

SAFER: Standardizing Admissions for Elderly Residents

FINAL REPORT

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Inclusive Dates of the Project: 9/30/10 – 2/28/13

This project was supported by grant number R18HS019604 from the Agency for Healthcare Research and Quality. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Agency for Healthcare Research and Quality.

STRUCTURED ABSTRACT

Purpose

The principal objective of the project was to document and standardize critical communication pathways and information between nursing facilities (NF), emergency medical services (EMS), and emergency departments (ED) to reduce medication errors, delays in treatment, infections, and missing or misunderstood patient directives and consent.

Scope

A statewide collaborative of stakeholders and cross-institutional community teams assessed current communication and developed and tested tools to improve information sharing during transitions of care for NF residents in 10 rural communities.

Methods

Using a mixed-methods design, we assessed changes in documentation, communication, and information sharing and evaluated the impact on the consistency and accuracy of shared patient information. Site visits, phone interviews, and surveys were used to document existing and new processes for communicating information during a patient transfer. The research team used a formative evaluation to iteratively document and assess changes and adapt improvement activities. Chart reviews were used to evaluate changes from baseline in documentation and sharing of patient information across settings during patient transfers.

Results

Chart audit data revealed significant improvements in documentation and sharing across three settings of care of key patient information, including infection status and baseline mental and physical functioning. Although improved, documentation of advanced directives and medication lists remains challenging. Pilot site interviews and site visits suggest that the key facilitators of improvement were baseline process mapping, technical assistance and training, structured chart reviews and formative evaluation, local champions and partnership, and degree of engagement with the statewide collaborative.

Key Words: patient safety, communication, rural, elderly, transfers

PURPOSE

Objectives of Study

The principal aim of this project was to reduce patient harm during interfacility transfer between the nursing facilities (NF), emergency medical services (EMS), and emergency departments (ED) that results from poor communication and missed or inaccurate patient information transfer across care settings. The principal objective was to document and standardize critical communication pathways and information to reduce medication errors, delays in treatment, infections, and missing or misunderstood patient directives and consent. Three interventions were used to achieve this objective.

- 1) A statewide stakeholder collaborative and local interfacility teams were created and used to align interests, address feasibility, avoid duplication of efforts, and increase widespread adoption of the safe practices.
- 2) Research staff used appreciative inquiry and process mapping techniques with demonstration sites (pilot sites) to document and assess current transfer practices and processes.
- 3) Tools (e.g., transfer forms, checklists, advance directives and end-of-life planning forms, medication reconciliation, and communication strategies) and process improvement options were identified and implemented to improve handoffs during the transfer of elderly residents from NF to admission at the hospital.

SCOPE

Background

Most healthcare is provided in settings focused on the type of care and the specialization of the professionals who provide the care. This “siloes” approach contributes to communication problems when patients travel between settings and contributes to errors and patient harm. Elderly patients are especially vulnerable to errors, miscommunication, and delays in treatment during transfers of care.

Context

This demonstration was conducted with a statewide Maine Critical Access Hospital Patient Safety Collaborative and local interfacility teams in 10 rural communities in Maine. The central participants were Critical Access Hospitals and their local NF and EMS partners.

CAH Collaborative

The Maine Critical Access Hospital Patient Safety Collaborative was formed in 2008 with support from the Maine Office of Rural Health and Primary Care, Maine Hospital Association, Maine Quality Forum, Maine Health Access Foundation, and the USM Muskie School of Public Service. Membership includes representation from Maine’s 16 Critical Access Hospitals (CAHs) and is interdisciplinary in nature, with participation from nursing executives, quality improvement staff, hospital administrative leaders, and pharmacists. The Collaborative mission is to identify and work on common patient safety and quality improvement issues. The Collaborative has served as a forum for the development and implementation of specific quality improvement initiatives, review of best practices, responses to grant opportunities, shared resources and benchmarking, and policy development particular to small rural hospitals in Maine.

Settings and Participants

This demonstration was conducted at both the statewide (macro) and local (micro) levels.

Macro level of demonstration project: In addition to the Maine Critical Access Hospital Patient Safety Collaborative, several state agencies, associations, and leading healthcare and quality improvement organizations provided leadership and content expertise as key stakeholders in the SAFER project:

- Maine Health Care Association (MHCA)
- Maine Health Access Foundation (MeHAF)
- Maine CDC, Division of Infectious Disease (also called Division of Disease Surveillance)
- Maine Office of Rural Health and Primary Care
- Maine State EMS
- Maine Quality Forum (MQF)
- Maine POLST Coalition

Micro Level (Community Pilot Projects): All 16 CAHs participating in the Maine CAH Patient Safety Collaborative were invited to participate in the SAFER project as pilot sites. Eleven of the hospitals initially committed to the 2-year demonstration activity. One pilot site team formed but did not complete the initial assessment process and was dropped from the demonstration (and is not included in the data for this report). The six other sites declined to participate due to lack of time and staff availability, involvement in other improvement initiatives, and/or leadership or staff turnover. Pilot intervention teams were formed at each of the 10 Critical Access Hospital communities participating in the demonstration. Collaborative members took the lead on assembling a team that included interdisciplinary staff from a local nursing facility, an EMS service provider, and hospital employees involved in the transfer process.

