

# Regardless of Age: Incorporating Principles from Geriatric Medicine to Improve Care Transitions for Patients with Complex Needs

Alicia I. Arbaje, MD, MPH<sup>1</sup>, Devan L. Kansagara, MD, MCR, FACP<sup>2</sup>,  
Amanda H. Salanitro, MD, MS, MSPH<sup>3</sup>, Honora L. Englander, MD<sup>4</sup>, Sunil Kripalani, MD, MSc<sup>5</sup>,  
Stephen F. Jencks, MD, MPH<sup>6</sup>, and Lee A. Lindquist, MD, MBA<sup>7</sup>

<sup>1</sup>Division of Geriatric Medicine and Gerontology, Department of Medicine, Johns Hopkins University, Baltimore, MD, USA; <sup>2</sup>Section of General Internal Medicine, Portland VA Medical Center, Oregon Health and Science University, Portland, OR, USA; <sup>3</sup>Vanderbilt University School of Medicine, Nashville, TN, USA; <sup>4</sup>Division of Hospital Medicine, Oregon Health and Science University, Portland, OR, USA; <sup>5</sup>Section of Hospital Medicine, Division of General Internal Medicine and Public Health, Vanderbilt University School of Medicine, Nashville, TN, USA; <sup>6</sup>Consultant in Healthcare Safety and Quality, Baltimore, MD, USA; <sup>7</sup>Section of General Internal Medicine and Geriatrics, Department of Medicine, Northwestern University Feinberg School of Medicine, Chicago, IL, USA.

With its focus on holistic approaches to patient care, caregiver support, and delivery system redesign, geriatrics has advanced our understanding of optimal care during transitions. This article provides a framework for incorporating geriatrics principles into care transition activities by discussing the following elements: (1) identifying factors that make transitions more complex, (2) engaging care “receivers” and tailoring home care to meet patient needs, (3) building “recovery plans” into transitional care, (4) predicting and avoiding preventable readmissions, and (5) adopting a palliative approach, when appropriate, that optimizes patient and family goals of care. The article concludes with a discussion of practical aspects of designing, implementing, and evaluating care transitions programs for those with complex care needs, as well as implications for public policy.

**KEY WORDS:** care transitions; geriatrics; utilization; healthcare delivery; vulnerable populations.

J Gen Intern Med 29(6):932–9

DOI: 10.1007/s11606-013-2729-1

© Society of General Internal Medicine 2014

Lessons learned from the specific transitions mentioned in this article can be broadened to other transitions. This article will primarily discuss examples of care transitions from the hospital to the community (e.g., home, skilled nursing facility, home health care) because much of the research in the field has been done on these transitions, and the Centers for Medicare and Medicaid Services (CMS) are working towards improving care during hospital to community transitions. This article provides a framework for incorporating geriatrics principles into care transition activities by discussing the following elements: (1) identifying factors that make transitions more complex, (2) engaging care “receivers” and tailoring home care to meet patient needs, (3) building “recovery plans” into transitional care, (4) predicting and avoiding preventable readmissions, and (5) adopting a palliative approach, when appropriate, that optimizes patient and family goals of care. The article concludes with a discussion of practical aspects of designing, implementing, and evaluating care transitions programs for those with complex care needs, as well as implications for public policy.

## INTRODUCTION

Geriatrics is the arm of medicine dedicated to treating the aging patient. With its focus on holistic approaches to patient care, caregiver support, and delivery system redesign, geriatrics has advanced our understanding of optimal care during transitions. Older adults experience many transitions across healthcare settings. Models of care for geriatric populations can provide insight into how to provide optimal transitional care for those with complex needs, regardless of age. Such populations include those with developmental disabilities, traumatic brain injuries, end-stage renal disease, or malignancies.

## THE CHALLENGE OF ENSURING OPTIMAL CARE DURING TRANSITIONS

Older adults’ care transition patterns are heterogeneous and complicated.<sup>1</sup> Almost one-fifth of seniors are re-hospitalized within 30 days of hospital discharge, costing Medicare \$17.4 billion yearly.<sup>2</sup> Nationwide, approximately 22 % of older adults experience a transition annually. Half of those transitions involve going to and from a hospital setting from either a skilled nursing facility or home, but the other half often involve complicated trajectories across different settings. Those with dementia experience an increased

number of transitions through acute and post-acute care settings.<sup>3</sup>

Care transitions have become a target for reform efforts; yet, our current understanding of how to optimize care transitions remains incomplete. Most improvement efforts have focused on the hospital discharge process and the immediate post-discharge period. These efforts often include the creation of a “navigator,” “transition coach,” or other role to provide continuity of care. Numerous interventions to improve care transitions have been developed. Yet, to date, no single intervention has reliably reduced 30-day readmission rates.<sup>4</sup> Interventions are often disease-specific,<sup>5-8</sup> require substantial financial investments in training allied healthcare professionals,<sup>6,9,10</sup> or focus primarily on hospital-based discharge planning with mixed results.<sup>4,11-13</sup> Additionally, interventions are often multifaceted, and it is difficult to identify which elements drive improvements in patient outcomes.<sup>14</sup> Besides older adults, there are also other populations with complex needs that may benefit from an approach to improve their care transitions.<sup>15</sup>

