Reducing Potentially Avoidable Hospitalizations of Nursing Home Residents: Results of a Pilot Quality Improvement Project

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Objectives: Hospitalizations expose nursing home (NH) residents to disruptions in care, iatrogenic events and related morbidity, and result in excess health care costs. Research has shown that a substantial proportion of these hospitalizations may be avoidable and that reducing such hospitalizations could save Medicare dollars that could be re-invested in improving the quality of care in US NHs. The objective of this project was to pilot test tools and strategies designed to assist NH professionals in reducing potentially avoidable hospitalizations.

Design: Six-month prospective quality improvement initiative conducted by the Georgia Medical Care Foundation, the Medicare Quality Improvement Organization (QIO) for Georgia. Participating NHs were provided with communication and clinical practice tools and strategies designed to assist in reducing potentially avoidable hospitalizations, and on-site and telephonic support by an advance practice nurse. A retrospective review of acute care transfers was conducted by facility staff. Outcome data were compared to measures collected retrospectively over a 15-month baseline period.

Setting: Three NHs in Georgia selected based on high rates of hospitalization that volunteered to participate.

Measurements: Use of the tools and strategies were monitored every 2 weeks during the intervention with on-site visits by the advance practice nurse. Baseline data on hospitalization rates were determined using the Minimum Data Set (MDS), and hospitalizations were rated by an expert panel as potentially avoidable using a structured implicit record review process similar to that used in a previous study of the appropriateness of hospitalizations of NH residents. All hospitalizations during the 6-month intervention were ascertained, and all hospitalizations of residents whose hospital stay was reimbursed by Medicare were reviewed by the expert panel to determine the proportion that was potentially avoidable.

Results: Although NH staff viewed the tools favorably, their use of them in the 3 facilities varied and none of the facilities fully implemented all of the tools. Despite only partial implementation, the quality improvement initiative was associated with a 50% reduction in the overall rate of hospitalizations during the 6-month intervention period compared to baseline. The proportion of hospitalizations rated as potentially avoidable was also reduced by 36%—from 77% at baseline to 49% during the intervention.

Conclusion: The quality improvement strategies and tools tested in this pilot project show promise for assisting NHs in reducing potentially avoidable hospitalizations. The results must be interpreted cautiously because this was not a controlled study, and was conducted in only 3 highly selected NHs. Refinement of the tools and implementation strategies and testing in a larger and more diverse sample of NHs is under way. **(J Am Med Dir Assoc 2009; 10: 644–652)**

Keywords: Nursing homes; avoidable hospitalizations

Hospitalization of nursing home (NH) residents can cause discomfort and anxiety for residents and families, iatrogenic complications during hospitalization, and excess health care costs. Many hospitalizations of NH residents may be either preventable through better care in the NH, or inappropriate, because the transfer exposes NH residents to additional risks associated with hospitalization, without substantial potential benefit for the residents' clinical and functional status, or quality of life. One study of hospital transfers from 8 Los Angeles NHs reported that 45% of 100 hospitalizations were rated as "inappropriate" when assessed by experienced physicians using a structured implicit record review.[1] In 2004, 23% of the $972 million spent on hospitalizations of long-stay NH residents in the state of New York were for "Ambulatory Care Sensitive Diagnoses" (ACSD), a proxy measure for potentially unnecessary hospitalizations.[2] This is an underestimate of the overall costs of these hospitalizations, because short-stay residents, among whom hospitalizations are more common than long-stay residents, were excluded from this analysis. A study of hospital admissions from Canadian long-term care facilities found 55% to be attributable to a modified list of ACSD.[3]

Reducing potentially avoidable hospitalizations of NH residents presents an opportunity to both improve care quality and avoid unnecessary health care expenditures. Savings from reducing these avoidable hospitalizations could be used to support staff and other infrastructure to improve the quality of NH care through the Centers for Medicare and Medicaid Services' (CMS) "value-based purchasing" or "pay-for-performance" initiatives.[4,5]

In preparation for the Medicare Quality Improvement Organization 9th scope of work related to care transitions, CMS supported a contract to examine variability in, and factors associated with, hospitalization of NH residents in the state of Georgia; to determine the proportion of these hospitalizations that were potentially avoidable and the reasons for these hospitalizations; and to develop and pilot test tools and strategies that might help reduce the frequency of avoidable hospitalizations. This article describes the results of the final phase of that project, in which tools and strategies to assist NH staff in reducing avoidable hospitalizations were pilot tested.

