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Standardizing the screening, assessment, and treatment of mild cognitive impairment in acute care: a multidisciplinary approach

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STANDARDIZING THE SCREENING, ASSESSMENT, AND TREATMENT OF MILD COGNITIVE IMPAIRMENT IN ACUTE CARE: A MULTIDISCIPLINARY APPROACH

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“The secret of getting ahead is getting started. The secret of getting started is breaking down complex overwhelming tasks into small manageable tasks, and then starting on the first one.”

— Mark Twain

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ABSTRACT

With an estimated prevalence of rate of 18.9% in the general population and 25% to 80% in individuals with heart failure (HF), mild cognitive impairment (MCI) results in impaired executive functioning, hospital readmissions, and increased utilization of the healthcare system (Alagiakrishnan, et al., 2017; Amini, et al., 2019). Studies suggest these cognitive impairments are often unidentified or undiagnosed (Amini, et al., 2019; Zhuang, et al., 2019). Despite the established effects of MCI and cognitive impairment in the hospitalized population, there are gaps in the research regarding a standardized approach to addressing this problem (Cameron, et al., 2017; Zhuang, et al., 2019). Currently, there are no effective pharmacological interventions that offer a long-term effect on delaying the progression from MCI to dementia. There is, however, a growing body of evidence supporting the important role of non-pharmacological interventions in MCI (Hong, et al., 2015; Sherman, et al., 2017). OTs have the skills to provide cognitive rehabilitation including global learning strategies, specific functional skills training, use of external aids, and cognitive retraining during functional activities, therefore, a standardized protocol was developed to benefit OTs and patients they are treating. The

Multidisciplinary Approach for MCI has three key components: 1) educating nurses on how to assess for MCI and cognitive impairments, including how to provide cognitive stimulation daily and when to consult occupational therapy to optimize care, 2) standardizing an approach for OTs on how to screen, assess, and treat MCI and cognitive impairment in acute care and 3) increasing awareness of OT's role within an interdisciplinary team to address MCI and cognitive impairments in acute care. This protocol aims to be a feasible and affordable method to educate nurses and OTs on how to treat MCI and cognitive deficits in acute care. Dissemination of this program is essential to its success. With more OTs implementing this program, the greater the opportunity for critical evaluation and refinement. The focus of this project was on the initial education and feasibility of the Multidisciplinary Approach for MCI, however the potential impact of its use to improve patient outcomes in the future is encouraging.

PREFACE

The basis for this research stemmed from my observations on the cardiac units and my desire to have a positive impact on patient outcomes as an occupational therapist. As healthcare expenditures reach into the trillions, it is now more important than ever for occupational therapists in acute care provide quality, evidence-based treatment focused on improving outcomes and reducing risk of readmissions. Mild cognitive impairment is an important target for occupational therapy intervention and this project is a culmination of my passion to provide occupational therapists with the tools to do so.