### IDENTIFYING FACTORS THAT MAKE TRANSITIONS MORE COMPLEX

Several factors characterize complex transitions from the hospital to the community. Figure 1 demonstrates a conceptual model adapted from previous work<sup>16</sup> that incorporates factors affecting implementation of the post-discharge plan of care. These factors encompass domains at

the healthcare system level, provider level, and patient level. For example, lack of care integration within a healthcare system can lead to suboptimal communication across settings. At the provider level, unclear roles during care transitions can lead to suboptimal execution of care processes. Finally, factors inherent to the patient and their post-discharge environment can affect implementation of the care plan. Examples of these are listed in Fig. 2. Many patients with complex needs have cognitive impairment, functional impairments, and limited health literacy.<sup>17</sup> When discharged from a hospital, these patients encounter frequent medication changes, complex multi-step instructions, and numerous details about follow-up appointments.<sup>18</sup> Following hospitalization, they encounter high rates of further functional decline, cognitive changes, adverse drug reactions, pressure ulcers, bowel and bladder dysfunction, malnutrition, and dehydration.<sup>19-21</sup>

Specifically relating to the patient and their post-discharge environment, solutions can be developed based on the presence of the phenomena in Fig. 2. These phenomena are frequently encountered in the care of older adults, and are often also present in others with complex illness. Though not meant to be comprehensive, Fig. 2 depicts some of the most common challenges faced by geriatricians caring for older adults. Hearing and vision impairments are common among vulnerable populations and should be considered when tailoring transitions interventions. For example, an 88-year-old man with hearing impairment may not be able to understand well-intentioned care providers making a follow-up phone call after hospital discharge. **Recommendations:** Post-discharge phone calls may need to be enhanced with written instruction guides or

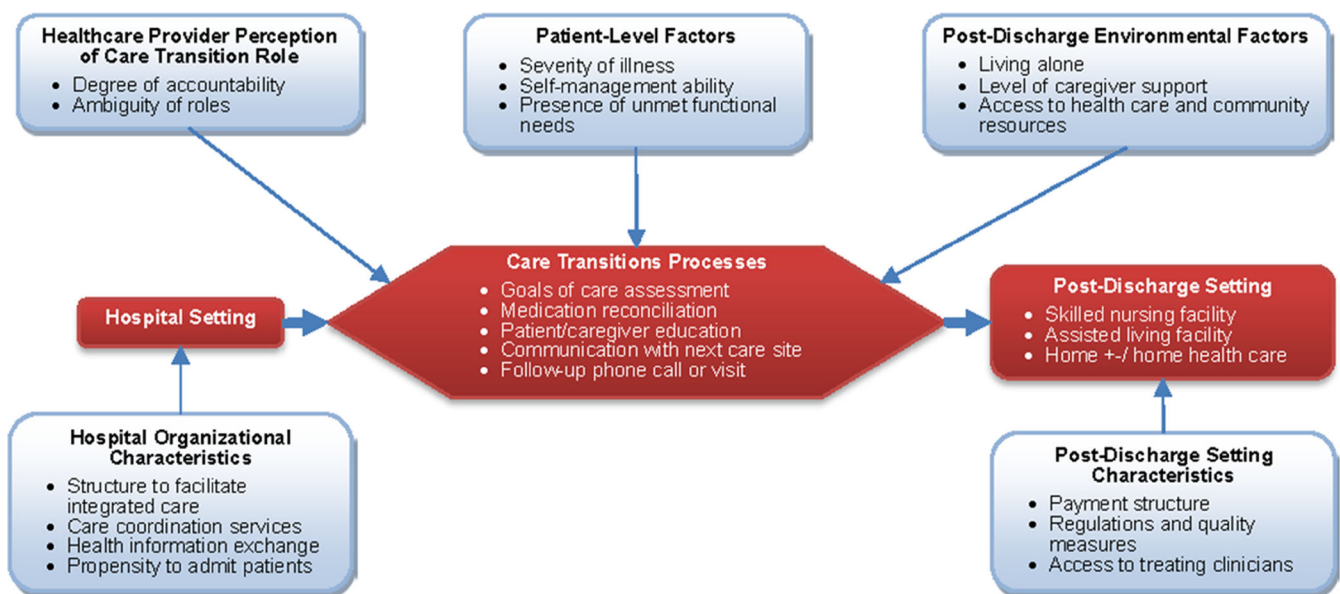
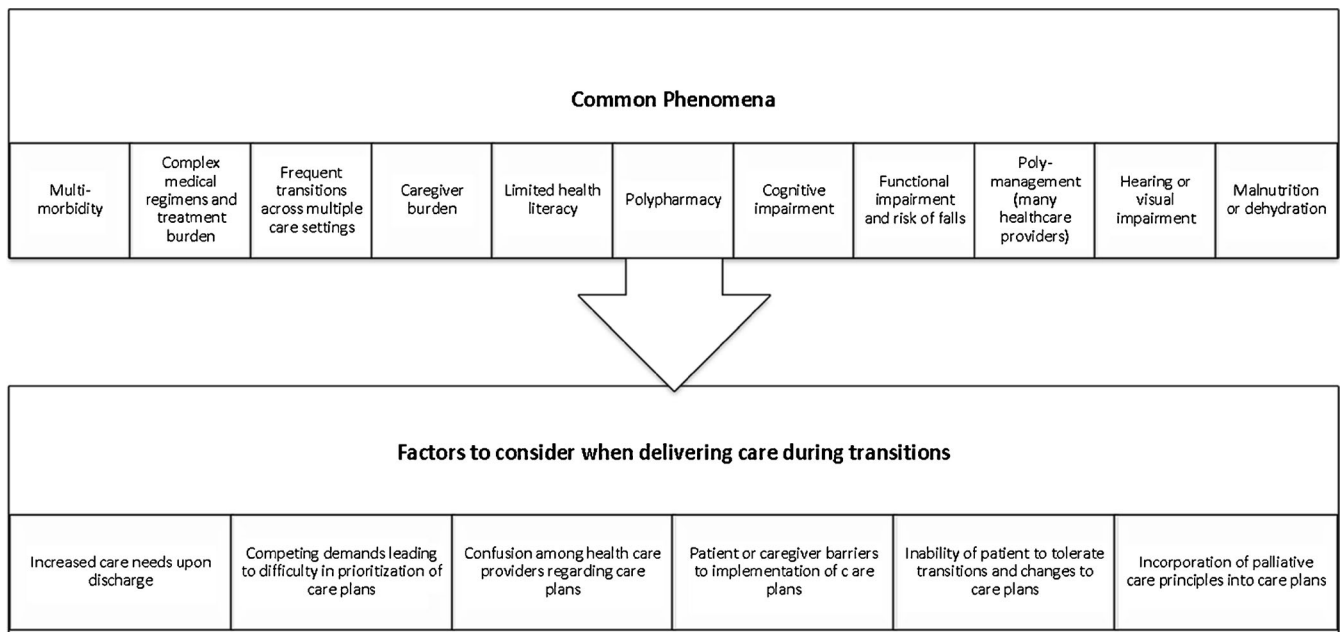


