

Assessing Functional Cognition in Patients with Mild Stroke: Feasibility in Acute Care

Author(s)

Judy Hamby, OTD, MHS, OTR/L, BCPR

Catherine Verrier Piersol, PhD, OTR/L, FAOTA

Author Contact Information

Judy Hamby

Email: judyhamby@att.net

Recommended Citation

Hamby, J., & Piersol, C.V. (2022). Assessing functional cognition in patients with mild stroke: Feasibility in acute care. *Journal of Acute Care Occupational Therapy*, 4(2), 1-35.

This original research study is brought to you for free and open access. It has been peer-reviewed and accepted for inclusion in Journal of Acute Care Occupational Therapy by an authorized editor for this journal. For more information, please contact journalofacutecareOT@gmail.com.

Abstract

Clients who have sustained a mild stroke often have unrecognized deficits in executive function. In the acute care setting, occupational therapists typically evaluate cognitive function using naturalistic observations of basic activities of daily living rather than standardized evaluation. When using an informal assessment approach, deficits in executive function may not be evident if higher-level cognitive processes are not required. Thus, patients with a mild stroke may be discharged home with executive function deficits that place them at risk for financial, emotional, and social instability. This study evaluated the feasibility of implementing a performance-based cognitive test protocol within the acute care setting of a large suburban hospital using a one-group pretest-posttest design. Trained acute care occupational therapists implemented the six-week protocol with patients diagnosed with a mild stroke. The therapists perceived that a performance-based functional cognition test in the acute care setting was beneficial for their patients, did not take excessive time and could be utilized routinely. Time constraints and patient conditions such as patient cognitive or medical status, aphasia, co-morbidities, or patient refusal to participate were the most common barriers reported. Still, therapists felt they could incorporate the protocol into their workflow. The implementation process of this protocol can be replicated to successfully introduce additional performance-based tests in the acute care setting.

Keywords: feasibility, functional cognition, occupational therapy, performance-based tests, Pillbox Test, stroke

Introduction and Background

Every year, approximately 795,000 people in the United States are diagnosed with a new or recurrent stroke (Virani et al., 2020). Up to 80 percent of people post-stroke experience cognitive deficits, affecting a person's occupational performance and safety (Lo et al., 2019). Unrecognized cognitive deficits can place a person at risk for financial, emotional, and social instability when discharged home (Blackburn et al., 2013). Spokoyny et al. (2015) found that approximately 1/3 of patients with a mild stroke did not return to functional independence at 90 days with a Modified Rankin Scale (mRS) score of 2 to 6. A mRS score of zero indicates no deficits, and one indicates no significant disability, while a score of two to six indicates progressive levels of disability ending in death. Romero-Ayuso et al. (2019) reported that 66 percent of patients with a mild stroke demonstrate executive function deficits even up to a year post-stroke. Adamit et al. (2014) found that 46.2% of patients had executive function deficits upon performance-based assessment. However, on a self-reported Health-related Quality of Life Scale, patients who sustained a transient ischemic attack or minor stroke reported impairments in executive function-related activities at only 7 percent and 13 percent, respectively (Sangha et al., 2015). It is not surprising that patients with mild stroke symptoms consistently report emotional distress and frustrations due to struggles with unrecognized cognitive deficits (Baum et al., 2019; Sangha et al., 2015). Within five years post-stroke, impaired cognition is associated with increased mortality, institutionalization, depression, and decreased independence in activities of daily living (Obaid et al., 2020).

Deficits in functional cognition can impede a full return to the community, including returning to work or independent living (Morrison et al., 2015). It is incumbent upon the acute care occupational therapist to identify cognitive deficits that could impact functional recovery (Borella et al., 2017; Edwards et al., 2019). Edwards et al. (2006) found that 100 percent of stroke patients in their study (N = 53) had at least one cognitive deficit, while 35 percent had three or more. These deficits were detected on standardized, non-performance-based tests but were not identified by clinicians during naturalistic evaluations. In 2011, Bottari and Dawson reported experienced occupational therapists (n=74; 3-22 years) identified only 44.5 percent of cognitive errors. Robertson and Blaga (2013) report that only 30 percent of the 70 acute care therapists surveyed in their study assessed patients' post-stroke cognition. These therapists primarily used pen-and-paper cognitive skill tests rather than a functional cognition performance-based test. Wolfenden and Grace (2015) stated, "from the moment stroke commences, survivors are vulnerable, and how they are treated, or not, during an acute stroke can influence post-stroke outcomes" (p. 3).

Several acute-care studies reported that therapists primarily used naturalistic observation-based assessment to determine functional performance (Sansone & Hoffmann, 2013; Smith-Gabai, 2016). In a scoping review of longitudinal evaluations of cognition utilized after stroke, Saa et al. (2019) found less than 1 percent of patients are assessed using functional task performance to assess cognition. Therapists tend to perform cognitive testing only to validate observation of perceived deficits (Baum et al., 2019; Bottari & Dawson, 2011; Robertson & Blaga, 2013; Sangha et al., 2015). Therefore, since nearly 45 percent of therapists do not identify cognitive deficits during

basic activities of daily living, follow-up evaluation of higher-order cognitive deficits is not performed (Bottari & Dawson, 2011; Morrison et al., 2015). Naturalistic observation of functional performance to determine cognitive deficits is not standardized and is subject to therapists' opinions and experience (Edwards et al., 2019; Robertson & Blaga, 2013).