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LIST OF ABBREVIATIONS

a-MCI-md .... Amnestic MCI-Multiple Domain

a-MCI-sd .... Amnestic MCI-Single Domain

na-MCI-md .... Non-Amnestic MCI-Multiple Domain

na-MCI-sd .... Non-Amnestic MCI-Single Domain

AD .... Alzheimer’s Disease

ADLs .... Activities of Daily Living

AJOT .... American Journal of Occupational Therapy

AOTA .... American Occupational Therapy Association

CABG .... Coronary Artery Bypass Graft

CMS .... Centers for Medicare and Medicaid Services

DM .... Diabetes Mellitus

HF .... Heart Failure

IADLs .... Instrumental Activities of Daily Living

KELT .... Kolb’s Experiential Learning Theory

MCI .... Mild Cognitive Impairment

MI .... Myocardial Infarction

MMSE .... Mini Mental State Examination

MoCA .... Montreal Cognitive Assessment

OT .... Occupational Therapy

SLUMS .... Saint Louis University Mental Status Examination

STAC-r .... Scaffolding Theory of Aging and Cognition- Revised

CHAPTER ONE - Introduction

Section One

Nature of the Problem

Impaired cognition occurs frequently in adults admitted to acute care hospitals and is correlated with the increased risk of hospital readmissions (Amini, et al., 2019; Cameron, et al., 2017). Impaired cognition, including mild cognitive impairment (MCI), and neurocognitive disorders have various etiologies however, cardiovascular disorders, high cholesterol, and diabetes mellitus (DM) are known risk factors for cognitive disorders (Čelutkienė, et al, 2016; Cheng, et al., 2012). MCI, along with other moderate to severe cognitive impairments, are important targets for intervention. With an estimated prevalence of rate of 18.9% in the general population and 25% to 80% in individuals with heart failure (HF), MCI results in impaired executive functioning, hospital readmissions, and increased utilization of the healthcare system (Alagiakrishnan, et al., 2017; Amini, et al., 2019; Cameron, et al., 2017; Petersen, et al., 2014). Studies suggest these cognitive impairments are often unidentified or undiagnosed (Amini, et al., 2019; Zhuang, et al., 2019). MCI is an especially important target for intervention because the progression rate to Alzheimer's disease (AD) or other dementia has been reported to be as high as 12-49% per year, while only 1–2% of healthy individuals progress to AD or other dementia each year (Petersen, et al., 1999; Zhuang, et al., 2019).

Despite the documented effects of MCI and cognitive impairment in the hospitalized population, there are gaps in the research regarding a standardized approach to addressing this problem (Cameron, et al., 2017; Zhuang, et al., 2019). There are questions regarding screening tools, including which measure is most sensitive, which screens are feasible and valid in which settings, how frequently patients should be screened, and how to design specific interventions to improve cognition in hospitalized patients. Occupational therapists (OTs) have the skill set to assess and provide intervention for MCI in the acute setting however, are not doing this consistently and will benefit from a standardized approach to addressing cognitive impairment in acute care.

Section Two

Mild Cognitive Impairment: An Overview

The term “MCI” was first introduced in the late 1980s to characterize the transitory phase from typical cognitive changes associated with aging to the beginning of dementing disorders, focusing primarily on memory impairments (Petersen et al., 2014). Clinical criteria were originally defined by researchers at the Mayo Clinic in the 1990s and culminated with an international symposium in 2003 to further define and expand the core criteria for MCI. Currently, to be classified as MCI, a subjective cognitive change (information gathered by questions from persons examined or next of kin) is confirmed by objective cognitive measures. Resulting poor performance in one or more cognitive domains (i.e. attention, memory, executive functioning, language, or visuospatial skills) is then differentiated from a diagnosis of dementia by examination of independence with activities of daily living (ADLs) and instrumental activities of daily living (IADLs). With MCI, basic ADL management is preserved while difficulty with IADLs is present, with basic ADL performance not impacted. Finally, the individual should be classified as “not demented” to follow the standard criteria to identify MCI (Petersen, et al., 2014).

Current typology further classifies MCI into four subtypes to include: Amnestic MCI-Single Domain (a-MCI-sd), Non-Amnestic MCI Single Domain (na-MCI-sd), Amnestic MCI-Multiple Domain (a-MCI-md), and Non-Amnestic MCI-Multiple Domain (na-MCI-md). These subtypes differentiate MCI based on type and/or domain of cognitive deficits (memory vs. non-memory and single domain or multiple domain) (Petersen, et al., 2014). Amnestic MCI is associated with poor episodic memory performance while Non-Amnestic MCI is characterized by poor performance on cognitive domains other than memory (i.e. executive functioning, visuospatial skills, etc.) (Petersen, et al., 2014). Understanding the difference among the MCI subtypes can guide intervention planning for OTs related to addressing cognitive impairment.

Factors Influencing MCI

There are numerous factors that contribute to MCI including hypertension, atrial fibrillation, impaired hemodynamics, and stroke, which are the most common (Čelutkienė, 2016). The association among heart failure (HF) and cognitive impairment is strong. Pathogenic links between HF and impaired cognition include cerebral hypoperfusion, oxidative damage, disruption of the blood-brain barrier, and brain-derived cytokines (Čelutkienė, et al., 2016). Neuroimaging reveals generalized volume loss, lacunar infarcts, and white matter hyperintensities as common features. Cognitive domains adversely affected by HF include attention, working memory, executive functioning, learning ability, and processing speed (Čelutkienė, et al., 2016).

Recent major population-based studies examining MCI found an average prevalence of 18.9% and incidence rate of 47.9 per 1000 persons (Petersen, et al., 2014). Jackson, MacLullich, Gladman, Lord, and Sheehan (2016) found that nearly 4 in 5 older adults admitted with medical emergencies who had delirium also have dementia or MCI, with half of those patients having no prior diagnosis of dementia or MCI. Every year, 10-15% of patients with amnestic MCI will develop dementia, with this study finding that 93% of the HF patients with MCI had the amnestic subtype. Additionally, impaired executive functioning was commonly seen in HF patients. Impaired executive functioning has been associated with poor functional independence and self, with effects on planning, decision making, and organizational skills.