METHODS

This project was conducted as a quality improvement initiative as a component of the work of the Georgia Medical Care Foundation (GMCF), the Medicare Quality Improvement Organization (QIO) in Georgia. Minimum Data Set (MDS) and Medicare data were available to the QIO, and review by a federally sanctioned Institutional Review Board and informed consent were not required to access these and medical record data.

MDS data were obtained for all Georgia NHs over a 15-month period, from May 1, 2005, to August 1, 2006. The MDS resident discharge disposition code was used to identify residents who were hospitalized. Three of the 10 facilities with the highest hospitalization rates were selected and invited to participate based on their geographic location (suburban versus urban and proximity to Atlanta), their medical staff model, and their willingness to participate in the pilot project. In the baseline phase of the project, a list derived from Medicare claims data of residents who were admitted to an acute care hospital under the Medicare Part A benefit from each of the 3 NHs was sorted by first name, and each 20th name was selected. From this group of residents, 10 hospitalizations were identified that met the following criteria: (1) 5 long-term stay residents (Medicaid or private pay) with nonelective hospital admission from May 1, 2005, to August 31, 2006; (2) 5 postacute residents (on Medicare Part A while in the NH) with nonelective hospital admission during the same time period; (3) if criterion 2 could not be met, review was conducted on as many postacute records as were available, the remainder on long-staying residents; and (4) if the resident had multiple admissions within the time frame, the most recent admission that met the nonelective criteria was chosen.

A panel consisting of experts in nursing home care and experienced practicing long-term care clinicians from Georgia was formed to conduct record reviews and provide input into the development of tools and strategies for the intervention phase of the study. (Panel members are listed in the Acknowledgment section.) A structured implicit record review (SIR) was used by panel members to rate the acute hospital admissions as unavoidable versus potentially avoidable, with identification of the reason(s) for the latter ratings. The SIR was based on a refinement of the methods used in a prior study of appropriateness of hospitalization of NH residents.[1] The SIR led panel members through a series of questions about the resident and circumstances surrounding the hospitalization. Questions covered the residents' baseline health status, advance directives, potential benefits of acute transfer, and the care provided in the NH when the residents' status changed. After responding to these questions, the reviewer was asked: "Was this hospitalization avoidable?" Response categories included the following: definitely not avoidable, probably not avoidable, probably avoidable, and definitely avoidable. Hospitalizations rated as definitely or probably avoidable are reported as "potentially avoidable" in this analysis. The expert panel underwent training on use of the SIR tool, including review of a detailed procedure manual and 2 conference calls facilitated by the tool's developer, Dr. Debra Saliba. The inter-rater reliability of the SIR tool was very good in the earlier study, with 84% agreement for emergency room transfers (kappa 0.678; and 89% for hospitalization (kappa 0.779).[1] For each hospitalization the panel member rated as potentially avoidable, they were also asked to rate factors that explained why they rated the hospitalization as avoidable and what could have prevented the hospitalization. To examine why the hospitalizations were rated as potentially avoidable, panel members were asked to rate a series of items on a 4-point scale from "Important" to "Not at All Important," with opportunities for open-ended comments. To describe what factors panel members thought would have enhanced the NHs' ability to prevent hospitalization and safely care for the resident without transfer, the panel was asked to rate a series of items on a 4-point scale ("Would Have Prevented Transfer," "Very Helpful,"