Figure 1. Conceptual model of factors affecting care transitions.



**Figure 2. Common phenomena affecting older adults and subsequent factors to consider when delivering care during transitions to any patient with complex needs.**

education of caregivers. During hospitalization, vulnerable populations frequently experience cognitive dysfunction that would potentially impair them from understanding discharge instructions. With cognition shown to improve following hospitalization,<sup>22</sup> programs could reinforce instructions when patients are better able to understand (e.g., in a follow-up phone call or visit, perhaps incorporating telehealth tools), or they must incorporate caregivers.

The patient's support network is often pivotal to a successful transition. Most patients will need assistance from support people following a hospitalization. Support people include family members, friends, paid caregivers, and the outpatient clinicians to whom patients will turn for answers. **Recommendations:** Family members and friends should be a routine part of patient education, and timing of discharge discussions should accommodate the ability of family members to be present. This may mean discharge planning may need to begin several days prior to discharge and take place during early evening hours to accommodate family members who work.

### ENGAGING CARE "RECEIVERS" AND TAILORING HOME CARE TO MEET PATIENT NEEDS

Populations with complex needs transition through many settings, including rehabilitation, skilled nursing, long-term care, assisted living, and home. As they move through these settings, their health and safety are frequently at risk due to fragmented, episodic, and uncoordinated care.<sup>2,16</sup> Much of

the work to improve care during transitions focuses disproportionately on improving the process of hospital discharge. **Recommendations:** Organizations may want to also focus on understanding and meeting the needs of the "receivers": outpatient care providers, post-acute care facilities, home healthcare agencies, family members and paid caregivers. This can be done with a needs assessment asking receivers to articulate their challenges during care transitions. Healthcare providers describe a lack of education on how to execute optimal transitions and a lack of feedback on their performance delivering care during transitions.<sup>23</sup> Various tools exist to assist with identifying the right post-discharge setting based on patients' needs.<sup>24</sup> Providers can be given feedback on a subset of transitions they help execute.

Skilled home health care (SHHC, e.g., nursing services, physical therapy) can help patients to transition back home safely.<sup>25</sup> Of the 14 million annual hospitalizations of older adults, approximately one in six patients are discharged with a referral to home health, and this figure is increasing.<sup>26</sup> The main goal of SHHC services for patients leaving the hospital is to provide services on a non-chronic basis to facilitate discharge, by providing skilled nursing or therapy services and teaching the patient or their caregiver to care for themselves safely in the home. Often SHHC services are not considered until the end of a hospitalization, severely limiting the time for services to be made, given the unique nature of SHHC. **Recommendations:** Well before the transition takes place, consider whether the patient would benefit from SHHC and notify the patient and agency early.