HF is not the only diagnosis that increases risk for cognitive impairments. A longitudinal population-based cohort study of 209,890 myocardial infarction (MI) survivors found a higher risk of vascular dementia compared to the general population after 35 years of follow up (Sundbøll et al., 2018). The risk of vascular dementia increased if the MI survivor underwent a coronary artery bypass graft (CABG) during their admission for MI or MI survivors who experienced a stroke in their first-year post MI. Finally, social isolation has a significant impact on cognitive health. Social isolation, commonly present later in life, has been found to contribute to memory decline, leading to increased social isolation and continued memory decline, and so on (Read, Comas-Herrera, & Grundy, 2019).

Importance of Addressing the Problem

In 2016, the United States healthcare expenditures reached $3.3 trillion and accounted for 17.9% of the US gross domestic product (GDP) (Zohrabian, et al., 2018). Unplanned hospital readmissions are often cited as a contributing factor to rising healthcare costs, with more than $17 billion in Medicare expenditures according to most recent estimates (Jencks, et al., 2009). As a result, the Centers for Medicare and Medicaid Services (CMS) have shifted the focus of the healthcare system onto quality care at reasonable costs. Unplanned hospital readmissions are now considered an indicator of poor quality and CMS developed a readmission reduction program as part of the Affordable Care Act of 2010. Hospitals are now penalized for hospital readmissions within 30 days for heart failure, coronary artery bypass graft surgery, acute myocardial infarction, pneumonia, hip or knee arthroplasty, and chronic obstructive pulmonary disease (CMS, 2020). Heart Failure (HF) has the highest readmission rate for patients aged 65 and older and the prevalence of Americans with HF is only expected to increase (Zohrabian, et al., 2018). By 2030, over 8 million Americans are expected to have HF, with the total projected cost of healthcare expenditures of HF increasing to $69.7 billion (Zohrabian, et al., 2018).

Several factors have been identified with hospital readmission such as diagnosis, marital status, health literacy, age, race, and cognitive impairment. MCI, with an estimated prevalence of rate of 18.9% in the general population and 25% and 80% in individuals with heart failure, results in impaired executive functioning and is associated with hospital readmissions (Petersen et al, 2014 ; Cameron, et al., 2017; Alagiakrishnan, et al., 2017).

Beyond hospital readmissions and the impact on the utilization of the healthcare system, the individual toll of MCI and cognitive impairment is high. MCI results in impaired IADLs, including medication management, work, social participation and/or leisure, among many others (Petersen, et al., 2014). Despite the person toll and cost of readmission rates associated with MCI, there are no specific guidelines for occupational therapists to screen for and treat MCI in the acute care setting.

CHAPTER TWO – Project Theoretical and Evidence Base

Theoretical and conceptual frameworks guide the proposed intervention approach for the identified problem described in Chapter One. A thorough review of the evidence literature identified four appropriate and meaningful frameworks that guide education of occupational therapy practitioners in addressing screening and intervention of MCI. These theories include: the Scaffolding Theory of Aging and Cognition – Revised, Knowles Theory of Adult Learning, Transformative Learning Theory and Kolb's Experiential Learning Theory.

