

Chapter 11. Reducing Functional Decline in Hospitalized Elderly

Ruth M. Kleinpell, Kathy Fletcher, Bonnie M. Jennings

Background

The elderly, or those older than 65 years, currently represent 12.5 percent of the U.S. population, and are projected to increase to 20 percent of the population by 2030—growing from 35 million to 72 million in number.^{1,2} By 2050, 12 percent of the population, or one in eight Americans, will be 75 years of age or older.³ In 2002, the elderly accounted for 12.7 million (41 percent) of the 31.7 million hospitalizations in the United States,⁴ and these numbers are expected to increase significantly as the population ages. Targeting the care needs of the hospitalized elderly and awareness of risks for illness-related complications are urgent concerns for managing acute health care conditions in this population.⁴

Hospitalization and Patient Safety Considerations for the Elderly

It is estimated that almost half of adults who are hospitalized are 65 years of age or older, although those older than 65 years represent only 12.5 percent of the population. The proportion of hospitalized adults who are elderly is only expected to increase as the population ages.⁴ The average hospital length of stay for patients age 65 and older has decreased to 5.7 days, down from 8.7 days in 1990.³ Shorter lengths of stay heighten the challenge to properly assess and address the care needs of older adults during hospitalization as well as their discharge needs. The focus of assessment and care is generally on resolving the immediate problem that triggered hospitalization; less attention is given to the underlying risk of functional decline and the vulnerability to hospital-associated complications.

A primary focus for improvement in health care is on promoting patient safety and avoiding injuries to patients.⁵ This becomes especially important for hospitalized elders, who are at risk for functional decline due to altered mobility levels as well as iatrogenic risks. For the frail elderly in particular, hazards of hospitalization include falls, delirium, nosocomial infections, adverse drug reactions, and pressure ulcer development.⁶⁻⁸

A dissonance exists between the hospital environment and therapeutic goals for the hospitalized elderly. The hospital environment, a tertiary care setting, has traditionally focused on medically managing illness states, not on improving patient functioning. The environment is designed for the rapid and effective delivery of care—not for enhancing patient function. Hospital redesign to address the care needs of the elderly have been proposed.^{9,10} Consideration of the milieu as well as age-related physiological changes are important aspects of creating a safe hospital environment for the hospitalized elderly.

Age-Associated Changes

A number of known physiological changes occur with aging, including reduced muscle strength and aerobic capacity, vasomotor instability, baroreceptors insensitivity and reduced total body water, reduced bone density, reduced ventilation, and reduced sensory capacity.^{4, 11, 12} Comorbid conditions and chronic illness may heighten these changes. Muscle mass and muscle strength are reduced with aging and contribute to a reduction of physical activity.¹² With aging, alterations in autonomic function, including baroreceptor insensitivity, occurs. Age-associated reduction in body water and plasma volume may predispose the elderly to syncope. Respiratory mechanics are also altered with aging, with reduced ventilation, increased residual capacity, and reduced arterial oxygen tension.¹² Other age-associated changes include reduced bladder capacity and increased urine production, prostate enlargement, bone demineralization, loss of taste and smell, decreased skin integrity, and reduction in sensory input.^{12, 13}

As a result, the elderly are at higher risk for adverse physiological consequences during acute illness, including impairment in functional status. Frailty—a state of musculoskeletal weakness and other secondary, widely distributed losses in structure and function—has been found to be attributed to decreased levels of activity and has been linked to the process of aging.¹⁴ Advanced age, acute and chronic disease and illness, functional limitations, and deconditioning all contribute to the older adult's vulnerability to functional decline during hospitalization. Functional decline—the inability to perform usual activities of daily living due to weakness, reduced muscle strength, and reduced exercise capacity—occurs due to deconditioning and acute illness during hospitalization.¹⁵

Functional Status

Functional status is determined by the ability to perform activities of daily living (ADLs)—eating, dressing, bathing, ambulating, and toileting—and instrumental ADLs (IADLs)—shopping for groceries, meal preparation, housework, laundry, getting to places beyond walking distance, managing medications, managing finances, and using a telephone.⁴ It is estimated that up to 8 percent of community-dwelling elders need assistance with one or more ADLs. Among those age 85 and older, the percentage who live at home but need assistance or who live in a nursing home increases significantly to 56 percent of women and 38 percent of men.⁴ Chronic illness and comorbidities can directly impact functional status in the elderly. Chronic health care conditions that are most prevalent in the elderly include heart disease, hypertension, arthritis, diabetes, and cancer.³ Acute illness due to chronic disease and chronic comorbidities accounts for a significant number of hospitalizations in the elderly.

