

Older adult safety while receiving home health services after hospital discharge

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1. ABSTRACT

Purpose:

Older adults requiring skilled home healthcare (SHHC) after hospital discharge are among those at highest risk of re-hospitalization and adverse events. SHHC agencies need strategies to provide safer transitions.

Scope:

The overall goal of this study was to develop an index for skilled home healthcare agencies to use in real time to identify and reduce potential risks to older adults' safety during transitions.

Methods:

This was a multisite, mixed-methods study at five home healthcare agencies in rural and urban sites across the US. We used observations, interviews, focus groups, online assessments of SHHC providers, and real-time application of the index to care transitions of older adults recently discharged from the hospital.

Results:

The index, a 12-item count of safe transitions practices, demonstrated feasibility of use, inter-rater reliability, stability, construct validity, and concurrent validity. The index identified safety threats during care transitions and targeted transitions for intervention. The vast majority of hospital-to-home health transitions had at least one safety issue, and older adults/caregivers identified more patient safety threats than did home health providers.

The Index of Home Health Care Transition Quality is a novel measure to assess the quality of hospital-to-home health transitions in real time. Older adults and caregivers provide valuable perspectives and should be included in patient safety reporting. Study findings can guide the design of interventions addressing threats to patient safety.

Key words:

Transitional care, home care services, human factors engineering, patient discharge, qualitative research, frail elderly, information management, home care agencies, patient safety

2. PURPOSE

The overall goal of this study was to develop an index for skilled home healthcare (SHHC) agencies to use in real time to identify and reduce potential risks to older adults' safety during hospital/SHHC transitions. We focused on two crucial care processes identified in preliminary work: (1) information management among SHHC providers across settings, and (2) establishment of older adult, caregiver, and SHHC provider roles for execution of healthcare tasks. *Information management* (IM) refers to the ability of SHHC providers to collect, organize, and communicate older adults' care plans to other SHHC providers and staff within the agency during the care transition. *Establishment of roles* refers to creating clear definitions of who is responsible for completion of healthcare tasks (e.g., medication administration) during the care transition and episode of care.

SPECIFIC AIM 1: To identify potential risks to older adults' safety related to (1) information management among SHHC providers across settings and (2) establishment of older adult, caregiver, and SHHC provider roles for execution of healthcare tasks. The following HFE prospective risk identification methods were used to identify potential risks: (a) direct observations and photographs of older adults' hospital/SHHC transition and (b) semi-structured interviews of older adults/caregivers/SHHC providers.

SPECIFIC AIM 2: To develop an index for SHHC agencies to use in real time to identify risks to older adults' safety during hospital/SHHC transitions with regard to processes of information management and establishment of roles. HFE risk prioritization methods were used through focus groups. SHHC providers rated each risk identified in SA1 on (1) its importance to ensuring safety during care transitions and (2) its frequency of occurrence.

Hypotheses (SA1, SA2): An HFE approach will identify and prioritize novel risks related to information management and establishment of roles not previously identified as crucial during hospital/SHHC transitions.

SPECIFIC AIM 3: To evaluate psychometric properties of the index and ascertain feasibility of use. SA3 was important for determining future use of the index in the design and implementation of interventions.

3a. To evaluate index inter-rater reliability among SHHC providers and establish initial construct validity among care transitions that differ in quality. For inter-rater reliability, the correlation between index scores was determined, as calculated by pairs of SHHC providers evaluating a series of care transitions. For construct validity, index scores were compared among cases that differ in care transition quality.

3b. To further evaluate construct validity using a different standard and ascertain feasibility of use among SHHC providers. In a prospective sample of older adults receiving SHHC after hospital discharge, the correlation between SHHC provider-generated index scores and a general measure of patient-reported care transition quality (Care Transitions Measure, or CTM-3) was determined.¹

Hypotheses: The index will exhibit moderate to high inter-rater reliability and will be able to distinguish between optimal and suboptimal care transitions (3a). The index will exhibit moderate negative correlation with the CTM-3 and will be simple to incorporate in SHHC provider workflow (3b).

