

Interventions to Improve Transitional Care Between Nursing Homes and Hospitals: A Systematic Review

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Transitions between healthcare settings are associated with errors in communication of information and treatment plans for frail older patients, but strategies to improve transitional care are lacking. A systematic review was conducted to identify and evaluate interventions to improve communication of accurate and appropriate medication lists and advance directives for elderly patients who transition between nursing homes and hospitals. MEDLINE, ISI Web, and EBSCO Host (from inception to June 2008) were searched for original, English-language research articles reporting interventions to improve communication of medication lists and advance directives. Five studies ultimately met all inclusion criteria. Two described interventions that enhanced transmission of advance directives, two described interventions that improved communication of medication lists, and one intervention addressed both goals. One study was a randomized controlled trial, whereas the remaining studies used historical or no controls. Study results indicate that a standardized patient transfer form may assist with the communication of advance directives and medication lists and that pharmacist-led review of medication lists may help identify omitted or indicated medications on transfer. Although preliminary evidence supports adoption of these methods to improve transitions between nursing home and hospital, further research is needed to define target populations and outcomes measures for high-quality transitional care. *J Am Geriatr Soc* 58:777–782, 2010.

Key words: transitional care; nursing home; hospital

The communication of accurate medical information is fundamental to providing quality care to all patients as they transfer between settings in the healthcare system.¹

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The provision of quality transitional care affects older patients the most, because they account for a high percentage of transitions.² Frail older patients, particularly those with cognitive impairment, have difficulty participating in this process, resulting in miscommunication of crucial information.^{2–5} They consequently suffer repeat hospitalizations, iatrogenic complications, and uncoordinated care.⁶

Researchers have sought to define medically frail or socially vulnerable subgroups of older adults who differ fundamentally from those who are “well” and who might benefit from targeted intervention.^{7,8} Given their high number of comorbidities and their high reliance on others for assistance with activities of daily living,⁹ nursing home residents, those receiving long-term care services rather than short-term Medicare Part A rehabilitation benefits, generally comprise a dependent population of individuals who might easily be described as frail or vulnerable. Studying this population of patients who are at greater risk may ultimately indicate how to provide better-coordinated, quality transitional care to all older adults.

Accurate, appropriate medication lists and advance directives are two crucial components of medical information for care of frail older patients as they transition between healthcare settings. Medication-associated errors have been identified as a major source of morbidity and mortality in transitional care.^{3,10} Previously completed advance directives are often not available to hospital physicians,⁴ although when they are present, they can influence medical decision-making.⁵ In the absence of a defined measure of high-quality transitional care, accurate communication of these two important elements of medical information were examined as potential evidence of high-quality transitions of older adults between nursing homes and acute care hospitals. A systematic review was conducted to examine the following questions. Can a clinical intervention improve transmission of accurate and appropriate medication lists for adults aged 65 and older in transition between nursing homes and hospitals? Has an intervention been shown to improve communication of advance directives for these patients between settings?

METHODS

Data Sources and Search Strategy

An electronic search, limited to English-language articles with an abstract available, was conducted of the MEDLINE, ISI Web of Knowledge, and EBSCO Host databases from inception through June 2008. A research librarian assisted in the formulation of a search strategy. The MEDLINE search used the combined medical subheading (MeSH) terms *nursing home* AND *hospital* with the query limited to practice guidelines, meta-analyses, clinical trials, and randomized control trials. These results were matched with the MeSH terms *patient transfer* OR *patient discharge* OR *medication systems*, *hospital* OR *medication errors* OR *advance directives* OR *resuscitation orders* OR *advance directive adherence*. The ISI Web of Knowledge and EBSCO Host databases were searched for articles or reviews that matched the terms *nursing home* AND *hospital*. These articles were then searched for those that matched the search terms *patient transfer** OR *patient discharge** OR *medication error** OR *advance directive** OR *resuscitation order** OR *medication reconciliation**. Four additional articles were selected from the authors' libraries. Reference lists of the articles reviewed were searched for potentially relevant titles, but no additional studies were identified.

Articles that studied patients aged 65 and older transitioning between nursing homes and hospitals in either direction and involved an intervention that attempted to improve communication of accurate and appropriate medication lists or advance directives were included. Included studies were not required to have a comparison group. Any outcomes measures for improved medication lists or reporting of advance directives were considered. There was no preferred study design beyond the limitations to the MEDLINE search described above.