Table 1. *Characteristics of the Pilot Homes*

Characteristic	Nursing Home		
	1	2	3
Certified beds	103	117	69
Urban/Rural	Urban	Rural	Urban
Chain	No	Yes	Yes
Ratio of average Medicare/Medicaid census	5/55	0/88	15/46
Clinical Resources			
Skilled care services			
24/7 presence of at least 1 RN	No	No	No
Oxygen therapy	Yes	Yes	Yes
Ability to start and administer IV 24/7	No	Yes	Yes
Ability to get new medications quickly (ie, 4–6h)	No	Yes	No
Ability to get onsite "stat" lab testing (ie, results in 4–6h)	No	Yes	Yes
Ability to get onsite "stat" x-rays (ie, results in 4–6h)	No	Yes	No
Physical therapy at least 5 days per week	Yes	Yes	Yes
Occupational therapy at least 5 days per week	Yes	Yes	No
Speech therapy at least 5 days week	No	No	No
Social work available daily	Yes*	Yes*	Yes*
Dietician available daily	No	No	No
Medical coverage			
How many MDs care for residents at nursing home?	1	4	1
On average how often is any MD in the home?	1×/wk	1×/wk	1×/wk
Does your home have 1 or more NP/PA seeing residents?	1 NP*	NP/PA†	No

RN, registered nurse; IV, intravenous; MD, medical doctor; NP, nurse practitioner; PA, physician assistant.

* Homes 1 and 3 had social workers with bachelor's degrees; 2 had a social services designee who is a trained certified nursing assistant.

† The NP/PAs were employed by the MD and visited the homes once a week.

"Somewhat Helpful," "Not Helpful"). Panel members also had the opportunity to list other factors in these ratings. Hospital admitting diagnoses were obtained through the Medicare Case Review Information System (CRIS) database.

During the intervention phase of the project, all hospitalizations were tracked by the project coordinator working in collaboration with NH staff in the 3 pilot facilities. NH and hospital records were obtained for all of the hospitalizations of patients whose hospital stay was reimbursed by Medicare and were abstracted and rated by the expert panel using the same methods as described previously. Hospitalization rates per 1000 resident days during the pilot were estimated by assuming the census in the 3 participating facilities was stable during the 2 years of the project.

The pilot was conducted from May 1 to October 31, 2007, in several phases, including prework, learning sessions, implementation, and evaluation. The intervention focused on the implementation of a toolkit, named "INTERACT" (Interventions to Reduce Acute Care Transfers), that was developed by the project director (J.G.O.) and coordinator (M.P.) with input from the expert panel ratings of the importance and feasibility of a set of 50 potential interventions. The tools included evidence-based practices and practice guidelines, and were designed to be simple and feasible to implement in everyday practice in NHs. A list of the tools is provided in Appendix 1, and updated tools can be downloaded from the Internet.[6]

Appendix 1 summarizes the quality improvement intervention. Each participating NH appointed a team responsible for attending the learning sessions. One member of the team at each home was designated as the project champion who was responsible for promoting use of the tools and was key

contact for the project team. The teams were generally composed of the director or assistant director of nursing, a member of the social worker staff, and a licensed nurse. The project champion met with the project coordinator to review progress and to complete systematic reviews of hospital transfers every 2 to 3 weeks during the 6-month intervention period.

RESULTS

Table 1 illustrates key characteristics of the 3 participating NHs. The use of the tools was tracked by the project coordinator at each of her regular visits to the NHs. Feedback on the tools was provided by 64 staff in the 3 facilities. Most of the NH staff found them to be useful, but some considered the SBAR communication tools and the "Stop and Watch" tool for Certified Nursing Assistants (CNAs) as "too much paperwork." They suggested that these tools were primarily useful as educational information.

Table 2 illustrates hospitalization rates in the 15-month baseline period and during the 6-month pilot. Compared with baseline, the facilities had a 58%, 44%, and 36% reduction in hospitalizations per 1000 resident days; the overall reduction in the 3 facilities combined was 50%. Even if one assumes the census was 10% lower during the 6-month pilot, the hospitalization rate was reduced by 41% compared with baseline. The average hospitalization rate during the intervention for the 3 pilot facilities (1.54/1000 resident days) was slightly lower than the average rate for all 377 Georgia NHs in the baseline phase (1.62/1000 resident days).