3. SCOPE

Errors during care transitions of older adults are common, costly, and sometimes lethal. A care transition is the movement of a person from one healthcare setting to another and is frequently associated with adverse outcomes.² Interventions to improve care transitions are a high priority under the Affordable Care Act.³ However, the best practices by which to achieve such improvements are not clear, in part because intervention efforts are often specific to a disease⁴⁻⁹ or setting¹⁰⁻¹² and vary widely.

The aging of the population is leading to greater reliance on care delivered in the home, the most common and poorly understood healthcare delivery setting.¹³ For unclear reasons, those who require skilled home healthcare (SHHC) services (e.g., home nursing) after hospital discharge are among those at highest risk of experiencing suboptimal outcomes during care transitions, including early re-hospitalization.^{14,15} Though there have been interventions focused on improving care transitions from hospital to home,^{11,16-19} these are not specific to SHHC settings, which are more complex. Re-hospitalization rates from SHHC settings have not declined over time.^{15,20} Strategies tailored to the complexity of the hospital/SHHC transition are needed to ensure safe transitions, yet there is relatively little research to guide improvement efforts.

In this study, SHHC refers to services provided by healthcare professionals under Medicare.²¹ These professionals provide skilled services on a short-term and intermittent basis in 60-day episodes of care to homebound patients. In 2012, about 30% of hospitalized Medicare beneficiaries received SHHC services at hospital discharge.²² In 2016, SHHC agencies provided care to approximately 3.5 million beneficiaries, with Medicare expenditures of \$18 billion.²³ The number of Medicare-certified home health agencies has been

increasing, with more than 12,000 agencies in 2016.^{23,24} With the aging of the population, the number of older adults receiving home-based services is expected to rise sharply in the coming years.^{25,26}

Human factors engineering (HFE) combines qualitative and quantitative research methods to proactively understand risks in complex systems. HFE approaches can be used to create tools that provide real-time feedback to healthcare providers, a critical step for ensuring the sustainability of safety improvements.²⁷⁻³⁰ It is not yet known what safety risks to focus on in real-time feedback mechanisms specific to the complex hospital/SHHC transition. Preliminary work has demonstrated a variety of risks threatening older adults' safety during various types of transitions. Development of psychometrically sound tools building on these results are needed to guide the development of interventions specific to SHHC settings. To address key limitations in our knowledge of hospital/SHHC transitions, the current proposal builds on prior work, expands data collection to regional systems, and uses HFE methods to develop tools to reduce safety risks.

4. METHODS

Study Design

We developed the Index of Home Health Transition Quality with older adult, caregiver, and SHHC provider input at each stage of development, including discussions of feasibility and implementation. Figure 1 provides an overview of the index development process, consisting of observations, interviews, focus groups, online assessments of SHHC providers, and real-time application of the index to care transitions of older adults recently discharged from the hospital. In the subsequent sections, we first describe index development and then describe psychometric and feasibility testing.

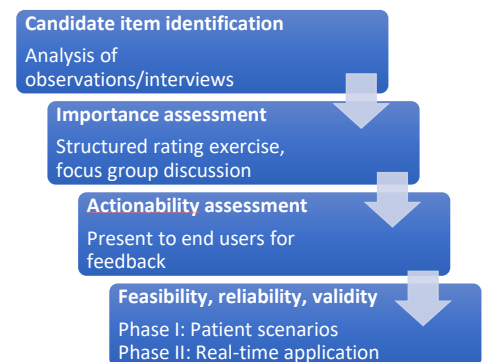


Figure 1: Summary of index development process

Index development. This was a multisite, qualitative study eliciting contextual factors influencing the quality of care during the hospital-to-home health transition—beginning with the home health pre-admission process (from hospital referral to home visit scheduling) and ending with the initial home visit (~48 hours after hospital discharge). We performed semi-structured interviews and direct observations with 33 SHHC administrative staff, 46 SHHC providers, 60 older adults, and 40 informal caregivers during the pre-admission process and initial home visit. Data were analyzed to identify and classify safety risks.