Functional Decline During Hospitalization

During hospitalization, the elderly patient often experiences reduced mobility and activity levels. Functional decline, including changes in physical status and mobility, has been identified as the leading complication of hospitalization for the elderly.¹⁶ The hazards of bed rest during hospitalization are well established and include immobility, accelerated bone loss, dehydration, malnutrition, delirium, sensory deprivation, isolation, sheering forces on the skin, and incontinence (see Table 1).^{12, 17}

Bed rest results in a reduction of exercise capacity due to several physiologic changes that occur, including reductions in maximal stroke volume, cardiac output, and oxygen uptake.¹⁷ The

muscle fatigue that results is associated with reduced muscle blood flow, red cell volume, capillarization, and oxidative enzymes.¹⁷ Accelerated bone loss can lead to a higher risk for injury to bones and joints, including hips and spine.¹⁸

Table 1. Effects of Bed Rest

System	Effect
Cardiovascular	↓ Stroke volume, ↓ cardiac output, orthostatic hypotension
Respiratory	↓ Respiratory excursion, ↓ oxygen uptake, ↑ potential for atelectasis
Muscles	↓ Muscle strength, ↓ muscle blood flow
Bone	↑ Bone loss, ↓ bone density
GI	Malnutrition, anorexia, constipation
GU	Incontinence
Skin	Shearing force, potential for skin breakdown
Psychological	Social isolation, anxiety, depression, disorientation

Sources: Amella EJ. Presentation of illness in older adults. *Am J Nurs* 2004;104:40-52. Creditor MC. Hazards of hospitalization of the elderly. *Ann Intern Med* 1993;118: 219-23. Convertino VA. Cardiovascular consequences of bed rest: effect on maximal oxygen uptake. *Med Sci Sports Exerc* 1997;29:191-6.

Deconditioning, which results in a decrease in muscle mass and the other physiologic changes related to bed rest, contributes to overall weakness.¹⁹ Functional decline can then occur as a consequence of those physiologic changes and result in inability to perform usual ADLs.¹⁹

Low levels of mobility and bed rest were common occurrences during hospitalization for the elderly.²⁰ Deconditioning and functional decline from baseline was found to occur by day 2 of hospitalization in elderly patients.²¹ Loss of functional independence during hospitalization resulted from not only the effects of acute illness, but also from the inability to maintain function during hospitalization.²² In assessing physical activity of 500 hospitalized elderly patients, those who remained in bed or who had chair activity rarely received physical therapy, had physician orders for exercises, or performed bedside strengthening exercises.²¹ Comparisons of functional assessment at baseline and day 2 of hospitalization in 71 patients over the age of 74 years demonstrated declining ability in mobility, transfer, toileting, feeding, and grooming.²³ Between day 2 and discharge, 67 percent demonstrated no improvement and 10 percent experienced further decline, highlighting the potential for delayed functional recovery in the hospitalized elderly.²³ A followup of 489 hospitalized elders age 70 years and older revealed that the prevalence of lower mobility in hospitalized elderly was significant, with 16 percent experiencing low levels of mobility, 32 percent experiencing intermediate levels of mobility, and 29 percent experiencing a decline in an ADL activity.²⁰ Yet for almost 60 percent of bed-rest episodes, there was no documented medical indication for limiting mobility status.

Preadmission health and functional status of the elderly can indicate risk of further functional decline associated with hospitalization. In examining the baseline functional status of 1,212 hospitalized patients age 70 years and older, the use of ambulation assistive devices, such as canes and walkers, was predictive of functional decline associated with hospitalization.²⁴ Use of a walker was associated with a 2.8 times increased risk for decline in ADL function by the time of hospital discharge ($P = 0.0002$). Moreover, 3 months after discharge, patients who had used an assistive device prior to hospitalization were more likely to have declined in both ADL status ($P = 0.02$) and IADL status ($P = 0.0003$).²⁴ Other risk factors found to be predictive of

functional decline in the elderly during hospitalization included having two or more comorbidities, taking five or more prescription medications, and having had a hospitalization or emergency room visit in the previous 12 months.²⁵

Associations between functional status and other risk factors such as cognitive status must also be considered. Hospital-related complications or inadequate hospital care have been linked to the development of delirium in the hospitalized elderly.²⁶ Impairment in cognitive status was found to be associated with changes in functional status in the hospitalized elderly. A study of 2,557 patients from two teaching hospitals examined the association between level of impaired performance on a cognitive status screen and maintenance and recovery of functioning from admission through 90 days after discharge. Performance on a brief cognitive screen on admission was strongly related to subsequent change in function. Among patients who needed help performing one or more ADLs at the time of admission, 23 percent of patients with moderate to severely impaired cognitive performance, 49 percent of patients with mildly impaired cognitive performance, and 67 percent of patients with little or no impairment in cognitive performance recovered the ability to independently execute an additional ADL by discharge ($P < 0.001$).²² Additional studies identified that prolonged recovery and continued ADL limitations occurred after hospitalization. In following 1,279 patients age 70 years and older after hospital discharge, a study found that 59 percent reported no change in ADL status, 10 percent reported improvement, and 39 percent reported declined ADL status at discharge when compared to preadmission status. At 3 months after discharge, 40 percent reported a new ADL or IADL disability compared with preadmission, reflecting the potential for continued functional decline after hospitalization for acute illness.²⁷

Yet, the loss of functional independence is not an inevitable consequence of hospitalization for the elderly.^{28,29} Evidence exists that targeted interventions can impact the degree of functional independence for hospitalized elders.³⁰

Research Evidence

Targeted measures that have proven beneficial in mitigating functional decline during hospitalization have included comprehensive geriatric assessments to identify patients at risk, structured geriatric care models, dedicated hospital units for acute care of the elderly, and the use of specific resources to enhance care for the hospitalized elder.