SAFER community pilot sites:

- Blue Hill Hospital, Peninsula Ambulance, and Penobscot Nursing Facility
- Bridgton Hospital, United Ambulance Service, and Bridgton Health Care Center
- Calais Hospital, Calais Fire – EMS, First Atlantic Nursing Facility
- Downeast Hospital, Moosabec Ambulance & Machias Ambulance, Sunrise Care Facility
- Mayo Hospital, Mayo EMS, and Hibbard Nursing Home
- Mount Desert Island Hospital, Bar Harbor Fire-EMS, Sonogee Nursing and Residential Care Facility
- Penobscot Valley Hospital (PVH), PVH EMS, and Colonial Nursing Facility
- Rumford Hospital, Medicare EMS, and two nursing facilities: Rumford Community Home and Victorian Villa Rehabilitation and Living Center
- Sebasticook Valley Hospital (SVH), SVH Ambulance Service, Sebasticook Health Care Facility
- St. Andrews Hospital, Boothbay Region Ambulance, and St. Andrews Village

Incidence and Prevalence

Handoff and transitional errors are among the most common and consequential errors in healthcare.(1) Each year, around 25% of nursing facility (NF) residents are transferred at least once to the hospital.(2-4) These transitions in care present significant challenges, because the transfers occur both between multiple settings and involve many different healthcare providers. Coleman’s work in transitional care indicates that coordination and continuity of care deficiencies place patients at significant risk.(5,6) Insufficient communication between hospitals and long-term care facilities during transfers of care may adversely affect the patient’s quality of care, lead to adverse events, and contribute to the overall cost of the services provided. The relatively small time period that is required to transfer the clinical responsibility for an NF resident to the admitting hospital via emergency medical services (EMS) is challenging at best and potentially harmful. Accurate reconciliation of medications, infection status or potential, patient-centered directives and personal information, and other necessary clinical background information are components of the transfer of information process that are all subject to process failures. Missing information is common in transfers between the NF and ED.(7)

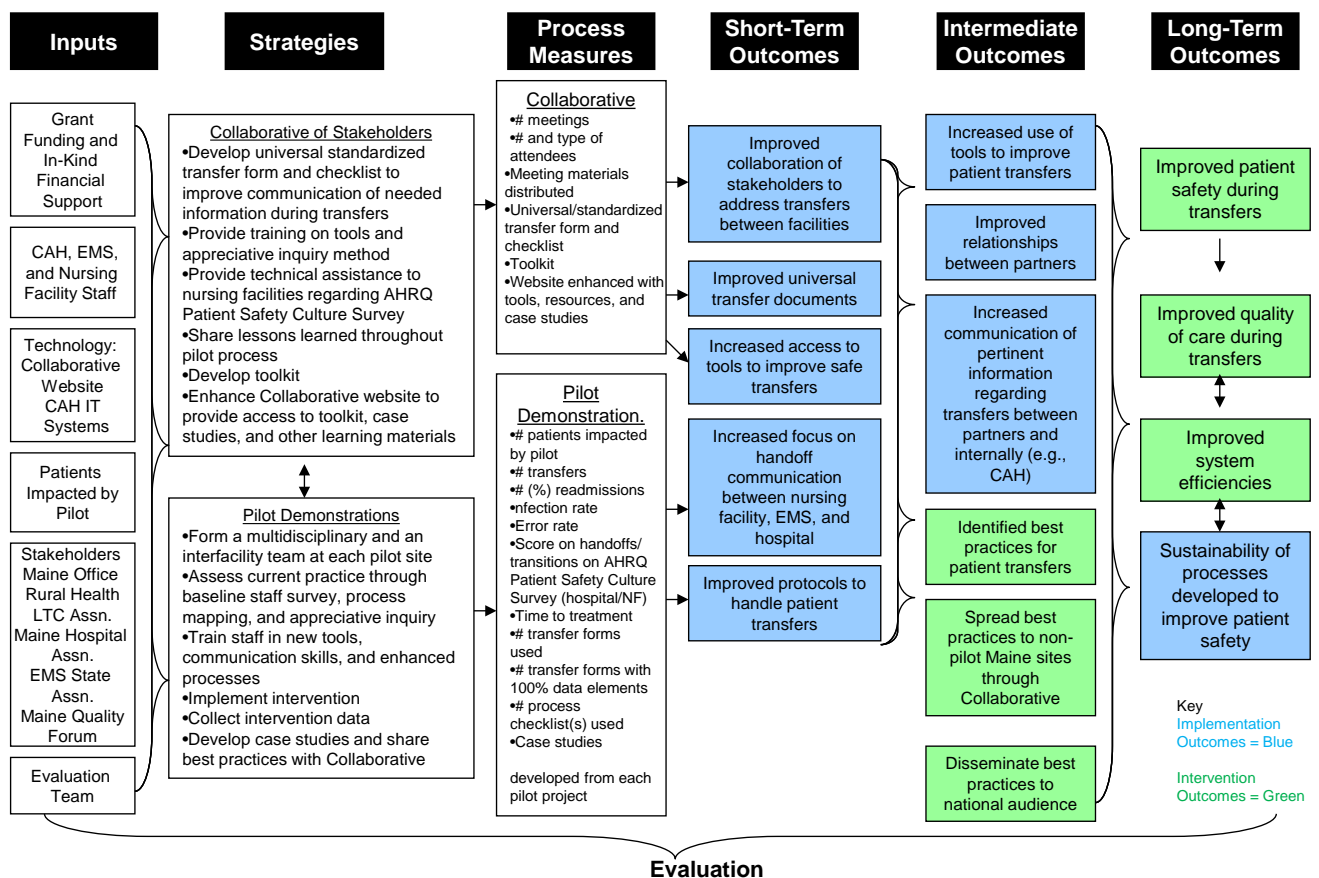
Ineffective handoffs from the NF to the EMS and then to the hospital emergency department (ED) can lead to delays in diagnosis and treatment, adverse events, patient complaints, and increased costs and length of stay.(8-12) The literature suggests that there are risks, communication challenges, possible inefficiencies, and duplications of care during the transfer of patients between NF and the hospital emergency department (ED).(8-12) Moreover, there is discussion about the “transfer distress” that often results in rapid deterioration in condition (13, 14) and a greater risk for iatrogenic illness due to excessive diagnostic and therapeutic interventions.(14, 15) Perry, Wears, and Patterson warn that “improving patient handoffs is not low-hanging fruit” that can be easily remedied through standardization alone.(16) They describe a complex domain with high consequences for failure that can only be addressed through a combination of tools, such as checklists or standardized transfer forms,(17, 18) standardized verbal content, shared mental models, communication training, and other human factors re-engineering processes. Furthermore, they, along with other researchers, urge that any improvement efforts in transitions occur through multidisciplinary teams.(8, 16, 19, 20)

METHODS

Study Design

The design, implementation, and evaluation of this demonstration were guided by the logic model shown in Figure 1.