While all care transitions are potential points for lapses in continuity of care, care transitions to SHHC are particularly risky. For reasons that are incompletely understood, older adults who require SHHC after hospital discharge are among those at highest risk of hospital readmission and adverse events.<sup>27–30</sup> SHHC services are unique in that medical professionals are present only intermittently, and health-related responsibilities are often shared with informal caregivers (e.g., family or friends).<sup>31</sup> SHHC agencies perform a comprehensive assessment of all admissions to SHHC, but they currently lack the means by which to effectively track care transitions,<sup>28</sup> in part because SHHC providers are not immediately aware of when patients are re-hospitalized.<sup>32</sup> SHHC agencies are required to submit patient-level and agency-level data on process and outcome measures to CMS, but these measures do not provide information on satisfaction with care during transitions and subsequent hospital utilization. **Recommendations:** SHHC agencies must be actively engaged as “receivers” in care transitions improvement efforts. Additionally, regulators can encourage reporting on patient-centered measures related to care transitions, such that SHHC agencies can better tailor services in the home. One evidence-based model addresses the needs of SHHC populations by having hospital social workers partner with SHHC agencies to coordinate post-discharge care.<sup>33</sup> Further research is needed in the area of improving care transitions for recipients of SHHC services.

Other receivers that must be engaged during care transitions are informal caregivers. They act as receivers, yet they are often unprepared and overwhelmed. Paid or formal caregivers are hired to support patients in their home following a hospitalization. With the goal to keep the patients out of a long-term care facility, paid caregivers assist with reminding patients to take their medications, ambulating, and are also required to manage agitation and mental confusion when patients return home from hospitalizations.<sup>34</sup> However, these caregivers are largely unskilled and many lack adequate training to handle these responsibilities.<sup>35</sup> **Recommendations:** Include activities that activate and support caregivers during and after care transitions.

Finally, clinical care providers in ambulatory care and skilled nursing facility settings must be engaged during care transitions. **Recommendations:** Clinical providers’ roles during care transitions remain poorly defined, and use of recently developed conceptual frameworks<sup>36</sup> may help incorporate clinician perspectives into care transition improvement efforts. Standard formats for reporting discharge summaries, medication lists, cognitive status, and other important information should be discussed among all stakeholders in a community across the patient’s continuum of care. CMS innovations projects are underway to design strategies to improve communication between hospitals and post-acute care facilities.

To summarize, transitional care interventions need to ensure that the receivers, including skilled nursing facilities, home health, formal and informal caregivers, are educated

at discharge and capable of handling potential scenarios that could lead to readmission.

## BUILDING “RECOVERY PLANS” INTO TRANSITIONAL CARE

To be resilient, high-performing organizations need to have systems (1) to minimize problems (e.g., readmission, poor communication across care sites, failures to implement care plan), and (2) to recover if failures occur. This includes having the ability to apply evidence in real time and draw from knowledge of healthcare delivery processes to improve care.<sup>37</sup> Because someone with complex needs may fail at any time (e.g., clinically deteriorate, experience lapses in care), making emergency contingency plans becomes extremely important. Most care transitions programs focus on implementing a structured intervention. What is often absent is an emergency plan or “recovery scenario,”—what to do when the patient begins to experience *failures in the implementation of the plan of care*.

Failures can be influenced by factors at several levels: patient level (not reporting the development of warning signs of clinical deterioration, not filling a prescription); health system level (failing to engage the patient and caregiver in discharge planning efforts; failing to notify outside care providers of changes to the plan of care); and regional level (lacking interchangeable or accessible electronic medical records). Table 1 lists several types of scenarios for which recovery plans could be designed. Though some care transitions efforts do have elements that recommend action plans if red flags are noted, these primarily act upon the patient level (e.g., clinical symptoms). **Recommendations:** To be comprehensive, recovery scenarios must be broadened to include the health system and region. Organizations may consider developing recovery scenarios that go beyond referring patients back to their primary care provider or others in the health system. At the regional level, for example, organizations may develop bi-directional communication across health systems that allows for messaging among providers and has automatic notification of care transitions. Table 1 provides examples of recovery plans at each level to possibly prevent unplanned healthcare utilization.

## PREDICTING AND AVOIDING PREVENTABLE READMISSIONS

The ability to predict which patients will be readmitted remains poor.<sup>38</sup> Likewise, the extent to which readmissions are preventable and can be reduced through hospital-based intervention programs is unclear. More attention needs to be

**Table 1. Examples of Care Transition Scenarios and Possible Recovery Plans**

Scenario	Possible recovery plan
<b>Patient level</b>	
Patient not able to obtain all medications	Provide vouchers to purchase medications in post-discharge period Arrangement with pharmacy for bedside or home delivery Reassessment of necessity of medications and prioritization of most important ones Transportation arrangements for medication pickup
Patient or caregiver concerned about symptoms or plan of care	Provide emergency assistance hotline to reach inpatient case manager or healthcare providers Provide tools for remote educational interventions (e.g., virtual home visits, remote monitoring)
Patient's cognitive or functional impairment impeding implementation of care plan	Develop strategies to engage community social workers to do an in-home assessment of care needs and caregiver support
<b>Health system level</b>	
Durable medical equipment does not arrive as scheduled (e.g., oxygen, walkers, hospital bed)	Provide emergency assistance hotline to reach home care agency Send out temporary supplies
Post-acute facility or home care agency concerned about patient's clinical status or unclear about plan of care	Provide emergency assistance hotline to reach inpatient case manager or healthcare providers Provide access to inpatient EMR, nursing assessments, and medication administration records Provide clear information on how to contact the primary care team
<b>Regional level</b>	
Patients' care transitions unable to be tracked beyond the health system	Develop strategies for health information exchange across healthcare systems
Outpatient providers not aware of patient's care transitions	Develop automated systems for notification of patient care transitions Develop bi-directional communication systems to allow outpatient providers to communicate with inpatient, subacute, or home care providers in real time about the plan of care

directed at what causal risk factors exist for preventable hospitalizations, and how to utilize post-discharge networks and community resources to reduce readmission. While patients with previous readmissions seem an obvious target, it may be that these individuals are very sick with multiple comorbidities and complex care needs, and readmission is not preventable.<sup>39</sup> The challenge remains on targeting interventions to those most likely to benefit.