Comprehensive Geriatric Assessment

Comprehensive geriatric assessment (CGA) is used to create a plan of care for hospitalized elders. A specific goal of the CGA is early identification of elder care needs in order to provide interventions to minimize high-risk events such as falls or the onset of delirium.³¹

A CGA should include assessment of ADL and IADL performance as well as assessment of cognition, vision and hearing, social support, and psychological well-being.¹⁹ A number of geriatric assessment tools can be used to make initial and ongoing evaluations of hospitalized elders. Commonly used tools include the Katz Index of Independence in Activities of Daily Living,³² the Lawton Instrumental Activities of Daily Living Scale,³³ and the Hospital Admission Risk Profile (HARP), among others (see Table 2).

Table 2. Commonly Used Geriatric Assessment Measures*

Instrument	Areas of Assessment	Reference
SPICES	Sleep, problems with eating or feeding, incontinence, confusion, evidence of falls, skin breakdown	Fulmer 1991 ⁵⁹ Wallace 1998 ⁶⁶
Geriatric Institutional Assessment Profile	Hospital staff knowledge of geriatric care principles, organizational environment	Abraham 1999 ⁴¹
Hospital Admission Risk Profile (HARP)	ADL, IADL, cognitive status	Sager 1996 ³⁴
Lawton Instrumental Activities Daily Living Scale	IADL activities: medication management, housekeeping, food preparation, transportation, shopping, managing finances, laundry	Lawton 1969 ³³
Functional Independence Measure (FIM)	Functional status in 7 areas: self-care, locomotion, communication, social cognition, cooperation, problem-solving, sphincter control	Kidd 1995 ⁶⁷ Keith 1987 ⁶⁸
Timed UP and Go Test	Mobility, balance, gait, transfer ability, walking	Podsiadlo 1991 ⁶⁹
2 Minute Walk Test	Exercise tolerance and exercise capacity	Brooks 2001 ⁷⁰

* For additional geriatric assessment resources, the Try This series can be found at www.hartfordign.org/resources/education/tryThis.html.

As part of CGA, baseline admission assessments have proved beneficial in identifying patients at risk for functional decline during hospitalizations. The HARP was used in one study to assess preadmission risk factors among more than 800 patients age 70 years and older who were hospitalized for acute medical illness.³⁴ The HARP includes assessment of ADL status, IADL status, and cognitive status. Researchers found that three factors independently predict functional decline: increasing age, lower admission cognitive status, and lower preadmission IADL function. Patients at low risk of functional decline were more likely to recover ADL function and avoid nursing home placement at 3 months after discharge.

Another functional status instrument that can be used to assess baseline activity and functional levels is the Mobility Classification Tool, described by Callen and colleagues.³⁵ The tool may prove useful for nurses to assess, quantify, and communicate baseline levels and changes in mobility. Baseline assessments can provide useful information for structuring care during hospitalization and establishing goals for the care.

Aside from the use of formal assessment instruments that measure ADL and IADL function, a general idea of functional status can be ascertained by assessing mobility and activity performance during hospitalization. The frequency of hallway ambulation in hospitalized elders was examined in an observational study of 118 patients age 55 years and older in a single setting.³⁶ While all patients were considered by their primary nurse as able to walk the hallways,

72.9 percent did not walk at all per 3-hour period of observation, 18.6 percent walked once, 5.1 percent twice, and only 3.4 percent walked more than twice.³⁵ The median time of ambulation was 5.5 minutes. Of the 32 patients who walked in the hallways, 46.8 percent (n = 15) did so alone, 41 percent (n = 13) walked with a therapist, 41 percent (n = 13) walked with a member of the nursing staff, and 18.8 percent (n = 6) walked with a family member.

Based on the results of the CGA, functional problems or potential problems are identified and specific interventions can be implemented to promote functional ability in hospitalized elders. A number of interventions, including structured exercise, progressive resistance strength training, and walking programs, have been implemented to target elder care functioning during hospitalization.^{35, 37, 38} A randomized control trial of a hospital-based general exercise program with 300 hospitalized elders that was started during hospitalization and continued for 1 month after discharge did not affect length of stay, but did demonstrate better IADL function at 1 month after discharge.³⁸ Measures to improve endurance—including exercise to enhance orthostatic stability, daily endurance exercise to maintain aerobic capacity, or specific resistance exercises to maintain musculoskeletal integrity^{17, 39, 40}—need further study on their impact in reducing functional decline in hospitalized elders. As hospital-based exercise programs require coordination and focused implementation plans, strategies for adopting them need to recognize the shortened length of hospital stay and the effects of acute illness on the patients' ability to participate.

In addition to utilizing tools to assess the elderly hospitalized patient, assessments of the hospital culture for providing elder care can also be beneficial. The Geriatric Institutional Assessment Profile was specifically developed to assess hospital workers' knowledge, attitudes, and perceptions of caring for elders, as well as the adequacy of the institutional environment to meet hospitalized elders' needs.⁴¹ It is recommended to help identify both the strengths in elder care and the opportunities for improvement.⁴²

Structured Geriatric Care Models

For more than 20 years, the concept of hospital-based geriatric assessment and interdisciplinary team care to improve outcomes for hospitalized elders has been implemented in various models. Early studies on the use of geriatric evaluation and geriatric evaluation units demonstrated an impact on reducing disability and nursing home placement.^{43–45} Several hospital-based geriatric resource models of care have also demonstrated benefits in promoting evidence-based care for hospitalized elders, including the use of geriatric interdisciplinary team training⁴⁶ and the use of a geriatric resource nurse.⁴⁷ National programs for geriatric interdisciplinary team training were created in 1997 to enhance the knowledge of caring for elders among a variety of health professions. While evaluation data have demonstrated improvement of geriatric interdisciplinary team trainees, most notably in attitudinal measures,⁴⁶ further study on the impact on geriatric care planning is needed.