Conceptual framework. Human factors engineering (HFE) studies interactions among people (e.g., older adults, informal caregivers, healthcare providers) and elements of their *work system* (e.g., hospital unit, SHHC agency, older adult's home) to optimize performance and reduce harm.^{13,31-33} Many have called for applications of HFE to evaluate care coordination, improve care transitions, and develop tools customized for home-based healthcare.^{31,34-37} The Systems Engineering Initiative for Patient Safety (SEIPS) 2.0(9) was our overarching conceptual framework guiding data collection and analysis.

Settings and Participants

The study was conducted at five SHHC sites associated with three SHHC agencies across rural and urban sites in the US. We recruited four types of participants most involved in executing or overseeing hospital-to-SHHC transitions: SHHC administrative staff (hospital SHHC coordinators, intake staff, visit schedulers, clinical team managers, quality improvement officers, executive leadership), SHHC providers (nurses, rehabilitation therapists), older adults aged 45 and older, and informal caregivers (e.g., friends or family).

Data Collection

Candidate item identification. Based on a combination of purposive and network sampling,³⁸ we identified and interviewed SHHC administrative staff to better understand the unique processes and challenges of each study site.

Each SHHC agency would identify English- or Spanish-speaking older adults referred for SHHC services after hospital discharge, regardless of diagnosis. We approached older adults either in person before hospital discharge or by phone the day after hospital discharge. We obtained written consent from the SHHC provider assigned to visit the older adult in the home and from the older adult (or the older adult's legally authorized representative, if applicable).

Using a SEIPS-informed observation guide, a geriatric medicine physician and a human factors engineer conducted direct observations of the SHHC pre-admission process and initial home visit. Immediately following each home visit, we interviewed the older adult, informal caregiver (interviewed at the same time as the older adult), and SHHC provider. Interviews focused on key goals of, and barriers and facilitators to, successful care transitions generally and during the most recent transition specifically. Interviews with participants lasted between 20 and 60 minutes, were audio recorded, and were transcribed. We transcribed observation notes electronically.

Importance assessment. Risks were identified based on frequency that something happens (rarely, sometimes, very often). They were also asked how likely a particular risk is to contribute to the following events: serious patient safety events (e.g., falls, delirium, hospital readmission within 30 days), negative patient/caregiver experience with the transition, and the overall quality of the care transition. These items were rated based on three answers (unlikely, somewhat likely, and very likely). The more likely a safety risk is to contribute to negative outcomes, the more important the safety risk. The data were analyzed to show the most important items per site as well as the most important items with all data combined. All data were converted in a number scale and then analyzed to determine which of the items were considered to be the most important to a successful home care transition.

Actionability assessment. Once importance of safety risks was calculated, actionability on those safety risks also needed to be calculated. For this measure, a survey was sent to a subset of the focus group participants, which was composed of Administrators, Nurses, Rehabilitation Therapists, and Researchers. These participants were asked to judge how actionable each safety risk is based on a Likert scale from 0 to 3 (0=definitely not actionable, 1=possibly actionable, 2=probably actionable, 3=definitely actionable). Participants then placed each item into one of seven predetermined categories based on data from our prior work. We calculated the average actionability score based on survey results and compared it to the item's importance score from our focus group data.

Psychometric testing and feasibility of use. This was a prospective cohort study, conducted at Site 5, during which older adults and SHHC providers were consented and recruited to use the index to rate the quality of the older adults' hospital/SHHC transition. Administrators at Site 5 forwarded all referrals (regardless of eligibility) to the researchers (AIA, MK) to confirm (or deny) eligibility. Once eligibility was confirmed, the researchers contacted the assigned SHHC provider and the older adult/caregiver to obtain verbal permission to attend the start-of-care visit. During the start-of-care visit, the researchers took notes on factors that could have affected the care transition (communication, social, environmental, economic, etc.). At the end of the visit, the older adult or caregiver, the researcher, and the SHHC provider completed the index separately and rated the quality of the transition, as measured by the number of safety threats identified by the index. The SHHC providers completed the same index 48 hours later to assess reproducibility and reliability of the index. The researchers followed each patient for the occurrence of an ED visit or hospitalization within 30 days of hospital discharge (primary outcome), identification of medication issues requiring resolution by a physician, and mortality (secondary outcomes).