Theoretical and Conceptual Frameworks

Scaffolding Theory of Aging and Cognition

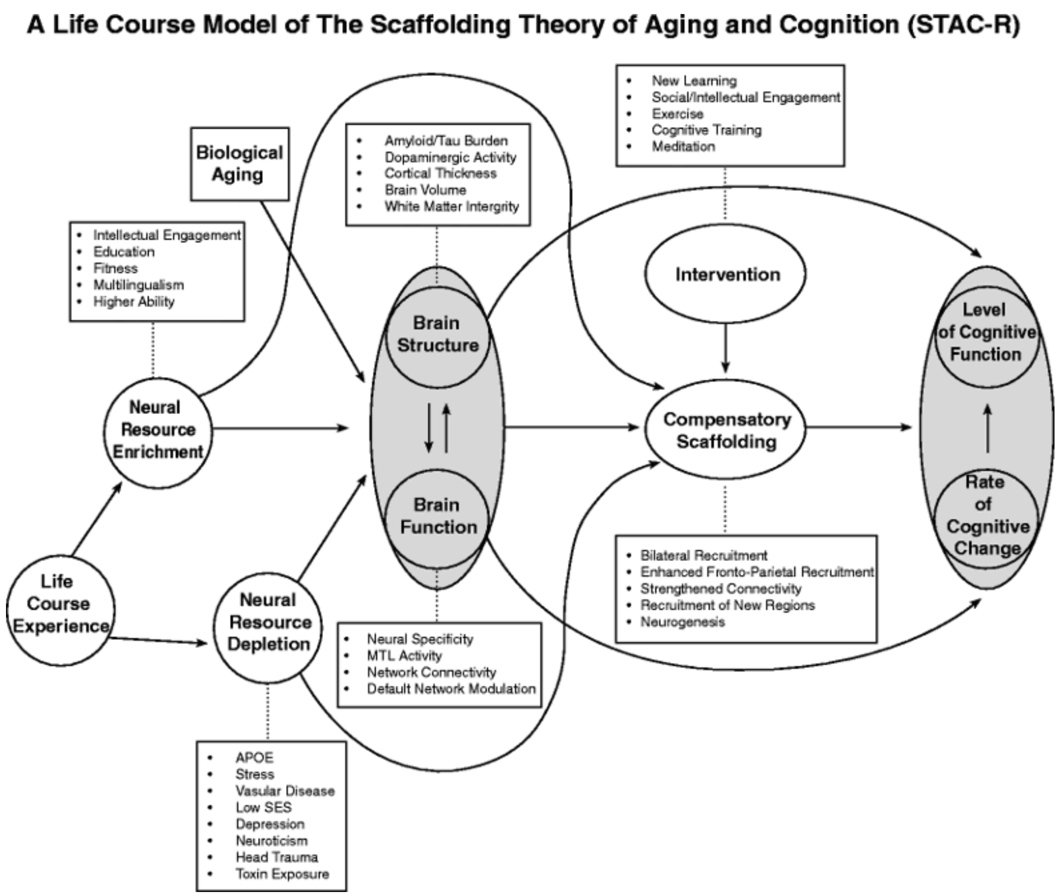
There are several theories as to how cognitive stimulation and cognitive retraining impact MCI. Sherman, et al. (2017) summarize several factors in their systematic review including that cognitive training has been associated with increased activation in the hippocampus, right inferior parietal lobe, occipito-temporal areas, and frontoparietal network. Learning more information about which cognitive interventions impact which specific neural pathways in MCI, may aid in targeting specific neural networks at before cognitive decline occurs (Sherman, et al., 2017).

The *Scaffolding Theory of Aging and Cognition – Revised* (STAC-r) provides insight into the mechanisms of cognitive change that occur during cognitive rehabilitation. The STAC-r suggest that cognitive rehabilitation activates "compensatory scaffolding" (Reuter-Lorenz & Park, 2014). Compensatory scaffolding is a neural process which compensates for or ameliorates neural and functional decline seen in aging and works as a type of positive “plasticity” (Reuter-Lorenz & Park, 2014). Reuter-Lorenz and Park (2014) go on to describe how compensatory scaffolding recruits computational support to preserve brain function in aging brains with localized or global cognitive decline. In their revised model, Reuter-Lorenz and Park (2014) identify activities such as intellectual stimulation and social participation as neural resource enrichment which contributes to brain health. Neural resource enrichment, along with interventions such as new learning, cognitive training, and exercise, all contribute to compensatory scaffolding which in theory, improves cognitive functioning (see *Figure 2-1*).

Sherman, et al. (2017) also cite research suggesting that cognitive training may active pre-existing cognitive reserves or facilitate hemispheric recruitment to satisfy processing demands. This relates back to the STAC-r theory that cognitive training may stimulation compensatory scaffolding which promotes neuroplastic reorganization to meet the demand of tasks and decreasing risk of overall cognitive decline (Reuter-Lorenez & Park, 2014; Sherman, et al., 2017). With these theories taken into consideration, Sherman, et al. (2017) found in their systematic review that multidomain and memory-based interventions had the most significant effects on improving cognition in individuals with MCI. Sherman, et al. (2017) conclude that multidomain interventions may work primarily due to the mechanisms described in the STAC-r model, with multicomponent interventions recruiting secondary neurosupport to assist with primary neural function to process load demands. Interventions that target both primary and secondary networks together may prompt small to moderate neuroplastic reorganization

(Sherman, et al., 2017). Memory-based interventions are also hypothesized to produce improved cognition as these interventions may promote partial activation of neuroplastic reorganization and compensatory strategies in several areas (Sherman, et al., 2017). While multidomain and memory-based interventions appear to have the greatest positive effects on improving cognition in individuals with MCI, conclusions about the most effective interventions continue to be speculative and will require continued research.