Several focused models of care designed to prevent functional decline of the hospitalized elderly have demonstrated significant results. The Hospital Elderly Life Program, a structured screening program for hospitalized patients age 70 years and older, concentrates on admission screening of six risk factors: cognitive impairment, sleep deprivation, immobility, dehydration, vision loss, and hearing impairment.¹⁶ More than 1,500 patients were screened, and targeted interventions based on the presence of admission risk factors were instituted. Patients were followed by an interdisciplinary team that included a geriatric nurse specialist, Elderly Life specialists, and geriatricians who worked in conjunction with the patient's primary care nurse to

formulate an individualized plan of care. Use of the program demonstrated significant results: only 14 percent of patients had a decline on ADL scores, compared to a decline in 33 percent of the control group.

Acute Care for Elderly (ACE) units. Models of care incorporate a variety of interventions to promote positive outcomes for the hospitalized elderly. Specific programs have also been tested on specialized units within the hospital setting. These units, termed Acute Care for the Elderly (ACE units), provide dedicated care to the hospitalized elderly.

Originating in the early 1990s, the ACE unit concept has been adopted by organizations as a strategy to provide care to elderly patients during hospitalization.⁴⁸⁻⁴⁹ ACE units promote a focused model of care that integrates geriatric assessment into medical and nursing care of patients in an interdisciplinary environment.⁵⁰ The focus is to provide expert care while simultaneously keeping patients mobile and preventing the loss of normal daily routines.⁴⁹ ACE units include specially designed environmental changes to promote activity such as ambulation in hallways, exercise facilities, and social gathering areas.⁵¹ Multidisciplinary teams composed of geriatric physicians; nurses; dietician; social worker; pharmacist; and occupational, speech, and physical therapists regularly discuss the plan of care for each patient.⁴⁹ Major components of the ACE unit concept include patient-centered nursing care (daily assessment of functional needs by nursing, nursing-based protocols to improve outcomes, daily rounds by a multidisciplinary team), a prepared environment, planning for discharge, and medical care review.^{10, 52}

Another model, designed to improve functional outcomes of acutely ill hospitalized elders, was tested in a randomized control trial with 1,794 patients 70 years of age and older in one unit of a hospital. A number of interventions were implemented under the direction of the primary nurse, including baseline and ongoing assessment of risk factors; following protocols to improve self-care, continence, nutrition, mobility, sleep, skin care, and cognition; conducting daily rounds with a multidisciplinary team; and environmental enhancements such as handrails, uncluttered hallways, large clocks and calendars, elevated toilet seats, and door levers.²⁹ Results indicated that 21 percent of intervention patients were classified as *much better* in ADL activity abilities, 13 percent as *better*, 50 percent as *unchanged*, 22 percent as *worse*, and 9 percent as *much worse*. In the control group, 13 percent were classified as *much better*, 11 percent as *better*, 54 percent as *unchanged*, 13 percent as *worse*, and 8 percent as *much worse* ($P = 0.0009$). While the program interventions improved functional status in a significant percentage of the patients, the majority of the patients in both the intervention and control groups were unchanged or worse at the time of discharge. At 3 months after discharge, the groups did not differ significantly in terms of ADL or IADL abilities.²⁹ The results of this study suggested that while targeted interventions can improve functional independence in the hospitalized elderly, some patients will continue to experience functional decline, despite focused interventions.

Research comparing ACE units and standard medical care units has demonstrated positive outcomes, with improvements in ADL function and fewer transfers to nursing home settings after discharge.²⁹ A randomized controlled study of 1,531 elders age 70 years and older demonstrated that use of an ACE unit improved processes of care and promoted patient and provider satisfaction without increasing hospital length of stay or costs.⁵¹ Additional study on the cost effectiveness of ACE units has demonstrated significant reductions in average length of stay (0.8 day) and a cost savings of \$1,490 compared to control patients on two medical-surgical units, a savings that translated to \$1.3 million in 9 months⁴⁸ as well as no increase in hospital costs.⁵³

The NICHE model. An additional model focusing on improving hospital care for the elderly, the Nurses Improving Care of Health System Elders (NICHE) project, was initiated in the early

1990s. The project is a national program focused on promoting evidenced-based care for elders.^{42, 54} Resources include best practice protocols, educational materials, nursing care models to replicate, and assessment tools. A unique series of online assessment tools, Try This, is available at www.hartfordign.org/resources/education/tryThis.html. Assessments of the NICHE program indicate that fewer patients were acutely confused at discharge,⁵⁵ restraint use was reduced by more than 60 percent, serious injuries related to falls were reduced by 30 percent, there were beginning signs of reduction in the incidence of aspiration pneumonia and urinary tract infection, and patient mobility equipment was standardized.⁵⁶ Outcome reports from implementation of NICHE also included increased nursing knowledge of geriatric care, decreased length of stay, and reduced costs.^{42, 56–58} The NICHE model of care is currently a voluntary program, and while additional outcomes-based research is needed, implementation of the program components by all hospital settings would facilitate best practices for elder care.

