



January 2023

## Predictors of Hospital Readmissions for People with Chronic Conditions

Melanie Morriss Tkach

*University of Missouri – USA, melanie.tkach@health.missouri.edu*

Patricia Bowyer

*Texas Woman's University-Houston – USA, pbowyer@twu.edu*

Marsha Neville

*Texas Woman's University-Dallas – USA, mneville1@twu.edu*

Timothy J. Wolf

*University of Missouri – USA, wolftj@health.missouri.edu*

Gerald Goodman

*Texas Woman's University-Houston – USA, ggoodman@twu.edu*

Follow this and additional works at: <https://scholarworks.wmich.edu/ojot>

 Part of the Occupational Therapy Commons

### Recommended Citation

Tkach, M. M., Bowyer, P., Neville, M., Wolf, T. J., & Goodman, G. (2023). Predictors of Hospital Readmissions for People with Chronic Conditions. *The Open Journal of Occupational Therapy*, 11(1), 1-10. <https://doi.org/10.15453/2168-6408.2045>

This document has been accepted for inclusion in The Open Journal of Occupational Therapy by the editors. Free, open access is provided by ScholarWorks at WMU. For more information, please contact [wmu-scholarworks@wmich.edu](mailto:wmu-scholarworks@wmich.edu).

---

# Predictors of Hospital Readmissions for People with Chronic Conditions

## Abstract

*Background:* Hospital readmissions remain prominent in health care. Functional, cognitive, and environmental factors predict hospital readmissions but may not be thoroughly measured or addressed prior to discharge.

*Method:* In this cross-sectional study, people hospitalized with chronic conditions completed measures of self-care function, functional cognition, occupational competence, and environmental impact. They also participated in a phone call or medical records review to identify hospital readmissions within 30 days of discharge. In a group session, occupational therapists who work in acute care completed acceptability, appropriateness, and feasibility measures for the standardized assessments administered to hospital participants.

*Results:* Occupational competence and functional cognition were significant predictors of hospital readmissions. Therapists rated the Activity Measure of Post-Acute Care (AM-PAC) as the most acceptable, appropriate, and feasible measure for acute care.

*Conclusions:* Occupational competence and functional cognition are predictors of hospital readmissions in people with chronic conditions. Occupational therapists in acute care should consider supplementing current evaluation practices with standardized measures of functional cognition and occupational competence to identify client needs objectively and initiate post-acute referrals that help clients discharge home successfully. Standardized measures, such as the AM-PAC may be feasible in acute care. Further research on the efficacy of standardized measures in this setting is needed.

## Comments

This project was partially funded by the Jean A. Spencer Research Award at Texas Woman's University. The authors report no conflicts of interest. The supporting source had no involvement or restrictions regarding publication.

## Keywords

chronic disease, functional cognition, the model of human occupation, occupational competence, occupational therapy

## Cover Page Footnote

The authors would like to thank Christus St. Michael Hospital as well as the patients and occupational therapists who participated in this study. The authors would also like to thank the Centers for Research Design and Analysis at Texas Woman's University for statistical consultation throughout this project. The content of this manuscript is part of a dissertation completed by the first author, and it was presented in a scientific research panel at the AOTA Annual Conference 2021.

## Credentials Display

Melanie Morriss Tkach, Ph.D., OTR/L, MSOT; Patricia Bowyer, Ed.D., MS, OTR, FAOTA, SFHEA; Marsha Neville, Ph.D., OT; Timothy J. Wolf, Ph.D., OTR/L, FAOTA, OTD; Gerald R. Goodman, Ph.D.

Copyright transfer agreements are not obtained by The Open Journal of Occupational Therapy (OJOT). Reprint permission for this Applied Research should be obtained from the corresponding author(s). [Click here to view our open access statement regarding user rights](#)

---

and distribution of this Applied Research.

DOI: 10.15453/2168-6408.2045

Hospital readmissions, defined as repeat hospitalizations within 30 days of discharge, cost the Centers for Medicare and Medicaid Services (CMS) an estimated \$26 billion annually, with approximately \$17 billion identified as preventable (CMS Office of Minority Health, 2018). Consequently, the CMS implemented the Hospital Readmissions Reduction Program (HRRP), which links hospital reimbursement and quality of care through value-based purchasing for Medicare recipients with the following target diagnoses: acute myocardial infarction (AMI), chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), pneumonia (PNA), total hip arthroplasty (THA), total knee arthroplasty (TKA), and coronary artery bypass graft (CABG) (CMS, 2021). Under the Medicare HRRP, hospitals can be penalized up to 3% of their total revenue if readmission ratios for the target diagnoses surpass the national average (CMS, 2021; Fisher & Friesema, 2013; Hoyer et al., 2014; Renda et al., 2016).