NH, emergency department, and hospital records were obtained for all 65 hospitalizations of residents whose hospital stay was reimbursed by Medicare and occurred during the 6-month intervention, and were rated by one member of

Table 2. Baseline and Intervention Rates of Hospitalization in the 3 Pilot Facilities

Facility	Baseline (15 months)				Intervention (6 months)			
	No. Certified Medicare and Medicaid Beds	Resident Days	No. Hospitalizations	Hospitalizations per 1000 Resident Days	Resident Days*	No. Hospitalizations	Hospitalizations per 1000 Resident Days*	% Reduction from Baseline
1	117	53,516	168	3.14	21,406	38	1.77	44%
2	103	49,125	138	2.81	19,650	16	1.17	58%
3	69	40,164	133	3.31	16,066	34	2.11	36%
All 3 facilities	289	142,805	439	3.07	57,122	88	1.54	50%

*Resident days were extrapolated from baseline data (ie, Baseline number of resident days×6/15) assuming a stable level of census.

the Expert Panel using the SIR tool. Results of the Expert Panel ratings are illustrated in Table 3. Of the 65 hospitalizations, 32 (49%) were rated as probably or definitely avoidable. The rate of potentially avoidable hospitalizations among residents on Medicare Part A (47%) was similar to the rate in long-term care residents. The baseline rate of potentially avoidable hospitalizations was 77% of the 30 hospitalizations reviewed in the 3 pilot facilities (compared with 68% for all 200 hospitalizations rated during baseline). Thus, the intervention was associated with a 28% absolute reduction in hospitalizations rated as potentially avoidable by the Expert Panel (77% to 49%). This represents a relative reduction of 36% (28%/77%).

Table 4 illustrates the diagnoses recorded by the Expert Panel members associated with the 32 hospitalizations rated as potentially avoidable during the intervention period. When compared with the distribution of diagnoses for the 105 potentially avoidable hospitalizations for which data were available among the 200 hospitalizations reviewed for baseline data, the proportion of hospitalizations related to dehydration/metabolic disturbances and gastrointestinal conditions were substantially higher (16% versus 7%, and 19% versus 7%, respectively).

Table 5 illustrates the Expert Panel members' ratings of reasons for the avoidable hospitalizations, and their ratings of resources that might have helped prevent the hospitalization. The ranking of these items was very similar to the ratings in the baseline data collection. Factors frequently considered somewhat or very important for rating the hospitalization as potentially avoidable included the availability of on-site physician care, the availability of registered nurses and nurse practitioners or physician assistants, the overall quality of NH care related to assessing and managing changes in condition, and the need for better advance care planning. Resources frequently rated as potentially helpful in preventing avoidable hospitalizations included greater on-site availability of physician or nurse practitioner or physician assistants, more registered nurses providing care, availability of lab results within 3 hours, and the capability of the NH to administer intravenous fluids.

DISCUSSION

The NH staff from the 3 participating facilities who completed feedback surveys during the pilot felt the INTERACT tools were valuable in their everyday practice, but they did not use them as frequently as was hoped. An important barrier was the perception of additional paperwork, which resulted in many of the forms not being used. In addition, with only a small number of exceptions, the physicians and physician extenders working at the participating NHs were not engaged in the intervention despite multiple communications with them. The Unplanned Transfer Review form was one exception—with encouragement from the project coordinator, these forms were completed for a majority of the hospitalizations that occurred during the 6-month pilot.

