% were for-profit, 13% were rural, the average number of beds was 139, average proportion of short-stay (<100 days) residents was 34%, the average licensed nurse (registered nurse/licensed practical nurse) hours per day was 1.60, and the average 5-star rating was 3.52. An interim analysis of approximately half of the QI tools was performed in the middle of the implementation period. The results of the analysis of all the QI tools presented in this article are almost identical to the interim analysis, demonstrating the consistency of the RCA data reported by the participating SNFs.

[Table 1](#) characterizes the clinical symptoms and signs as well as other factors reported as reasons for the transfers. Most QI tools had multiple symptoms and signs checked for the reason for the transfer (24% listed 1 reason, 29% listed 2 reasons, and 40% listed 3 or more reasons). The most commonly checked items (in >10% of transfers) included abnormal vital signs, altered mental status, shortness of

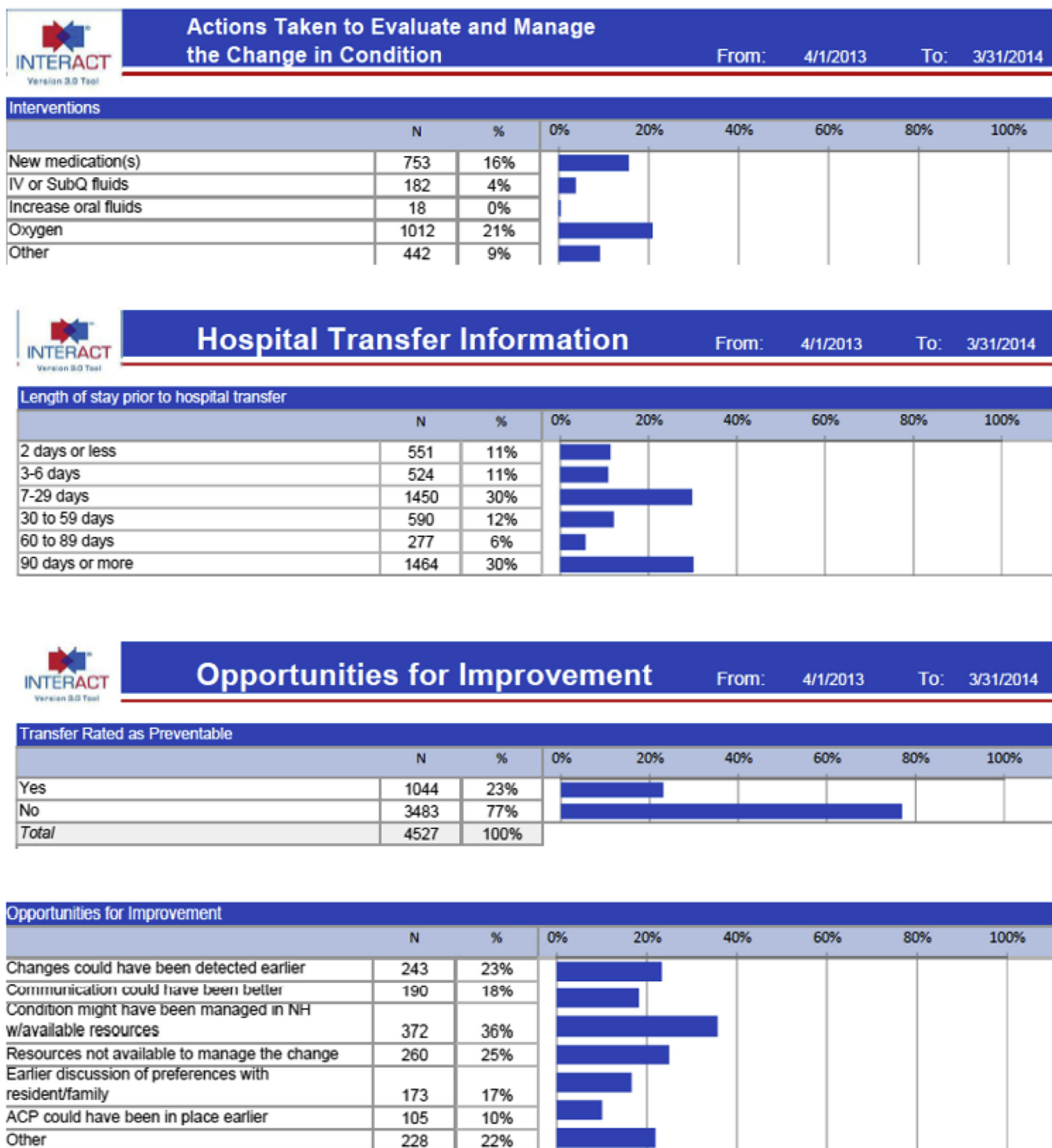


Fig. 1. Examples of selected data from summaries of the INTERACT QI Tool that were sent to participating SNFs. SNFs also received a summary of their own facility's data for comparison, with a brief interpretation.

breath, pain, functional decline, behavioral symptoms, fever, decreased food or fluid intake, and unresponsiveness. The most common combinations of reasons checked were abnormal vital signs and shortness of breath (9%), fall and pain (7%), and altered mental status and behavioral symptoms (7%). There were 353 QI tools (7%) that did not identify a symptom or sign. The most common reasons identified for transfer on these QI tools were that the primary care clinician ordered the transfer (41%), a low hemoglobin

level (30%), abnormal kidney function on laboratory testing (13%), other abnormal laboratory tests not specified (11%), the resident or family member preferred or insisted on the transfer (7%), an abnormal radiograph (5%), and an advance directive not being in place (4%). Most often a combination of 2 or more of these reasons was checked. Among these 353 transfers, 31 (9%) did not originate from the SNF, but from a physician's office (in 16) or a dialysis unit (in 15).

