Older adults residing in nursing homes are among the most vulnerable members of our society. A large percentage of nursing home residents are at risk of experiencing a care transition to a hospital. This review examines care transitions from nursing homes to hospitals, focusing on resident safely, effectiveness and timeliness of these transitions, and ways to enhance resident-centered care. Recommendations to improve care include promoting clear communication, managing medications, encouraging appropriate use of formal advance directives, providing timely access to care to reduce the risk of potentially avoidable hospitalization, and promoting an interdisciplinary resident-centered approach in geriatrics education. Studies examining nursing homes that have adopted models of care that emphasize resident autonomy as well as qualitative research focusing on in-depth ethnographic approaches can provide new perspectives of care transition experiences, and help to identify additional ways to improve care. (J Am Med Dir Assoc 2010; 11: 231–238)

Keywords: Hospitalization; potentially avoidable hospitalizations; care transitions; geriatrics education; long-term care; nursing homes
and identifies implications for practice, geriatrics education, and research.

METHODS
The goal of the Institute of Medicine is to develop a new perspective for quality of care to best meet patient needs. The Institute of Medicine’s report states that the purpose of the health care system is to “continually reduce the burden of illness, injury, and disability, and to improve the health and functioning of the people of the United States” (p. 39). The Institute of Medicine report also suggests that “the ultimate test of a health care system is whether it helps the people it is intended to help” (p. 44). Using the Institute of Medicine report as a framework with which to explore care transitions, we used the following databases to identify articles: CinAHL, Medline, and Academic Search Premier. Search terms included nursing home(s) and residents, long-term care, hospitalization, transitions of care, safety, effectiveness, timeliness, and patient-centered care. Most articles identified as relevant for this review were published from 2000 to 2009. Care practices have changed in nursing homes during the past decade, with an increased level of resident care needs and implementation of culture change models. Thus, an emphasis on research published within the past decade is useful for implications for practice, geriatrics education, and policy. All articles in this review were published after 1990.

Articles that were identified were further analyzed to identify themes in the Institute of Medicine framework. After the themes were identified, further searches were conducted with the same databases described in the previous paragraph using terms relevant to each theme (eg, medication errors in the domain of safety); references in articles identified as highly relevant were examined to identify additional relevant articles and as a cross-check for our earlier database searches. This review was not intended to be exhaustive; its objective is to describe articles that are relevant to the 4 dimensions of the Institute of Medicine framework.

Three literature reviews of hospitalization of nursing home residents were also identified. These reviews focused on transition prevalence and incidence, and identifying resident and facility characteristics associated with transitions. In contrast, the emphasis of our review is on the core dimensions of the Institute of Medicine’s framework that are closely aligned to individual care experiences of residents: safety, effectiveness, timeliness, and patient-centered care.

RESULTS
Nursing Home to Hospital Transitions Guided by the Institute of Medicine Framework
In this section, care challenges in each of the 4 dimensions of care identified by the Institute of Medicine, safety, timeliness, effectiveness, and resident-centered, are described. Dimensions of timeliness and effectiveness are closely related, especially in the area of potentially avoidable hospitalizations, described in the section “Effective and Timely Care” later in this article. The Institute of Medicine defines effective care as “providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit (avoiding overuse and underuse)” (p. 39). Timely care is described as “reducing waits and sometimes harmful delays for both those who receive and those who give care” (p. 40). Thus, in the context of hospitalizations among residents, effective care encompasses appropriate hospitalizations, and timely care is represented by appropriate identification and treatment of acute or chronic illnesses that may lead to hospitalizations and adverse outcomes of hospitalization.

Safety
Medication Errors. Considerable research has examined inappropriate medication prescribing among nursing home residents. Inappropriate prescribing is common, occurring in almost half of nursing home residents, measured at both a 3-month and 12-month stay and among residents both before (25.4%) and after admission (20.8%). Many studies, including those just cited, use Beers criteria to identify inappropriate prescribing. Beers criteria identify wrong drug, wrong dosage, and drug-disease interaction.