Figure 2-1, A conceptual model of the scaffolding theory of aging and cognition-revised (STAC-r), by 2014, Reuter-Lorenz and Park, 2014, *Neuropsychology Review, 24*(3)



Theories of Adult Learning: Knowles Adult Learning Theory, Transformative Learning Theory, and Kolb's Experiential Learning Theory

The purpose of adult learning theories is to explain how adults learn and how instructors can be more effective when teaching adults. Concepts from *Knowles's Adult Learning Theory*, *Transformative Learning Theory* and *Kolb's Experiential Learning Theory (KELT)* will be combined to describe the purpose and format of the educational materials presented to the nurses and OTs during the introduction to MCI and how to address the problem. Briefly, Knowles created six assumptions about adult learners, which included the following (Knowles, Holton & Swanson, 2015):

1. Adults need to know what, why, and how.
2. Adults have a maturing self-concept.
3. Adults have a reservoir of experiences to draw upon.
4. Adults have a readiness to learn that is related to their new social or life roles.
5. Adult learning is problem centered.
6. Adult learning is intrinsically motivated.

Knowles's Adult Learning Theory also described implications for practice based on these six assumptions including: setting a cooperative climate for learning, developing learning objectives based on the learner's specific needs or abilities, and working collaboratively to choose methods and resources for instruction, among others (Knowles, et al., 2015).

The *Transformative Learning Theory* is a theory that explains how adults revise their meaning structures with a focus on learning understood "as the process of using a prior interpretation to construe a new or revised interpretation of the meaning of one's experience in order to guide future action" (Mezirow, 1996, p. 162). Transformative learning occurs when adults encounter new knowledge and then build upon or alter their meaning schemes.

Kolb's Experiential Learning Theory (KELT) describes a four-stage cycle of learning that combines experience, perception, cognition, and behavior. The four cycles include concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb, 1984). While these theories are different in structure and design, there are many overlapping themes and commonalities.

At first glance, these three theories appear to view the interaction between the person and environment differently. *Knowles's Adult Learning Theory*, influenced by a humanistic perspective, is heavily focused on the individual's needs and personal development. Common critiques of Knowles's theory cite a lack of attention to societal implications; Grace (1996) stated that Knowles's perspective on andragogy is consumed by self-directed learning, individualization, institutionalization, exclusionary politics, techno-scientization, and conformity, while ignoring cultural and social concerns, thus de-contextualizing and depoliticizing adult learning. KELT also does not take into account cultural or social influences on adult learners directly. KELT does however, describe learning as a synergistic reaction with the environment and details individual learning styles which can influence learning preferences (Kolb & Kolb, 2009). This detail goes beyond *Knowles's Theory of Adult Learning* which does not address individual learning styles. This contrasts with the Transformative Learning Theory which focuses heavily on the influence of the social, political, and cultural influences on learning. Mezirow (1991) explains that the meaning perspectives that adults develop are ways to explain our daily lives and yet at the same time, reflect the cultural and psychological assumptions of the world around us. However, the relationship of the individual within relation to society or social action has been questioned in this. Newman (1993) states perspective transformation focuses on the adult examining his or her own personal experiences and has an emphasis on the adult's orientation towards making meaning and understanding of the world around him or her.

While there are some similarities, the process of change is addressed differently in each of the theories. Knowles articulates the developmental shifts that occur with his six assumptions, as a learner progresses from pedagogy to andragogy, using a continuum. Knowles does not state how learning occurs nor does he present a mechanism of action in his theory. Knowles et al., (2015) describe the progression from pedagogy to andragogy in the following ways: as a person matures, he or she moves from dependency to being self-driven and more independent, enabling he or she to self-direct his or her learning. As this maturation occurs, adults begin to have an increased reservoir of experiences to draw upon to enhance their learning, whereas children have limited experiences (Knowles, et al., 2015). The readiness to learn changes over time as an adult assumes new life roles (i.e. work related, parenting, etc.) and becomes motivated to tailor learning towards these new roles. Learning shifts from subject-centered (i.e. studying geometry in high school) to problem-centered (i.e. learning information that applies directly to a job). Finally, Knowles et al., (2015) espoused that children are motivated extrinsically to learn (i.e. compulsory school attendance) while adults are motivated intrinsically to seek out learning opportunities that will increase competency in their life roles. Knowles's view of learning as a continuum contrasts with both KELT and Transformative Learning Theory which are both cyclic in nature. The four stages of KELT's learning cycle include concrete experience, reflective observation, abstract conceptualization, and active experimentation and specifically describe how learning occurs through experience (Kolb, 1984). Learning can begin at any one of the four stages listed. However, it preferably begins in the concrete experience stage (Kolb & Fry, 1975). Mezirow (1995) identified 10 stages of perspective transformation to explain the process of how personal paradigms develop and evolve in adulthood. These 10 stages reflect the themes of centrality of experience, critical reflection, and rational discourse in the process of meaning structure transformation, however the first phase "a disorienting dilemma" is the starting point for the transformative learning. Furthermore, Mezirow states that once this cycle which results in transformative learning occurs, "it is irreversible once completed" (Merziow, 1991, p. 7).