A preventable hospitalization is a one that could have been avoided if modifiable system-level or patient-level factors had been identified and intervened upon. It is important to include factors beyond the patient level and include the other domains in Fig. 1. Among those with multiple comorbidities, targeting those with particular medical conditions (e.g., congestive heart failure) is

unrealistic when patients have multiple chronic conditions, and social and functional needs. National data demonstrate that the odds of re-hospitalization are increased by living alone, having unmet functional need, lacking self-management skills, and having limited education.<sup>16</sup> **Recommendations:** Social and functional factors can be routinely examined by a comprehensive evaluation (geriatric assessment), yet they are frequently overlooked in determining risk of readmission. Collecting such data elements in an accessible and accurate electronic medical record may be helpful in identifying preventable readmissions.

Additionally, system-level factors may be modifiable. **Recommendations:** In determining preventable readmissions, performing a root cause or failure mode effect analysis (a proactive risk assessment method used to ask groups to identify solutions to safety problems before they occur)<sup>40</sup> can uncover factors leading to the readmission. Partnering with experts in human factors engineering can also be critical to the design of interventions to improve patient safety.<sup>41–44</sup> Using the following criteria, one could ask if the hospitalization could have been avoided if: (1) care processes were changed, (2) education of the patient or proxy was appropriate, (3) social and functional issues were remedied, (4) timely and adequate health provider follow-up had occurred, or (5) recovery plans had been established and followed. Through these criteria, we emphasize that preventability is not limited to patient-level characteristics alone. Instead, applying concepts from geriatric medicine, a more encompassing view is needed to determine preventability of hospitalizations.

#### ADOPTING A PALLIATIVE APPROACH, WHEN APPROPRIATE, THAT OPTIMIZES PATIENT AND FAMILY GOALS OF CARE

Good palliative care can lead to good transitional care by matching care processes to desired goals and outcomes. A patient whose medications are streamlined and whose goals are clear is easier to transition across settings. Younger patients with complex illness also need help easing treatment burden and prioritizing goals of care. Patients and caregivers can utilize healthcare services more appropriately if their expectations are clear. **Recommendations:** Primary care and hospital providers should have conversations with all patients and surrogate decision makers regarding their goals and expectations for care. Conversations must go beyond determinations of “code status,” and in some cases may include offering concepts such as “do not hospitalize.” Establishing end-of-life care goals in long-term care settings could effectively reduce unnecessary transitions or readmissions to hospitals.<sup>45</sup> The use of Provider Orders for Life-Sustaining Treatment (POLST) is

an example of how forms can ensure goals of care are known throughout various care settings.

The five principles outlined in this paper thus far provide a framework for incorporating principles from geriatric medicine into care transitions improvement activities, regardless of age. In providing this framework, we emphasize the importance of moving beyond the patient level and incorporating system and regional factors into improvement efforts. Informed by a geriatrics perspective, we now discuss practical aspects of designing, implementing, and evaluating care transitions programs and implications for public policy.

**THE NEED FOR CONTINUED HIGH-IMPACT, HIGH-QUALITY RESEARCH ON CARE TRANSITIONS**

Progress in reducing readmission rates has been stagnant. Organizations partnering with researchers to improve care transitions may consider using innovative research and implementation methods, such as those adapted from the fields of qualitative research, quality improvement, implementation science, and human factors engineering. These methods allow for inclusion of a wide variety of stakeholders and provide an in-depth analysis of the complex phenomena involved in healthcare delivery. They have been incorporated successfully for use in other industries and in other aspects of healthcare delivery (e.g., surgical and intensive care).<sup>46</sup> These methods may provide insights not previously noted as important in care transitions efforts.

The implementation of transitional care programs is more complex than introducing a new drug or diagnostic procedure. Before implementing transitional care programs, health systems should consider several aspects of measurement: needs assessment to inform program planning, process measurement, and outcome measurement. This should be done within a structure that facilitates continuous quality improvement.

**PRACTICAL ASPECTS OF DESIGNING, IMPLEMENTING, AND EVALUATING CARE TRANSITIONS PROGRAMS FOR THOSE WITH COMPLEX CARE NEEDS**

The first step is to understand local needs. A needs assessment for transitional care improvements should take into consideration patient needs and local factors such as community resources and practice patterns. Key steps of a needs assessment are: (1) identifying key stakeholders for each setting a patient experiences along the care continuum; (2) surveying of key stakeholders (patients and caregivers, post-acute care settings, regional health systems, and

community networks) regarding gaps in the delivery of optimal care; and (3) reviewing local and regional data relevant to care transitions (e.g., utilization patterns, satisfaction).