Preliminary HRRP outcomes are promising but may be misleading. Many studies indicate that the HRRP resulted in readmission reductions for Medicare recipients across the country and that those reductions extended to people with Medicaid and private insurance (Ferro et al., 2019). However, other studies show that hospital readmissions have been replaced with emergency room visits and observation stays after discharge (Khera et al., 2020; Wadhwa et al., 2019). Altogether, the literature suggests that many people still struggle to recover at home after hospitalization and may seek follow-up medical care in some capacity (DePalma et al., 2013; Greysen et al., 2014; Greysen et al., 2017; Jönsson et al., 2017).

Functional, cognitive, and environmental factors predict hospital readmissions, and these factors can be assessed and addressed before discharge for improved client outcomes. For example, greater dependence on others to participate in activities of daily living (ADLs); unmet ADLs needs; worse cognitive performance, especially executive dysfunction; and feeling unprepared for discharge increase a patient's risk of hospital readmissions (Anderson & Birge, 2016; DePalma et al., 2013; Fogg et al., 2019; Hoyer et al., 2014; Jönsson et al., 2017). Clients specifically cite functional limitations, a lack of social support, finances, or the physical environment as barriers to health management in the community (Greysen et al., 2014). A formal assessment of functional, cognitive, and environmental factors may help interdisciplinary teams identify people at risk of hospital readmissions and initiate referrals or treatments that promote improved client outcomes (Hoyer et al., 2014; Jönsson et al., 2017; Raad et al., 2020).

Occupational therapists in acute care use a quick, informal approach to evaluations that may not adequately capture information on clients' discharge needs and their risk for readmission (Britton et al., 2015; Robertson & Blaga, 2013). Occupation-focused, standardized measures may supplement the current approach with objective data gathered in the context of occupational performance that helps occupational therapists identify client needs more objectively and comprehensively (American Occupational Therapy Association [APA], 2014; Baum & Wolf, 2013). However, little is known about the acceptability, appropriateness, and feasibility of standardized measures in this setting. If occupation-focused, standardized measures add value and are deemed acceptable, appropriate, and feasible in acute care, occupational therapists could use them to supplement the current evaluation approach to identify deficits objectively and make referrals that help clients discharge to home successfully.

The primary purpose of this study was to identify predictors of hospital readmissions for people hospitalized for chronic conditions. We hypothesized that self-care function, functional cognition, occupational competence, and environmental impact would predict hospital readmissions. The secondary purpose of this study was to explore occupational therapists' perceptions of the implementation of standardized measures in acute care. We hypothesized that the standardized measures used in this study would be acceptable and appropriate to occupational therapists who work in this setting.

## Method

### Research Design

This study included two parts: (a) a cross-sectional sample of people hospitalized with chronic conditions and (b) a preliminary exploration of occupational therapists' perceptions of standardized measures in acute care. We used convenience sampling to enroll hospital and occupational therapy participants at a 312-bed hospital in the southern United States from June 2019–January 2020. Data on hospital participants were collected in a single assessment session during hospitalization, and a follow-up phone call or chart review was conducted after discharge. Occupational therapists' perceptions of standardized measures in acute care were gathered in a single, face-to-face group meeting. The institutional review boards (IRBs) at CHRISTUS Health and Texas Women's University, Houston, approved the research study.

### Participants

We screened people admitted to the hospital and referred to occupational therapy services for study eligibility. People 18 years of age or older with an admitting diagnosis of CABG, AMI, COPD, THA, TKA, or PNA were invited to participate in the research study. People admitted for CABG were only included if their past medical history indicated chronic cardiovascular disease. Similarly, people admitted for THA or TKA were only included if their past medical history indicated chronic osteoarthritis. People admitted for long-term care, in the intensive care unit, with hospice orders, or with moderate to severe cognitive impairment were excluded from the research study. People admitted for long-term care or with hospice orders were excluded to reduce confounding variables; those admitted to the intensive care unit were excluded because of medical instability; and, those with moderate to severe cognitive impairment were excluded because of their decreased ability to provide informed consent and complete self-report questionnaires.

### Outcomes

#### Primary Measures

**The Montreal Cognitive Assessment** (Nasreddine et al., 2005). We used the Montreal Cognitive Assessment (MoCA) Version 7.1 to screen for cognitive impairment. The MoCA assesses visuospatial skills, naming, memory, attention, language, abstraction, and orientation. Overall scores range from 0–30, where higher scores represent better cognitive function. The MoCA detects mild cognitive impairment with high sensitivity (100%) and specificity (87%) (Nasreddine et al., 2005). Sensitivity and specificity improve to 96% and 95%, respectively, when the cutoff score is 23 (Luis et al., 2009).

**The Boston University Activity Measure for Post-Acute Care “6 clicks” Inpatient Daily Activities Short Form** (Jette et al., 2013). The Boston University Activity Measure for Post-Acute Care “6 clicks” Inpatient Daily Activities Short Form (AM-PAC) was used as a measure of self-care function, or of a person's ability to complete the following activities: self-feeding, grooming, upper body dressing, toileting, bathing, and lower body dressing. Each activity is scored from 1 (*unable to complete*) to 4 (*no difficulty*). Overall scores range from 6 to 24, where lower scores represent greater activity limitations. The AM-PAC has high internal consistency (Cronbach's alpha = 0.91) and interrater reliability (ICC = 0.78, 95% CI = [0.80, 0.85]). It can predict discharge destination in acute care (Jette et al., 2014a, 2014b).