Data Extraction

The reviewers abstracted data from each study to a standardized collection instrument, including study type, population, intervention, and results in evidence tables. Reviewers additionally abstracted information about study methods and scientific rigor, including experimental design, presence of a comparison group, and standardization of primary outcome measures. Studies were then classified according to the strength of contained evidence (grades Ia–IV), as developed by the British Committee for Standards in Haematology.¹¹ Heterogeneity precluded meta-analysis as a part of this systematic review.

RESULTS

Six hundred ninety-six titles were identified in the initial search. Two authors reviewed these and excluded 620 titles that were clearly not relevant. Of the remaining 76 articles, 28 were excluded after the abstracts were reviewed. Each of the remaining articles underwent full review, and those not meeting the inclusion criteria were excluded for the following reasons: did not describe an intervention; did not study nursing home populations, medication lists, advance directives, or transitions between a hospital and a nursing home; or did not report outcomes. Differences of opinion were resolved by discussion between the reviewers.

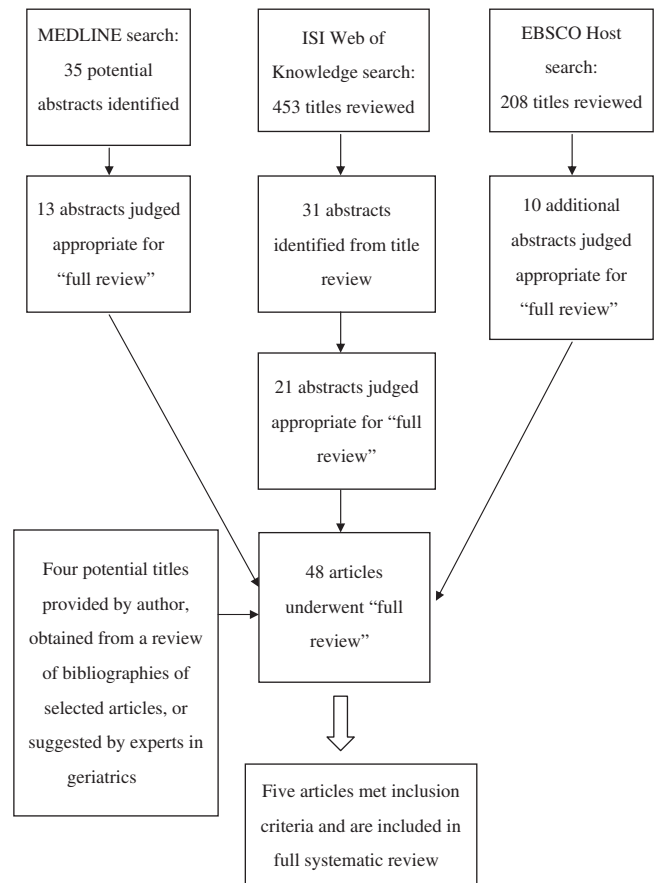


Figure 1. Search results and selection of studies for systematic review.

Five articles met all of the inclusion criteria (Figure 1). Two described interventions that resulted in improved transmission of accurate and appropriate medication lists,^{12,13} two described interventions that resulted in the enhanced transmission of advance directives,^{14,15} and one described an intervention that accomplished both of these goals (Table 1).¹⁶ The five included studies had quality ratings ranging from Ib to III, indicating evidence from a randomized controlled trial (Ib) to evidence from a well-designed nonexperimental descriptive study (III).

Interventions to Improve Communication of Appropriate Medication Regimens

One study¹² described a single-blind randomized controlled trial of a pharmacy consultant intervention designed to detect an increase in appropriate medication use for patients admitted to nursing homes in South Australia after hospitalization. At discharge from the hospital, the control group was given standard pharmacy care, whereas the intervention group's providers were sent a medication transfer summary and helped with the coordination of an evidence-based medication review within 10 to 14 days of admission to the nursing home. Approximately 8 weeks after hospital discharge, new, masked pharmacists conducted medication reviews of control and intervention patients' medication regimens and calculated a Medication Appropriateness Index (MAI) score.