Despite these implementation challenges, there was a marked decrease (28% absolute reduction and a 36% relative reduction) in the proportion of hospitalizations rated as

Table 3. *Pre-Post Comparison of Expert Panel Ratings of Potentially Avoidable Hospitalizations in the 3 Pilot Study Homes*

Nursing Home	Baseline		During 6-Mo Intervention	
	No. Records Reviewed[1]	No. (%) rated as probably or definitely avoidable†	No. Records Reviewed*	No. (%) rated as probably or definitely avoidable†
1	10	6 (60)	15	6 (40)
2	10	10 (100)	25	13 (52)
3	10	7 (70)	25	13 (52)
All 3 homes	30	23 (77)	65	32 (49)

* In baseline, 10 hospitalizations of residents age 65 and older from a 15-month period were selected randomly for review by the expert panel. All 65 hospitalizations of residents age 65 and older were reviewed during the 6-month intervention phase.
† Ratings were based on a modification of a Structured Implicit Review process used in previous studies (1).

potentially avoidable by the expert panel. Just as, if not more important, there was an estimated 50% reduction in the hospitalization rates in the 3 participating facilities over the 6-month intervention period. Expert panel ratings of factors related to avoidable hospitalizations and resources helpful in preventing them were very similar to those cited in the baseline phase of the project. Data collected on the INTERACT Unplanned Transfer Review forms highlight the potential impact of this tool. The NH champions rated almost 40% of the hospitalizations as potentially avoidable when reviewing them in retrospect. This suggests that this tool could be a powerful learning strategy in future quality improvement initiatives focused on reducing avoidable hospitalizations.

If one uses these pilot data to make simple assumptions, a crude estimate of the potential reduction in Medicare expenditures for hospital care would be as follows. There were 65 hospitalizations paid for by Medicare during the 6-month

Table 4. *Comparison of Causes of Potentially Avoidable Hospitalizations during the Baseline and Pilot Intervention Phases*

Hospital Admitting Diagnosis*	Frequency at Baseline (N=105)	Frequency During Pilot Intervention (N=32)
Cardiovascular	22 (21%)	4 (13%)
Respiratory	21 (20%)	5(16%)
Mental status change/ Neurological	13 (12%)	4 (13%)
Urinary tract infection	11 (11%)	5 (16%)
Sepsis/Fever	8 (8%)	2 (6%)
Skin (cellulitis, infected wound, or pressure ulcer)	8 (8%)	0
Dehydration and/or metabolic disturbance	7 (7%)	5 (16%)
Gastrointestinal (bleeding, diarrhea)	7 (7%)	6 (19%)
Musculoskeletal pain and/or fall	3 (3%)	0
Psychiatric	1 (1%)	0
Other	2 (2%)	1 (3%)

* Hospital diagnoses were obtained from the Medicare Case Review Information System (CRIS) database for baseline reviews, and recorded by expert panel members while doing the Structured Implicit Review for the intervention phase data. When the primary admitting diagnoses were multiple, the diagnosis that most closely related to the nursing home resident's presenting symptoms and/or was most likely to be responsible for hospital admission was selected as the admitting diagnosis.

pilot in the 3 participating NHs; of these, 49%, or 32, were rated as potentially avoidable by the Expert Panel. Assuming no major seasonal variation (the pilot did not include winter months when hospitalizations may be more frequent for respiratory illnesses), this would annualize to 64 potentially avoidable hospitalizations for the 3 facilities. If the pilot intervention resulted in about a one-third reduction in avoidable hospitalizations, then there may have been as many as an additional 31 potentially avoidable hospitalizations (calculated by the formula $[x–0.33x = 64]$). Assuming an average hospital Diagnosis Related Group (DRG) payment of $6500 (based on data collected in baseline), and one third of these residents being readmitted to the NH on the Medicare Part A benefit for an average of 30 days with an average Resource Utilization Group payment of $350 per day, 31 hospitalizations would cost Medicare Part A slightly over $300,000. This amount is enough to support a full-time nurse practitioner or physician assistant in each facility. A more potent intervention in different facilities would likely result in substantially more Medicare savings.