Data Analyses

We analyzed data from more than 180 hours of observation and 80 hours of interviews. To characterize IM goals, we used HFE methodology employed in our previous work,³³ first performing content analysis of observation notes and interviews and then creating process-flow diagrams as a data representation approach, which we reviewed with SHHC subject matter experts.

We used an iterative approach to conduct content analysis and create our coding framework.^{39,40} Two researchers reviewed all transcripts and identified IM-related items. These items became the first-order codes in our framework and included terms, concepts, and categories originating from the participants.⁴¹ Four researchers combined these codes into second-order codes representing IM goals and IM-related process failures. We also identified emergent codes representing ideas not falling within our conceptual or coding frameworks. The research team discussed and reconciled coding differences by consensus. ATLAS.ti qualitative data management software facilitated analyses.⁴² This study was approved by the Institutional Review Board at each participating site.

During feasibility testing, descriptive analyses were conducted to assess the occurrence of safety threats and the incidence of primary and secondary outcomes. Spearman correlation coefficients and kappa coefficients were calculated to assess reliability, reproducibility, and construct validity of the index. Fisher’s exact test was conducted to assess concordance of index ratings.

5. RESULTS

Table 1 summarizes characteristics of participating study sites and the number of transitions contributing to data for SA 1 and 2. This was a multisite, qualitative study using semi-structured interviews and direct observations with 33 SHHC administrative staff, 46 SHHC providers, 60 older adults, and 40 informal caregivers during the hospital-to-SHHC transition. SHHC providers (n=46) had an average of 11.8 years of experience in the home care industry (range, 0.5-33 years). SHHC providers were 69.6% nurses, 19.6% rehabilitation therapists, and 8.6% administrators or SHHC coordinators. SHHC administrative staff (n=33) had an average of 16.5 years of experience in the home care industry (range, 2-35 years). The average age of the older adults (n=60) was 73.8 years (range, 48-98) and the informal caregivers (n=40) was 62.9 years (range, 21-87).

Table 1: Characteristics of participating study sites

SHHC Agency Site	SHHC Agency Ownership	Region	Average Daily Census	Average Monthly Admissions	Number of Transitions Observed (N=60)
1	Not-for-profit	Urban	1,977	1,280	13
2	Not-for-profit	Urban	3,229	2,152	11
3	For-profit	Rural	98	28	8
4	For-profit	Urban/suburban	170	51	6
5	Not-for-profit	Urban/suburban	750	550	22

SHHC: skilled home healthcare

We identified IM goals during two phases of the hospital-to-SHHC transition (SHHC admissions process and initial home visit), and we characterized associated IM-related process failures: information scatter, information conflict, information underload, information overload, and erroneous information. Examples of the most frequent risk factors contributing to IM-related process failures were as follows: SHHC provider with lack of access to a physician,

communication breakdown between the hospital and SHHC provider, role ambiguity in the home, older adults’ challenging living situations, and older adults’ improper use of medications. We identified numerous consequences resulting from IM-related process failures (e.g., delays in care, adverse events, workaround development).

We also identified three key strategies SHHC providers used to obtain needed information when facing IM-related process failures: using the older adult or informal caregiver as a messenger; using alternative methods to access information; and drawing on special relationships or connections with others. IM-related process failures are associated with wide-ranging consequences that can affect older adults’ health, SHHC provider morale, and organizational efficiency.