The second step is identification of high-impact process and outcome measures. Process measurement and tracking provides critically important information about intervention fidelity and will facilitate dissemination. Without this

**Table 2. Examples of Outcome Metrics**

Conceptual domain	Data source/Examples
Patient	
Satisfaction	Care Transitions Measure (CTM) Hospital Consumer Assessment of Health Plans Survey (HCAHPS) Press Ganey
Activation	Patient Activation Measure (PAM)
Treatment burden	American Geriatrics Society guiding principles for assessment of multi-morbidity Patient and caregiver surveys
Access	Usual source of care Percentage of patients with primary care provider visit within a certain time frame
Medication Adherence	Morisky 8 Medication Adherence Questionnaire Adherence to Refills and Medications Scale (ARMS)
Adverse drug events	Patient safety reporting systems
Quality of life	EuroQol EQ-5D Short Form SF-12 Short Form SF-36
Functional status	Lifespace mobility assessment Activities of Daily Living
Ease of care	Health Care Systems Hassle Questionnaire
Cognitive status	Confusion Assessment Method (CAM) Mini-Cog Folstein Mini-Mental Status Examination St. Louis University Mental Status Exam (SLUMS)
Home	
Caregiver support/activation	Patient Activation Measure
Caregiver satisfaction	Hospital Consumer Assessment of Health Plans Survey (HCAHPS) Press Ganey
Caregiver burden	Zarit Caregiver Burden Scale
Health system	
Care integration	American Hospital Association Annual Survey of Hospitals American Hospital Association Annual Survey of Hospitals Clinical Informatics Scale
Service lines relevant to the care of complex patients	
Health information technology and exchange	
Total cost of care (case-mix adjusted relative cost of care)	Health system utilization or insurance claims data
Length of stay	
Healthcare provider satisfaction	Administrative Provider surveys
Region	
Community resources	City or state health departments
Admission/Re-admission rates	Health system utilization or insurance claims data
ED visit/Observation stay rates	Health system utilization or insurance claims data
Mortality rates	Health system utilization or insurance claims data

information, it is difficult to know what components comprise an intervention, their relative importance, and their feasibility. Several groups, including the Agency for Healthcare Research and Quality, the National Transitions of Care Coalition and the Physician Consortium for Performance Improvement have identified process measures that link to successful outcomes.<sup>47–49</sup> Process measures should reflect major intervention components, identify measurable outcomes at various stages of the intervention, and be easily integrated into workflows. Examples include timely transfer of information across settings, effective coordination, and timely delivery of care. Table 2 summarizes outcome metrics and includes those related to care quality, functional status, and quality of life. Adopting a robust approach to measuring processes and outcomes requires tracking patients across healthcare settings and payment systems. A community-wide data sharing agreement could facilitate collection of more comprehensive data.

### IMPLICATIONS FOR PUBLIC POLICY

System-level improvements to provide better transitional care will only occur if public policy guides systems to do so. Policy efforts can influence data collection, which in turn can inform the design and implementation of new care transition interventions. The approach outlined in this paper can provide policymakers with a wider lens through which to look at measures and outcomes aside from rehospitalizations.

Because hospital readmissions are common and costly, it is not surprising that most care transitions discussions have focused on the goal of reducing readmission rates.<sup>2</sup> Moreover, the biggest national efforts to incentivize change—such as financial penalties for high readmission rates, and public reporting of readmission rates—function at the individual hospital level. The broader community context within which care transitions take place is an under-recognized and critical factor. Indeed, the single biggest factor associated with readmission rates in an analysis of national Medicare data was not patient comorbidity, discharge planning quality, or supply-level factors.<sup>50</sup> Rather, communities with the highest admission rates had the highest readmission rates, suggesting that communities differ in the way health care is organized and in the way they respond to patients with urgent complaints. Hence, we recommend understanding the context of the admission rate before interpreting the readmission rate.

Community-level problems deserve community-level solutions. Emergence of accountable care organizations (ACOs), shared savings models, and bundled payments create opportunities to both improve measurement capability and integrate additional outcome measures. For example, ACOs could facilitate data sharing and continuity across administrative data sources. In addition, ACOs could reward outcomes such as timely care coordination and

follow-up. Opportunities exist to introduce additional transitional care measures into publicly obtained and reported measures. The measures listed in Table 2 can serve as a guide.

### CONCLUSION

Patients with complex needs can benefit from optimal transitional care, regardless of age. A 50-year-old man with uncontrolled diabetes and limited mobility has similar needs to an 80-year-old woman with cognitive impairment and limited transportation. Both would benefit from additional transitional care visits post-discharge to enhance self-management and caregiver support. Additionally, lessons learned from transitions from hospitals back to the community can be applied more broadly to other transitions. The field of geriatric medicine provides a framework for others to use when analyzing how to improve care transitions, especially for those with complex needs. Geriatricians' holistic approach to patient management, caregiver support, and understanding of the continuum of care (and associated payment systems), facilitates the design, implementation, and evaluation of care delivery systems responsive to the needs of older adults and those with complex needs. Ultimately, the principles used to improve care transitions for the most complex older adults can lead the way to optimizing care for all populations.