The results of this pilot project must be interpreted cautiously for several reasons. First, the project was carried out in only 3 facilities in 1 state. Although the demographic and clinical characteristics of Georgia NH residents are similar to those of residents in other US NHs, Georgia does differ from other states in some important ways that could influence the interpretation of the results. The GMCF, the Medicare QIO for the state of Georgia, has excellent relationships with its stakeholders (scoring over 90% on satisfaction scores on a recent independent survey conducted by CMS). The participating facilities did not volunteer to participate, but agreed after being contacted by the project team. They were not selected on the basis of quality, nor did they have any incentives, except the opportunity to test new clinical practice tools. No reimbursement was provided to the facilities for the time spent by staff learning about or implementing the tools. Thus, generalizability to more diverse NHs in other states is difficult. Refinement and testing of the INTERACT tools in a collaborative quality improvement project in 30 NHs in 3 states supported by the Commonwealth Fund is currently under way.

Second, the methods for determining "potentially avoidable" hospitalizations are imperfect. We used a modification of the SIR tool developed by Saliba and her colleagues in previous research.[1] Inter-rater agreement on a sample of approximately 20% of the hospital admissions rated during baseline

Table 5. *Expert Panel Ratings of Factors Associated with Resources Necessary to Reduce Potentially Avoidable Hospitalizations*

Factors Associated with Potentially Avoidable Hospitalizations*	All 3 Pilot Nursing Homes	
	Important	Somewhat Important
The same benefits could have been achieved at a lower level of care	66%	31%
The nursing home should have been able to do everything done by the hospital	59%	25%
The quality of care in the nursing home by the physician or physician extender	28%	31%
One physician visit could have avoided the transfer	34%	38%
Quality of care by nursing home staff	50%	47%
Better quality of care would have prevented or decreased severity of acute change	34%	44%
Better advance care planning would have prevented the transfer	38%	34%
The resident's overall condition limited his ability to benefit from the transfer	38%	19%
Resident/family did not want hospitalization	13%	3%
Family or proxy insisted on transfer	9%	9%
Resources Needed to Reduce Potentially Avoidable Hospitalizations†	**Could Have Prevented the Hospitalization**	**Would Have Been Very or Somewhat Helpful in Avoiding the Hospitalization**
Physician or physician extender present in nursing home at least 3 days per week	9%	69%
Nurse practitioner working in the facility	3%	75%
Exam by physician or physician extender within 24hours	38%	38%
Registered nurse providing care	6%	59%
Availability of lab tests within 3hours	28%	59%
Intravenous therapy	47%	31%
Pulse oximetry	3%	31%
Respiratory therapy	0%	22%
Psychiatric consultation	3%	3%
Blood products	0%	9%
Total parenteral nutrition	0%	0%
Patient-controlled analgesic pumps	0%	0%

Row and Column percentages do not total 100% because different panel members rated different numbers of hospitalizations as avoidable, and multiple items could have been rated as important/somewhat important for any given hospitalization.

* Expert panel members were asked to rate each item for each hospitalization they rated as avoidable on a 4-point scale from "Important" to "Not at All Important".

† Expert panel members were asked to rate each item for each hospitalization they rated as avoidable as to whether the item would have enhanced the nursing home's ability to prevent hospitalization and safely care for the resident without transfer on a 4-point scale ("Would Have Prevented Transfer," "Very Helpful," "Somewhat Helpful," "Not Helpful."

was good (68%) for the items defining a hospitalization as definitely or probably potentially avoidable. Although the SIR tool is very comprehensive and guides the reviewer through a thorough assessment of the circumstances surrounding the hospitalization in a systematic manner, even expert clinicians may have difficulty making judgments without knowing the individual NH resident, his or her family, and the NH staff. Despite these caveats, the SIR tool resulted in good interrater agreement, and is likely to be just as if not more valid in defining potentially avoidable hospitalizations than using administrative data, such as ACSD. A recent study of the costs of potentially avoidable hospitalizations of NH residents in the state of New York used ACSD to determine potentially avoidable admissions.[2] These diagnoses do not include the type of individual case-based clinical information that is critical in making judgments about care. Of note, the most common diagnoses causing potentially avoidable hospitalizations in that study were pneumonia, urinary tract infection, congestive heart failure, and dehydration—similar to our findings, and all conditions that are addressed by the INTERACT

Care Paths and SBAR Communication Tools. Thus, if ACSD will serve as a basis for defining potentially avoidable hospitalizations in future NH value-based purchasing initiatives, the INTERACT toolkit should be extremely useful for participants in these efforts.