While the KELT and Transformative Learning Theory appear to be very different in their descriptions of adult learning when compared to Knowles's andragogy, there are commonalities. For example, Mezirow (1995) believes that communicative learning, which involves rational discourse and discussion with others, is the most important practice to foster transformative learning. This relates to Knowles's theory who believed that the experience adults bring to the learning environment is an important resource aiding in the learning process (Knowles, 1980). He therefore encouraged group discussion and collaboration to facilitate this exchange of life learning and experiences. KELT posits that individuals create knowledge from interaction with their environment and from experience, rather than just by receiving instruction (Bergsteiner, Avery, & Newman, 2010). This same principle is demonstrated when Knowles's andragogy is applied program design for various educational opportunities (i.e. management education, online education, etc.). Recommendations for program design include involvement of the students in planning of the learning objectives (to ensure relativity to their lives) and use of real-world problems (Chan, 2010). All three of the theories focus on the process of learning or reason for learning as being self-directed. Knowles assumes adult learners are self-directed; Kolb and Kolb (2009) state that learners make choices about which parts of their environment they will engage with and learn from; the Transformative Learning Theory articulates the goal of this adult learning theory "to help the individual become a more autonomous thinker" (Mezirow, 1997, p. 11).

Utilizing concepts from all three theories will enable a robust explanation of the rationale behind the educational component of this protocol to standardize the treatment of MCI in acute care. Using Knowles's theory, a description of how the instructional component of the protocol for the OTs will be designed. This would include an introductory lecture (recalling that Knowles's first assumption is that adults need to know what, why, and how), reflection and discussion on each occupational therapist's current practice related to MCI, and use of case studies to explore MCI screening and treatment options. This design utilizes several components of andragogy including peer-to-peer discussion, "real-world" experience, and problem-centered learning. Using the four-stage learning cycle of the KELT explains how this instruction will be internalized and used in actual OT practice. First, the OTs engage in concrete experience (the introductory lecture). Next, OTs reflect on their own practice related to MCI and discuss with their peers (observation and reflection stage). Then, through the use of case studies, the OTs will form new abstract concepts that lead them to the final stage: testing in a new situation. Using the concept of the critical self-reflection of assumptions (CSRA) from Transformative Learning, the OTs can examine what assumptions, biases, and theories they are using to conceptualize cognitive screening and treatment in acute care. Taken together, all three theories complement each other and enable the description of the assumptions, learning process, and mechanism of change during the educational component of this protocol.

Evidence to Support Need for Standardization of Treatment for MCI

Several factors result in the underdiagnosis of MCI. Detection of MCI in hospital settings can be difficult to distinguish from typical cognitive decline, as "forgetfulness" is consistent with normal aging (Sanford, 2017). Although clinical guidelines recommend screening for cognitive impairment in HF patients and the International Association of

Gerontology and Geriatrics issued a consensus paper in 2015 recommending that all persons 70 years and older have an annual subjective or objective cognitive testing, there are no specific guidelines on a specific protocol (i.e. timing, specific cognitive screens, etc.) (Cameron, et al., 2017; Čelutkienė, et al., 2016; Sanford, 2017). Even with awareness of MCI, there is limited evidence from which to recommend the optimal cognitive screening method. There are a variety of screening tools used to detect MCI including the Mini Mental State Examination (MMSE), the Montreal Cognitive Assessment (MoCA), the Quick Mild Cognitive Impairment screen (Qmci), Saint Louis University Mental Status Examination (SLUMS), and the Rapid Cognitive Screen, among many others (O'Caoimh, et al., 2016; Sanford 2017). The two most common screening measures used are the MoCA and MMSE (Cameron, et al., 2017).