---

#### Acknowledgments:

**Contributors:** The authors would like to acknowledge Drs. Elizabeth Eckstrom, Hollis Day, and Steve Counsell for their guidance in the preparation of this manuscript.

**Funders:** The Association of Specialty Professors provided funding for the conceptualization of priority areas for publication, of which this manuscript is one. The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the United States government.

**Prior Presentations:** None.

**Conflict of Interest:** The authors declare that they do not have a conflict of interest.

**Corresponding Author:** Alicia I. Arbaje, MD, MPH; Division of Geriatric Medicine and Gerontology, Department of Medicine, Johns Hopkins University, Mason F. Lord Building, Center Tower, 5200 Eastern Avenue, 7th Floor, Baltimore, MD 21224, USA (e-mail: aarbaje@jhmi.edu).

### REFERENCES

1. Sato M, Shaffer T, Arbaje AI, Zuckerman IH. Residential and health care transition patterns among older Medicare beneficiaries over time. *Gerontologist*. 2010;51(2):170–178.

2. **Jencks SF, Williams MV, Coleman EA.** Rehospitalizations among patients in the Medicare fee-for-service program. *N Engl J Med.* 2009;360(14):1418-1428.
3. **Callahan CM, Arling G, Tu W, et al.** Transitions in care for older adults with and without dementia. *J Am Geriatr Soc.* 2012;60(5):813-820.
4. **Hansen LO, Strater A, Smith L, et al.** Hospital discharge documentation and risk of rehospitalisation. *BMJ Qual Saf.* 2011;20(9):773-778.
5. **Rich M, Beckham V, Wittenberg C, Leven C, Freedland K, Carney R.** A multidisciplinary intervention to prevent the readmission of elderly patients with congestive heart failure. *NEJM.* 1995;333:1190-1195.
6. **Naylor MD, Brooten DA, Campbell RL, Maislin G, McCauley KM, Schwartz JS.** Transitional care of older adults hospitalized with heart failure: a randomized, controlled trial. *J Am Geriatr Soc.* 2004;52(5):675-684.
7. **Koelling TM, Johnson ML, Cody RJ, Aaronson KD.** Discharge education improves clinical outcomes in patients with chronic heart failure. *Circulation.* 2005;111(2):179-185.
8. **Phillips CO, Wright SM, Kern DE, Singa RM, Shepperd S, Rubin HR.** Comprehensive discharge planning with postdischarge support for older patients with congestive heart failure: a meta-analysis. *JAMA.* 2004;291(11):1358-1367.
9. **Coleman EA, Smith JD, Frank JC, Min S-J, Parry C, Kramer AM.** Preparing patients and caregivers to participate in care delivered across settings: the care transitions intervention. *J Am Geriatr Soc.* 2004;52(11):1817-1825.
10. **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(7):613-620.
11. **Phillips CO, Wright SM, Kern DE, Singa RM, Shepperd S, Rubin HR.** Comprehensive discharge planning with postdischarge support for older patients with congestive heart failure: a meta-analysis. *JAMA.* 2004;291(11):1358-1367.
12. **Jack BW, Chetty VK, Anthony D, et al.** A reengineered hospital discharge program to decrease rehospitalization: a randomized trial. *Ann Intern Med.* 2009;150(3):178-187.
13. **Shepperd S, Parkes J, McClaren J, Phillips C.** Discharge planning from hospital to home. *Cochrane Database Syst Rev.* 2004;1:CD000313.
14. **Hesselink G, Schoonhoven L, Barach P, et al.** Improving patient handovers from hospital to primary Care: a systematic review. *Ann Intern Med.* 2012;157(6):417-428.
15. **Englander H, Kansagara D.** Planning and designing the care transitions innovation (C-Train) for uninsured and Medicaid patients. *J Hosp Med.* 2012;7(7):524-529.
16. **Arbaje AI, Wolff JL, Yu G, Powe NR, Anderson GF, Boulton C.** Postdischarge environmental and socioeconomic factors and the likelihood of early hospital readmission among community-dwelling Medicare beneficiaries. *Gerontologist.* 2008;48(4):495-504.
17. **Gazmararian JA, Baker DW, Williams MV, et al.** Health literacy among Medicare enrollees in a managed care organization. *JAMA.* 1999;281(6):545-551.
18. **Anderson G, Horvath J.** Chronic conditions: making the case for ongoing care. Baltimore: Robert Wood Johnson Partnership for Solutions; 2002.
19. **Fernandez HM, Callahan KE, Likourezos A, Leipzig RM.** House staff member awareness of older inpatients' risks for hazards of hospitalization. *Arch Intern Med.* 2008;168(4):390-396.
20. **Creditor MC.** Hazards of hospitalization of the elderly. *Ann Intern Med.* 1993;118(3):219-223.
21. **Covinsky KE, Pierluissi E, Johnston CB.** Hospitalization-associated disability: "she was probably able to ambulate, but I'm not sure". *JAMA.* 2011;306(16):1782-1793.
22. **Lindquist LA, Go L, Fleisher J, Jain N, Baker D.** Improvements in cognition following hospital discharge of community dwelling seniors. *J Gen Intern Med.* 2011;26(7):765-770.