Table 1. Overview of Five Studies Included in Review

Reference	Design and Presence of Comparison Group	Intervention/ Goal	Setting/ Direction of Transfer	Number of Patients	Result	Evidence Grade*
Crotty et al. ¹²	Single-blind randomized controlled trial; comparison group described	Evidence-based medication review followed by case conference between medical providers to discuss medications	Transition to 85 long-term care facilities in South Australia	110 patients consented to participate, 88 patients finished study	Intervention group had increase in appropriate medication use	Ib
Boockvar et al. ¹³	Pre-/postintervention study	Medication reconciliation on return to nursing home after discharge from a hospitalization	Not-for-profit nursing home in New York City	168 nursing home patients (87 pre, 81 post) with 259 hospital stays (149 pre, 110 post)	In the postintervention group, 2.3% had discrepancy-related adverse drug event versus 14.5% pre-intervention (odds ratio 0.11)	Iib
Madden et al. ¹⁶	Prospective observational study with cross-sectional survey; no comparison group described	Patient transfer sheet used for nursing home patients transferred to emergency department	Transition to an emergency department in North Carolina	420 patient visits; 34 nurses and 7 doctors surveyed	88% of survey respondents said that list of medications made care “a lot easier” 234 (55.7%) patients had DNR preference reported	III
Tolle et al. ¹⁴	Prospective chart review of cohort of individuals; no comparison group described	Use of prospective order form for life-sustaining treatment	Transition from 8 long-term care facilities to acute care hospitals in Oregon	180 residents of long-term care facilities	Of 180 cases, 24 patients (13%) were hospitalized, with none receiving cardiopulmonary resuscitation, intubation, or intensive care unit admission	III
Terrell et al. ¹⁵	Observational pre-/postintervention study; comparison group described	Use of a one-page transfer sheet for extended care facility patients transferred to emergency department	Transition to an emergency department in Indiana	65 patients in the pre-intervention period; 72 patients in the postintervention period	“Successful” documentation rates increased from 58.5% to 77.8% DNR status recorded increased from 64.6% to 87.5%	Iib

* Evidence levels assigned according to paradigm used by British Committee for Standards in Haematology.¹¹

DNR = do not resuscitate.

Using an intention-to-treat analysis, the investigators found a statistically significant difference between the MAI scores of intervention and control patients of 4 points on an 18-point scale, indicating that intervention patients had more-appropriate use of medications than control patients at the study's conclusion. This difference remained after controlling for baseline MAI, Charlson Comorbidity Index, and number of drugs discontinued during admission.

In another study,¹³ a before-and-after intervention investigated pharmacist-conducted medication reconciliation aimed at decreasing adverse drug events (ADEs) in patients in transition from a large, academic, tertiary care hospital to a large, not-for-profit nursing home in New York. For the postintervention group, a pharmacist performed reconciliation of medications ordered after hospitalization with those ordered before hospitalization within 24 hours of the patient's return; categorized the discrepancies as omissions, additions, dose changes, or substitutions; and completed a

communication form that the nursing home physician reviewed. The physician recorded a plan of action and signed the form, which was included in the medical record. A research assistant abstracted medication data and discrepancies associated with transfer between the nursing home and hospital, and two physicians reviewed them and independently assigned 4-point Likert scores of risk of harm.

Overall, there were a small number of events, with 10 ADEs in the pre-intervention and one in the postintervention group, giving an incidence of 14.5% and 2.3%, respectively. The relative risk in the postintervention group was 0.16, but the 95% confidence interval was 0.02–1.2. In an as-treated analysis, there was a significant difference in risk between the two groups, with no ADEs in the intervention group and a 15.7% rate in the treated group. In those for whom reconciliation was performed, the most common errors were omissions, and the most common types of medications involved were cardiovascular,

neuropsychiatric, and analgesic or anti-inflammatory. In 429 (71.7%) of the discrepancies, the physician was aware of the discrepancy, and in 73 (10.5%), prescribing changes were potentially attributed to the reconciliation intervention.

Another study prospectively evaluated a one-page transfer document designed to ease transitions of nursing home patients to a university hospital emergency department in North Carolina.¹⁶ A task force of community members, nursing home employees, nurses, and physicians developed the form before initiation of the study. It was based on the previously published “Universal Nursing Home Transfer Form” adapted to the local community’s needs. It included a section where the patient’s current medication regimen could be recorded, as well as the time of the last given dose of medication.