The index (Table 2) is a count of safe transitions practices addressing organizational and individual threats to patient safety: mismatched expectations, ability to implement the care plan, information management, and administrative barriers to delivering care. The responses to each item are “Yes,” “No,” or “Not Enough Information to Assess.”

Table 2: Index of Home Health Transition Quality

SHHC provider version	Older adult or caregiver version
I received complete information regarding the patient’s hospital stay and plan of care	I know what happened during the hospital stay and understand the plan of care moving forward
I was able to easily communicate with, or get a hold of, the patient and/or caregiver prior to the home visit*	I was able to easily communicate with the home care provider prior to the visit*
I am able to come up with an accurate medication list by the end of the visit*	The home care provider and I were able to come up with an accurate medication list during the home visit*
I am confident the older adult or caregiver can do what is needed to execute the plan of care*	I feel confident that I can do what is needed to improve my [my loved one’s] health*
I am able to reach the physician supervising the plan of care to clarify questions*	I was able to reach the doctor to clarify questions after I [my loved one] left the hospital*
I feel the start of care occurred in a timely fashion given the patient’s clinical status <ul style="list-style-type: none"> • Low risk (72 hours) • Moderate risk (48-72 hours) • High risk (24-48 hours) 	The home care visit occurred in a timely fashion given my [my loved one’s] health state. <ul style="list-style-type: none"> • Not too sick, getting better (72 hours) • A bit sick, slow improvement (48-72 hours) • Still really sick, not really better (24-48 hours)
I feel the older adult’s home is a safe environment (no physical safety hazards)	The home care provider evaluated the home environment and helped make it safe for me [my loved one] to navigate
The older adult or caregiver:	
Has clear expectations about the role of home care (understands frequency of visits, type of services provided, and their role in managing health)	I have clear expectations about the role of home care services (how often they will visit, what they will do, and my role in managing my [my loved one’s] health)
Can use equipment or supplies as directed	I know how to use the equipment and supplies as instructed
Can manage the medications (understands indications, can dose and administer appropriately)	I can manage the medications (their purpose and how to take them)
Can navigate the healthcare system to arrange follow-up care (appointment scheduling, contacting providers, arranging for transportation)	I am able to arrange for follow-up care (scheduling appointments, reaching healthcare providers, and arranging for transportation)
Understands what they are supposed to do to improve their health*	I understand what I am supposed to do to improve my [my loved one’s] health*

* Items added after receiving additional stakeholder feedback)

Phase I—Testing with patient scenarios: We designed a survey consisting of 16 clinical scenarios depicting a range of poor to excellent hospital-to-SHHC transitions drawn from actual home health evaluations. Six experts (geriatricians, SHHC staff) took the survey to ensure agreement with the overall “excellent” and “poor” scenario category ratings. Ten scenarios (agreement > 80%) remained after expert ratings. After each scenario, we asked SHHC providers to (1) rate the overall quality of the care transition (1-5 stars), (2) use the index items

to further characterize the quality of the care transition, and (3) suggest strategies for improvement.

The index distinguished between known groups of excellent- and poor-quality transitions. In reviewing percent agreement, percent unable to assess, and percent correct, we found the index to have high inter-rater reliability (percent agreement > 90%) and construct validity (percent correct > 80%) in our initial psychometric testing. Each item demonstrated substantial to almost perfect agreement (kappa range, 0.62-0.95). We added five items from our candidate items to the index after receiving feedback from SHHC staff, older adults, and informal caregivers (noted by an asterisk in Table 2).

Phase II—Real-time application and feasibility testing: At the end of the home visit, we asked recently discharged older adults, their caregivers, and their SHHC providers to use the index to rate the quality of the older adults' hospital/SHHC transition, as measured by the number of safety threats identified on the index. We as researchers also observed and rated each transition at the end of the visit and followed each patient for the occurrence of an ED visit or hospitalization within 30 days of hospital discharge (primary outcome), identification of medication issues requiring resolution by a physician, and mortality (secondary outcomes).