Figure 1. SAFER (Standardizing Admissions For Elderly Residents) Logic Model



The evaluation will also assess external factors that may impact the demonstration as well as negative or unintended consequences.

The SAFER research team used a formative evaluation approach to iteratively document and assess current practices, changes, and adapt improvement activities. Using a mixed-methods design, we assessed current information sharing practices and systems and changes in documentation, communication, and information sharing, and we evaluated the impact on the consistency and accuracy of shared patient information. Site visits, phone interviews, and surveys were used to document existing and new processes for communicating information during a patient transfer. Chart reviews were used to evaluate changes from baseline in documentation and sharing of patient information across settings during the transfer process.

Data Sources/Collection

Pilot project leaders conducted chart reviews on all patients transferred during the second quarter of 2010 (baseline), quarters two through four in 2011, and the second quarter in 2012. Chart reviews assessed presence and consistency of *infection status*, *advance directives*, *baseline physical and mental functioning*, and *medication lists* from each of three sources of information – nursing facility transfer record, EMS electronic run report, and the patient’s ED record. The hospital’s patient chart was reviewed for the presence of all these data in addition to consistency of the information provided by each setting. Final chart reviews (Q2 2012) were compared with pre-intervention chart reviews (Q2 2010).

Qualitative data were collected over the course of the project through site visits, in-person interviews, and phone interviews to determine the baseline communication processes, assess the environment in which the intervention occurred, and document changes in the communication processes following project interventions.

An initial site visit was conducted with each project to collect baseline information. The research team initially met with each provider separately to map what information is shared and how at each handoff in the transfer process. We created a matrix to document what was reported by each partner, which was then shared with the newly formed local pilot team. This appreciative inquiry matrix was usually the basis of the local teams’ conversation about what works well in the transfer/handoff process, what doesn’t, and what might facilitate better, more complete, and consistent sharing of critical patient information.

Follow-up semistructured phone interviews were conducted with project participants and partners in both years to capture information about relationships developed through the intervention, factors that made partnerships successful, barriers that were encountered, and how these barriers were overcome. These interviews also included information about the environment in which the interventions were implemented, how they were implemented in unexpected ways, and unique characteristics of each pilot site. Some of the contextual factors that were assessed include whether the nursing facility and/or EMS are owned by the hospital, a description of the health system they belong to, and the extent to which the hospital or partners have attempted to work on transfer-related policies prior to this demonstration. At the close of the demonstration project, each pilot site completed a project closeout survey, which included information about implemented project activities, factors that affected implementation and impact of the project, and plans for the future.

The evaluation includes intervention assessments at both the macro and local pilot levels. Thematic analyses of qualitative interviews and aggregate chart review data informed macro-level activities at the Collaborative level. The research team used the data to focus educational and best practice activities to advance individual and organizational learning through the Collaborative. At the local pilot level, each project received feedback from the site visit and received site-level chart review summary reports on a quarterly basis. Pilot sites used these summary reports to target areas for improvement, establish improvement activities, and track changes over time.

Interventions

Macro-level partnerships: At the macro level, the demonstration focused on the activities and functions of the Maine CAH Patient Safety Collaborative and the additional stakeholder participation. The Collaborative and the stakeholders took the lead to review available models and universal transfer tools that have been used to standardize and improve transfers between NF and hospital. Key stakeholders, such as the Maine EMS and the Maine Health Care Association, were provided modest stipends to cover the expenses related to participation in the macro-level project work. These modest stipends reduced the financial barriers for time and travel for Collaborative meetings. The SAFER research team modeled best practices and strategies for project participants with training and assistance on process mapping, appreciative inquiry, interprofessional communication, administration of surveys, and data collection. The Collaborative offered a platform for the local project leaders to share lessons learned and successful strategies. The SAFER team reviewed aggregate project data with the Collaborative and sought input on the interpretation of findings.

Micro-level partnerships: Multifacility, multidisciplinary teams formed at each of the 10 CAH community sites. CAH staff took the lead on assembling an interdisciplinary team that included staff from a local nursing facility, EMS personnel, and hospital employees who are involved in the transfer process. Participants were provided modest financial support through project site-level subcontracts. These stipends allowed the CAHs to underwrite the expenses of interfacility project meetings, data collection, and other project-related expenses, such as travel to state-wide Collaborative meetings.

Each pilot team developed an intervention strategy that reflected both local needs and resources. Most teams developed transfer forms and provided training to partners on relevant issues, such as infection control. Team activities included creation of transfer forms and checklists; transfer packets that traveled with patients across settings of care; revisions in electronic records to include transfer information; increased efforts to communicate infection status; equipment purchases to improve patient transfers; and professional staff development and training. This training included relevant topics, such as advance directives, infection control, patient mental and physical status assessment and documentation, medication reconciliation, and handoff communication.

Process mapping, appreciative inquiry, and technical assistance: Facilitation of an appreciative inquiry activity with the pilot teams regarding transfers between settings of care was a key intervention strategy for the SAFER demonstration. We modeled the appreciative inquiry process as we sought to uncover the facilitators for effective information handoff during transitions in care between NF, EMS, and ED staff. The SAFER team used this approach to collect baseline data and create the “as-is” assessment of the information sharing process. Without careful attention to the appreciative inquiry focus, interviews often slipped toward a negative accounting of lapses in communication and protocol. Pilot team members were encouraged to describe experiences in which transfers proceeded smoothly and to detail the factors that contributed to an optimum patient transfer. The research team used semistructured interviews to collect descriptions of successful approaches. During the site visits, we met separately with each pilot site partner organization to facilitate an open, honest exchange of information.