Dhalla et al used a subset of Beers criteria to identify 49 medications identified as inappropriate. Barker and colleagues used direct observation and independent verification to identify medication errors. Medication errors were identified in about 19% of all medication doses administered in a small sample of hospitals (n = 12) and skilled nursing facilities (n = 6) in 2 states. Errors were defined as administration of unauthorized medications, discrepancies between medications dispensed and ordered (dosage, route of administration, form, time or technique of administration) and omission (the medication was not administered).

About 34% of residents experiencing inappropriate prescribing were found to be at risk of severe harm, as identified using Beers criteria of high levels of potential harm. Factors associated with inappropriate prescribing include resident characteristics (eg, age, dementia, taking 9 medications or more), physician characteristics (eg, male, nonspecialists), and facility factors (eg, lower staffing ratios, number of beds). Only a small percentage of adverse drug events cause serious health problems; however, these events result in additional morbidity and mortality given the large use of medications among older people. Residents who experienced an incidence of inappropriate prescribing in the previous month were at greater risk of death (21% higher) and of hospitalization (almost 30% higher).

About 20% of residents transferring between nursing homes and hospitals who have changes in medications are at risk of adverse drug events. Most medication changes implicated in the adverse drug events occurred in the hospital setting; however, the resulting events most frequently occurred after residents were readmitted to nursing homes.

Communication. A number of challenges posed by lack of or poor communication during care transitions have been identified. Poor communication and an inadequate understanding of emergency department (ED) and hospital procedures among nursing home staff often leads to unnecessary
ED transfers and overnight hospitalization.\textsuperscript{25} Lack of communication among nursing home staff, physicians, nurse practitioners, ED physicians, and emergency medical services personnel adversely affects care quality during and following nursing home and ED transitions.\textsuperscript{26} Lack of clear communication contributes to increased risk of hospital admission by negatively affecting patient care by the ED staff, reducing the ability of the nursing home staff to adequately inform family members about care received in the ED, and decreasing the ability to incorporate the care preferences of the resident during acute medical emergencies.\textsuperscript{26}

Research has found that communication between nursing home and ED staff can be improved through use of fax machines and audio-recordings to transmit resident information and brief standardized communication forms.\textsuperscript{23,26,27} Information included in these forms depends on the direction of the transfer. The ED should receive details of the resident’s medical history, medications, baseline condition, and nursing home contact information.\textsuperscript{26} The nursing home should receive information about the ED diagnosis, treatment received, results of diagnostic tests, and recommendations for treatment and follow-up.\textsuperscript{26} Studies suggest interventions that improve relationships and understanding between the 2 health care locations have the potential to decrease hospitalizations.\textsuperscript{25,26} One study examined a training program developed by ED nursing staff to provide information to nursing home nursing staff, and found that providing educational sessions at nursing homes by an ED nurse and ambulance service representative reduced the risk of hospitalization.\textsuperscript{25}

Communication challenges can also be attributed to different cultures of nursing homes and hospitals.\textsuperscript{23} For example, hospitals often use monthly medical staff rotations; staff turnover is high in many nursing homes.\textsuperscript{23} To improve communication, researchers and practitioners suggest implementing the following strategies: offering educational programs to increase cultural understanding between the 2 locations of care; assigning liaisons between the 2 organizations; standardizing hospital discharge forms; and providing educational materials for hospital staff, which include information about nursing home staffing, resources, and practice policies.\textsuperscript{23,25–27}

**Cognitive and Mental Status Communication Needs.** Lack of clear communication increases the risk of misdiagnosis and of not meeting care needs, particularly among residents with dementia. One study found that 62% of residents with moderate-to-severe dementia transferred from a nursing home to hospital had no mental status assessment in their transfer records.\textsuperscript{28} In a related area, it is important to ensure accurate diagnosis of delirium, particularly among residents seen in the ED. Differential diagnosis for delirium, dementia, and depression is challenging because of similarities in their presentation.\textsuperscript{29} Thus, it is vital that ED physicians receive information about residents’ baseline cognitive function.