Table 1
Clinical Symptoms and Signs and Other Factors Identified by SNF Staff as Reasons for Acute-Care Transfers

Factors Listed on the QI Tool	Yes n (%)
Clinical factors related to transfer	
Symptoms and signs	
Abnormal vital signs	1622 (33.4)
Altered mental status	1356 (27.9)
Shortness of breath	1132 (23.3)
Pain (uncontrolled)	901 (18.5)
Functional decline	759 (15.6)
Behavioral symptoms	733 (15.1)
Fever	587 (12.1)
Decreased food or fluid intake	567 (11.7)
Unresponsiveness	498 (10.3)
Skin wound or ulcer	407 (8.4)
Fall	392 (8.1)
Bleeding	380 (7.8)
Nausea/vomiting	345 (7.1)
Urinary incontinence	164 (3.4)
Other symptoms and signs specified on QI tool ^a	72 (1.5)
Other symptoms and signs not specified on QI Tool ^b	1585 (32.6)
No symptoms reported	
Abnormal laboratory or test results	
Pulse oximetry	792 (16.3)
Low hemoglobin	424 (8.7)
Radiograph	317 (6.5)
Kidney function	214 (4.4)
Urinalysis or urine culture	191 (3.9)
Blood sugar (high)	170 (3.5)
Other abnormal laboratory or test results specified on QI tool ^c	138 (2.8)
Other abnormal laboratory or test results not specified on QI tool ^d	296 (6.1)
No laboratory or test results reported	2957 (60.9)
Other factors contributing to transfer	
Primary care clinician decision	2505 (51.6)
Resident or family members preferred or insisted on transfer	767 (15.8)
Advance directive not in place	312 (6.4)
Other contributing factors not specified on QI tool ^e	198 (4.1)
No reason for transfer checked	90 (1.9)

Percentages may add to more than 100% because multiple items could be checked.

^aDiarrhea, weight loss.

^bIncludes abdominal pain, chest pain, edema, loss of consciousness, gastroenterology tube blockage or displacement, seizure, respiratory infection, respiratory arrest, cardiac arrest.

^cBlood sugar (low), electrocardiogram, international normalized ratio.

^dIncludes white blood cell count (high).

^eIncludes resources to provide care if the SNF were not available, SNF policies do not support providing care in SNF for the condition.