Third, the Expert Panel was aware of the purpose of the project and may have been biased in terms of perceiving a need to both improve the quality of NH care and reduce unnecessary hospitalizations. They were also aware that the second round of records they reviewed was related to the intervention they helped develop. Moreover, the pilot project was a quality improvement initiative that did not include a control or comparison group owing to time and budget constraints. Thus, many of the principles of clinical trials were not used because of the preliminary nature of this pilot initiative. The changes we note in the ratings of potentially avoidable hospitalizations must be interpreted in this context.

Despite these caveats, the results of this pilot project are promising and suggest that with some revisions, the INTERACT tools and implementation strategies could result in

improvements in quality of care, reductions in avoidable hospitalizations, and substantial savings for the Medicare program—some of which could be re-invested for incentives in value-based purchasing or pay-for-performance initiatives.

The INTERACT tools, and the experience gained in implementing them, should provide a sound basis for CMS to build upon in care transitions projects in the QIO 9th Scope of Work currently being implemented in 14 communities throughout the United States, as well as in NH value based purchasing or pay-for-performance initiatives designed in part to improve NH care by reducing avoidable hospitalizations.[4] The current Medicare fee-for-service system, however, provides financial incentives for physicians, NHs, and acute hospitals that favor hospitalization of NH residents. The unreimbursed costs of implementing quality improvement projects involving strategies such as the INTERACT tool, as well as the potential regulatory and legal liabilities of caring for sicker residents, are potent disincentives to managing residents with acute changes in status in the NH.[5,7–10] Managed care programs such as Evercare and others mitigate these financial incentives and have been shown to reduce hospitalization of NH residents when more care is provided in the NH by teams of physicians and nurse practitioners or physican assistants.[11–14] The number of NH residents in these programs, however, remains relatively small.

Financial incentives to reduce avoidable hospitalizations of NH residents in a pay-for-performance model may be effective if the incentives are adequate to support the costs of providing safe and high-quality care in the NH for residents with acute changes in status. Medicare is beginning a demonstration of a value-based purchasing initiative that will reward NHs based in part on lower rates of potentially avoidable hospitalizations.[4] In addition, Medicare is exploring "bundling" payments for 30-day episodes of care for certain conditions. If skilled NH care is included in these bundled payments, hospitals and NHs would have a potent financial incentive to collaborate and communicate better to avoid hospitalization of NH residents whenever safe and feasible. Both strategies are, however, fraught with many pitfalls,[4,5,9,15] and could be counterproductive if support for the infrastructure to manage sicker NH residents in the NH is not made available to complement these financial incentives.

Reducing potentially avoidable hospitalizations of NH residents presents a timely and important opportunity to both improve quality of care and avoid unnecessary health care expenditures. The results of this pilot project reinforce the need for a multifaceted approach to reducing these potentially avoidable hospitalizations. The intervention strategies and INTERACT tools appear to hold promise for helping to achieve these goals, but need further refinement for optimal incorporation into every day practice. Providing interventions and tools, however, without adequate infrastructure and on-site expertise and incentives to use them is unlikely to have a substantial impact. Similarly, providing financial incentives to reduce hospitalizations, without interventions and tools that can be used in everyday clinical practice, is unlikely to have the intended effects. NH health professionals need practical tools they can use in everyday practice, and

incentives that will support the infrastructure and expertise to use these tools to meet the goal of improving quality of NH care by reducing potentially avoidable hospitalizations in the NH population.