**End-of-Life Care.** Cheng et al\textsuperscript{22} emphasized end-of-life care as an area where communication can be substantially improved. Cheng and colleagues\textsuperscript{22} documented the path of clinical decisions that led to an 89-year-old woman with severe dementia to be hospitalized 3 times during the last 6 weeks of her life. These researchers concluded that poor care coordination, delayed discussion of end-of-life decisions and the goals of hospitalization, and lack of care plan evaluation, resulted in multiple hospitalizations and poor management of the transition process. Cheng and colleagues\textsuperscript{22} suggested that guidelines for nursing homes be developed to evaluate care quality during inpatient stays for residents, and that the use of professional and continuing education programs for long-term care professionals be expanded.

**Effective and Timely Care**

**Potentially Avoidable Hospitalizations and Emergency Department Visits.** Hospitalization for ambulatory care–sensitive (ACS) conditions (also referred to as potentially avoidable hospitalization), is a widely used indicator of access to primary health care of reasonable quality, and of the overall effectiveness of the primary health care system.\textsuperscript{30–34} The US Institute of Medicine has recommended this indicator for evaluating access to primary health care.\textsuperscript{35} A similar indicator for ED visits, also specifically for ACS conditions, is an emerging area of study.\textsuperscript{36} The rationale for these indicators is that timely access to outpatient care for ACS conditions such as diabetes, bronchitis, and congestive heart failure can reduce the risk of hospitalization and ED visits for exacerbations of those conditions, through use of antibiotics, pharmaceuticals to manage chronic conditions such as congestive heart failure, and other medical treatments or management, including monitoring blood glucose levels.\textsuperscript{35} A growing number of studies have used hospitalizations and/or ED visits for ACS conditions as indicators of care quality for nursing home residents.\textsuperscript{9,10,37–40} Although the application of hospitalization for ACS conditions has not been established in nursing homes, researchers work from the premise that it is reasonable to expect that residents face similar medical problems as those faced among older adults living in the community.\textsuperscript{10} Thus, ACS hospitalizations and ED visits for ACS conditions could have been avoided or managed in the nursing home setting with timely and effective medical care.\textsuperscript{9,10,37–40}

Most researchers who have applied ACS hospitalizations to nursing home residents have identified hospitalizations and/or ED visits with an ACS primary diagnosis as defined by the Institute of Medicine.\textsuperscript{35} These ACS diagnoses usually include asthma, angina, congestive heart failure, bacterial pneumonia, cellulitis, chronic obstructive pulmonary disease, hypertension, dehydration, gastroenteritis, complications of diabetes mellitus (including ketoacidosis or hyperosmolar coma), lower-extremity amputation for individuals with diabetes, and kidney and/or urinary tract infections.\textsuperscript{9,10,17–40}

Grabowski et al\textsuperscript{38} found that 29% of hospitalizations among nursing home residents in New York State were for ACS conditions. Carter et al\textsuperscript{39} found the most common potentially avoidable ED visits were for congestive heart failure, bacterial pneumonia, and urinary tract infections. Lack of access to health care professionals, including physicians, nurses, and midlevel providers such as nurse practitioners and physician assistants, and timely outpatient services is associated
with increased risk of potentially avoidable ED visits or hospitalization. In related findings, hospitalizations for ACS conditions are also associated with preventive care provided by the nursing home.

A review of hospitalizations among long-term care residents identified several strategies to reduce hospitalizations, including improving the availability of nurse practitioners or physicians assistants and increasing staffing levels of registered nurses. Konetzka and colleagues also found that enhancing preventative health care can reduce the risk of clinical conditions that have an associated risk for hospitalization, such as pneumonia and uncontrolled congestive heart failure. Nurse practitioners or medical evaluations have been identified as the resources most difficult to access, especially on nights and weekends. Reaching a similar conclusion, Carter suggested that nursing homes with more registered nurses are more likely to recognize changes in a resident’s medical condition, and to have lower rates of hospitalization for ACS conditions.