Feasibility of recruitment and index completion: We screened 218 patients, and 164 (76%) were eligible for the pilot (i.e., met age criterion and were referred from a hospital). **We successfully recruited our target sample size of 50 patients within 2 months, and our consent rates were high (95% of SHHC providers approached, and 96% of older adults approached).** Overall index completion time was < 10 minutes, with no omissions/missing data.

Occurrence of transition safety issues as measured by index items: The vast majority of transitions (86%) had at least one safety issue. Individual safety issues occurred in 20%-52% of transitions (Figure 3).

Incidence of outcomes: Seventeen participants (37%) experienced an ED visit or readmission within 30 days of hospital discharge. SHHC providers classified 10 participants (20%) as having medication issues requiring resolution by a physician. Four participants (8%) died during the study period.

Reliability/reproducibility of the index: To assess stability of the index, we asked SHHC providers to use the index to rate the care transition again 48 hours after the home visit. The correlation was high between the first and second index scores (Spearman's correlation coefficient = 0.86), demonstrating good stability. For index items for which we expected fewer changes over 48 hours, 8 of 10 items had kappa statistics ≥ 0.59 .

Concordance among SHHC providers, older adults/caregivers, researchers: Older adults/caregivers consistently rated their hospital/SHHC transitions as having more safety threats than did SHHC providers rating the same transition. Older adult/caregiver safety ratings were consistent with researcher ratings for the same transition. Average index ratings (0-12, higher is safer) for SHHC providers, older adults/caregivers, and researchers were 10.7, 8.1, and 7.5, respectively.

Validity: Construct validity is demonstrated with significant positive associations between index scores and the single overall star rating question (Spearman's correlation coefficient = 0.72 among older adults/caregivers and 0.37 among providers). For concurrent validity, we hypothesized that lower index scores (presence of fewer safe care transitions practices) would be associated with presence of medication issues. The association was confirmed among older adult/caregiver ratings ($p = 0.006$) but not among provider ratings ($p = 0.710$). We found a promising trend that lower index scores were associated with more ED visits or re-hospitalizations within 30 days. This finding did not reach statistical significance. Of note, the pilot study was primarily a feasibility study and was not powered to test this hypothesis.

Phase II findings provide evidence of feasibility of recruitment, ease of index completion, measurement of inter-rater reliability, stability, construct validity, and concurrent validity for the index. The index has the potential to identify safety threats during care transitions and target transitions for intervention.

Taxonomy of organizational strategies. Participants suggested organizational strategies for improving transitions and reducing re-hospitalization. We classified strategies into categories from most to least frequently suggested: improve clarity of information in plan of care documents sent from the hospital; facilitate frontloading of home visits; recommend additional service providers (e.g., social work, behavioral health); improve accuracy of older adult contact information; clarify role of SHHC services with older adult prior to home visit; improve screening of older adult for appropriateness for SHHC services; and identify caregiver availability prior to hospital discharge.

Conclusions and implications. This section describes examples of research agenda items emerging from this framework and from study findings. We also describe implications for policymakers interested in improving care transitions.

Development of measures of care transition quality

Developing protocols for providing feedback on care transition quality to SHHC agencies and health systems requires identification of quality metrics specific to the hospital/SHHC transition. We identified IM-related process failures, risk factors, and outcomes that can serve as measures health systems and SHHC agencies can operationalize for use in real time. Researchers could identify the best ways to obtain the data elements needed to collect and disseminate measures to key stakeholders. Researchers could also perform feasibility and usability testing of dashboards created from these measures. Policymakers could create incentives (e.g., grant allocations, tax incentives, insurance benefits) for the development and implementation of measurement protocols and dashboards for use in improving transitional care.

Development of protocols to assist health systems and SHHC agencies to manage IM-related process failures

Researchers can develop system-level strategies for health systems and SHHC agencies to identify IM-related process failures specific to their environment and patient population. Following this, researchers can assist health systems and SHHC agencies identify strategies for managing process failures. Strategies could include assistance with developing protocols for contingency plans and recovery scenarios when process failures occur. For example, a protocol to reduce information underload might be a patient assistance hotline for older adults and informal caregivers recently discharged from the hospital to call if they have questions about the care plan.