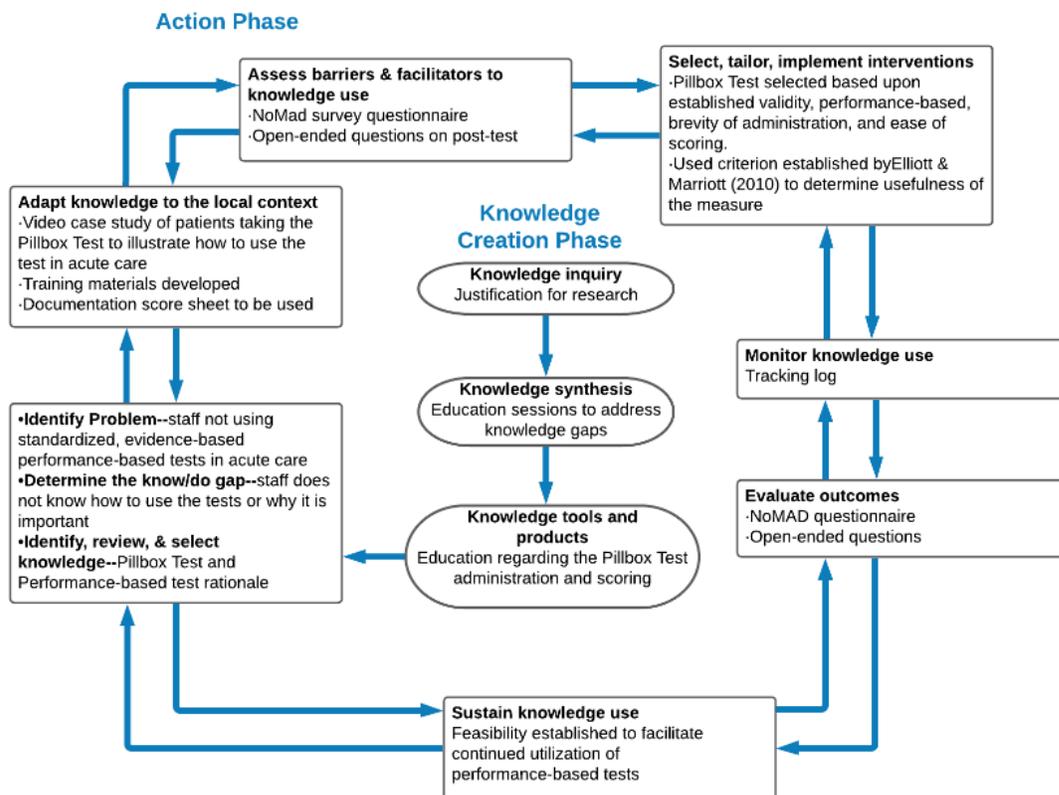
Using performance-based assessments is considered the best practice for evaluating functional cognition (AOTA, 2019; Morrison et al., 2015; Romero-Ayuso et al., 2019; Sansonetti & Hoffmann, 2013). Multiple studies have demonstrated that using standardized performance-based tests is superior to global cognitive pen-and-paper tests to identify functional cognition deficits. They tease out the performance consequences of cognitive deficits versus the impairment level deficits (Edwards et al., 2019; Toglia et al., 2017). Despite these findings, clinical observation skills are often considered the primary method for assessment in the acute care setting, especially since therapists lack familiarity with standardized assessments (Robertson & Blaga, 2012; Sansonetti & Hoffman, 2013). In Smith-Gabai's study on occupational therapy and acute care discharge planning, she found that the occupational therapists were also frustrated with the inadequacy of performance-based standardized tests to address the full scope of encountered issues (2016). Therapists reported various reasons for not using standardized performance-based tests, including productivity demands, time constraints, practicality, and pressure to discharge patients from the hospital (Smith-Gabai, 2016).

This study aimed to evaluate the feasibility of implementing a performance-based cognitive assessment protocol in the acute care setting for patients with mild stroke using the Knowledge to Action framework (Graham et al., 2006). The Knowledge to

Action (KTA) framework offers a systematic approach to embedding a new process or procedure into clinical practice through two interactive phases: (1) Knowledge Creation Phase and (2) Action Phase. Knowledge Creation involves understanding the current research and effectively tailoring it to align with the context of the setting. This phase then informs the Action Phase, which follows a process framework. Figure 1 displays how this study applied the KTA framework.

Figure 1

Implementing the Performance-based Cognitive Assessment Protocol: Application of the Knowledge to Action Framework



Adapted from Graham et al., 2006

Complementary to the KTA framework is the Normalization Process Theory (NPT), an action theory that explains the implementation processes in which individuals or teams engage (May, 2015). NPT involves four processes.

1. *Coherence* is the process that people and teams undertake to make sense of a new thought process.
2. *Cognitive participation* is the process by which people commit to the plan and discern their role in a new approach.
3. *Collective action* is the process of operationalizing the new intervention, including embedding it into their existing and evolving skillset and fitting into the worksite context.
4. *Reflexive monitoring* is the process of measuring outcomes.

Guided by the KTA framework and NPT, the following three outcomes were sought to be achieved through this study:

1. Occupational therapists' perceptions of the practicality, acceptability, and suitability of administering the performance-based cognitive assessment protocol will improve after training and implementing the protocol.
2. Occupational therapists will successfully administer the protocol to 95 percent of patients with a mild stroke referred to their caseload.
3. Occupational therapists will identify barriers, facilitators, and practical methods for implementing a standardized performance-based test.

Methodology

Performance-based Cognitive Assessment Protocol

This study was a one-group pretest-posttest design. The Performance-based Cognitive Assessment Protocol (P-CAP) was integrated into the usual occupational therapy evaluation procedure. A typical evaluation primarily included basic ADLs, physical and visual components, and unstandardized cognitive assessment embedded in tasks that could be accomplished in the patient's unit, such as grooming and hygiene and using the vending machine or hospital signage. For patients with mild stroke (NIHHS score of ≤ 5) the occupational therapist completed the typical occupational therapy evaluation process described above, followed by the P-CAP, which involved administering the Pillbox Test (Zartman et al., 2013) and interpreting the findings to inform discharge recommendations.

The Pillbox Test evaluates functional cognition using the complex task of pill organization and adequately assesses executive functioning skills for an everyday instrumental activity of daily living (Zartman et al., 2013). There are five different medications with standardized but vague labels. Using a pill organizer with four compartments per day (labeled breakfast, lunch, dinner, bedtime) for seven days, patients are instructed to read the labels on the medication and then fill the pillbox for an entire week. Scoring is based on omissions (not putting in a medication), commission (putting too many pills in the organizer), or misplaced movements (placing a pill in the wrong place). Zartman et al. (2013) established that ≥ 5 errors signify a failing score. The Pillbox Test has established validity, good construct and criterion validity, specificity, and sensitivity (Logue et al., 2015; Zartman et al., 2013).

During assessment administration, the occupational therapist made behavioral observations, such as frustration level, organizational strategies, and self-correction. Afterward, the therapist made discharge recommendations based on performance, including follow-up services. Follow-up services might include outpatient or home health occupational therapy or a driving assessment. Safety considerations at home, such as coordinating the recommended level of supervision, support for medication and home management, financial assistance, and return to work and driving, were also addressed. Training was provided to all participating occupational therapists to improve their ability to rapidly recognize and accurately evaluate cognitive deficits. Ongoing P-CAP monitoring was provided to ensure intended administration.

Educational topics included:

- Role of occupational therapy in the evaluation of functional cognition deficits
- Functional cognition and executive functioning
- Common cognitive deficits in patients with mild stroke
- Synthesizing and analyzing functional cognition performance-based test results
- Appropriate discharge recommendations
- Staff, patient, and family education

Participants

A convenience sample of 10 acute-care occupational therapists were recruited and consented to participate in the study. All ten staff occupational therapists were from the acute care rehabilitation department at a 650-bed suburban level II trauma hospital in the southeastern United States (Table 1). Years of experience in acute care ranged from one to four years.