Demographics and reasons for transfer were collected over 12 months for 420 patients who were seen in the emergency department from nine nursing facilities. Accuracy of transmitted medication administration lists was not assessed, but a survey regarding the transfer form’s effectiveness at improving providers’ abilities to care for their patients was administered to a cross-sectional convenience sample of 34 nurses and seven physicians in the emergency department. Of these 41 providers surveyed, 88% replied that the list of medications included in the transfer form made providing care to these elderly patients “a lot easier” than before. It also saved a significant amount of time, with 56% of the staff reporting needing more than 10 minutes to collect data in patients without forms and 93% requiring less than 5 minutes to collect data on patients with forms.

Interventions to Improve Communication of Advance Directives

In the same study,¹⁶ the authors evaluated the transfer form’s effectiveness at transmitting advance directives. The authors reported that 234 patients (55.7% of the study population) had a do not resuscitate (DNR) preference recorded on their transfer form and that 156 patients had indications of whether they had a living will recorded on their transfer form. Rates of provider awareness of DNR orders or living will forms were not recorded before this intervention, so it is unclear whether the intervention improved communication of this information.

A study of end-of-life care for residents of eight nursing homes in Oregon investigated the effect of a physician order form for life-sustaining treatment (POLST).¹⁴ A cohort of 180 individuals who had a POLST completed with an indication of DNR and to “transfer only if comfort measures fail” was followed for 12 months. Discharges, health status changes, hospitalizations, deaths, admitting diagnoses, treatment provided, and circumstances of transfer if a patient was admitted to the hospital were collected. POLSTs were found in 169 (94%) of patients’ charts at the end of the study period. Over the course of a year, there were 26 instances in which patients who had requested to be transferred only if comfort measures failed were transferred to the hospital. Of these 26 cases, 22 (85%) were to pursue more-aggressive comfort measures, and four (15%) were to pursue life-extending therapies. None of these 26 cases was admitted to an intensive care unit, intubated, or received

cardiopulmonary resuscitation (CPR). Of the patients who died in this study, 95% died in their nursing home, but rates of hospitalization, intensive care unit admission, ventilator use, or CPR administration were not reported for this population before the intervention.

A final pre-/postintervention study¹⁵ reported the effect of a one-page emergency department transfer form on “successful” communication (defined as at least 9 of 11 pieces of medical information) for nursing home patients transferring to an Indiana emergency department. The information on the transfer form included the patient’s name and demographic information, the patient’s usual mental and functional status, the reason for the patient’s transfer, and the patient’s DNR status. Chart abstraction assessed the presence of the pieces of medical information in the charts of all patients transferring from any of 10 study nursing homes during a 3-month pre-intervention period ($n = 65$ patients) and a 3-month period after implementation of the transfer form ($n = 72$ patients). Successful documentation increased from 58.5% to 77.8% with use of the transfer form, and the rate of documentation of DNR status rose from 64.6% to 87.5%.

DISCUSSION

This systematic review identified five studies of interventions to improve the communication of medication lists and advance directives for elderly patients transitioning between nursing homes and hospitals. Interventions identified included one randomized controlled trial and one pre-/postintervention study of the use of pharmacist medication review (evidence grades Ib and IIb, respectively),^{12,13} one pre-/postintervention study and one descriptive study of the use of standardized transfer documents (evidence grades IIb and III, respectively),^{15,16} and one descriptive study of the use of portable medical orders for the scope of treatment (evidence grade III).¹⁴ Although medication errors are a major problem in transitions,^{3,10,13} this review identified no intervention that clearly improved the communication of accurate and appropriate medication lists bidirectionally between nursing homes and hospitals. The review found that two unique transfer documents facilitated the transfer of advance directive information,^{15,16} although these studies did not report the accuracy of information transfer. Indeed, current research illustrates the potential of several different interventions to contribute to the improved communication of patient information in transfer but does not provide compelling evidence of a single solution.