**The Craig Hospital Inventory of Environmental Factors Short Form** (Craig Hospital Research Department, 2001). The Craig Hospital Inventory of Environmental Factors Short Form (CHIEF-SF) was used to measure environmental impact or how the environment supports or restricts a person's participation in daily activities. Each item is rated based on the frequency of occurrence in the past year

(0 [*never*] to 4 [*daily*]) and the magnitude of the barrier (1 [*little problem*] 2 [*big problem*]). Each item score is the product of its frequency and magnitude ratings. Item scores are averaged for an overall CHIEF-SF score, where larger scores represent more frequent and significant barriers to participation. The CHIEF demonstrates content validity through factor analysis, which identified five distinct subscales of questions that account for 48% of the cumulative variance, and construct validity through its development and endorsement by key stakeholders in disability research (Craig Hospital Research Department, 2001). The CHIEF also differentiates scores between those with and without disabilities and across disability groups, such as traumatic brain injury and spinal cord injury (Craig Hospital Research Department, 2001).

**The Executive Function Performance Test-Bill Pay Subtest** (Baum & Wolf, 2013). The Executive Function Performance Test (EFPT)-Bill Pay Subtest was used to measure functional cognition, or the complex thinking and processing skills used to complete ADLs. Scores are assigned for initiation, execution, organization, sequencing, judgment and safety, and completion based on the level of assistance each person needs while performing the task (0 [*independent*] to 5 [*do for participant*]). Subtest scores range from 0–25, where larger scores represent greater functional cognition impairments. The EFPT has excellent internal consistency overall ( $\alpha = 0.94$ ) and acceptable internal consistency for the bill pay subtest ( $\alpha = 0.78$ ) (Baum et al., 2008). The EFPT also demonstrates construct validity, as evidenced by significant differences between control, mild stroke, and moderate stroke participants, and concurrent validity, as evidenced by significant correlations with neuropsychological measures, the Functional Independence Measure ( $r = -0.40$ ) and the Functional Assessment Measure ( $r = 0.68$ ) (Baum et al., 2008).

**The Occupational Self-Assessment Short Form** (Popova et al., 2019). The Occupational Self-Assessment Short Form (OSA-SF) was used as a measure of occupational competence, or the ability to self-manage daily activities, roles, and routines that reflect one's interests and values. Occupational competence is important for client perceptions of preparedness for discharge, and the lack of preparedness for discharge is a predictor of hospital readmissions (Kaya et al., 2018).

On the OSA-SF, each item is rated based on a person's ability to perform the task (1 [*a lot of difficulty*] to 4 [*extremely well*]). Overall competence scores range from 0–48, where higher scores represent greater competence. The OSA 2.2 and OSA-SF have high concurrent validity for the competence scale ( $r = 0.95$ ,  $p < 0.001$ ), and the OSA-SF has strong construct validity, as evidenced by excellent item and person goodness of fit (Popova et al., 2019). After modifications made during measure development, 0% of the items misfit the Rasch model expectations, and only 10.5% of people surveyed misfit the competence scale (Popova et al., 2019).

**Hospital Readmissions.** Hospital readmissions were defined as repeat hospitalizations within 30 days of discharge (Renda et al., 2016). Therefore, a follow-up phone call or medical records review was conducted postdischarge to identify hospital readmissions within 30 days of discharge.

### **Secondary Measures**

**Acceptability, Appropriateness, and Feasibility of Assessment Measures** (adapted from (Weiner et al., 2017)). We adapted the language of the Acceptability, Appropriateness, and Feasibility of Intervention Measures created by Weiner et al. (2017) to focus on the acceptability, appropriateness, and feasibility of standardized assessments. All other aspects of the measures remained the same. Occupational therapists completed the Acceptability, Appropriateness, and Feasibility of Assessment Measures for each standardized assessment administered to the hospital participants. Items were rated from 1 (*completely disagree*) to 5 (*completely agree*), and higher scores represented greater acceptability, appropriateness, and feasibility of the assessment measure. The Acceptability, Appropriateness, and Feasibility of

Intervention Measures demonstrate acceptable structural (0.85–0.91) and test-retest reliability (0.73–0.88) (Weiner et al., 2017).

## **Data Collection**

### ***Hospital Participants***

We conducted a medical records review to screen for study eligibility and invited those who met the inclusion criteria to participate. We confirmed study eligibility with the MoCA, a cognitive screen, and obtained written informed consent from the participants who remained eligible for the research study. The informed consent form was developed from a hospital IRB-approved template, and all text was presented at a third-grade reading level to accommodate a variety of literacy levels. A member of the research team and licensed occupational therapist administered standardized measures to all of the hospital participants. The occupational therapist had formal training in the EFPT and MoCA and demonstrated competency in practice trials before study enrollment. The occupational therapist completed follow-up phone calls or chart reviews after discharge to identify hospital readmissions within 30 days of discharge. We issued gift cards to the hospital participants who completed the research study.