Reducing Hospitalization Risk among Residents with Dementia. Porell and Carter suggested that treatment uncertainty among physicians is associated with greater risk of potentially preventable hospitalization for residents with dementia. Care practices, such as the use of nurse-practitioners and registered nurses, have been shown to prevent hospitalization for ACS conditions among residents with dementia, despite the fact that those with dementia are at greater risk for some ACS conditions, such as gastroenteritis and kidney and/or urinary tract infections.

Residents in nursing homes with specialized care units have lower rates of hospitalization. For example, Gruneir et al. found that an Alzheimer’s disease–specific care unit reduced the odds of hospitalization among residents with and without dementia (odds ratio [OR] 0.90, 95% confidence interval [CI] 0.86–0.94; OR 0.93, CI 0.90–0.98, respectively). Reasons suggested for the reduced risk of hospitalization have been attributed to both resident and facility characteristics; such as medical and technological resources, clinical practices and philosophy of care, and the familiarity and confidence of the staff to care for residents with dementia.

Among residents with advanced dementia in their last 6 months of life, almost 25% were transferred from a nursing home to an ED or hospital. In a review of the literature of experiences of persons with dementia, Murray and Boyd conclude that approaches that focus on biomedical processes, care approaches that focus on medical needs of residents, are a barrier to quality of care and quality of life. Although medical management is an essential component of care, these researchers suggest care should also include a focus on social needs to support the quality of life and demonstrate respect for residents with dementia. Thus, residents with dementia who are cared for in an environment that emphasizes quality of life and by specially trained staff may provide more appropriate care, particularly at the end of life.

Outcomes of Hospitalization. Hospitalization of residents is often associated with adverse outcomes, including iatrogenic and nosocomial infection, and increased mortality rates. Boockvar and colleagues found that residents who were hospitalized within 3 days of onset of infection were at increased risk of pressure ulcers and death compared with those treated in the nursing home. Fried et al. used a standard nursing assessment to determine functional status, scoring levels of independence/dependence in 4 functional activities of daily living. Among residents, all of whom were diagnosed with pneumonia, those with a severe diagnosis of pneumonia, measured by respiratory rate, and were not hospitalized had poor outcomes, measured by mortality and functional status decline. Residents with a less severe diagnosis of pneumonia and who were admitted to a hospital had significantly worse outcomes (P = .016) 2 months after this acute care episode, in comparison with those treated in the long-term care facility.

Positive outcomes of hospitalization should also be considered. As described in the preceding paragraph, Fried et al. suggest that hospitalization may be appropriate for most residents with severe pneumonia. Wakefield and Holman suggested that functional decline occurring before hospitalization may have the potential to be reversed; hospitalization providing an opportunity to address functional decline. Outcomes associated with hospitalization are complicated by the fact that residents with the poorest health are hospitalized most frequently.

Resident-centered Care

Resident-centered care is based on the knowledge of, and respect for, the diversity, values, choices, and needs of individuals. It emphasizes care coordination and continuity, communication, education, and shared decision-making. Few studies specifically explore resident-centered care in the context of the hospitalization of nursing home residents. Directors of nursing and medical directors emphasize patient-centered factors in the hospitalization decision, identifying resident preference as the most important factor.

Advanced Directives. Advanced directives communicate an individual’s preferences about end-of-life care. The do-not-hospitalize (DNH) order, written by physicians, indicates preferences of residents or their proxies to avoid hospitalization. Residents with DNH orders are less likely to be hospitalized compared with those without these directives. Dobalian found the hospitalization rates of residents with DNH orders (3% of 5899) were less than half of those without these orders. Lamberg et al. found 24.6% of their sample of residents with advanced dementia (n = 240) experienced a hospital transfer in their last 6 months of life. However, only 4 who had a DNH order were hospitalized. Factors affecting the increased use of DNH orders are older age, a proxy decision-maker who was not an adult child, problems with eating, and long nursing home stays. Despite efforts to increase use of DNH orders, these directives are underused. Further, there are instances in which these orders are not upheld.