Initial evidence suggests that well-designed and structured patient transfer records may improve the frequency and the accuracy of transfer of medication lists and advance directives. In addition, review of medication lists by a pharmacist after patient transfer may increase appropriate medication use. Future work will need to determine the optimum amount of information to be included on any transfer document and the ideal medium—paper or electronic—for its transmission, although electronic means are attractive. Many nursing homes use computers already to track Minimum Data Set figures¹⁷ and may have the ability to implement advanced health information technology to facilitate electronic transfer of patient information. Moreover, the federal government has invested in projects

through the National Health Information Network¹⁸ to allow exchange of medical records, and there is initial evidence that health information technology may ultimately improve patient safety.¹⁹

Though it is a prerequisite for effective transitional care, the communication of patient information alone is inadequate to ensure the continuity and provision of excellent care by physicians, nurses, allied health providers, emergency medical services, and ambulance transport staff. Conceptually, effective transitional care can be understood as a summation of several key steps: communication between sending and receiving clinicians, preparation of the caregiver and patient for the transition, reconciliation of patients' pre- and posthospitalization medication lists, arrangement of a plan for follow-up of outstanding tests and for an appointment with the receiving physician, and discussion of warning signs that might necessitate further more-emergent medical evaluation.² More broadly, the National Quality Forum has proposed that transitional care is only one of four domains that must be measured when assessing quality of care coordination, including the quality of communication between providers, information quality, and the capacity for care services after the patient's transfer.²⁰

In any discussion of transitional care of nursing home patients, it should be acknowledged that, at times, the best patient transfer is the one that never occurs at all, either because expanded care is provided on-site, or hospitalization is not consistent with the patient's care goals. One study estimated that as many as one-third of nursing home transfers are potentially avoidable²¹ and calculated to cost \$1.24 billion in spending in New York State alone.²² Admission rates for certain diagnoses are lower from nursing homes that provide expanded services, such as midlevel providers on staff and intravenous therapy.²³ Evercare and Program of All-Inclusive Care for the Elderly are two prominent examples of comprehensive, capitated health programs designed to improve health outcomes of nursing home and nursing home-eligible older adults, respectively, that have shown some success in reducing health-care use.^{24,25}

New research is needed on interventions to improve the transitional care provided to vulnerable and frail older adults transferring between nursing homes and hospitals. Future clinical trials will be methodologically stronger if interventions are tested for effect on standardized, validated outcome measures designed for this field. Fundamentally, the lack of such measures reflects varied definitions of high-quality transitional care.

The Care Transitions Program at the University of Colorado Health Sciences Center and the University of Pennsylvania's NewCourtland Center for Transitions and Health have performed important work in articulating a vision of ideal transitional care and developing promising transitions interventions.^{26–30} Other investigators in geriatric medicine and health services research can build on the methodological framework that the Care Transitions Program and the Center for Transitions and Health have proposed to lay out a research agenda for transitional care. This might occur under the purview of a national body coordinating research efforts to promote work toward standardized care end points in harmonized research

endeavors. Ultimately, the results of larger, randomized studies and demonstration projects will be necessary to address gaps in knowledge of how to operationalize high-quality transitional care. Populations at risk for poor transitions, such as frail and vulnerable older adults and nursing home residents, deserve special attention within this research agenda.

LIMITATIONS

The search strategy, its review of English-language only articles, and publication bias may have limited this systematic review. To limit the effect of these potential biases, the search strategy was developed with the assistance of a research librarian, and articles that were known to the authors previously were included in the review. The interventions described in the reviewed studies were performed in a variety of healthcare systems and with a limited number of patients, which may constrain the external validity of their results. Although many of the studies demonstrated efficacy during a period of intensive study, the sustainability of these results and the effectiveness of these interventions are unclear.

CONCLUSION

The accurate communication of important patient information is one of several prerequisites to providing excellent health care to elderly nursing home patients transferring to and from acute care hospitals. Interventions performed in a variety of settings show that a standardized patient transfer document may assist with the successful communication of advance directives and medication lists, whereas a pharmacist-developed review of medication lists may help identify omitted or indicated medications on patient transfer. Randomized controlled trials with large numbers of elderly patients in varied healthcare systems are needed to determine the ideal design and medium for a patient transfer document. Further work should aim to coordinate research efforts, adopt operationalized definitions for high-quality transitional care, and define target populations and outcomes measures.

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