Table 1

Demographics Characteristics of Participants (N = 10)

Demographic Characteristic	Number
Years of experience	
2	1
5	1
6	2
7	1
14	2
17	2
21	1
Years of experience in acute care	
1	2
2	5
4	3
Gender	
Male	2
Female	8
Ethnicity	
Caucasian	3
Black or African American	5
Asian	1
Other/wish not to disclose	1
Type of Training to treat patients with cognitive deficits	
Occupational therapy education	9
Experiential at this hospital	8
Experiential elsewhere	8
Literature reviews	7
Continuing education	10

Note. N=10

Instruments

Normalization Measure Development Survey

The Normalization Measure Development (NoMAD) survey measured occupational therapists' perceptions of the practicality, acceptability, and suitability of integrating the P-CAP into clinical practice (Finch et al., 2015). The NoMAD survey consists of 23 items on a 5–point agreement scale from (1) strongly disagree to (5) strongly agree and three general questions using a 10-point response scale from 0 (not at all) to 10 (completely). The tool allows for customization to the study's setting and objectives. For this study, the questions were edited to focus on using the P-CAP. Occupational therapists completed the NoMAD survey before and after implementing the P-CAP. Four open-ended questions were added to the post-survey addressing barriers, facilitators, and suggestions for future implementation.

Tracking Log

Developed specifically for this study, occupational therapists used the Tracking Log to monitor the administration of the P-CAP with patients diagnosed with a mild stroke referred for occupational therapy (Figure 2).

Figure 2

Tracking Log Sample

Tracking Log					
(please record information on <u>ALL stroke patients</u> who are on your caseload)					
Patient	Date	Stroke NIHSS score	Pillbox test given?	If not, why? (i.e., aphasic, NIHSS \geq 6, time, availability of supplies)	Comments (optional)
1					
2					
3					
4					
5					
6					
7					

Procedure

The Institutional Review Board of the hospital approved the study (Expedited IRB 1710003-1). Participating Occupational therapists provided written consent and completed the NoMAD survey before engaging in a two-hour training session on Pill Box Test administration and the evaluation process with embedded P-CAP. The occupational therapists implemented the P-CAP over six weeks and maintained the tracking log. Oversight was provided throughout the six weeks to answer questions and ensure fidelity to the study protocol. At the end of the six weeks, the occupational therapists completed the NoMAD and the open-ended questions. Survey data was stored on a password-protected computer.

Data Analysis

Descriptive statistics were used to calculate frequency distributions for demographic characteristics of the occupational therapists. Following the recommended analysis procedure for the NoMAD, response frequencies for each survey item were

calculated and compared (May et al., 2015). Strongly agree and agree were considered positive responses, except for one item in which the ratings were reversed (i.e., disagree and strongly disagree were considered positive responses).

Content analysis was completed on the narrative responses to the open-ended questions and the comment section of the tracking logs. The open-ended questions were transcribed verbatim and analyzed using NPT constructs and sub-constructs, adapted from the work of Connell et al. (2014; Table 2). In their qualitative study, Connell et al. (2014) used this coding framework to implement a rehabilitation intervention into clinical practice. The framework was adapted for this implementation feasibility study to analyze the responses to the NoMAD open-ended questions. The percentage of patients to whom the therapists administered the full P-CAP was calculated by dividing the number of referrals by patients who received the P-CAP.

Table 2*Sub-Construct Definitions*

Associated Construct	Sub-Construct	Sub-Construct Definition
Coherence	Individual specification	Individual understanding
	Internalization	Aspects that are valued
Cognitive Participation	Enrollment	Who should be involved (staff and patients); suitability for involvement.
	Activation	Methods for embedding the new practices in policies, procedures, and processes.
Collective Action	Initiation	Refers to influential people
	Contextual integration	Perceptions of organizational support.
Reflexive Monitoring	Interactional workability	Logistics of actually doing the work.
	Skillset workability	Allocation of work to people
	Reconfiguration	Adaptations and changes that people make.
	Individual appraisal	Reflections about whether the test is worth doing for specific individuals.

The responses by therapists were reviewed and categorized by the constructs and sub-constructs using NPT (Table 3). The most comprehensive comments were in the collective action construct, indicating the same barriers, facilitators, and implementation suggestions on tracking logs. Overall, the open-ended questions elicited responses regarding time, including constraints and time-saving strategies, educational efforts, and the effect of communication on the administration of the standardized

assessment. Therapists supported using standardized assessments in the acute care setting as indicated in the reflexive monitoring comments.

Table 3

Participant Responses Regarding Content Analysis

Construct	Sub-Construct	Facilitators	Barriers	Recommendations for implementation
Coherence	Individual specification		Patient compliance	Educating MDs, families, management, and staff about the benefits of administering the test
	Internalization			Education on its use and benefits to improving evidence-based therapy
Cognitive Participation	Enrollment	MD support Staff support Team working with other disciplines	Patient's cognition and limiting co-morbidities	
	Activation	Based on functional assessment and NIH score		
	Initiation	Sufficient instruction on the efficacy and administration prior to implementation Clinical champion		
Collective Action	Contextual Integration	Having the materials available	Time constraints	Necessary availability of resources for validity
			Patient being discharged prior to [administration]. I was worried if I spent too much time in one patient's room...my productivity numbers [would] look bad	
	Interactional Workability	Low barrier documentation using smart phrases Relatively quick if known in advance that it is appropriate to administer	Not always being able to administer the test to patients identified that needed further cognitive testing.	If time is an issue on the day of eval, attempt the test the following day if patient is appropriate.
			I feel pressure to do such a broad and detailed assessment [and] also see a certain amount of people	
Reflexive Monitoring	Reconfiguration			It will just take time for it to become a part of our day-to-day work process. Would like to incorporate other types of functional, task-based assessments
	Individual Appraisal			I believe it should become a standard of our assessment

Note. Definitions of sub-constructs in Table 2. NPT Constructs and Sub-constructs applied to comments.

Results

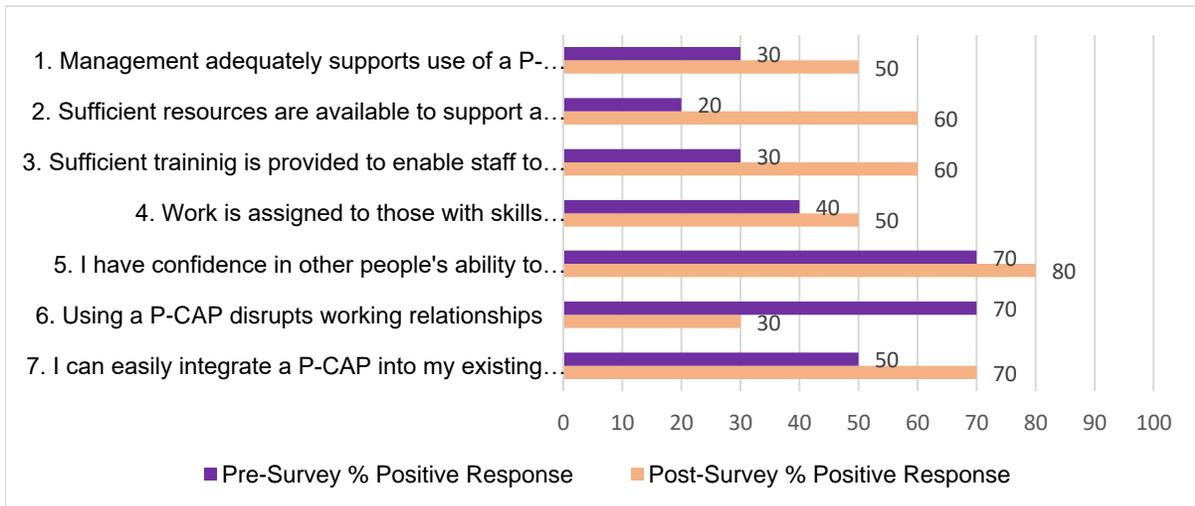
Outcome 1: Improved Perception of Practicality, Acceptability, and Suitability