The geriatric resource nurse model is the most widely used NICHE model. In the geriatric resource nurse model, unit-based nurses acquire competency in elder care and improve care by modeling best practices and providing consultation for elder care.^{42, 56, 57} Implementation reports highlight anecdotal evidence of benefit, but researched-based outcome evaluations is limited. One study of 173 hospitalized elders demonstrated improvements in outcome measures, including functional and cognitive status from admission to discharge when managed by the geriatric resource nurse model; however, a comparison of a subset of the intervention patients and a control group of patients revealed no differences in patient outcomes.³⁰ Further research on this model of care for hospitalized elders is required.

Other Measures to Enhance Care for the Hospitalized Elder

Additional resources to promote hospital-based elder care that are evidence based include nursing staff education to enhance geriatric assessment and care, promotion of nursing certification in geriatric care, and promotion of family participation in caring for hospitalized elders.^{59–62} Other focused interventions—including geriatric consultation on specific units, comprehensive discharge planning, and nutritional support—have had beneficial effects on clinical outcomes of hospitalization of the elderly.^{63, 64} Ongoing initiatives that have the potential for impacting the care of hospitalized elders include strategies for enhancing geriatric content in nursing school curriculum, advanced practice nurse training in geriatric care, centers of geriatric nursing excellence, and geriatric nursing scholar work. Yet, much remains to be learned about not only the causes of functional decline during hospitalization for the elderly, but also the best approaches for comprehensively modifying the hospital care environment to promote best outcomes. As nurse staffing levels have been demonstrated to impact the quality of hospital care,⁶⁵ exploration of innovative models of nurse staffing to enhance care for the hospitalized elderly is also needed. In addition, there is limited research on hospital designs to improve functioning for hospitalized elders. Hallway walking is not always encouraged, and hospital hallways are often designed for transport of supplies, equipment, staff, and patients. The effect of environmental designs to enhance functioning of hospital elders, such as designated walking tracts on nursing units with shock-absorbing flooring and railings solely for patient use, require further exploration.

Table 3. Summary of Key Points Based on Research Evidence

- Functional status or the ability to perform self-care and physical needs activities is an important component of independence for the elderly. Maintaining function is central to fostering health and independence in the hospitalized elderly.
- The hospitalized elderly are at risk for decreased mobility and functional decline.
- Hospitalization has been shown to be associated with low mobility and functional disability.
- Comprehensive initial and ongoing geriatric assessments assist in identifying the older adult at risk for decline, enabling timely and targeted implementation strategies.
- Targeting risk factors—cognitive impairment, prehospitalization functional impairment, and low social activity level—that can contribute to functional decline during hospitalization can promote better outcomes for elders.
- Encouraging activity during hospitalization can help to prevent functional decline. Interventions such as structured exercise, progressive resistance strength training, and walking programs have been implemented to target elder care functioning during hospitalization.
- Redesign of the environment and processes of hospital care can improve the quality of the care delivered to the hospitalized elderly.
- Key elements and features of successful intervention programs targeting functional outcomes in the hospitalized elderly include
 - Baseline and ongoing assessment of risk factors
 - Protocols aimed at improving self-care, continence, nutrition, mobility, sleep, skin care, and cognition
 - Daily rounds with a multidisciplinary team
 - Protocols to minimize adverse effects of selected procedures (e.g., urinary catheterization) and medications (e.g., sedative-hypnotic agents) and limit the use of mobility restrictors (lines, tubes, and restraints)
 - Environmental enhancements, including handrails, uncluttered hallways, large clocks and calendars, elevated toilet seats, and door levers
 - Encouraging mobilization during hospitalization
- Specialty geriatric nursing care can positively impact elder care in the hospital setting.
- The potential for delayed functional recovery should be considered in discharge planning for hospitalized elders.

Evidence-Based Practice Implications

Table 4 outlines several evidence-based strategies for care of the hospitalized elder. A number of evidence-based practice guidelines that pertain to hospitalized elder care can be used to structure care to promote best practices in a variety of areas, including pain management, strategies for assessing and treating delirium, fall prevention for older adults, prevention of pressure ulcers, and changing the practice of physical restraint use in acute care. The guidelines can be found at www.guideline.gov.

Table 4. Evidence-Based Strategies for Care of the Hospitalized Elder.

A number of important considerations for addressing potential risks for the hospitalized elder are outlined in Table 5.

Table 5. Practice Implications to Avert Potential Risks

Potential Risks for the Hospitalized Elderly	Practice Implication
1. Decreased mobility and functional decline	Conduct comprehensive initial and ongoing geriatric assessment to formulate targeted strategies to enhance mobility levels and functional status, such as structured exercise, progressive resistance strength training, and walking programs.
2. Adverse effects of immobility and bed rest	Incorporate the use of practice guidelines to address potential adverse effects, including prevention of skin breakdown, fall prevention, treating delirium, prevention of pressure ulcers, and management of urinary incontinence.
3. Altered nutrition or dehydration	Incorporate the use of practice guidelines to enhance nutritional status and hydration during acute illness.
4. Impaired sleep and rest	Integrate established protocols aimed at improving sleep and rest during hospitalization.
5. Alterations in self-care	Promote participation in activities of daily living; promote normal daily routine activities.
6. Cognitive alterations	Conduct ongoing assessment of cognitive status changes and implementation of measures to address confusion and delirium.

Potential Risks for the Hospitalized Elderly	Practice Implication
7. Complications of acute illness (e.g., infection, aspiration, pneumonia)	Use multidisciplinary care models to address management of acute illness and implementation of prevention measures.