### ***Occupational Therapist Participants***

We invited full-time, part-time, and per diem occupational therapists at Christus St. Michael Hospital to participate. We obtained written informed consent from all of the participants in a one-time, face-to-face group session. We provided the participants with copies of each standardized measure administered to the hospital participants and a brief informational session on the assessment's purpose, target population, estimated completion time, mode of administration, training requirements, and licensing fees. We also demonstrated assessment administration. The participants then completed Acceptability, Appropriateness, and Feasibility of Assessment Measure forms for each standardized measure that was administered to the hospital participants. We issued a gift card to the occupational therapist participants who completed the research study.

## **Data Analysis**

We checked all data for accuracy and completeness. We identified one outlier with a complicating medical factor (hypoventilation syndrome) and an extended hospitalization, but that participant was left in the sample to improve the ecological validity of the study. All analyses were conducted with IBM SPSS v27,  $p < .05$  (IBM Corp., 2020).

### ***Descriptive Statistics***

We calculated descriptive statistics for each variable as well as the frequency and percentage of hospital readmissions within 30 days of discharge for the sample and each diagnosis.

### ***Predictors of Hospital Readmissions***

We used a logistic regression model to determine whether self-care function, functional cognition, occupational competence, and environmental impact predict hospital readmissions. First, we examined the omnibus test using a chi-square for overall model significance. The effect size for the overall model is expressed as Nagelkerke  $R^2$ . Then, we tested each individual predictor. The effect size for each individual predictor is expressed as an odds ratio (Exp[B]). When the odds ratio is higher than 1, increasing values of the predictor could increase the risk of hospital readmissions.

### ***Occupational Therapist Perceptions***

We calculated frequencies and percentages of therapist responses in a preliminary exploration of the acceptability, appropriateness, and feasibility of each standardized measure.

## Results

### Participants

#### *Hospital Participants*

One hundred and thirteen hospital patients met the study's inclusion criteria. Eighteen people declined to participate because of pain, fatigue, or pending discharge, and 43 were unable to participate because they did not meet the MoCA cutoff score, were discharged before the study invitation, or had medical holds. Therefore, 52 hospital participants were enrolled in the study. One participant was excluded because of a lack of experience with checkbooks, a required criterion for the EFPT Bill Pay Subtest, and one participant expired before follow-up. See Table 1 for hospital participant demographics. Time to complete the assessment battery and the number and type of interruptions are reported in a related study on predictors of occupational competence for this population (Tkach et al., in press).

**Table 1**

*Demographics for Participants with Chronic Health Conditions*

Characteristic	Respondents	
	n (%)	M(SD)
<b>Gender</b>		
Female	27 (52.9)	
Male	24 (47.1)	
<b>Race</b>		
African American	7 (13.7)	
European American	44 (86.3)	
<b>Admitting Diagnosis</b>		
CABG	3 (5.7)	
CHF	8 (15.1)	
COPD	3 (5.7)	
TKA	22 (41.5)	
THA	5 (9.4)	
PNA	7 (13.2)	
COPD, CHF	1 (1.9)	
CHF, PNA	2 (3.8)	
<b>Age (years)</b>		63.4 (11.8)
<b>Education (years)</b>		13.4 (2.67)
<b>Number of Comorbidities</b>		8.67 (4.82)

*Note.*  $n = 52$ .  $n = 50$  for education because of missing data. CABG = coronary artery bypass graft; CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; TKA = total knee arthroplasty; THA = total hip arthroplasty; PNA = pneumonia; M = mean; SD = standard deviation.

#### *Occupational Therapist Participants*

During the second component of the research study, we invited five occupational therapists who work in acute care to participate. Two of the per diem occupational therapists declined to participate because they were not scheduled to work the day that the group meeting took place. The three occupational therapists included in the study worked in acute care full-time and were females between 25 and 34 years of age. Two of the occupational therapists identified as European American, and one identified as Hispanic and European American. Two of the occupational therapists held a master's degree, and one held a clinical

doctorate. Two of the occupational therapists had 0–5 years of experience, and one had 6–10 years of clinical experience.

### Predictors of Hospital Readmissions

We used a logistic regression to predict hospital readmissions with self-care function, functional cognition, occupational competence, and environmental impact. See Table 2 for specific results. The overall model was significant,  $\chi^2(4) = 10.9, p = 0.03$ , with an acceptable effect size (Nagelkerke  $R^2 = 0.35$ ). Of the individual predictors, occupational competence was a significant negative predictor (OR = 0.84,  $p = 0.03$ ), and functional cognition was a significant positive predictor (OR = 1.90,  $p = 0.04$ ). Based on the odds ratio, higher scores for occupational competence, which indicate greater levels of occupational competence, decrease the likelihood of hospital readmissions, whereas higher scores on measures of functional cognition, which indicate greater impairments in functional cognition, increase the likelihood of hospital readmissions.