Table 2 illustrates other characteristics of these transfers that are relevant to improving care processes and related education. As expected, most (65%) of the transfers were evaluated by a clinician over the phone without an in-person visit. Blood tests, radiographs, and urinalysis and cultures were performed before transfer in 15%, 9%, and 6% of cases, respectively, and approximately one-third of the transfers were preceded by an intervention, such as a new medication or oxygen administration. Just over 1 in 5 transfers occurred less than 1 week after admission to the SNF; 11% occurred less than 2 days after admission. Transfers were relatively equally distributed among days of the week, and 29% occurred on the night or evening shift. Most (78%) of the transfers for which QI Tools were completed resulted in inpatient hospital admission; approximately 1 in 5 resulted in an ED visit without hospital admission. Patient and/or family preference or insistence was noted to have played a role in 16% of the transfers; the most common clinical factors identified as additional reasons for these transfers included abnormal pulse oximetry (19%), low hemoglobin (9%), abnormal radiograph (8%), abnormal kidney function on laboratory testing (6%), abnormal urinalysis or culture (6%), high blood sugar (4%), or other laboratory abnormality (12%). Although advance

directives were mentioned on 32% of the QI Tools (mainly noting that a do not resuscitate order was in place), a new advance directive or order was placed before transfer in only 2%. Lack of an advance directive was noted as a factor in 6% of the transfers.

In the final section of the QI tool, SNF staff are asked to identify opportunities for improvement. Among 4527 QI tools that had a response to the question “In retrospect, does your team think this transfer might have been prevented?” 1044 (23%) were identified as potentially preventable. The most common opportunities for improvement identified were (1) staff recognized that the condition might have been managed in the facility with existing resources (36%), (2) discussion of care preferences could have occurred earlier and/or advance directives could have been in place (27%), (3) resources necessary to manage the condition were not available (25%), (4) the change could have been detected earlier (23%), and (5) communication could have been better (18%).

Discussion

Previous research on the causes of hospitalization among SNF patients has focused on the most common diagnoses associated with hospital admission based on administrative data or review of medical records.^{11–17} Few studies have described the multifactorial causes of hospital transfers from the perspective of SNF staff.^{18,19} On-site evaluation of acute changes in condition by SNF staff does not usually result in a definitive diagnosis, and focusing on diagnoses narrows the perspective on many other factors that may be involved in deciding to transfer a patient to a hospital. The RCAs performed by SNF staff on hospital transfers reported in this article provide important insights into the factors that precipitate these transfers, and suggest multiple areas of focus for care process improvements and related education that may help prevent unnecessary ED visits, hospital admissions, and readmissions.

Most transfers reviewed were associated with multiple signs and symptoms, predominantly of a nonspecific nature. These data highlight important principles of geriatric care, and suggest that SNF staff should be trained in comprehensive, rather than disease-specific evaluation of acute changes in condition. Many decision support tools available in clinical practice guidelines as well as in templates in electronic health records focus on the evaluation of a narrow set of signs and symptoms related to one organ system, and/or do not include evaluation of changes in function and mental status. For example, evaluation of shortness of breath commonly focuses on a lung and heart examination. This approach may result in lack of information on changes in function and mental status that may be critical in the decision to transfer, as well as in the decision to admit a patient if he or she is transferred to an ED. Templates for the evaluation of acute changes in SNF patients and related decision support tools, as well as interfacility transfer forms used to communicate critical clinical information, should account for the common occurrence of multiple and nonspecific symptoms in the SNF population.

Only one-third of the transfers were preceded by an on-site evaluation by a physician, nurse practitioner, or a physician assistant. Previous research suggests that the availability of physicians or nurse practitioners for on-site evaluations reduces hospitalizations,^{20–23} but this strategy is not feasible in many SNFs due to limited availability of health professionals trained in geriatrics, post-acute, and long-term care, as well as logistical issues, especially in rural areas. These data suggest at least 3 important strategies that may help reduce unnecessary transfers. First, training licensed nurses in structured evaluations, documentation, and communication strategies, such as the SBAR approach (Situation, Background, Assessment, Recommendations), and providing them tools that can be used in everyday practice to use this approach may result in improved ability of off-site clinicians to make informed decisions about transfers. The AMDA—The