Research Implications

To improve the quality and safety of care for hospitalized elderly patients, the following questions deserve further investigation:

- What interventions are the most effective in enhancing functional status in the hospitalized elderly?
- What is the impact of single-site successful models of care in multiple hospital care settings?
- What is the cost effectiveness of intervention programs aimed at targeting functional decline in the hospitalized elderly?

Future research on reducing functional decline in the hospitalized elderly should target the following significant gaps in research:

- Additional research on the impact of models of care for the hospitalized elderly (including NICHE) is needed to build evidence-based practice recommendations. Most of the existing “evidence” comes from small randomized studies, nonrandomized studies, case studies, and expert opinion.
- Hospital design outcomes research is warranted to further evaluate the impact of redesign interventions in enhancing outcomes for hospitalized elders.
- Most research on interventions targeting functional status during hospitalization of the elderly was conducted at single-site locations. Therefore, it is not clear if the findings can be generalized to other settings. Additional research is needed that focuses on multidisciplinary interventions with larger sample sizes and in multicenter, randomized clinical studies.
- A conceptual model for targeting functional decline in the hospitalized elderly is needed. Factors to be considered include the fact that the elderly are a heterogeneous group—some are frail upon admission and others are robust. The hospitalized elderly come to the hospital with different comorbidities and reasons for admission. Polypharmacy in the elderly needs to also be considered. In addition, the tertiary care environment is not a living environment, creating a dissonance between the goals of restorative care and environmental function.
- While structured models of care focusing on assessment, physical therapy, ADL protocol use, and multidisciplinary team care have demonstrated significant benefits on independence for hospitalized elders, relatively simple interventions such as hallway walking, communal dining, and group therapy need to be further examined.
- Nursing-focused interventions aimed at promoting functional independence for hospitalized elders need further exploration in formal research studies.

Conclusion

This chapter has presented an overview of research and evidence-based practices for elderly care during hospitalization to prevent functional decline. A number of other chapters in this book further address related areas, such as averting patient falls, preventing pressure ulcers, symptom management, and other aspects of care for the hospitalized elder. Continued research and dissemination of best practices will lead to additional strategies that nurses can use to improve the quality of health care and outcomes for hospitalized elders. Assessment of function and targeting interventions during hospitalization are critically important to acute care of older adults.⁷¹ The impact of functional decline on resource utilization and health care costs may further reinforce the need to assess and intervene to prevent functional decline.⁷² Additional research on factors influencing functional decline will also provide information for nurses to present to administrators to develop programs to identify and mitigate functional decline in the hospitalized elderly.

Acknowledgments

The authors would like to acknowledge Mary H. Palmer, Ph.D., R.N.C., F.A.A.N., Helen W. & Thomas L. Umphlet Distinguished Professor in Aging, University of North Carolina at Chapel Hill, and Eileen M. Sullivan-Marx, Ph.D., C.R.N.P., F.A.A.N., associate professor, associate dean for Practice & Community Affairs, and Shearer Endowed Term Chair for Healthy Community Practices, University of Pennsylvania School of Nursing, for their review and suggestions for editing of the chapter.

Author Affiliations

Ruth M. Kleinpell, Ph.D., R.N., F.A.A.N., Rush University College of Nursing, Chicago, Illinois; e-mail: Ruth_M_Kleinpell@rush.edu.

Kathy Fletcher, R.N., G.N.P., A.P.R.N.-B.C., F.A.A.N., University of Virginia Health System, Charlottesville, Virginia; e-mail: krf8d@virginia.edu.

Bonnie M. Jennings, D.N.Sc., R.N., F.A.A.N., Colonel, U.S. Army (Retired), and health care consultant; e-mail: bmjennings@cox.net.