Perception of Practicality

There was an increase in positive responses by the occupational therapists across all seven practicality items. With a 20 to 40 percent improvement in positive responses, therapists indicated that management supports using a P-CAP and that there were adequate resources and training to implement the P-CAP. Of note is the therapists' perception of how much the P-CAP would disrupt working relationships, declining from 70 percent on the pretest to 30 percent at the posttest (Figure 3).

Figure 3

Change in Therapists' Perception of Administering the Performance-based Cognitive Assessment Protocol: Practicality¹ (N=10)



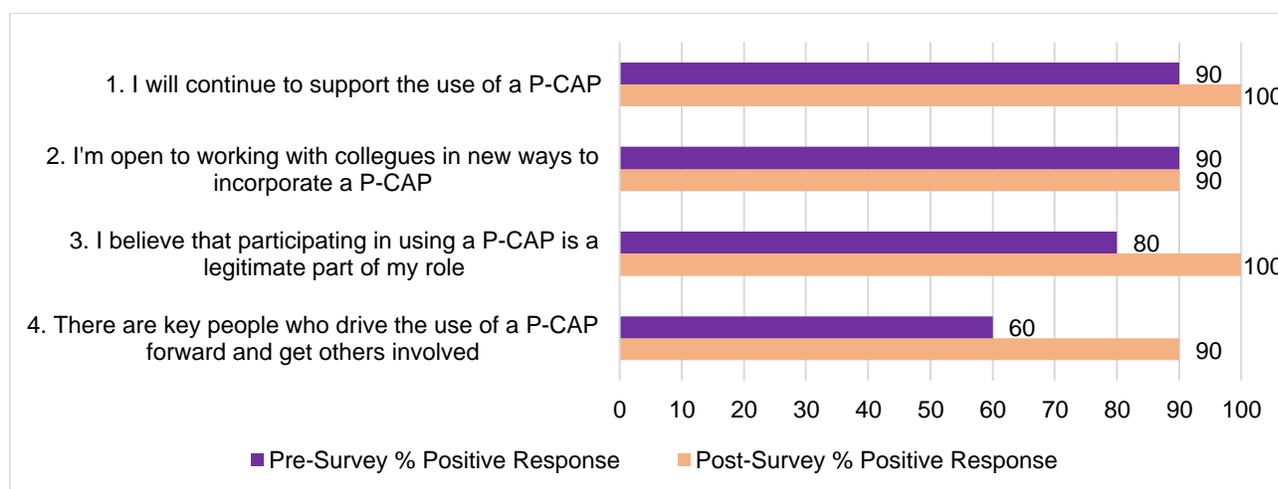
Note. ¹Practicality is analogous to collective action on the NoMAD

Perceptions of Acceptability

There was an increase in positive responses by the occupational therapists on three acceptability items, with one item remaining consistent. The responses indicate the therapists are committed to using the P-CAP, with 100 percent reporting they will continue to support the P-CAP and believe it is a legitimate part of their role (Figure 4).

Figure 4

Change in Therapists' Perception of Administering the Performance-based Cognitive Assessment Protocol: Acceptability² (N=10)