**Table 2**  
*Summary of Logistic Regression Predicting Hospital Readmissions*

Predictor	$\beta$	SE	$p$	OR	95% CI	
					LL	UL
Self-Care Function	0.05	0.17	0.76	1.05	0.76	1.47
Functional Cognition	0.64	0.32	0.04*	1.90	1.02	3.54
Occupational Competence	-0.18	0.08	0.03*	0.84	0.72	0.99
Environmental Impact	-1.01	0.75	0.18	0.36	0.08	1.59

Note.  $n = 50$ . Nagelkerke  $R^2 = 0.35$ . SE = standard error; OR = odds ratio; CI = confidence interval; LL = lower limit; UL = upper limit. The reference category is hospital readmissions. \* $p < .05$ .

### Occupational Therapist Perceptions

See Table 3 for preliminary data on occupational therapists' perceptions of standardized measures in acute care. Occupational therapists rated the AM-PAC most favorably, the CHIEF-SF was deemed least acceptable, and the EFPT was rated least appropriate and feasible.

**Table 3**  
*Frequency of Positive Ratings for the Acceptability, Appropriateness, and Feasibility of Standardized Measures in Acute Care*

		EFPT n (%)	OSA-SF n (%)	CHIEF-SF n (%)	AM-PAC n (%)
<b>Acceptability</b>	Meets my approval	2 (66.7)	1 (33.3)	0 (0)	3 (100)
	Appealing to me	1 (33.3)	2 (66.7)	0 (0)	3 (100)
	Likeable to me	1 (33.3)	1 (33.3)	0 (0)	3 (100)
	Welcomed by me	0 (0)	2 (66.7)	0 (0)	3 (100)
<b>Appropriateness</b>	Seems fitting	0 (0)	1 (33.3)	0 (0)	3 (100)
	Seems suitable	0 (0)	1 (33.3)	0 (0)	3 (100)
	Seems applicable	0 (0)	1 (33.3)	0 (0)	3 (100)
	Seems like a good match	1 (33.3)	1 (33.3)	0 (0)	3 (100)
<b>Feasibility</b>	Seems implementable	0 (0)	2 (66.7)	2 (66.7)	2 (66.7)
	Seems possible	1 (33.3)	2 (66.7)	1 (33.3)	3 (100)
	Seems doable	0 (0)	2 (66.7)	1 (33.3)	3 (100)
	Seems easy to use	0 (0)	2 (66.7)	2 (66.7)	3 (100)

Note.  $n = 3$ . Only agree or completely agree responses are recorded in the table. EFPT = Executive Function Performance Test; OSA-SF = Occupational Self-Assessment Short Form; CHIEF-SF = Craig Hospital Inventory of Environmental Factors Short Form; AM-PAC = Boston University Activity Measure of Post-Acute Care Daily Activity Inpatient Short Form '6 Clicks'.

## Discussion

The primary purpose of this study was to determine whether self-care function, functional cognition, occupational competence, and environmental impact predict hospital readmissions in people with chronic conditions. The secondary purpose was to explore occupational therapists' perceptions of standardized measures in acute care.

### Predictors of Hospital Readmissions

Functional cognition is a significant positive predictor of hospital readmissions, so people with greater impairments in functional cognition are more likely to be readmitted to the hospital. These people may struggle to execute appropriate organization, sequencing, or judgment and safety skills when they manage their health and daily activities in the community. In addition, they may have difficulty problem-solving a course of action when acute symptoms arise, resulting in frequent trips to the hospital for medical attention. Our results support the relationship between cognition and hospital readmissions found in existing literature (Anderson & Birge, 2016; Fogg et al., 2019; Hoyer et al., 2014). Our study adds to the evidence base by incorporating a performance-based test of cognition compared to neuropsychological testing used in prior studies. Performance-based tests like the EFPT provide objective information on how functional cognition supports or hinders participation in daily activities, which can help therapists identify needs more effectively (AOTA, 2014; Baum & Wolf, 2013).

Occupational competence was a significant negative predictor of hospital readmissions, so people who report higher levels of occupational competence are less likely to be readmitted to the hospital. Our findings can be explained by theoretical literature on occupational competence that postulates people with high levels of occupational competence actively participate in activities of interest or value to them, and, as a result, they experience feelings of competence (Taylor, 2017). It follows that people with chronic conditions who report high levels of occupational competence feel confident in their ability to manage their conditions in the community and do so successfully. In contrast, people with chronic conditions and low levels of occupational competence feel unprepared for health management at home and may seek emergency medical care to navigate acute symptoms. In addition, the relationship between occupational competence and hospital readmissions loosely correlates with the literature on preparedness for discharge, which demonstrates that people who feel unprepared for discharge often return to the hospital for follow-up medical care (Kaya et al., 2018). These findings also build on existing theory-based literature related to occupational competence (Taylor et al., 2010) by establishing a significant link between occupational competence and hospital readmissions for people hospitalized with chronic conditions.