23. **Kripalani S, LeFevre F, Phillips CO, Williams MV, Basaviah P, Baker DW.** Deficits in communication and information transfer between hospital-based and primary care physicians: implications for patient safety and continuity of care. *JAMA.* 2007;297(8):831-841.
24. **Kane RL.** Finding the right level of posthospital care: "we didn't realize there was any other option for him". *JAMA.* 2011;305(3):284-293.
25. **Vasquez MS.** Preventing rehospitalization through effective home health nursing care. *Home Healthc Nurse.* 2008;26(2):75-81.
26. **Wier LM, Andrews RM.** Hospital utilization among oldest adults, 2008. Rockville: Agency for Healthcare Research and Quality; 2010.
27. **Murtaugh CM, Litke A.** Transitions through postacute and long-term care settings: patterns of use and outcomes for a national cohort of elders. *Med Care.* 2002;40(3):227-236.
28. **Wolff JL, Meadow A, Weiss CO, Boyd CM, Leff B.** Medicare home health patients' transitions through acute and post-acute care settings. *Med Care.* 2008;46(11):1188-1193.
29. **Madigan EA.** A description of adverse events in home healthcare. *Home Healthc Nurse.* 2007;25(3):191-197.
30. **Rosati RJ, Huang L.** Development and testing of an analytic model to identify home healthcare patients at risk for a hospitalization within the first 60 days of care. *Home Health Care Serv Q.* 2007;26(4):21-36.
31. **Levine C, Albert SM, Hokenstad A, Halper DE, Hart AY, Gould DA.** "This case is closed": family caregivers and the termination of home health care services for stroke patients. *Milbank Q.* 2006;84(2):305-331.
32. **Fortinsky RH, Madigan EA, Sheehan TJ, Tullai-McGuinness S, Fenster JR.** Risk factors for hospitalization among Medicare home care patients. *West J Nurs Res.* 2006;28(8):902-917.
33. **Altfeld SJ, Shier GE, Rooney M, et al.** Effects of an enhanced discharge planning intervention for hospitalized older adults: a randomized trial. *The Gerontol.* 2013;53(3):430-440.
34. **Lindquist LA, Cameron KA, Messerges-Bernstein J, et al.** Hiring and screening practices of agencies supplying paid caregivers to older adults. *J Am Geriatr Soc.* 2012;60(7):1253-1259.
35. **Lindquist LA, Jain N, Tam K, Martin GJ, Baker DW.** Inadequate health literacy among paid caregivers of seniors. *J Gen Intern Med.* 2011;26(5):474-479.
36. **Schoenborn N, Arbaje AI, Eubank KJ, Maynor KA, Carrese JA.** Clinician roles and responsibilities during care transitions of older adults. *J Am Geriatr Soc.* 2013;61(2):231-236.
37. **Greene SM, Reid RJ, Larson EB.** Implementing the learning health system: from concept to action. *Ann Intern Med.* 2012;157(3):207-210.
38. **Kansagara D, Englander H, Salanitro A, et al.** Risk prediction models for hospital readmission: a systematic review. *JAMA.* 2011;306(15):1688-1698.
39. **Lindquist LA, Baker DW.** Understanding preventable hospital readmissions: masqueraders, markers, and true causal factors. *J Hosp Med.* 2011;6(2):51-53.
40. **DeRosier J, Stalhandske E, Bagian JP, Nudell T.** Using health care failure mode and effect analysis: the VA National Center for patient safety's prospective risk analysis system. *Jt Comm J Qual Improv.* 2002;28(5):248-267.
41. **Carayon P, ed.** Handbook of human factors and ergonomics in health care and patient safety. 2nd ed. Boca Raton: CRC Press; 2012.
42. **Carayon P, Wood KE.** Patient safety - the role of human factors and systems engineering. *Stud Health Technol Inform.* 2010;153:23-46.
43. **Ms B.** Human error in medicine. Hillsdale: Lawrence Erlbaum Associates; 1994.
44. **Dekker S.** Patient safety: a human factors approach. 2011.
45. **Givens JL, Selby K, Goldfeld KS, Mitchell SL.** Hospital transfers of nursing home residents with advanced dementia. *J Am Geriatr Soc.* 2012;60(5):905-909.
46. **Pronovost PJ, Bo-Linn GW.** Preventing patient harms through systems of care. *JAMA.* 2012;308(8):769-770.
47. **Transitions of Care Measures: Paper by the NTOCC Measures Work Group.** National Transitions of Care Coalition. 2008. [www.ntocc.org](http://www.ntocc.org).
48. **Care Transitions: Performance Measurement Set (Phase I: Inpatient Discharges & Emergency Department Discharges).** Report from the Physician Consortium for Performance Improvement (PCPI). American Medical Association. 2009. <http://www.ama-assn.org>.
49. **McDonald KM, Schultz E, Albin L, et al.** Care coordination measures atlas. Rockville: Agency for Healthcare Research and Quality; 2010:11-0023-EF.
50. **Epstein AM, Jha AK, Orav EJ.** The relationship between hospital admission rates and rehospitalizations. *N Engl J Med.* 2011;365(24):2287-2295.