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INTERACT Interventions

Improvement Strategies and Tools	Key Interventions for Reducing Avoidable Hospitalizations

Organizational and Leadership Commitment
Provide strong and consistent organizational commitment to reducing avoidable acute care transfers
	• Develop an organizational goal for quality improvement efforts that focuses on avoiding hospitalizations when appropriate, and maintain stable administration and clinical leadership that establishes an environment that fosters efforts to reduce avoidable hospitalizations
	• Appoint an INTERACT implementation team and champion or leader of the team who will be responsible for overseeing implementation and serving as the key point of contact for the GMCF project team, and enable the team and its leader to have the time to participate in the project
	• Facilitate access to facility staff, the medical director, primary care clinicians, and family members for education on the INTERACT intervention
	• Adhere to key INTERACT implementation strategies, including:
	  ○ Structured review by the team leader or other designated nursing home staff member, using an INTERACT review tool, of each unplanned transfer that occurs during the 6-month project period
	  ○ Assessment by a designated supervisory nurse of the need for each unplanned ACT before the resident is transferred (with the exception of emergent life-threatening situations)
	• Full utilization of all INTERACT tools and forms, keeping copies of each for collection by GMCF project staff
	• Provide, on a monthly basis, data on the number of hospitalizations, and a copy of selected sections of the medical record of each resident who had an unplanned transfer

Communication Strategies and Tools Enhance communication practices relating to change in resident condition: • Among nursing home staff • Between nursing home staff and primary care clinicians • Between nursing home staff and the acute care hospital	• Use of an early warning tool ("Stop and Watch") for communication between nursing assistants and licensed nurses • Introduce interdisciplinary Situation, Background, Assessment, Recommendation (SBAR) tool using case studies/scenarios on common reasons for avoidable hospitalizations • Establish communication protocols using SBAR related to reporting resident change in condition from nursing assistants to licensed nurses, and from licensed nurses to nursing supervisors • Establish communication protocols for reporting change in condition from nursing home staff to primary care clinicians focusing on common reasons for avoidable hospitalizations ○ Utilize elements of AMDA guidelines for communicating change in condition • Recommend assessment by a designated supervisory nurse of the need for each unplanned transfer before the resident is transferred (with the exception of emergent life-threatening situations) • Evaluate and revise current hospital transfer forms including a checklist for all documents that should accompany residents upon transfer • Facilitate interaction between the nursing home, emergency room, and acute care hospital staffs through site visits to understand roles and abilities • Review each transfer using an "Unplanned Transfer Review" tool as part of the facility's quality improvement activities

Care Paths
Implement selected basic care paths for conditions that are common causes of avoidable hospitalizations
	• Care paths for residents with common acute conditions that result in hospitalization, focused on checklists to determine which residents should be considered for management in the nursing home, including:
	  ○ Acute change in mental status
	  ○ Fever
	  ○ Dehydration
	  ○ Urinary Tract Infection
	  ○ Pneumonia/Lower Respiratory Infection
	  ○ Congestive Heart Failure
	• SBAR templates for reporting symptoms relating to above syndromes
	• Incorporate targeted AMDA guidelines for acute changes related to these conditions into tools for daily practice (eg, focused SBAR communication templates, laminated cards by the phone, and quick reference pocket guides)

(Continued)

Improvement Strategies and Tools	Key Interventions for Reducing Avoidable Hospitalizations
Advance Care Planning Resources Enhance advance care planning by focusing on resident and family education about advance directives, palliative/comfort care, and hospice benefits	• Resident, family, and staff education • Provision of advance care planning tools: "Five Wishes," overall power of attorney for health care documents • Protocols for advance care planning discussions and documentation • Tools including simple language vignettes to describe the risks and benefits of CPR and tube feeding • Written guidance on discussions related to palliative/comfort care and the benefits of hospice care when appropriate

INTERACT, Interventions to Reduce Acute Care Transfers; GMCF, Georgia Medical Care Foundation; AMDA, American Medical Directors Association; CPR, cardiopulmonary resuscitation.