Once each site identified their intervention(s), the research team offered sites technical support with implementation questions and issues.

Nursing Facility Patient Safety Survey: Recognizing that patient safety has received less attention in NFs than in the hospital setting, the research team provided technical assistance to nursing facilities to pilot their first trial of the AHRQ Nursing Home Survey on Patient Safety Culture. This intervention was designed to raise the level of awareness and knowledge of patient safety in the participating nursing facilities and to contribute to building a culture of safety. The Muskie School team provided survey

administration and analysis and reported summary findings back to participating nursing facilities. Aggregated findings were also shared with the Collaborative.

EMS Training Curriculum: The site visit work with the pilot teams and the Collaborative identified the need for a training curriculum around infection control for EMS personnel. The SAFER Project Director worked directly with stakeholder participants, Maine EMS, and the Maine Center for Disease Control & Prevention (CDC)’s infection control program to identify goals, learning objectives, and relevant content. The project resulted in an online infection control and prevention training module that is currently housed on the Maine EMS Education portal (MEMSED). The curriculum offers an updated infection control and prevention training through a sustainable educational product and delivery system. After the completion of the evaluation this fall, the curriculum will be offered to other state EMS agencies.

Measures

The research team conducted a pre-post evaluation of the SAFER demonstration project using a mixed-methods approach. The purpose of the evaluation was to assess changes in communication and patient information sharing before and after the formation of the pilot site teams and the implementation of site-specific interventions designed to improve the communication and sharing of patient information across settings. Qualitative data were obtained through site visit interviews, phone interviews, and Collaborative meeting notes. Process mapping was conducted during site visits with projects at the beginning of the project. A matrix was created to document what was reported by each partner. Phone interviews were conducted in both 2011 and 2012 with each project lead and partners. Most partners attended all Collaborative meetings. The evaluation team attended each Collaborative meeting, with notes taken at each meeting. Quantitative data were obtained through chart review summary reports, project reports, and results from the nursing facility AHRQ patient safety survey. In total, 829 chart reviews were conducted for 2010-2012 in specified quarters. At the end of the project, projects submitted a project closeout report that included information about changes made during the project, factors that impacted the project, and plans for the future. The nursing facility AHRQ patient safety survey was conducted with five nursing facilities in the state. The following research questions were addressed using the data sources listed in Table 1.

Table 1. Research Questions and Data Sources

Evaluation Questions		Data Sources
Implementation	<ul style="list-style-type: none"> • What resources has the Collaborative provided to assist implementation by the pilot demonstrations of the interventions and how have they affected the implementation process? 	<ul style="list-style-type: none"> • Interviews with interfacility team – phone interviews • Project closeout reports • Notes from Collaborative meetings
	<ul style="list-style-type: none"> • To what extent have the pilot demonstrations successfully implemented the planned interventions? • How have relationships between partners been enhanced? • What barriers were encountered with these partnerships? 	<ul style="list-style-type: none"> • Interviews with interfacility team – site visits, phone interviews • Project closeout reports • Chart reviews
Outcomes	<ul style="list-style-type: none"> • Has the pilot demonstration improved communications and information flow? 	<ul style="list-style-type: none"> • Interviews with interfacility team – site visits, phone interviews • Project closeout reports • Chart reviews
	<ul style="list-style-type: none"> • Has the pilot demonstration improved the safety of patient transfers from the NF to the CAH? • Has the pilot demonstration improved system efficiencies? 	<ul style="list-style-type: none"> • Project closeout reports • Chart reviews • AHRQ NF Patient Safety Survey

Chart Reviews: Based on the initial pilot site assessment, the research team identified five patient information items that present a common challenge in the transfer process between the settings of care: (1) advance directives; (2) infection status; (3) current medication list; (4) baseline mental status; and (5) baseline physical status. Following feedback sessions with the pilot teams and the Collaborative, each local pilot team developed a plan to improve communication of key patient information across the settings of care. Pilot teams completed quarterly chart reviews to monitor documentation of key information from each of three settings of care (NF, EMS, and ED) and to further determine if this information was consistently collected/documented and shared across the settings of care (i.e., medication lists with the same list of medications, dosages, frequency, etc.). All nursing facility residents transferred to the pilot site hospital during the study time period were included in the study (any gender, all ethnicities, and all races; see Inclusion of Priority Populations, below). The research team provided a chart review tracking form (Figure B) to the hospital project leads for data collection. The hospital chart abstractor reviewed data in the patient record. Operational definitions for each patient information item were provided to the reviewers. In total, 829 chart reviews were completed and submitted to the SAFER research team for the second quarter of 2010 (baseline), Q2-Q4 of 2011, and Q2 of 2012. Patient-level information was de-identified by the hospital abstractor through a dummy ID protocol.

Figure 2. SAFER Chart Review Form

Information Is it present in the chart?	Nursing Facility	Emergency Department	EMS Run Report	Consistent Across Settings?
	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Advanced Directives	If yes, how was the advanced directives documented (check all that apply)?			
	<input type="checkbox"/> Checkbox	<input type="checkbox"/> Checkbox	<input type="checkbox"/> Checkbox	
	<input type="checkbox"/> Advanced Directives Form	<input type="checkbox"/> Advanced Directives Form	<input type="checkbox"/> Advanced Directives Form	
	<input type="checkbox"/> POLST Form	<input type="checkbox"/> POLST Form	<input type="checkbox"/> POLST Form	
Medication List	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Infection Status	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Baseline Mental Status	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Baseline Physical Status	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

If the chart review indicated that information was provided by all three settings with consistent information, then the chart review score for that patient information item totaled 4. The best total score possible for a chart was 20 (high score of 4 on all five information items). The chart reviews were analyzed to assess if the change in scores were statistically significant ($p < .05$) using the Wilcoxon rank-sum test to analyze total scores for the five patient information items (advanced directives, infections, medications, baseline mental status, and baseline physical status). To account for clustering of data by project, the means of each variable for a project were applied to the Wilcoxon rank-sum test. To account for the multiple tests conducted (advanced directives, medications, infections, baseline mental status,

and baseline physical status), the Bonferroni procedure was employed. Percent of charts documented with a specific information item (i.e., infection status) were analyzed using the chi-square test, with an adjustment for clustering by practices, and the Bonferroni procedure was used to account for multiple information items at each setting of care. The Wilcoxon rank-sum test along with the Bonferroni procedure were used to produce project reports.