Note. ² = Acceptability is analogous to cognitive participation on the NoMAD

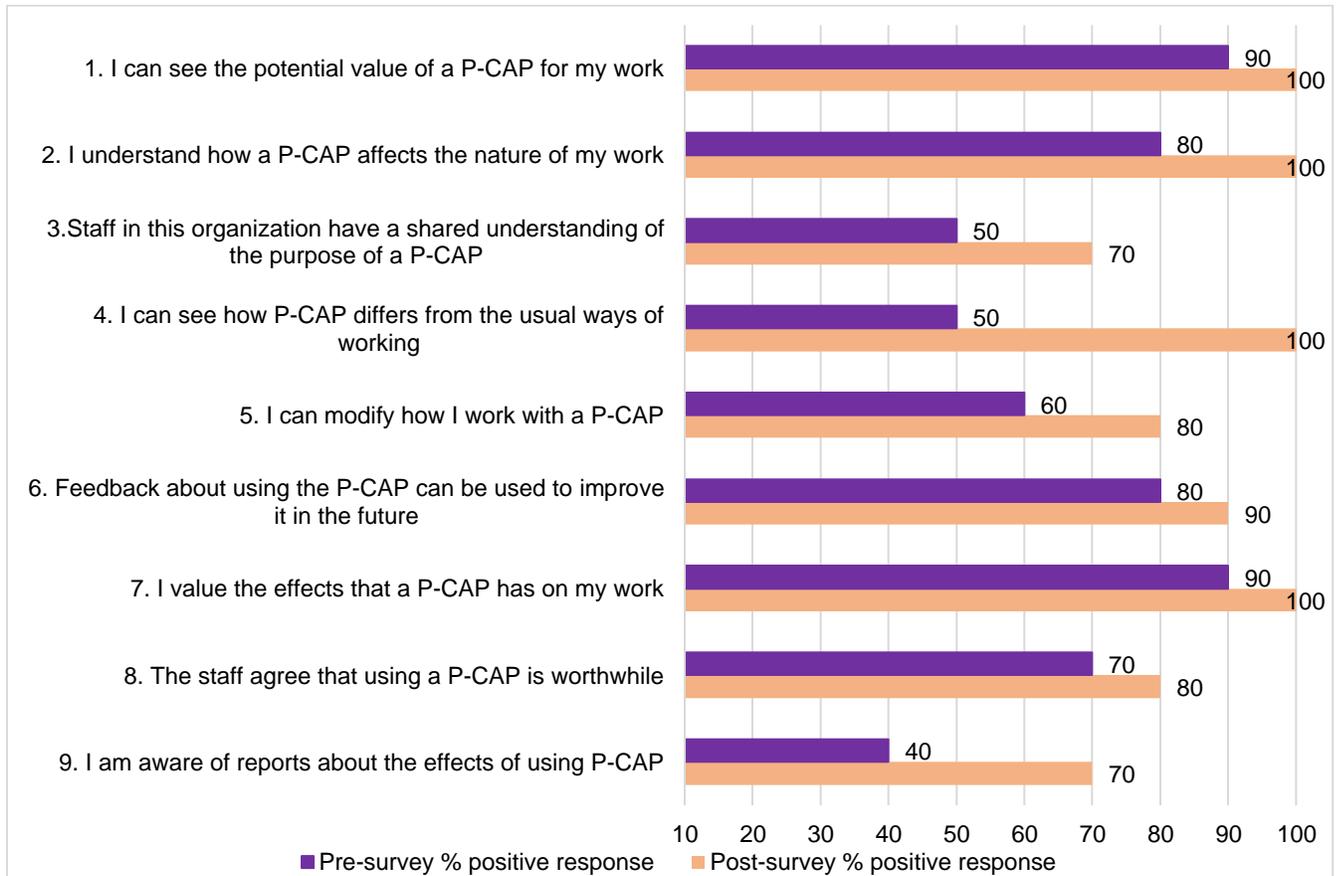
Perceptions of Suitability

There was an increase in positive responses by the occupational therapists across all nine suitability items. The responses indicate the therapists value the P-CAP and can modify their typical workflow to incorporate P-CAP. The positive responses doubled from 50 percent to 100 percent regarding how the use of a P-CAP differed from the usual workflow and then improved by 30 percent for awareness of the effects of

using a P-CAP (figure 5, suitability, question 9), indicating the value of the training and clinical implementation (Figure 5).

Figure 5

Change in Therapists' Perception of Administering the Performance-based Cognitive Assessment Protocol: Suitability³ (N=10)



Note. ³ = Suitability is analogous to coherence and reflexive monitoring on the NoMAD

Outcome 2: Administer P-CAP to 95 Percent of Referred Patients with a Mild Stroke

Three of the ten occupational therapists completed the tracking logs accurately, although seven turned in some tracking data. During informal debriefing, therapists did not fully understand the need for the tracking logs, and incorporating them into the workflow was difficult due to time constraints and productivity requirements. Of the three therapists who turned in completed logs, 34 percent of eligible patients were administered the Pillbox Test. The other therapists reported administering the complete protocol to 10 patients.

Outcome 3: Identify Facilitators, Barriers, and Practical Methods for Implementing the P-CAP

Facilitators

Occupational therapists identified test brevity, readily available supplies, and staff/management support as factors that facilitated success. A supportive staff was the primary facilitator, with one participant stating that "MD support [and] the team working with other disciplines" was beneficial. Supportive colleagues were also identified as helpful to implementation. "Access to the necessary tools" and "availability of resource materials" were other facilitators. "Low barrier documentation using smart phrases" was helpful to reduce the therapists' burden and communicate findings more effectively to the team. A medication management section was also added to the computerized documentation flowsheet.

Conversely, the assessment administration was not hindered when the therapists had adequate information regarding the patient's condition and diagnosis. One therapist

stated, "[it's] relatively quick if known in advance that it is appropriate to administer [the test]." Familiarity with the evaluation, including "sufficient instruction of the efficacy and administration prior to implementation," was helpful.

Barriers

Occupational therapists reported time constraints affecting productivity as the primary barrier to administering the P-CAP. One participant stated,

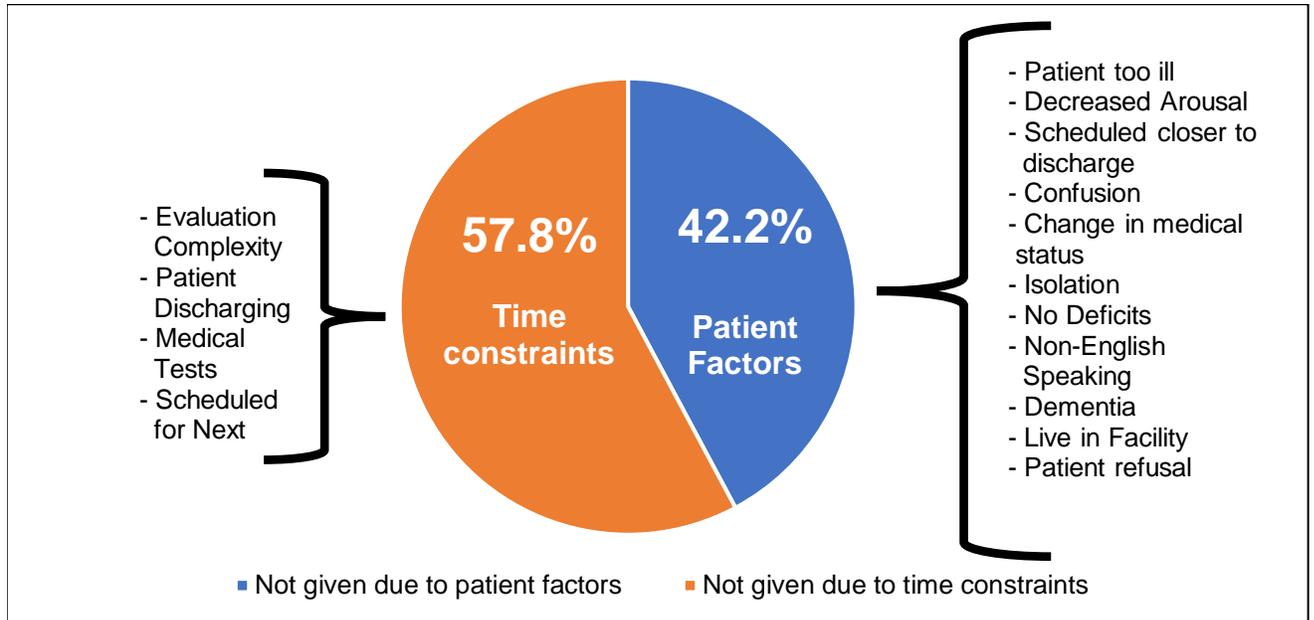
Many times, I did not complete the assessment because I was worried if I spent too much time in one patient room, I would not be able to see another visit, and that would make my productivity numbers look bad, which shouldn't matter.

Another therapist stated, "Sometimes I wouldn't have enough time during my eval/treat [to administer the assessment]."

Multiple therapists indicated that patient cognitive status, co-morbidities, or refusal to participate were barriers. One participant identified a barrier as "lack of information [about the patient's stroke status] prior to initiating the assessment [NIHSS score not indicated, stroke not indicated initially]." This indicates a breakdown in communication that hinders the therapist's ability to plan for test administration. The barriers reported on the tracking sheets for not administering the test to eligible patients reflected the barriers identified by therapists in the NoMAD survey (Figure 6).