There continue to be questions regarding these screens including which screen is the most sensitive, which screens are feasible and valid in which settings, and how frequently patients should be screened (Cameron, et al., 2017). The SLUMS has been found to be more sensitive in detection of MCI compared to the MMSE and scoring is adjusted for educational level (Sanford, 2017). The Rapid Cognitive Screen is a 10-point questionnaire developed from the SLUMS that is efficient and easy to administer, however is not as sensitive as the SLUMS in detection of MCI (Sanford, 2017). The MoCA is considered the "gold standard" for detecting MCI, however the MMSE continues to be the most frequently used screening tool for MCI detection (Ciesielska, et al., 2016). A direct comparison of the MMSE and MoCA found that MoCA had greater sensitivity and specificity for detection of MCI (Ciesielska, et al., 2016). Another study examining the MoCA compared to the Qmci found the Qmci takes less time and more accurately identifies MCI (O'Caoimh, et al., 2016).

Additional studies have focused on non-invasive objective measures of brain activity. One such study conducted by Chehrehnegar et al., (2019) examined the diagnostic value of saccadic eye movements in detecting cognitive changes in the MCI population. This study found that error response, reaction time, and anti-saccadic trials were significantly different in MCI individuals vs. healthy controls. Based on these studies, the selection of a MCI screening tool in acute care should be tailored to the environmental and time constraints of the setting, with the awareness of the limitations of all the screening tools. More research should be conducted to determine the ideal cognitive screening tool for use in acute care.

Qualitative interviews conducted with a multidisciplinary team, including registered nurses (RNs) and doctors at a 20-bed cardiology ward, illustrate the inconsistencies in frequency of screening for cognitive impairment and use of subjective screening for cognitive impairment rather than objective screens or assessments (Nilsson, Rasmussen, & Edvardsson, 2013). This study found that there are clear guidelines and protocols for diagnosis, treatment, and care for cardiology related conditions on hospital units however there are no clear guidelines for staff to screen for and treat cognitive impairments. Rather, cognitive impairments are typically not addressed until "escalated and emerged as problems that disrupted the usual flow or threatened safety issues at the unit" (Nilsson et al., 2013).

Rogers, et al. (2016) identified OT as the only spending category to reduce hospital readmission in HF patients due to the profession's focus on the functional and holistic needs of the patient. Despite this report and the increased research and attention regarding MCI, there is a lack of understanding on how OTs address MCI. A 2015 survey of Canadian OTs reported a widespread lack of use and consensus on assessment practices regarding identifying and treating MCI (Belchior, et. al, 2015). This inconsistency of assessment and treatment is likely the result of a lack of guidelines and the continued need for expanding research into lifestyle factors associated with preventing or remediating MCI.

Previous Attempts to Address the Problem

Currently, there are no effective pharmacological interventions that offer a long-term effect on delaying the progression from MCI to dementia. There is, however, a growing body of evidence supporting the important role of non-pharmacological interventions in MCI (Hong, et al., 2015; Sherman, et al., 2017). Some non-pharmacological interventions identified include occupational therapy, combined cognitive training and exercise, cognitive training, psychotherapy, and cognitive stimulation (Hong, et al, 2015; Train the Brain Consortium, 2017; WHO, 2019).

A systematic review conducted by Hong, et al. (2015) examining non-pharmacological cognitive interventions for MCI, supports the use of "group-based multi-component cognitive intervention including cognitive exercise of multiple domains, education for memory strategies and meta-memory with long durations of intervention" (p. 12) to improve multiple cognitive domains including attention, executive functioning, memory, visuospatial skills, and general cognitive functioning. A randomized trial on the effects of combined physical and cognitive training in aged MCI subjects found that the “Train the Brain” intervention improved cognitive status and evidence of neurological health (Train the Brain Consortium, 2017). Key ingredients of the “Train the Brain” intervention included the intensity of the intervention (intervention 3 times a week for 7 months), the confluence of the physical, cognitive, and social components, the supervision of the cognitive and physical training, training activities "inspired by everyday activities" and the small group training which facilitated social interaction.

An additional systematic review on efficacy of cognitive intervention on neuropsychological measures found significant, moderate effects for multidomain and memory-based interventions (Sherman, et al., 2017). Sherman, et al. (2017) also found that there were no significant differences in categorical moderators such MCI diagnostic type, training type, mode of intervention, or duration of intervention (number of hours). This is significant because it may indicate that the structural elements and duration of the intervention may be less important than the content (Sherman, et al., 2017). The WHO (2019) report on “Risk reduction for cognitive decline and dementia” included a review of several systematic reviews on cognitive stimulation and its effect on mild cognitive impairment and dementia. Overall, the WHO (2019) review found that there is mild to moderate evidence to support the use of cognitive stimulation to improve various domains of cognitive in adults. Based on these findings, the WHO (2019) recommend cognitive stimulation as an intervention for treatment of MCI.