Project Closeout Reports: Each pilot site project completed a survey in the fall of 2012 to summarize changes in the communication of information across settings of care, policy changes, and lessons learned that occurred as a result of the intervention. Pilot site leaders presented these reports to their colleagues at a Collaborative meeting.

Final phone interviews: Follow-up interviews were conducted with pilot site leaders in December 2012 and January 2013. Research staff used the closeout reports to guide the interview discussion. The staff asked the pilot site leaders to discuss the intervention implementation and changes in relationships between the community partners through the SAFER initiative. Other topics covered in the phone interviews included the provision of training, policy and protocol changes, contextual factors that impacted the results, lessons learned, and sustainability of improvements.

Limitations and Challenges

This project illustrates some of the methodological challenges and limitations inherent in conducting evaluations of community interventions with nonequivalent interventions. The original research plan proposed collecting and reporting measures on infection rates at the hospitals, length of stay, time to treatment, readmission rates, error rates, staff surveys, and stakeholder surveys. During the implementation of the demonstration, the research team determined that these measures could not be reasonably provided by the participants and would hinder the development of stakeholder engagement. The original proposal included the development of a universal transfer form. The Collaborative hosted a speaker from the state of New Jersey who detailed the development and implementation of a state-mandated universal transfer form. After the presentation, Collaborative members discussed the adoption of such a form in Maine, but the consensus was that the group was not interested in replicating New Jersey's long and contentious process and that the form was too complicated and reflected a burdensome activity that would alienate local partnerships. Consequently, each pilot site developed their own form and continued to modify and refine their approach in consultation with Collaborative stakeholders and community colleagues.

Although the absence of a controlled design limits our ability to draw causal connections between the interventions and observed changes in outcomes, the evaluation yielded valuable practical observations. The research team considered the success of these interventions in real-time organizational and community contexts and observed changes in key dimensions of human, provider, and organizational/interorganizational behavior and systems.

Although SAFER is a single-state demonstration, potentially limiting the generalizability of the results, a key focus of our evaluation was on understanding the contextual factors that may influence both implementation and outcomes. To the extent that we were able to identify factors that influenced implementation and/or outcomes, the lessons are relevant to states, quality improvement collaboratives, hospitals, and other providers outside of the state of Maine.

RESULTS

Principal Findings

The key findings of the SAFER demonstration project derive from two data sources: audits of patient charts from the participating hospitals and pilot site interviews and surveys. Chart audit data revealed significant improvement in documentation and sharing across the three settings of care of key patient information, including infection status and baseline mental and physical functioning. Although improved, documentation of advanced directives and medication lists remains a challenge. Pilot site interviews and site visits suggest that the key facilitators of improvement were baseline process mapping, technical assistance and training, structured chart reviews and formative evaluation, local champions and partnership, and degree of engagement with the statewide collaborative.

Outcomes

All local pilot sites and teams participated in the site visits, phone interviews, chart reviews, and project closeout reports. Additionally, five pilot site teams participated in an in-depth interview concerning intervention implementation and pilot site partnerships. The following section reviews the project's research questions and findings.

What resources has the Collaborative provided to assist implementation by the Pilot Demonstrations of the interventions and how have they affected the implementation process?

Ten in-person and monthly conference calls with the CAH Collaborative were held. Meetings included guest speaker presentations and trainings designed to increase member knowledge and skills in topics such as healthcare-associated infection prevention, advance directives, data collection, emergency medical service protocols, transfer forms, appreciative inquiry, and process mapping. Pilot site leaders and team members shared their pilot activities and "lessons learned" during the meetings. Collaborative members established new professional relationships with stakeholder organizations. One of the unanticipated benefits of the Collaborative meetings and stakeholder relationships was that SAFER pilot sites hosted regional infection control trainings through the SAFER partnership with the Maine CDC's Division of Infectious Disease (Division of Disease Surveillance).

SAFER pilot teams report that the face-to-face Collaborative meetings were important to the momentum of the pilot site interventions. The Collaborative provided a forum for sharing implementation strategies; a venue for sharing tools and forms; and pertinent, just-in-time education related to SAFER project topics, such as the use of the POLST (Physician Orders for Life Sustaining Treatment) form. For example, very few of the pilot site partners had information about the POLST forms, policies, and procedures prior to the education provided through the Collaborative and associated stakeholder groups.

To what extent have the Pilot Demonstrations successfully implemented the planned interventions?

All 10 pilot site projects implemented one or more activities to improve communication and the transfer of patient information between settings of care. All teams developed a transfer form, and most included a checklist to be used for patient transfers. Many did trainings with staff on topics such as SAFER activities, handoff communication, and medication documentation. Half of the projects purchased equipment that aided in the transfer of patients between settings.

Several factors impacted the successful implementation of SAFER interventions. Many project teams mentioned that the process to implement changes across settings of care took longer than anticipated. Strong leadership at each of the partner sites contributed to intervention success. Also, the availability of grant funds to cover local expenses was critical. These costs may have otherwise impeded engagement or full participation. Several sites reported that physical proximity of the NF and EMS partners to the CAH (or lack of proximity) affected implementation. Some hospitals reported greater engagement in process improvement, because the NF or EMS partners were owned by or are business affiliates of the hospital.

Additionally, community size is a potential facilitator, as it was not uncommon for healthcare personnel to be employed at more than one participating partner organizations, thereby promoting and reinforcing communication and process improvements across settings of care.