Figure 6

Reasons for Not Administering the Pillbox Test



Implementation Suggestions

Implementation suggestions were primarily focused on workflow, education for other staff members, and time. Several workflow suggestions were "make it a part of our evaluation," "encouraging more use," and complete the Pillbox Test the following day if there was not enough time on the day of the evaluation". One therapist stated, "Increase education on its use and benefits to improving evidence-based therapy". Despite the brevity of the P-CAP, several therapists suggested "something less time consuming" and "[implementing] a modified abridged version that can be used as part of a formal OT initial assessment."

Discussion

Value-based Care

Value-based care is a priority in the American healthcare system, required by both the Centers for Medicare & Medicaid Services and private insurers (Esposti & Banfi, 2020). Addressing cognitive functioning in patients who have sustained a mild stroke further supports occupational therapy's distinct value. Performance-based evaluations to assess functional cognition highlight occupational therapy's unique role in acute care. Performance-based evaluations also provide a mechanism to identify cognitive deficits accurately and comprehensively ascertain discharge needs, addressing recovery quality, timing, and sustainability (Ebbevi et al., 2016). Assessing underlying conditions that contribute to clinical issues is of utmost importance in vulnerable populations. Giles et al. (2020) endorsed the need for clinicians to utilize functional cognition performance-based tests, reinforcing the point that functional cognition can prevent readmission by ensuring adequate self-management for clients in the home environment.

Integrating evidence-based standardized assessments into clinical practice has been fraught with barriers. There is a certain degree of ambivalence among therapists to move beyond the naturalistic observation of basic activities of daily living. Occupational therapists tend to take an expedient route to patient assessment and intervention, relying on experience, facility traditions, and convenience primarily due to productivity concerns (Cramm et al., 2013; Robertson & Blaga, 2013; Smith-Gabai, 2016). Therapists recognize the benefits but indicate that a lack of time is a more significant concern (Robertson & Blaga, 2013; Smith-Gabai, 2016). However, when the

expedient and non-standardized route is chosen, ineffectual care provision sometimes occurs, and "clients become vulnerable to their therapists' variable expertise" (Cramm et al., 2013, p. 121). The occupational therapists who participated in this study echo those concerns; however, study outcomes demonstrate improved acceptance and implementation of the P-CAP.

Facilitators and Barriers to Implementation

A primary factor to successful implementation, which the NPT supports, is garnering coherence. Coherence looks at how the clinician understands and conceptualizes the rationale for implementation and how the new system is embedded and operationalized into practice (May & Finch, 2009). However, this study revealed differences in the degree of coherence amongst therapists. While all scores on the NPT improved with regards to feasibility, several therapists did not consistently administer the P-CAP to patients, with only 34% of patients who met the eligibility criteria being administered the assessment. For example, the Pillbox Test was supposed to evaluate executive functioning. However, one reason therapists provided for not administering the test was that patients did not take or manage medications (see Figure 4). There appeared to be a disconnect in the rationale, such as assessing executive functioning versus medication management. This could be an example of a lack of coherence due to training that did not clearly articulate the foundational reason for test administration. Coherence is dependent upon the initial training. Presenting a more apparent distinction of the P-CAP so that all clinicians had a shared understanding of the rationale and administration goals would have improved collective action.

May et al. (2018), in their systematic review of implementation studies using the NPT, indicate that establishing coherence is a priority. The occupational therapists reported that a well-laid educational foundation was a valuable step before implementation to understand how to administer the test and its necessity. For this study, coherence, through formal protocol training, was a critical piece before successful implementation would be realistic. This knowledge led to the therapists internalizing the assessment process and their role in implementation (cognitive participation). Establishing coherence was echoed by Foidel et al. (2020) in their research on delirium practice implications for acute care therapists. Proper groundwork needs to be laid by fostering coherence. Lockwood et al. (2016) argue that "facilitation of evidence implementation must be localized and context-driven, nuanced to the immediate environment and those who work in it.... Implementation planning that precedes changes to practice can lead to better outcomes and sustainability of change processes" (p. 323).

Addressing barriers within the local context will be imperative to successful implementation. In this study, 57.8% of patients did not receive the standardized test due to time constraints (Figure 6). Therapists reported a primary concern was that incorporating the standardized assessment into the patient assessment or intervention would impact their productivity. Chapleau (2015) states that high productivity concerns are one reason that occupational therapists have shifted away from performance-based assessments to impairment level tests that more closely resemble the medical model. There must be an organizational change that values objective, performance-based, and standardized evaluations that ensure improved outcomes and efficiency, so they are

woven into productivity expectations instead of being at odds with those expectations. Garnering organizational support (e.g., manager, administrator) to meld evidence-based strategies into productivity expectations is essential for successful implementation.

Limitations

Due to pandemic distancing precautions, half of the group participated in a separate educational session during which the audio in the video case studies was not audible. The researcher narrated the audio to mitigate the issue. However, this may have reduced understanding even though participants reported the solution was acceptable. This study used a convenience sample of 10 occupational therapists in a large suburban hospital. Findings may not generalize to other hospital settings or areas of the country, so further research would be recommended.

Future Research

Translating knowledge into clinical practice is of utmost importance. There is an urgent need for occupational therapists to utilize evidence-based standardized tests; however, little evidence exists on the process of administering performance-based tests in the acute care setting. To maximize the use of the KTA model, specifically in monitoring and sustaining the new practice, the researcher continues to adjust the protocol as workflow, and departmental needs dictate. Changes include making additional test kits as usage increases, modifying productivity allowances, and improving and archiving educational sessions for new staff for improved coherence. As implementation improves, the next step would be implementing more evaluations. Further research is recommended at other facilities to determine how to foster implementation.

The researchers did not address the disposition of patients in the post-acute care phase and the impact that a performance-based cognitive assessment may have on the risk for readmission; therefore, further study is recommended. There is a gap in the literature regarding the link between cognitive deficits and readmission risk. Most studies regarding functional cognition are completed in the post-acute phase indicating a gap in knowledge regarding functional cognition and post-discharge needs for the patient who has sustained a stroke (Saa et al., 2019). Improving standardized evaluations in the acute care setting will set the stage for further research on correlations between functional performance, readmission, and follow-up service provision. Performance-based cognitive assessments should be utilized in the acute care setting to explore the correlation between cognitive deficits and readmission risk. If occupational therapists performed additional standardized testing, this correlation could be established. Most studies allude to cognitive impairments being a risk, but few deliberately address it. Instead, they extrapolate because cognitive dysfunction has been associated with high readmission risk diagnoses such as congestive heart failure, pneumonia, and chronic obstructive pulmonary disease (Anderson & Birge, 2016) and needs to be studied on stroke survivors.

Implications for Occupational Therapy

There is a need for acute care occupational therapists to establish a distinct and evidence-based role in the hospital setting to meet the AOTA Vision 2025 (AOTA, 2017). Using standardized performance-based testing can guide intervention and discharge recommendations to optimize patient safety and improve value-based care for people with mild stroke by preventing inadequate identification of subtle cognitive

deficits (Blackburn et al., 2013; Wolfenden & Grace, 2015). Providing value in today's healthcare environment will require standardized and validated assessments that will demonstrate the necessity for OT services. Acute care occupational therapists can contribute to value through cognition evaluation and the impact on functional performance post-discharge.