Residents with advanced dementia
identified by Lamberg et al 44 who were hospitalized despite the presence of DNH were transferred because of orthopedic emergencies, emboli, and gastrointestinal bleeding. The authors considered the management of orthopedic emergencies in a hospital setting as a form of palliative care. 44 Thus, among residents with DNH orders, those hospitalized may have conditions that require palliative care 44; residents with DNH orders have also been found to have more comorbidities and to be in poorer health than those who are not hospitalized. 50

Concerns among medical directors and directors of nursing about family preferences to hospitalize and fear of litigation have been associated with the decision to hospitalize. 32 However, when identifying factors that influence this decision, both groups rated resident preferences above family preference. 42 In addition, DNH orders are often implemented in the last few weeks of a resident’s life, sometimes after a history of recent hospitalizations. 44 Delays in DNH order use have been identified even in the presence of a terminal disease such as advanced dementia. 44

DISCUSSION

How Can Transitional Care Be Improved?

Our review points to implications for practice, geriatrics education, and research.

Practice Implications

Polypharmacy is common among residents. Problems associated with adverse drug events underscore the importance of medication management during and after care transitions, and of clear communication. Greater use of electronic medical records and health information technology may be useful for these efforts. However, widespread implementation of such systems has occurred mainly in teaching hospitals and in urban areas. 51 Health information technology could also improve communication between health care providers and care locations, and help ensure that needed medication information is transmitted to the hospital or ED. 51, 52 However, research in this area is sparse. To the authors’ knowledge, only one study has examined effects of health information technology on adverse drug events in nursing homes. Examining the effectiveness of a computerized health order entry in nursing homes, Gurwitz et al 53 found no significant reductions in adverse drug events. The authors attributed the findings, in part, to lack of integration of laboratory and clinical information systems. 53

Findings from a growing number of studies that include a focus on potentially avoidable hospitalization and/or ED visits indicate that access to preventive and outpatient care, and availability of midlevel providers such as nurse practitioners, can reduce the risk of hospitalization for residents and help ensure appropriate care. 10, 11, 37, 40, 42 In the area of end-of-life care, improved information and education about use of advance directives and DNH orders for health care professionals, including administrators, physicians, and nurses, as well as families, may influence the decision-making process and help reduce the risk of potentially avoidable hospitalizations and ED visits. 42, 54

Implications for Geriatrics Education

There is a vital need for improved education about the needs of older adults and appropriate systems of care for providers of long-term care. Recent initiatives in medical school and graduate medical education that are useful in this area include the following: enhancing core competencies to care for older adults, 55, 56 emphasizing knowledge to care for older adults in continuing education programs, 57 and incorporating innovative training to increase geriatrics knowledge among nongeriatrician physicians. 58, 59

Caring for residents requires an interdisciplinary approach. 60 Thus, it would be useful for nursing homes to incorporate interdisciplinary educational approaches to increase understanding of residents’ needs, and roles of health professionals and care locations. The American Geriatrics Society calls for enhancements in both education and communication among all health care professionals involved in the transitional care of older adults. 6 Interdisciplinary educational programs have the potential to meet both goals.

Resident-centered care provides a framework for educational strategies. Resident-centered care encompasses both quality of care and quality of life, and is defined as a culture of care that emphasizes “well-being and quality of life as defined by the individual” (p. 48). 60 Initiatives in geriatrics education should be guided by (1) resident preferences, either communicated directly, by advanced directives, or by proxy; and (2) treatment options that consider residents’ health status, quality of care and quality of life, and the treatment setting.

Educational interventions should also address efficient methods of communication. Health information technology offers the ability to transfer information between providers, even when different systems are used 61 and to provide clinical decision support. 51 In addition, among residents with reduced cognitive function, electronic methods to communicate information about physical and cognitive status between health care providers offers the potential to improve care. 62

Research Implications

Care Models Emphasizing Resident Needs and Autonomy. There is a growing cultural shift in many nursing homes toward empowering residents and providing a higher level of satisfaction for residents and families. 63, 64 This shift emerged from 2 earlier models. The Eden Alternative, which incorporates home-like characteristics such as pets, plants, and intergenerational interactions, has evolved into the Green House Model. 65 The Wellspring model is a coalition of long-term care providers who collaborate to improve both quality of care and culture change within their facilities. 66