Strong leadership at each of the partner sites (NF, EMS, and CAH) was a positive factor impacting the implementation of SAFER.

How have relationships between partners been enhanced?

Most pilot site members had not worked together previously on quality or clinical improvement initiatives. After implementing SAFER, pilot sites reported more open lines of communication between the settings of care and improved relationships. Several projects mentioned that, in contrast to behavior prior to the intervention, partners now routinely call each other when questions or concerns arise about patient information or other issues impacting staff or patients. Pilot site participants also reported increased communication between staff during actual patient transfers.

Many participants described persistency of effort and mutual commitment to improvement as key factors to success. Relationships and trust began to develop between the settings of care as the partners learned more about each other's policies, procedures and staffing challenges. More than one site described this process as "learning to walk a mile in my shoes."

At the close of the project period, most pilot site teams indicated plans to continue project activities, such as team meetings, discussion of communication issues, chart reviews, and networking with Collaborative members and associated stakeholders.

What barriers were encountered with these partnerships?

Scheduling local partnership meetings presented a challenge to most of the pilot sites. Partnership meetings were affected by time constraints and differing work schedules. Frequent turnover at both the frontline and administrative levels resulted in reorientation and training. Project teams reported varying commitment to the initiative among project partners, which resulted in some challenges in "getting all the partners on the same page at the same time." Many acknowledged challenges in finding the common ground among unique workplace cultures and practices.

Has the Pilot Demonstration improved communications and information flow?

SAFER pilot teams reported:

- The use of transfer forms resulted in more complete and consistent transfer of key patient information from the nursing facility and improved the consistency and standardization of communication (Table 2).
- Critical information is easier to locate during the patient transfer.
- Staff are more knowledgeable about the importance of documenting information.
- Relationships between the between settings of care (nursing facility, EMS, ED) have improved.
- Patient transfer communication has improved along with communication about other issues that impact staff and patients.

Most teams report improved documentation of mental and physical functioning, infection status, reason for transfer, EMS report, advance directives, nurse report, documentation of treatment provided to a patient, and vital signs. Some teams reported improvement in vaccinations, contact info about providers, past medical history, the medication list, and face sheet. Most projects reported no change in communication of recent lab work, information from the primary care provider, and information from the patient/family – information items not targeted in the chart reviews.

Table 2. Pilot Site Assessment of Intervention

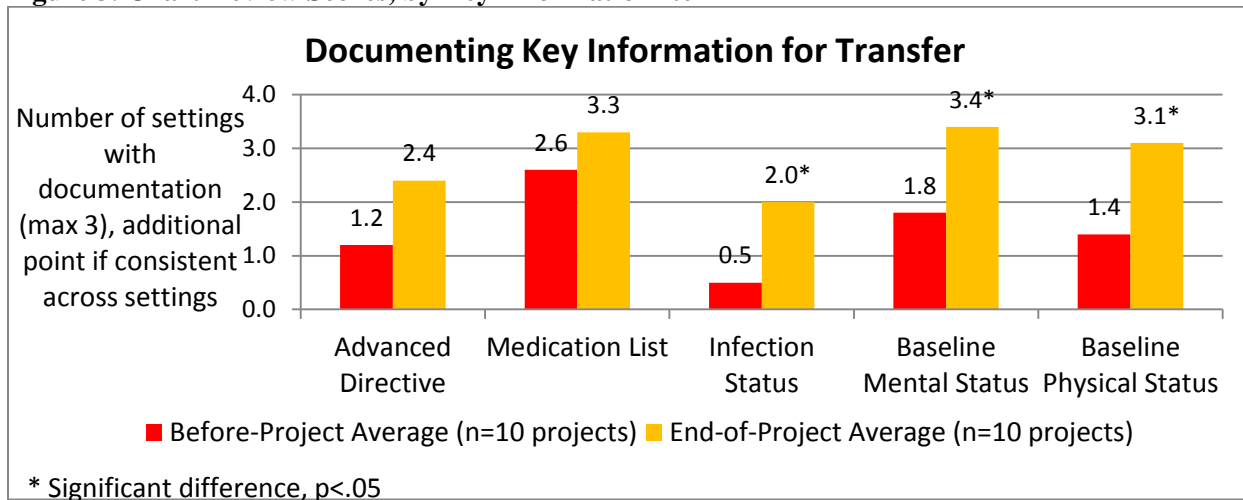
Information needed during patient transfer	Number of Practices Reporting (n=10)		
	Improved communication	Decline in communication	No change
Baseline mental functioning	10	0	0
Baseline physical functioning	10	0	0
Infections	10	0	0
Reason for transfer	9	0	1
EMS report	9	0	1
Advanced directives	9	0	1
Nurse report	8	0	2
Documentation of treatment provided to patient	8	0	2
Recent vital signs	8	0	2
Vaccinations	7	0	3
Contact information of NF, EMS, and hospital contacts	7	0	3
Past medical history	7	0	2
Medication list	7	0	2
Face sheet	6	0	4
Recent lab work	4	0	6
Information from primary care provider	3	0	7
Information from patient/family	3	0	6

Has the Pilot Demonstration improved the safety of patient transfers from the NF to the CAH?

Transfer improvement efforts focused on the five patient information items identified during the initial site visit: advance directives, infection status, medication list, baseline mental status, and baseline physical status. As indicated in Figure 3, comparison of chart reviews before, during, and at the end of SAFER revealed the following:

- Infection status and baseline mental and physical statuses all showed significant improvement from what was documented at baseline.
- Each setting of care improved in at least two areas of key information documentation.
- At the pilot site level, some sites achieved optimal documentation for certain information areas.
- Documentation of advanced directives showed improvement but remains challenging to document.
- There is still a lack of consistency in documented information across settings.