The non-significant relationship between self-care function and hospital readmissions was unexpected since greater ADL dependence and unmet ADL needs are typically associated with higher rates of readmission (DePalma et al., 2013; Greysen et al., 2017; Hoyer et al., 2014; Jönsson et al., 2017). Acute symptoms may have driven readmissions more than self-care impairments for this sample. For example, one participant was readmitted after TKA because of an infection at the surgical site, not functional limitations or decline. Others were readmitted for shortness of breath and associated psychosocial symptoms, such as anxiety.

### Occupational Therapist Perceptions

The small sample of occupational therapists included in the study rated the AM-PAC as the most acceptable, appropriate, and feasible standardized measure for acute care. This finding may be related to the fact that the occupational therapists currently rate all six self-care activities included on the AM-PAC with a similar scale during the initial evaluation. The occupational therapists ranked the MoCA and the

OSA-SF second and third, respectively. Favorable ratings for the MoCA correspond to existing literature that reports cognitive measures are the most commonly used standardized assessments in acute care (Robertson & Blaga, 2013). Our results add preliminary evidence for therapist perceptions of the OSA-SF, which was developed and validated in 2019 (Popova et al., 2019). However, these perceptions should be interpreted with caution, since the sample of occupational therapists was small ( $n = 3$ ) and drawn from one acute care facility in the southern United States.

### **Implications**

Occupational therapists in acute care should consider using standardized measures to quantify functional cognition and occupational competence in people hospitalized with chronic health conditions when appropriate. These measures may complement the current evaluation approach by providing a more comprehensive picture of client needs for effective treatment and discharge plans. They would enable occupational therapists to communicate with the interdisciplinary team and justify therapy recommendations and services as well (Fisher & Friesema, 2013; Jönsson et al., 2017; Raad et al., 2020). Occupational therapists in acute care should also refer clients with impairments in functional cognition or low levels of occupational competence for continued therapy services to facilitate a safe discharge home and support health management in the community. Finally, managers should consider obtaining clinical licenses for standardized assessments so that occupational therapists have access to these tools in acute care. Standardized assessments meet the need for evidence-based measurement of client outcomes in value-based purchasing initiatives and aid in discharge planning (Fisher & Friesema, 2013; Jönsson et al., 2017; Raad et al., 2020). Furthermore, preliminary evidence from this study suggests that measures like the AM-PAC may be acceptable, appropriate, and feasible in acute care.

### **Limitations**

This study included a small sample of hospital participants and occupational therapists, which limits the generalizability of findings. In addition, the study involves self-report measures for occupational competence and environmental impact, which may increase the likelihood of socially preferred responses. The sample includes many participants with THA/TKA ( $n = 28$ ), and this population is typically healthier, more physically active, and more cognitively intact compared to other chronic medical diagnoses. These differences may have influenced study results. Finally, the sample included an uneven distribution of hospital readmissions outcomes, which increases the challenge of finding significant results and the likelihood of a Type 2 error.

### **Future Research**

Future research should incorporate larger samples of hospital participants with more even distributions of diagnoses and hospital readmissions outcomes to increase the generalizability of findings. Future research should also expand the sample to include additional medical-surgical, neurologic, and orthopedic diagnoses to represent better the makeup of occupational therapy caseloads in this setting. Studies should incorporate data on health disparities by race as well as socioeconomic and psychosocial factors that may influence hospital readmissions. Future research should investigate the efficacy of an enhanced evaluation approach that incorporates standardized measures of functional cognition and occupational competence on client outcomes as well. Finally, future studies should include larger samples of occupational therapists from various acute care settings across the United States to improve the generalizability of findings. These studies should also provide occupational therapists with opportunities

to use standardized measures in practice to capture better the acceptability, appropriateness, and feasibility of tools.

### Conclusion

This study (a) investigated the predictors of hospital readmissions for people with chronic conditions and (b) explored occupational therapists' perceptions of the implementation of standardized measures in acute care. Functional cognition and occupational competence were significant predictors of hospital readmissions for people with chronic medical conditions. Thus, people with greater cognitive impairments and lower levels of occupational competence were more likely to be readmitted to the hospital. A small sample of occupational therapists rated the AM-PAC as the most acceptable, appropriate, and feasible measure for the acute care setting. Occupational therapists should consider supplementing current evaluation practices with standardized measures when appropriate to increase the likelihood of a safe and successful discharge home. Specific standardized measures, like the AM-PAC, may be easily implemented in acute care. Future research should explore the efficacy of an enhanced evaluation approach that incorporates standardized measures of functional cognition and occupational competence.