This study showed the value of utilizing a framework to organize the educational and research process and a theoretical model to explain the implementation processes. Replicating the process using a model or theoretical framework would benefit subsequent efforts to facilitate change. Identifying strategies to maximize research implementation in the setting would reduce the time from the knowledge inquiry phase to the action phase, thus bridging the knowledge to practice gap. Determining the existing culture and mechanisms for change through a framework would enable operationalization. Methods of establishing coherence and cognitive participation need to be site-specific, including:

- Identifying opinion leaders and champions to advocate for the utilization of a new process to improve adherence
- Adapting the implementation of a new method to the local context
- Educational materials should be utilized for all new staff members during the orientation process so that coherence endures. These educational materials should be archived to allow new staff members to view the classes.

Conclusion

When formal cognitive testing is not completed, mild impairments may go undetected; however, occupational therapists have an opportunity to identify these

deficits before discharge (Saa et al., 2019). This study showed that the administration of the performance-based cognitive assessment test, the Pillbox Test, is feasible in the acute care setting. Applying the Knowledge to Action framework, complemented by the Normalization Process Theory, provided the structure to successfully implement a new assessment protocol. Future research should endeavor to determine the best methods to implement performance-based assessments in the acute care setting, fostering further correlational research between functional performance, readmission, and follow-up service provision.

References

- Adamit, T. Maeir, A., Assayag, E. B., Bornstein, N.M., Korczyn, A.D., & Katz, N. (2015). Impact of first-ever mild stroke on participation at 3- and 6-months post-event: The TABASCO study. *Disability and Rehabilitation*, *37*, 667-673.
<https://doi.org/10.3109/09638288.2014.923523>
- American Occupational Therapy Association. (2017). Vision 2025. *American Journal of Occupational Therapy*, *71*, 7103420010.
<https://doi.org/10.5014/ajot.2017.713002>
- American Occupational Therapy Association. (2019). Cognition, cognitive rehabilitation, and occupational performance. *American Journal of Occupational Therapy*, *73*(Suppl. 2), 7312410010. <https://doi.org/10.5014/ajot.2019.73S201>
- Anderson, R. E., & Birge, S. J. (2016). Cognitive dysfunction, medication management, and the risk of readmission in hospital inpatients. *Journal of the American Geriatric Society*, *64*, 1464-1468. <https://doi.org/10.1111/jgs.14200>
- Baum, C., Ghiglieri, M., & Eagle, S. (2019). The reality of a mild stroke: A qualitative study. *American Journal of Occupational Therapy*, *73*(4-supplement 1).
<https://doi.org/10.5014/ajot.2019.73S1-PO1040>
- Blackburn, D. J., Bafadhel, L., Randall, M., & Harkness, K. A. (2013). Cognitive screening in the acute stroke setting. *Age and Ageing*, *42*, 113-116.
<https://doi.org/10.1093/ageing/afs116>
- Borella, E., Cantarella, A., Joly, E., Ghisletta, P., Carbone, E., Coraluppi, D., Piras, F., & De Beni, R. (2017). Performance-based everyday functional competence measures across the adult lifespan: The role of cognitive abilities. *International Psychogeriatrics*, *29*, 2059-2069. <https://doi.org/10.1017/S10411610217000680>

- Bottari, C., & Dawson, D. R. (2011). Executive functions and real-world performance: How good are we at distinguishing people with acquired brain injury from healthy controls? *OTJR: Occupation, Participation, and Health*, 31, S61-S68.
<https://doi.org/10.3928.15394492-20101108-10>
- Chapleau, A. M. (2015). Exploring the role and scope of clinical assessment in occupational therapy. *The Open Journal of Occupational Therapy*, 3(3), 1-5.
<https://doi.org/10.15453/2168-6408.1200>
- Connell, L. A., McMahon, N. E., Harris, J. E., Watkins, C. L., & Eng, J. J. (2014). A formative evaluation of the implementation of an upper limb stroke rehabilitation intervention in clinical practice: A qualitative interview study. *Implementation Science*, 9(90).
- Cramm, H., White, C., & Krupa, T. (2013). From periphery to player: Strategically positioning occupational therapy within the knowledge translation landscape. *American Journal of Occupational Therapy*, 67, 119-125.
<https://doi.org/10.5014/ajot.2013.005678>
- Ebbevi, D., Forsberg, H. H., Essen, A., & Ernestam, S. (2016). Value-based health care for chronic care: Aligning outcomes measurement with the patient perspective. *Quality Management in Healthcare*, 203-212.
<https://doi.org/10.1097/QMH.0000000000000115>
- Edwards, D. F., Hahn, M. G., Baum, C. M., Perlmutter, M. S., Sheedy, C., & Dromerick, A. W. (2006). Screening patients with stroke for rehabilitation needs: Validation of the post-stroke rehabilitation guidelines. *Neurorehabilitation and Neural Repair*, 20, 42-48. <https://doi.org/10.1177/1545968305283038>

- Edwards, D. F., Wolf, T. J., Marks, T., Alter, S., Larkin, V., Padesky, B. L., Spiers, M., Al-Heizan, M. O., & Giles, G. M. (2019). Reliability and validity of a functional cognition screening tool to identify the need for occupational therapy. *American Journal of Occupational Therapy, 73*, 7302205050p1-7302205050p10.
<https://doi.org/10.5014/ajot.2019.028753>
- Esposti, F., & Banfi, G. (2020). Fighting healthcare rocketing costs with value-based medicine: The case of stroke management. *BMC Health Services Research, 20*, 1-8. <https://doi.org/10.1186/s12913-020-4925-0>
- Finch, T. L., Girling, M., May, C. R., Mair, F. S., Murray, E., Treweek, S., Steen, I. N., McColl, E. M., Dickinson, C., & Rapley, T. (2015). *NoMad: Implementation measure based on Normalization Process Theory* [Measurement instrument]. Retrieved August 1, 2020, from <http://www.normalizationprocess.org>
- Foidel, S. E., Birrer, C. M., Stinogel, A. K., & Krusen, N. E. (2020). Delirium in acute care: Occupational therapists' perspectives, experiences, and practice implications. *Journal of Acute Care Occupational Therapy, 3*(1), 1-25.
- Giles, G. M., Edwards, D. F., Baum, C., Furniss, J., Skidmore, E., Wolf, T., & Leland, N. E. (2020). Making functional cognition a professional priority. *American Journal of Occupational Therapy, 74*, 7401090010p1-7401090010p6.
<https://doi.org/10.5014/ajot.2020.741002>
- Graham, I. D., Logan, J., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W., & Robinon, N. (2006). Lost in knowledge translation: Time for a map? *Journal of Continuing Education in the Health Professions, 26*, 13-23.
<https://doi.org/10.1002/chp.47>