Figure 3. Chart Review Scores, by Key Information Item

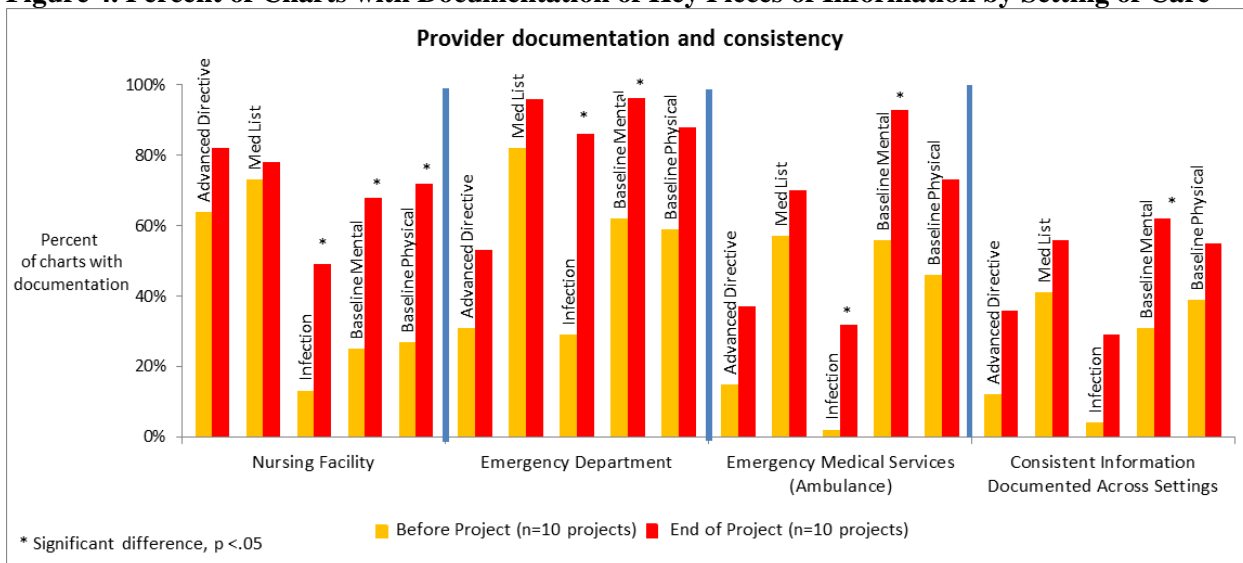


In terms of improving documentation in each area, each pilot site significantly improved documenting at least two key patient information items (Figure 4). All settings of care significantly improved in documenting infection status and baseline mental status.

Chart reviews were used by all project teams to focus improvement efforts and monitor change. However, the teams expressed some concern about the time commitment necessary to undertake chart reviews. Other implementation challenges included selecting staff to complete the chart reviews and creating methods to accurately and consistently capture all the needed patient information for the chart reviews. For example, some hospitals had not made a practice of keeping a copy of the EMS run report in the patient record. Despite these challenges, four of the 10 hospitals plan to continue periodic chart reviews to monitor transfers from nursing facilities.

The demonstration project proposal projected a review of 280 patient transfers between NF and ED. Our actual project chart review included 829 patient transfers.

Figure 4. Percent of Charts with Documentation of Key Pieces of Information by Setting of Care



In February 2012, several of the SAFER NF partners participated in their first use of the AHRQ Nursing Home Patient Safety Culture Assessment Tool. The research team coached the process and conducted the analysis of the survey data. The survey results were reported back to the nursing facilities and to the Collaborative. Overall, 359 surveys were disseminated, with a response rate of 73%. Areas of strength were identified: overall perceptions of resident safety, feedback and communication about incidents, training and skills, and supervisor/manager expectations and actions promote patient safety. Areas for improvement included staffing, handoffs, communication openness, and nonpunitive response to mistakes/error. An area of specific concern identified in the survey results, “communication within nursing facility staff and other healthcare setting staff,” is clearly related to the focus of the SAFER demonstration.

Has the Pilot Demonstration improved system efficiencies?

Not only has SAFER has improved communication between settings of care but also several pilot sites have plans to expand their focus beyond the transfer process between NF and ED. Some of the potential improvement areas include improving documentation on the return trip from the ED/hospital to the nursing facility; expanding the SAFER project to other nursing facilities and other EMS services in the catchment area; and providing in-service training with ED and NF staff on infection control issues. Four of the projects plan to continue periodic chart reviews to provide quality improvement information about patient transfers.

EMS online training

An online infection control and prevention training curriculum for EMS providers is one of the products product developed by the SAFER project. We will continue to study the impact of an online educational intervention to increase the knowledge, skills, and attitudes of EMS providers on the topic of infection control and prevention. The need for this curriculum was identified by anecdotal reports from EMS providers in SAFER pilot communities and a review of the literature. The goal of the online training is to ensure that participants have the *knowledge, skills, and attitudes* necessary to demonstrate competency in infection prevention and control strategies that include understanding of emerging infectious diseases; knowledge and compliance with universal precautions; care of patients with known infections; clinical handovers of patients; post-exposure procedures; EMS personnel self-care; and documentation and reporting requirements. Quantitative evaluation data include EMS participant self-assessments and pre- and post-test course scores. Additional variables, such as EMS license level, professional status, and geographic location, will also be available in the evaluation. The online course serves to fill a knowledge and skills gap within a profession that has access to Internet service, laptops, need for continuing education in a flexible delivery mode, and availability for asynchronous programs. The impact of the intervention will be measured through an analysis of the pre-post test content knowledge scores and participant evaluation. Subproblems include (a) whether a difference in EMS license level impacts the participant response to the intervention; (b) determining if volunteer EMS personnel respond differently to the intervention than professional EMS personnel; and (c) determining if participation and response to the educational intervention are impacted by the location of the EMS personnel (rural vs. urban). The final results of the curriculum evaluation will be provided to AHRQ and submitted for publication in a peer-reviewed journal.