As part of developing these protocols, researchers can also assist with identifying which information sources are the most useful, why they are useful, and how to make useful information more available. Study findings point to the critical importance of the SHHC referral form, because it serves as an integrated source of information during transitions, a time when more complete information is lacking. Policymakers could mandate the transfer of standardized data elements to SHHC agencies during transitions, such as the discharge summary and cognitive/functional status, to improve IM. Such mandates already exist for interfacility transfers (e.g., hospital-to-hospital, hospital-to-skilled nursing facility).

Study findings demonstrate how risk factors in the external environment and in organizations considerably affect IM-related process failures. Researchers could develop interventions to address organizational culture change to improve safety culture and increase providers' sense of ownership and accountability during the hospital/SHHC transition. Efforts to improve care transitions need to address the underlying reasons for physicians' absence during the critical transition period, such as lack of reimbursement. Researchers could also study different

reimbursement mechanisms to assist policymakers in developing reimbursement strategies to incentivize cross-site communication.

Regional health information exchange

We described the information scatter and information underload that is often present during hospital/SHHC transitions and the lack of infrastructure to support IM during this time. Policymakers could create incentives for investments in information technology solutions for regional health information exchange to include information exchange among health systems, SHHC agencies, laboratories, imaging centers, health departments, and skilled nursing facilities. The state of Indiana has the largest regional health information exchange in the US and can serve as a model for how this infrastructure can be put into place.⁴³

6. PUBLICATIONS AND PRODUCTS

Original Research

1. Nasarwanji MF, Werner NE, Carl K, Hohl D, Leff B, Gurses AP, **Arbaje AI**. Identifying Challenges associated with the Hospital to Skilled Home Healthcare Transition Workflow: Perspectives of Home Healthcare Agency Providers. *Home Health Care Services Quarterly*. 2015 Jul-Dec; 34(3-4):185-203; Epub 2015 Oct 23. PMID: 26495858.
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Review Articles

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Book Chapters, Monographs

1. ***Arbaje AI**. Transitions in Care. In: Medina-Walpole A, Pacala JT, Potter JF, eds. *Geriatrics Review Syllabus: A Core Curriculum in Geriatric Medicine, 9th ed*. New York, NY: American Geriatrics Society; 2016
2. Burke M, Leff B, **Arbaje AI**. Transitions of Care. In: Fulmer T, Chernof B, eds. *Handbook of Geriatric Assessment, 5th ed*. Burlington, MA: Jones & Bartlett Learning; 2019.
3. ***Arbaje AI**. Transitions in Care. In: Harper GM, Lyons WL, Potter JF, eds. *Geriatrics Review Syllabus: A Core Curriculum in Geriatric Medicine, 10th ed*. New York, NY: American Geriatrics Society; anticipated publication 2019. [published online 2018]; <http://geriatricscareonline.org>

Guidelines/Protocols, Consensus Statement, Expert Opinion, Consortium Articles

1. **Arbaje AI**, Kansagara D, Englander H, Salanitro A, Kripalani S, Jencks S, Lindquist L. Regardless of Age: Incorporating Principles from Geriatric Medicine to Improve Care Transitions for Patients with Complex Needs. *J Gen Int Med*. 2014 Feb. 21 [Epub ahead of print]. 2014 Jun; 29(6):932-9. PMID: 24557511 PMCID: PMC4026496.
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We also presented numerous abstracts (> 30 oral podium presentations and poster presentations) at a wide variety of national and international scientific meetings.

Presentations included the following scientific meetings: American Geriatrics Society, Gerontological Society of America, Human Factors and Ergonomics Society, Academy Health, Society for General Internal Medicine, International Association for Gerontology and Geriatrics, International Home Care Nurses Organization, Chinese Geriatrics Society, Dominican Geriatrics Society.

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