A number of recent studies examining the effects of these models on resident care have found evidence of improved quality of life, 67 decreased perceptions of boredom and helplessness, 68 decreased levels of depression, 69 and increased satisfaction with the facility. 67 Increased satisfaction with the nursing home was also found among family members. 69 Comparing a nursing home using the Green House Model and 2
traditional nursing homes, Kane and colleagues found that residents in the Green House nursing home had higher scores in the quality of life domains of privacy, dignity, autonomy, and food enjoyment than those in the traditional nursing homes. Residents in the nursing home with the Green House model also had higher scores in the quality of life domains of meaningful activities, relationships, and individuality than residents at one of the comparison sites. In addition, compared with those in traditional nursing homes, residents in the Green House facility were more likely to rate their facility as a good place to live.

Bergman-Evans compared measures of perceived loneliness, helplessness, and boredom between residents at a nursing home that had implemented the Eden Alternative and a traditional facility. The percentage of residents classified as experiencing helplessness and boredom decreased among the residents in the Eden Alternative model nursing home (38.1% to 23.8%, 33.3% to 23.8%, respectively) between baseline measurements and 1 year after the culture change was implemented. A postintervention comparison of the Eden site and the control site revealed significantly lower levels of boredom and helplessness among the Eden nursing home residents (z = -2.6, P = .01 and z = -2.2, P = .03 respectively).

In another study, Robinson and Rosher evaluated the implementation of the Eden Alternative in one nursing home using baseline and 2-year follow-up data from residents, staff, and families. Depression among residents without cognitive impairment decreased from a mean of 4.9 to 2.6 (P < .01) between baseline and the 2-year follow-up; analogous results among residents with cognitive impairment were 8.4 to 6.6 (P < .01). Family satisfaction scores improved significantly during this same period, from 77.1 to 88.8 (P < .001).

Although these studies offer insight into potential benefits of these models in resident care, to the authors’ knowledge no studies of culture change in nursing homes have examined care transitions. It would be useful for future studies to address this research gap. For example, it would be useful to explore the effects of the organizational culture in nursing homes and prescribing practices. Research in this area could improve the safety of prescribing practices in nursing homes and provide insight into care transitions.

Qualitative Research Emphasizing Ethnographic Approaches. Considerable research has examined care transitions. Yet, virtually no research includes residents’ perspectives about care transitions and care preferences. Phenomenological and ethnographic studies, commonly used in health services and nursing research, are lacking. Qualitative research that gives voice to residents can provide in-depth evaluations of transitions of care experiences and yield insight into areas in which improvements can be made. Recent innovations in gerontology education and research, such as approaches in which graduate students reside in long-term care facilities (eg, the Bridge Program), promote in-depth observation and ethnographic studies that may yield new insights in this area.

A study was recently published by Shippee, who participated in the Bridge Program. She lived in a continuing care retirement community for 2 years and examined residents’ perspectives about transitions within the continuing care retirement community. This study highlights the potential for qualitative research to shed new light on residents’ perspectives about nursing home to hospital transitions. Innovative qualitative approaches of residents’ perspectives about care transitions may help develop practice guidelines for long-term care administrators, staff, and family members, and to help inform gerontology and geriatrics education.

CONCLUSION

This review of care transitions from nursing homes to hospitals using the Institute of Medicine framework identified a number of practical implications for health care professionals, geriatrics educators, and researchers. Long-term care in nursing homes exists to fill the gap in the continuum of care between older adults who require acute hospital care and those who may remain in their own homes supported by a system of informal and formal care. Thus, it represents both the merger and a clash of these 2 cultures, medical care and supported independent living. Issues highlighted in this review illustrate this clash. Care for residents based on a medical model often views care in terms of cure and disease management. An increased emphasis on quality of life, autonomy, and resident-centered care may serve to bridge the gap between these 2 cultures. In turn, this culture shift can provide a framework in which the decision to hospitalize focuses less on institutional and medical personnel needs and more on the quality of life of older individuals and the most appropriate setting for their care.

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