References

1. He W, Sengupta M, Velkoff VA, et al. 65+ in the United States: Current population report. U.S. Census Bureau. Washington, DC: U.S. Government Printing Office; 2005.
2. Federal Interagency Forum on Aging-Related Statistics. Older Americans 2004: Key indicators of well-being. Federal Interagency Forum on Aging-Related Statistics. Washington, DC: U.S. Government Printing Office; November 2004.
3. National Center for Health Statistics. Health United States 2005. Hyattsville MD: Author; 2005.
4. Merck Manual of Geriatrics. <http://www.merck.com/mrkshared/mmg/home.jsp>. Accessed September 20, 2006.
5. Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington, DC: National Academies Press; 2001.
6. Gillick MR, Serrell NA, Gillick LS. Adverse consequences of hospitalization in the elderly. *Soc Sci Med* 1982;16:1033-8.
7. Lang NM, Kraegel JM, Rantz MJ, et al. (1990). Quality of health care for older people in America. Washington, DC: American Nurses Association.
8. National Patient Safety Foundation (2006). Agenda for research and development in patient safety. <http://www.npsf.org/download/researchagenda.pdf>. Accessed August 15, 2006.
9. Ferguson-Pare M, Bourett E, Bernick L, et al. Best practices in the care of the elderly persons in the hospital. *Healthc Q* 2000;3:30-7.
10. Landefeld CS. Improving health care for older persons. *Ann Intern Med* 2003;139:421-4.
11. Amella EJ. Presentation of illness in older adults. *Am J Nurs* 2004;104:40-52.
12. Creditor MC. Hazards of hospitalization of the elderly. *Ann Intern Med* 1993;118:219-23.
13. Palmer MH. Physiologic and psychologic age-related changes that affect urologic clients. *Urol Nurs* 2004;24(4):247-52.
14. Bortz WM. A conceptual framework of frailty: a review. *J Gerontol* 2002;57: M283-8.
15. Wu H, Sahadaven S, Ding YY. Factors associated with functional decline of hospitalized older persons following discharge from an acute geriatric unit. *Ann Acad Med Singapore* 2006;35:17-23.
16. Inouye SK, Bogardus ST, Baker DI, et al. The hospital elder life program: a model of care to prevent cognitive and functional decline in older hospitalized patients. *J Am Geriatr Soc* 2000;48;12:1697-706.
17. Convertino VA. Cardiovascular consequences of bed rest: effect on maximal oxygen uptake. *Med Sci Sports Exerc* 1997;29:191-6.
18. U.S. Department of Health and Human Services. The Surgeon General's report on bone health and osteoporosis. Washington, DC: U.S. Department of Health and Human Services, Office of the Surgeon General; 2004.
19. Graf C. Functional decline in hospitalized older adults. *Am J Nurs* 2006;106:58-67.
20. Brown CJ, Friedkin RJ, Inouye SK. Prevalence and outcomes of low mobility in hospitalized older patients. *J Am Geriatr Soc*;2004;52:1263-1270.
21. Hirsch CH, Sommers L, Olsen A, et al. The natural history of functional morbidity in hospitalized older patients. *J Am Geriatr Soc* 1990;38:1296-303.
22. Narain P, Rubenstein LZ, Wieland GD, et al. Predictors of immediate and 6-month outcomes in hospitalized elderly patients. *J Am Geriatr Soc* 1988;36: 775-83.
23. Sands LP, Yaffe K, Covinsky K. Cognitive screening predicts magnitude of functional recovery from admission to 3 months after discharge in hospitalized elders. *J Gerontol A Biol Sci Med Sci* 2003 Jan; 58:37-45.
24. Shelton P, Sager MA, Schraeder C. The community assessment risk screen (CARS): identifying elderly persons at risk for hospitalization or emergency department visit. *Am J Manag Care* 2000;6:925-33.
25. Mahoney JE, Sager MA, Jalaluddin M. Use of an ambulation assistive device predicts functional decline associated with hospitalization. *J Gerontol A Biol Sci Med Sci* 1999;54:M83-8.
26. Inouye S, Schlesinger M, Lydon T. Delirium: a symptom of how hospital care is failing older persons and a window to improve quality of hospital care. *Am J Med* 1999;106: 565-73.

27. Sager MA, Franke T, Inouye SK, et al. Functional outcomes of acute medical illness and hospitalization in older persons. *Arch Intern Med* 1996;156:645-52.
28. Sager MA, Rudberg MA. Functional decline associated with hospitalization for acute illness. *Clin Geriatr Med* 1998;14:669-79.
29. Landefeld CS, Palmer RM, Kresevic DM, et al. A randomized trial of care in a hospital medical unit especially designed to improve the functional outcomes of acutely ill older patients. *N Engl J Med* 1995;332:1338-44.
30. Fitzpatrick JJ, Stier L, Eichorn A, et al. Hospitalized elders: changes in functional and mental status. *Outcomes Manag* 2004;8:52-6.
31. Scanlan BC. The value of comprehensive geriatric assessment. *Care Manag J* 2005;6:2-8.
32. Katz S, Downs TD, Cash HR, et al. Progress in development of the index of ADL. *Gerontologist* 1970;10:20-30.
33. Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. *Gerontologist* 1969;9:179-86.
34. Sager MA, Rudberg MA, Jalaluddin M, et al. Hospital admission risk profile (HARP): identifying older patients at risk for functional decline following acute medical illness and hospitalization. *J Am Geriatr Soc*. 1996;44:251-7.
35. Callen BL, Wells TJ, Hughes S, et al. Admission and discharge mobility of frail hospitalized older adults. *Medsurg Nurs* 2004;13(3):156-64.
36. Callen BL, Mahoney JE, Grieves CB, et al. Frequency of hallway ambulation by hospitalized older adults on medical units of an academic hospital. *Geriatr Nurs*. 2004; 25(4):212-7.
37. Latham N, Anderson C, Bennett D, et al. Progressive resistance strength training for physical disability in older people. *Cochrane Database Syst Rev* 2003;2:CD002759.
38. Siebens H, Aronow H, Edwards D, et al. A randomized controlled trial of exercise to improve outcomes of acute hospitalization in older adults. *J Am Geriatr Soc* 2000;48:1545-52.
39. Mallery LH, et al. The feasibility of performing resistance exercise with acutely ill hospitalized older adults. *BMC Geriatr* 2003;3:3.
40. Tucker D, Molsberger SC, Clark A. Walking for wellness: a collaborative program to maintain mobility in hospitalized older adults. *Geriatr Nurs* 2004;25:242-5.
41. Abraham IL, Bottrell MM, Dash KR, et al. Profiling care and benchmarking best practice in care of hospitalized elderly: the Geriatric Institutional Assessment Profile. *Nurs Clin North Am*. 1999;34:237-55.
42. Mezey M, Kobayashi M, Grossman S, et al. nurses improving care to health system elders (NICHE): implementation of best practice models. *J Nurs Adm* 2004;34:451-7.
43. Rubenstein LZ, Josephson KR, Wieland GD, et al. Effectiveness of a geriatric evaluation unit. A randomized clinical trial. *N Engl J Med*. 1984;311:1664-70.
44. Reuben DB, Borok GM, Wolde-Tsadiq G, et al. A randomized trial of comprehensive geriatric assessment in the care of hospitalized patients. *N Engl J Med* 1995;332:1345-50.
45. Stuck AE, Siu AL, Wieland GD, et al. Comprehensive geriatric assessment: a meta-analysis of controlled trials. *Lancet*. 1993;342:1032-6.
46. Fulmer T, Hyer K, Flaherty E, et al. Geriatric interdisciplinary team training program: evaluation results. *J Aging Health*. 2005;17:443-70.
47. Lopez M, Delmore B, Ake JM, et al. Implementing a geriatric resource nurse model. *J Nurs Adm*. 2002;32:577-85.
48. Haugh R. ACE units take a wholistic, team approach to meet the needs of an aging America. A fresh model for gerontology. *Hosp Health Netw* 2004;78:52-6.
49. Jayadevappa R, Bloom BS, Raziano DB, et al. Dissemination and characteristics of acute care for elders (ACE) units in the United States. *Int J Technol Assess Health Care* 2003;19:220-7.
50. Palmer RM, Landefeld CS, Kresevic D, et al. A medical unit for the acute care of the elderly. *J Am Geriatr Soc*. 1994;42:545-52.
51. Counsell SR, Holder CM, Liebenauer LL, et al. Effects of a multicomponent intervention on functional outcomes and process of care in hospitalized older patients: a randomized controlled trial of Acute Care for Elders (ACE) in a community hospital. *J Am Geriatr Soc* 2000;48:1572-81.