### References

- American Occupational Therapy Association. (2014). Occupational therapy practice framework: Domain & process (3rd ed.). *American Journal of Occupational Therapy*, 68(Suppl. 1), S1–S51. <https://doi.org/10.5014/ajot.2014.682006>
- Anderson, R. E., & Birge, S. J. (2016). Cognitive dysfunction, medication management, and the risk of readmission in hospital inpatients. *Journal of the American Geriatrics Society*, 64(7), 1464–1468. <https://doi.org/10.1111/jgs.14200>
- Baum, C. M., Connor, L. T., Morrison, T., Hahn, M., Dromerick, A. W., & Edwards, D. F. (2008). Reliability, validity, and clinical utility of the Executive Function Performance Test: A measure of executive function in a sample of people with stroke. *The American Journal of Occupational Therapy*, 62(4), 446–455. <https://doi.org/10.5014/ajot.62.4.446>
- Baum, C. M., & Wolf, T. J. (2013). *Test manual: Executive Function Performance Test*. Washington University.
- Britton, L., Rosenwax, L., & McNamara, B. (2015). Occupational therapy practice in acute physical hospital settings: Evidence from a scoping review. *Australian Occupational Therapy Journal*, 62(6), 370–377. <https://doi.org/10.1111/1440-1630.12227>
- Centers for Medicare and Medicaid Services. (2021). *Hospital Readmissions Reduction Program (HRRP)*. <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program>
- Centers for Medicare and Medicaid Services Office of Minority Health. (2018). *Guide to reducing disparities in readmissions*. [https://www.cms.gov/about-cms/agency-information/omh/downloads/omh\\_readmissions\\_guide.pdf](https://www.cms.gov/about-cms/agency-information/omh/downloads/omh_readmissions_guide.pdf)
- Craig Hospital Research Department. (2001). *Craig Hospital Inventory of Environmental Factors (CHIEF) manual version 3.0*. Craig Hospital.
- DePalma, G., Xu, H., Covinsky, K. E., Craig, B. A., Stallard, E., Thomas III, J., & Sands, L. P. (2013). Hospital readmission among older adults who return home with unmet need for ADL disability. *The Gerontologist*, 53(3), 454–461. <https://doi.org/10.1093/geront/gns103>
- Ferro, E. G., Secemsky, E. A., Wadhera, R. K., Choi, E., Strom, J. B., Wasfy, J. H., Wang, Y., Shen, C., & Yeh, R. W. (2019). Patient readmission rates for all insurance types after implementation of the hospital readmissions reduction program. *Health Affairs*, 38(4), 585–593. <https://doi.org/10.1377/hlthaff.2018.05412>
- Fisher, G., & Friesema, J. (2013). Implications of the Affordable Care Act for occupational therapy practitioners providing services to Medicare recipients. *The American Journal of Occupational Therapy*, 67(5), 502–506. <https://doi.org/10.5014/ajot.2013.675002>
- Fogg, C., Meredith, P., Culliford, D., Bridges, J., Spice, C., & Griffiths, P. (2019). Cognitive impairment is independently associated with mortality, extended hospital stays and early readmission of older people with emergency hospital admissions: a retrospective cohort study. *International Journal of Nursing Studies*, 96, 1–8. <https://doi.org/10.1016/j.ijnurstu.2019.02.005>
- Greysen, S. R., Harrison, J. D., Kripalani, S., Vasilevskis, E., Robinson, E., Metlay, J., Schnipper, J. L., Meltzer, D., Sehgal, N., & Ruhnke, G. W. (2017). Understanding patient-centred readmission factors: a multi-site, mixed-methods study. *BMJ Quality & Safety*, 26(1), 33–41. <https://doi.org/10.1136/bmjqs-2015-004570>
- Greysen, S. R., Hoi-Cheung, D., Garcia, V., Kessell, E., Sarkar, U., Goldman, L., Schneidermann, M., Critchfield, J., Pierluissi, E., & Kushel, M. (2014). “Missing pieces”—functional, social, and environmental barriers to recovery for vulnerable older adults transitioning from hospital to home. *Journal of the American Geriatrics Society*, 62(8), 1556–1561. <https://doi.org/10.1111/jgs.12928>
- Hoyer, E. H., Needham, D. M., Atanelov, L., Knox, B., Friedman, M., & Brotman, D. J. (2014). Association of impaired functional status at hospital discharge and subsequent rehospitalization. *Journal of Hospital Medicine*, 9(5), 277–282. <https://doi.org/10.1002/jhm.2152>
- IBM Corp. (2020). *IBM SPSS Statistics for Windows, Version 27.0*. IBM Corp.
- Jette, A., Haley, M., Coster, W., & Ni, P. S. (2013). *AM-PAC Short Forms for Inpatient and Outpatient Settings: Instruction manual*. [http://www.bu.edu/bostonroc/files/2013/10/AM-PAC-Short-Form-Manual\\_10.24.2013-SAMPLE.pdf](http://www.bu.edu/bostonroc/files/2013/10/AM-PAC-Short-Form-Manual_10.24.2013-SAMPLE.pdf)
- Jette, D. U., Stilphen, M., Ranganathan, V. K., Passek, S. D., Frost, F. S., & Jette, A. M. (2014a). AM-PAC “6-Clicks” functional assessment scores predict acute care hospital discharge destination. *Physical Therapy*, 94(9), 1252–1261. <https://doi.org/10.2522/ptj.20130359>
- Jette, D. U., Stilphen, M., Ranganathan, V. K., Passek, S. D., Frost, F. S., & Jette, A. M. (2014b). Validity of the AM-PAC “6-Clicks” inpatient daily activity and basic mobility short forms. *Physical Therapy*, 94(3), 379–391. <https://doi.org/10.2522/ptj.20130199>
- Jönsson, M., Appelros, P., & Fredriksson, C. (2017). Older people readmitted to hospital for acute medical care—implications for occupational therapy. *Scandinavian*