- Lo, J., Crawford, J., Desmond, D., Godefroy, O., Jokinen, H., Mahinrad, S., Bae, H., Lim, J., Kohler, S., Douven, E., Staals, J., Chen, C., Xu, X., Chong, E., Akinyemi, R., Kalaria, R., Ogunniyi, A., Barbay, M., Roussel, M., ... Mok, V. (2019). Profile of and risk factors for poststroke cognitive impairment in diverse ethnoregional groups. *Neurology*, *93*(24), E2257–E2271.
<https://doi.org/10.1212/WNL.00000000000008612>
- Lockwood, C., Stephenson, M., Lizarondo, L., Den Hoek, J., & Harrison, M. (2016). Evidence implementation: Development of an online methodology from the knowledge-to-action model of knowledge translation. *International Journal of Nursing Practice*, *22*, 322-329. <https://doi.org/10.1111/ijn.12469>
- Logue, E., Marceaux, J., Balldin, V., & Hilsabeck, R. C. (2015). Further validation of the Pillbox Test in a mixed clinical sample. *The Clinical Neuropsychologist*, *29*, 611-623. <https://doi.org/10.1080/13854046.2015.1061054>
- May, C., & Finch, T. (2009). Implementing, embedding, and integrating practices: An outline of Normalization Process Theory. *Sociology*, *43*, 535-554.
<https://doi.org/10.1177/0038038509103208>
- May, C., Rapley, T., Mair, F. S., Treweek, S., Murray, E., Ballini, L., Macfarlane, A., Girling, M., & Finch, T. L. (2015). *Normalization Process Theory online users' manual, toolkit and NoMAD instrument*. Normalization Process Theory. Retrieved January 2, 2021, from <http://www.normalizationprocess.org/nomad-study/how-to-use-nomad/>
- May, C. R., Cummings, A., Girling, M., Bracher, M., Mair, F. S., May, C. M., Murray, E., Myall, M., Rapley, T., & Finch, T. (2018). Using Normalization Process Theory in

feasibility studies and process evaluations of complex healthcare interventions: A systematic review. *Implementation Science*, 13, 1-27.

<https://doi.org/10.1186/s13012-018-0758-1>

Morrison, M. T., Edwards, D. F., & Giles, G. M. (2015). Performance-based testing in mild stroke: Identification of unmet opportunity for occupational therapy.

American Journal of Occupational Therapy, 69, 6901360010p1-6901360010p5.

<https://doi.org/10.5014/ajot.2015.011528>

Obaid, M., Flach, C., Marshall, I., D A Wolfe, C., & Douiri, A. (2020). Long-term outcomes in stroke patients with cognitive impairment: A population-based study.

Geriatrics (Basel, Switzerland), 5(2), 32.

<https://doi.org/10.3390/geriatrics5020032>

Robertson, L., & Blaga, L. (2013). Occupational therapy assessments used in acute physical care settings. *Scandinavian Journal of Occupational Therapy*, 20, 127-

135. <https://doi.org/10.3109/11038128.2012.737369>

Romero-Ayuso, D., Castellero-Perea, A., Gonzalez, P., Navarro, E., Molina-Masso, J. P., Funes, J. J., Ariza-Vega, P., Toledano-Gonzalez, A., & Trivino-Juarez, J. M.

(2019). Assessment of cognitive instrumental activities of daily living: A systematic review. *Disability and Rehabilitation*, 1-17.

<https://doi.org/10.1080/09638288.2019.1665720>

Saa, J. P., Tse, T., Baum, C., Cumming, T., Josman, N., Rose, M., & Carey, L. (2019). Longitudinal evaluation of cognition after stroke--A systematic scoping review.

PLoS ONE, 14(8), 1-18. <https://doi.org/10.1371/journal.pone.0221735>

- Sangha, R. S., Caprio, F. Z., Askew, R., Corado, C., Bernstein, R., Curran, Y., Ruff, I., Cella, D., Naidech, A. M., & Prabhakaran, S. (2015). Quality of life in patients with TIA and minor ischemic stroke. *Neurology*, *85*, 1957-1963.
- Sansonetti, D., & Hoffmann, T. (2013). Cognitive assessment across the continuum of care: The importance of occupational performance-based assessment for individuals post-stroke and traumatic brain injury. *Australian Occupational Therapy Journal*, *60*, 334-342. <https://doi.org/10.1111/1440-1630.12069>
- Smith-Gabai, H. (2016). *Occupational therapy discharge planning and recommendations in acute care: An action research study* [Doctoral dissertation, Nova Southeastern University]. NSUWorks, College of Health Care Sciences – Occupational Therapy Department. https://nsuworks.nova.edu/hpd_ot_student_dissertations/54.
- Spokoyny, I., Raman, R., Ernstrom, K., Khatri, P., Meyer, D. M., Hemmen, T. M., & Meyer, B. C. (2015). Defining mild stroke: Outcomes analysis of treated and untreated mild stroke patients. *Journal of Stroke and Cerebrovascular Diseases*, *24*, 1276-1281. <https://dx.doi.org/10.1016/j.jstrokecerebrovasdis.2015.01.037>
- Toglia, J., Askin, G., Gerber, L. M., Taub, M. C., Mastrogiovanni, A. R., & O'Dell, M. W. (2017). Association between 2 measures of cognitive instrumental activities of daily living and their relation to the Montreal Cognitive Assessment in persons with stroke. *Archives of Physical Medicine and Rehabilitation*, *98*, 2280-2287. <https://doi.org/10.1016/j.apmr.2017.04.007>
- Virani, S. S., Alonso, A., Benjamin, E. J., Bittencourt, M. S., Callaway, C. W., Carson, A. P., Chamberlain, A. M., Chang, A. R., Cheng, S., Delling, F. N., Djousse, L.,

Elkind, M. S. V., Ferguson, J. F., Fornage, M., Khan, S. S., Kissela, B. M., Knutson, K. L., Kwan, T. W., Lackland, D. T., ... Heard, D. G. (2020). Heart disease and stroke statistics—2020 update: A report from the American Heart Association. *Circulation*, E139-E596.

<https://doi.org/10.1161/CIR.0000000000000757>

Wolfenden, B., & Grace, M. (2015). Vulnerability and post-stroke experiences of working-age survivors during recovery. *SAGE Open*, 1-14.

<https://doi.org/10.1177/2158244015612877>

Zartman, A. L., Hilsabeck, R. C., Guarnaccia, C. A., & Houtz, A. (2013). The Pillbox Test: An ecological measure of executive functioning and estimate of medication management abilities. *Archives of Clinical Neuropsychology*, 28(4), 1-13.

<https://doi.org/10.1093/arclin/act014>