Table 2
Characteristics of Transfers Relevant to Improving Care Processes and/or Targeting Education

	n	%
Actions taken before the transfer		
Medical evaluation (n = 4856)*		
Telephone only	3170	65
Nurse practitioner or physician assistant visit	466	10
Physician visit	654	13
Diagnostic testing (n = 4856)		
Blood tests	717	15
Radiograph	449	9
Urinalysis/culture	273	6
Electrocardiogram	62	1
Venous Doppler	36	1
Radiograph	449	9
Interventions (n = 4856)		
Intravenous or subcutaneous fluids	182	4
Increase oral fluids	18	0
Oxygen	1012	21
Other	442	9
Advance care planning (n = 4856)		
Advance care planning/advance directives considered	1530	32
New advance directive/order	81	2
Type of new advance directive order (n = 81)		
Do Not Resuscitate order (DNR)	30	37
Do Not Hospitalize order (DNH)	2	2
Comfort or palliative care orders	10	12
Order for hospice care	11	14
Physician Orders for Life-Sustaining Treatment/ Medical Orders for Life-Sustaining Treatment/ Physician Orders for Scope of Treatment	21	26
Hospital Transfer Information		
Length of stay before hospital transfer, d (n = 4856)		
≤2	551	11
3–6	524	11
7–29	1450	30
30–59	590	12
60–89	277	6
>90	1464	30
Day of week (n = 4790)		
Sunday	549	11
Monday	755	16
Tuesday	694	14
Wednesday	767	16
Thursday	749	16
Friday	711	15
Saturday	565	12
Time of day (n = 4243)		
Morning, 7 AM–noon	1189	28
Afternoon, noon–7 PM	1816	43
Evening, 7 PM–midnight	764	18
Night, midnight–7 AM	474	11
Outcome of transfer (n = 4282)		
ED only	812	19
Admitted, inpatient	3325	78
Admitted, outpatient	144	3
Other factors contributed to transfer (n = 4856)		
Advance directive not in place	311	6
Clinician insisted on transfer	2504	52
Resident or family preferred or insisted on transfer	767	16
Resources to provide care in SNF were not available	8	0
SNF policies do not support providing care in SNF	3	0
Other contributing factors	190	4
Opportunities for Improvement (n = 4527)		
Transfer rated as preventable		
Yes	1044	23
No	3483	77
Reasons for rating as preventable (n = 1044)		
Condition might have been managed in the SNF with available resources	372	36
Earlier discussion of preferences with resident/family or advance care plans could have been in place earlier	278	27
Resources not available to manage the change	260	25

(continued on next page)

Table 2 (continued)

	n	%
Changes could have been detected earlier	243	23
Communication could have been better	190	18
Other	228	22

*For most sections, percentages do not total 100% because only relevant items were checked, and multiple items could be checked in one section. Some items have a different denominator because the item is relevant to only a subset of the tools.

Society for Post-Acute and Long-Term Care Medicine's "Know It All before You Call" program and the INTERACT SBAR Communication Form and Progress Note and related decision support are examples of such tools. Second, telehealth is becoming increasingly available in the SNF setting and can incorporate the tools mentioned previously.²⁴ As the effectiveness of telehealth becomes more accepted, reimbursement for telehealth visits should become more available, especially in capitated, bundled, and value-based payment systems. Third, evidence-based, expert-consensus-derived order sets that address the most common symptoms and signs associated with transfers are now available for post-acute and long-term care and may be helpful to clinicians evaluating and managing acute changes in condition without hospital transfer.²⁵

Anecdotal reports often suggest that transfers most commonly occur on the evening and night shifts (7:00 PM to 7:00 AM) and on weekends, when staffing tends to be lower and on-call clinicians may not be familiar with patients they are called about; however, in this sample of several thousand transfers, this was not the case. These data demonstrate the need for SNFs to evaluate such anecdotal impressions objectively by using RCA as part of an overall QI program, so that resources and education can be focused on the times of day and days of the week during which most transfers occur in their SNF.

Just over 1 (22%) in 5 of the transfers reviewed occurred within 6 days of admission to the SNF; 11% occurred within 2 days of admission. Transfers back to the hospital within a few days of SNF admission are more likely to involve care transition problems than transfers that occur after the patient has been in the SNF for several weeks, such as clinical instability warranting a longer hospital stay, inadequate communication of critical clinical information,²⁶ or medication-related issues. "Warm handoffs" with direct nurse-to-nurse and physician-to-physician communication via telephone, secure texting, or e-mail may help reduce rapid readmissions. Members of the clinical leadership of hospitals and SNFs have developed consortia and convened regular in-person meetings to jointly discuss RCAs and implement strategies to address care transition problems identified. These face-to-face joint QI meetings should be encouraged as networks of hospitals and SNFs develop in bundled payment models and accountable care organizations.