- Journal of Occupational Therapy*, 24(2), 143–150.  
<https://doi.org/10.1080/11038128.2016.1227367>
- Kaya, S., Sain Guven, G., Aydan, S., Kar, A., Teleş, M., Yıldız, A., Koca, G. Ş., Kartal, N., Korku, C., & Ürek, D. (2018). Patients' readiness for discharge: Predictors and effects on unplanned readmissions, emergency department visits and death. *Journal of Nursing Management*, 26(6), 707–716.  
<https://doi.org/10.1111/jonm.12605>
- Khera, R., Wang, Y., Bernheim, S. M., Lin, Z., & Krumholz, H. M. (2020). Post-discharge acute care and outcomes following readmission reduction initiatives: national retrospective cohort study of Medicare beneficiaries in the United States. *BMJ*, 368. <https://doi.org/10.1136/bmj.l6831>
- Luis, C. A., Keegan, A. P., & Mullan, M. (2009). Cross validation of the Montreal Cognitive Assessment in community dwelling older adults residing in the Southeastern US. *International Journal of Geriatric Psychiatry*, 24(2), 197–201.  
<https://doi.org/10.1002/gps.2101>
- Nasreddine, Z. S., Phillips, N. A., Bédirian, V., Charbonneau, S., Whitehead, V., Collin, I., Cummings, J. L., & Chertkow, H. (2005). The Montreal Cognitive Assessment, MoCA: A brief screening tool for mild cognitive impairment. *Journal of the American Geriatrics Society*, 53(4), 695–699. <https://doi.org/10.1111/j.1532-5415.2005.53221.x>
- Popova, E. S., Ostrowski, R. K., Wescott, J. J., & Taylor, R. R. (2019). Development and validation of the Occupational Self-Assessment–Short Form (OSA–SF). *The American Journal of Occupational Therapy*, 73(3), 7303205020p7303205021–7303205020p7303205010.  
<https://doi.org/10.5014/ajot.2019.030288>
- Raad, J. H., Papadimitriou, C., Jordan, N., & Heinemann, A. W. (2020). Allied health professionals utilization of standard measures assessing measurement practice in physical medicine and rehabilitation. *Journal of Allied Health*, 49(2), 92–98.  
<https://www.proquest.com/docview/2409696898>
- Renda, M., Lee, S., Keglovits, M., & Somerville, E. (2016). The role of occupational therapy in reducing hospital readmissions. *OT Practice*, 21(15), CE1–CE8.
- Robertson, L., & Blaga, L. (2013). Occupational therapy assessments used in acute physical care settings. *Scandinavian Journal of Occupational Therapy*, 20(2), 127–135. <https://doi.org/10.3109/11038128.2012.737369>
- Taylor, R. R. (2017). *Kielhofner's model of human occupation* (5th ed.). Wolters Kluwer.
- Taylor, R. R., O'Brien, J., Kielhofner, G., Lee, S.-W., Katz, B., & Mears, C. (2010). The occupational and quality of life consequences of chronic fatigue syndrome/myalgic encephalomyelitis in young people. *British Journal of Occupational Therapy*, 73(11), 524–530.  
<https://doi.org/10.4276/030802210x12892992239233>
- Tkach, M. M., Bowyer, P., Neville, M., Wolf, T. J., & Goodman, G. (in press). Predictors of occupational competence in people hospitalized with chronic conditions. *The Open Journal of Occupational Therapy*.
- Wadhwa, R. K., Yeh, R. W., & Maddox, K. E. J. (2019). The hospital readmissions reduction program—time for a reboot. *The New England Journal of Medicine*, 380(24), 2289. <https://doi.org/10.1056/nejmp1901225>
- Weiner, B. J., Lewis, C. C., Stanick, C., Powell, B. J., Dorsey, C. N., Clary, A. S., Boynton, M. H., & Halko, H. (2017). Psychometric assessment of three newly developed implementation outcome measures. *Implementation Science*, 12(1), 1–12. <https://doi.org/10.1186/s13012-017-0635-3>

---

Activity Measure for Post Acute Care: <https://www.pearsonassessments.com/store/usassessments/en/Store/Professional-Assessments/Cognition-%26-Neuro/Activity-Measure-for-Post-Acute-Care/pP100003000.html#:~:text=The%20Activity%20Measure%20for%20Post.across%20post%2Dacute%20care%20settings>

Montreal Cognitive Assessment: <https://www.mocatest.org>

Occupational Self-Assessment Short Form: <https://mofo-irm.uic.edu/productDetails.aspx?aid=2>

---