Discussion

Key patient information is inconsistently transferred or is missing during transfers among the three settings (NF, EMS, ED), including data on patient infection status, baseline mental and physical functioning, advance directives, and medications. Inconsistencies in patient information or missing information could significantly impair appropriate and safe care for elderly nursing facility residents as they transition to hospital care through EMS. Stakeholder expertise and collaboration, along with focused patient safety improvement activities between different settings of healthcare, contributed to improved practices during transfers of elderly residents from nursing facilities to hospital emergency care.

Key facilitators of pilot site improvement included 1) initial assessment and process mapping by evaluation team; 2) technical assistance and training; 3) formative evaluation through chart reviews; 4) the availability of strong local champions and partnerships; and 5) the availability of the Maine CAH Patient Safety Collaborative network to support and reinforce local activity.

Each setting of care (NF, EMS, and ED) had its own quality improvement activities but had not paid attention to transitions between the settings or areas of mutual interest. Significant misinformation and misunderstanding existed among the participants regarding regulations/practices in the other settings, particularly in regard to communication protocols, advance directives, staff roles, infection control and prevention, and documentation. The pilot sites all reported some difficulties and inconsistencies transferring patient information concerning advance directives, infection status, baseline physical and mental functioning, and current medications. Each site explored the development or adaptation of tools such as checklists, transfer forms, and staff communication training to address these deficiencies. By focusing on partnership relationships and the documentation of key pieces of information during patient transfers, we supported improved communication between settings of care and, ultimately, safer care of elderly patients.

Conclusions

Key patient information is inconsistently transferred or is missing during transfers among the three settings (NF, EMS, ED), including data on patient infection status, baseline mental and physical functioning, advance directives, and medications. Inconsistencies in patient information or missing information could significantly impair appropriate and safe care for elderly nursing facility residents as they transition to hospital care through EMS. Stakeholder expertise and collaboration, along with focused patient safety improvement activities between different settings of healthcare, contributed to improved practices during transfers of elderly residents from nursing facilities to hospital emergency care.

Significance

Inconsistencies in patient information or missing information can significantly impair appropriate, safe care for elderly nursing facility residents as they transition to hospital care through EMS. Incorrect, missing or inconsistent patient information becomes part of the patient narrative as the patient receives care in the acute care setting. The patient narrative, once documented in the patient record inaccurately, becomes very difficult to change, and these errors or omissions in patient information may contribute to a series of faulty assumptions regarding the patient clinical history. This study exposes a gap in patient safety that reflects challenges in information exchange and cross-setting communication. Communication and handoffs can be improved with collaborative action and simple tools at the local community level. The small rural hospital may provide the leadership to build and maintain critical relationships between the silos of patient care. Appreciative inquiry offers a positive approach to identify communication barriers and facilitators in patient transfers.

Implications

The demonstration activities suggest some documentation and intervention strategies to address this patient safety gap. The facilitators and barriers of making changes at the NF, EMS, and ED are important to understand in order to improve patient safety through improved communication between settings. The facilitators and barriers of cross-setting improvement work should be explored early in patient safety interventions. Healthcare professionals can provide practical solutions by using appreciative inquiry and other approaches to describe elements of successful and safe transfers of care between settings. Frequent monitoring of key information data points in patient records can reinforce quality improvement. This type of chart monitoring can also target areas to improve communication, coordination, and the accuracy and timeliness of patient information. The evaluation also suggests contextual factors that may influence

both implementation and outcomes in patient safety initiatives with multiple settings of care. State agencies, professional organizations, and quality improvement organizations are well poised to offer collaborative activities that support implementation of cross-setting communication improvement efforts.

LIST OF PUBLICATIONS and PRODUCTS

Presentations in date order:

Coburn A, Tupper J, Gray C, Pearson K. *SAFER: Standardizing Admissions for Elderly Residents*. Presented at the National Rural Health Association Annual Meeting; 2012, April 18; Denver, CO.

Tupper J, Gray C, Pearson K, Coburn A. *SAFER: Standardizing Admissions for Elderly Residents*. Poster presentation at the National Patient Safety Foundation 14th Annual Patient Safety Congress; 2012, May 23-25; National Harbor, MD.

Tupper J, Gray C, Pearson K, Coburn A. *SAFER: Standardizing Admissions for Elderly Residents*. Presentation at the AcademyHealth Annual Research Meeting; 2012, June 24-26; Orlando, FL.

Tupper J, Gray C, Pearson K, Coburn A. *SAFER: Standardizing Admissions for Elderly Residents*. Poster presentation at the AHRQ Annual Conference; 2012, September 9-12; Bethesda, MD.

Tupper J, Gray C, Pearson K, Coburn A. *SAFER: Standardizing Admissions for Elderly Residents*. Presentation at the Maine Centers for Disease Control and Prevention Infectious Disease Conference; 2012; Augusta, ME.

Publications

- Manuscript, “Improving the safety of RURAL nursing home to ED transfers: communications and information transfer strategies” in process for submission to the *Journal of Healthcare Quality*
- Manuscript on the EMS intervention and online training tool to be submitted to a peer-reviewed publication, Fall 2013.
- Tupper J, Gray C, Pearson K, Coburn A. *SAFER: Standardizing Admissions for Elderly Residents*. Portland, ME: University of Southern Maine, Muskie School of Public Service, 2013; Project Brief. <http://muskie.usm.maine.edu/Publications/PHHP/SAFER-Project-Brief.pdf>
- Fenner-Koepp A. *Improving nursing home patient safety in Maine: A review of the AHRQ Patient Safety Culture Survey implementation process*. Portland, ME: University of Southern Maine, Muskie School of Public Service, 2012; Masters Thesis.
- Pearson KB, Coburn AF. *Emergency transfers of the elderly from nursing facilities to Critical Access Hospitals: Opportunities for improving patient safety and quality*. Portland, ME: Flex Monitoring Team, 2013; Policy Brief #32. <http://flexmonitoring.org/documents/PolicyBrief32-Transfer-Protocols-with-Appendix.pdf>

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