52. Covinsky KE, Palmer RM, Kresevic DM, et al. Improving functional outcomes in older patients: lessons from an acute care for elders unit. *Jt Comm J Qual Improv* 1998;24:63-76.
53. McCormack B. An acute care unit for elderly medical patients did not increase hospital costs. *Evid Based Nurs* 1998;1:26.
54. Fulmer T, Mezey M, Bottrell M, et al. Nurses improving care for healthsystem elders (NICHE): using outcomes and benchmarks for evidenced-based practice. *Geriatric Nurs* 2002;23:121-7.
55. Guthrie PF, Edinger S, Schumaker S. TWICE: a niche program at North Memorial Health Care. Nurses improving care for healthsystem elders. *Geriatric Nurs* 2002;23:133-9.
56. Swauger K, Tomlin C. Best care for the elderly at Forsyth Medical Center. *Geriatric Nurs* 2002;23:145-50.
57. Lee VK, Fletcher KR. Sustaining the geriatric resource nurse model at the university of Virginia. *Geriatric Nurs* 2002;23:128-32.
58. Pfaff J. The geriatric resource nurse model: a culture change. *Geriatric Nurs* 2002;23:140-4.
59. Fulmer TT. The geriatric nurse specialist role: a new model. *Nurs Manage* 1991;22:91-3.
60. Li H, Melnyk BM, McCann R, et al. Creating avenues for relative empowerment (CARE): a pilot test of an intervention to improve outcomes of hospitalized elders and family caregivers. *Res Nurs Health* 2003;26:284-99.
61. Li H. Family caregivers' preferences in caring for their hospitalized elderly relatives. *Geriatric Nurs* 2002; 23(4):204-7.
62. Lee V, Fletcher K, Westley C, et al. Competent to care: strategies to assist staff in caring for elders. *MedSurg Nurs* 2004;13:281-9.
63. Naylor MD, Brooten D, Campbell R, et al. Comprehensive discharge planning and home follow up of hospitalized elders: a randomized clinical trial. *JAMA*. 1999;281:613-20.
64. Palmer RM, Counsell S, Landefeld CS. Clinical intervention trials: the ACE unit. *Clin Geriatr Med* 1998;14:831-49.
65. Needleman J, Buerhaus P, Mattke S, Nurse-staffing levels and the quality of care in hospitals. *N Engl J Med* 2002;346, 1715-22.
66. Wallace M, Fulmer T, Fulmer SPICES. An overall assessment tool of older adults *J Gerontol Nurs* 1998;24:3.
67. Kidd D, Stewart G, Baldry J, et al. The functional independence measure: a comparative validity and reliability study. *Disabil Rehabil* 1995;17:10-4.
68. Keith RA, Granger CV, Hamilton BB, et al. The Functional Independence Measure: a new tool for rehabilitation, *Adv Clin Rehabil* 1987;1:6-18.
69. Podsiadlo D, Richardson S. The timed "Up & Go" a test of basic functional mobility for frail elderly persons. *J Am Geriatr Soc* 1991;39:142-8.
70. Brooks D, Parsons J, Hunter JP, et al. The 2-minute walk test as a measure of function in persons with lower limb amputation. *Arch Phys Med Rehabil* 2001;82:1478-83.
71. National Guideline Clearinghouse. Assessment of function of critical importance to acute care of older adults. 2003. http://www.guidelines.gov/summary/summary.aspx?doc_id=3504&nbr=002730&string=hospitalized+AND+elderly. Accessed August 5, 2006.
72. Murray MD, Wells, TJ, Callen BL. Hospital resource utilization and functional decline of geriatric patients. *Nurs Econ* 2003; 21(3):114-9.