SNF staff commonly report that family and/or patient insistence plays an important role in the decision to transfer. This was reported as a factor in only 16% of the RCAs in this sample of transfers, and in many of these transfers, other factors that could have played an important role in the decision to transfer were also noted. Family preferences related to transfer (as well as to many other tests and procedures) are an important component of providing person-centered care. SNFs should develop close trusting relationships with families, educate them on the capabilities of the SNF, have empathic discussions about person-centered goals of care, and use educational materials that are available from many sources.^{6,12,27–34}

SNF staff rated 23% of the transfers as potentially preventable after their retrospective RCAs. This is remarkably consistent with a previous study involving 25 SNFs in 3 states using an earlier version of the INTERACT QI tool, in which 24% of just over 1300 transfers

were rated as potentially preventable.³⁵ Although this is a lower percentage than other studies using different methodologies, that fact that SNF staff recognize in retrospect that almost 1 in 4 transfers may be preventable suggests substantial room for improvement. Studies in which expert panels have reviewed SNF and hospital records have rated 45% to 68% as potentially avoidable.^{36,37} Other studies using large administrative databases that defined “avoidability” based on a list of diagnoses have found that 23% to 39% of hospitalizations from SNFs are associated with an ambulatory care-sensitive diagnosis or a condition that can often be managed outside of a hospital.^{11,14–16} 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, and not all hospitalizations for diagnoses such as congestive heart failure and pneumonia are avoidable, dependent on the severity of the patient’s condition.^{14,15,18,19} In the current study, important insights into strategies that might prevent transfers were identified by SNF staff among the 1044 transfers rated as potentially preventable. SNF staff indicated that in retrospect, they felt that the condition could have been managed in the SNF with available resources in 36% of the transfers; and in more than 40% of the transfers, they noted that the acute changes could have been detected earlier or that communication about the changes could have been better. These data suggest that performing RCAs on transfers and reviewing summaries of the data on an ongoing basis can result in SNF staff learning and changing their approach to acute changes in condition.

In more than one-quarter of the transfers rated as potentially preventable, SNF staff recognized that earlier discussion of patient/family preferences and/or the presence of advance care plans and advance directives could have helped prevent the transfer. This is one of the major reasons that expert clinicians rated transfers as potentially avoidable in 2 previous studies.^{36,37} These data highlight the critical role of educating the SNF interdisciplinary team on advance care planning and person-centered care for preventing unnecessary hospitalizations, and the need to include complete and detailed information on advance directives and discussions related to them when transferring SNF patients to the hospital.

There are several important limitations that must be considered when interpreting these data. First, the data were received from only 64 SNFs that may not be representative of approximately 16,000 SNFs in the United States. In addition, these SNFs volunteered to participate in the implementation trial, and are likely to be early adopters and motivated by local factors to reduce unnecessary hospital transfers. This is not true of many SNFs throughout the United States. Second, the transfers selected for review by the SNFs were not a random sample of transfers. They may have been enriched with transfers the SNFs considered preventable, or may have represented a higher acuity of illness related to the acute changes in condition. Third, the extent to which SNF staff reported all of the factors related to the transfer on the QI tools could not be determined. Thus, it is possible that some factors were underreported. The fact that the overall findings from the 4856 QI Tools were almost identical to an interim analysis of approximately half of the tools does illustrate the consistency of selecting and reviewing transfers in the participating SNFs. Fourth, the QI Tools did not include some elements that would be very useful in enhancing the data collected, such as vital signs at the time of transfer and suspected diagnoses of conditions that are considered ambulatory care sensitive and/or manageable outside of a hospital by the Centers for Medicare and Medicaid Services. These items have been added to an updated version of the INTERACT QI Tool. Despite these limitations, the data reported provide important insights that may help prevent unnecessary ED visits, hospital admissions, and readmissions; reduce complications of hospitalizations; and reduce overall expenditures for care in the post-acute and long-term care population.

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Supplementary Data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.jamda.2015.11.018>.

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