With the rapid growth of studies examining non-pharmacological interventions for MCI, there has been a lack of studies reporting outcomes related to everyday function and ADL performance. A meta-analysis by Chandler, et al. (2017) examined the utilization of everyday outcomes in cognitive interventions for individuals with MCI. This specifically included outcome measures such as ADL performance, quality of life (QOL), mood, and metacognitive outcomes. Overall trends suggest that cognitive interventions (computer-based, therapist-based, and multi-modal interventions) in individuals with MCI have a small, positive effect on everyday outcomes, with therapist-based cognitive interventions having the greatest observed impacted on ADLs and improvement of meta-cognitive aspects of memory (Chandler, et al., 2017).

There have been few studies examining the identification and treatment of MCI in acute care specifically. McDougall (2017) makes specific recommendations for nursing care in acute care. These recommendations include establishing a cognitive baseline based on the first interaction with the patient and using that baseline to gauge subtle improvements or changes. Routine screening for delirium is also recommended (McDougall, 2017).

Cognitive stimulation is defined as the participation in activities that aim to improve cognitive and social functioning (Clare & Woods, 2004). In general, observation studies have found that cognitively stimulating activities may have a protective effect on cognitive reserve or slow down cognitive decline (WHO, 2019). Examples of cognitively stimulating activities include reading, puzzles, word games, and money calculations.

No studies have specifically examined the effect of OT on MCI in acute care however the role of OT addressing cognitive impairment related to cardiac dysfunction is emerging. Norris (2018) examined OT's role in chronic disease management in patients with cardiac dysfunction and the importance of addressing cognitive impairments (Norris, 2018). Through a holistic approach, OTs can apply principles of lifestyle medicine to promote engagement in meaningful and purposeful activities through cognitive intervention (Norris, 2018).

Additionally, the role of OT in the identification and treatment of MCI is still emerging. Currently, AOTA describes occupational therapy's role in acute care and adult cognitive disorders in two separate position papers, however there is no mention of MCI in either paper. As stated by AOTA (2017), occupational therapists can provide cognitive rehabilitation including global learning strategies, specific functional skills training, use of external aids, and cognitive retraining during functional activities. Based on the current evidence for the most effective treatment of MCI, which includes physical, mental, and social stimulation, OTs in conjunction with the nursing and support staff are equipped to provide this treatment. The feasibility of treatment for MCI in acute care continues to be unknown and presents an opportunity for future research.

Recommendations for Addressing the Problem

In recent years, The Centers for Medicare and Medicaid Services (CMS) have shifted the focus of the healthcare system onto quality care at reasonable costs. Unplanned hospital readmissions are now considered an indicator of poor quality and the CMS developed a readmission reduction program as part of the Affordable Care Act of 2010. Hospitals are now penalized for hospital readmissions within 30 days for heart failure, coronary artery bypass graft surgery, acute myocardial infarction, pneumonia, hip or knee arthroplasty, and chronic obstructive pulmonary disease (CMS, 2020). Several factors have been associated with hospital readmission such as diagnosis, marital status, health literacy, age, race, and cognitive impairment. With an increased emphasis on decreasing hospital readmission, there is still limited research investigating the relationship between cognitive deficits and readmission. Although there are only a few studies examining how occupational therapy (OT) practitioners can identify, treat, and remediate MCI, the literature is promising. One landmark study by Rogers, Bai, Lavin, and Anderson (2016) identified OT as the only spending category, out of 19 distinct categories, to reduce hospital readmissions due to the profession's unique focus on the functional and social needs of patients. Another study examined OT's role in chronic disease management in patients with cardiac dysfunction and highlighted the OT skill set for assessing and improving functional abilities related to cognitive domains (Norris, 2018). These studies reinforce the positive impact of OT in acute care, cognitive assessment and treatment, and establishes the need for continued research in this area.

MCI, delirium, and major neurocognitive decline have been linked to discharge to a facility rather than home, increased risk of hospital readmission, and increased assistance for ADLs (Jackson, et al., 2016). Currently, the evidence supports the use of group-based and multicomponent interventions to treat MCI (Hong, et al., 2015; Sherman, et al., 2017). Multicomponent interventions include cognitive rehabilitation, education on meta-memory health, relaxation techniques, stress management, techniques, motor exercise, external memory aids, and self-assertiveness training (Hong, et. al., 2015; Kurz, et al., 2009). Several interventions included a group-based component as the social interaction resulting from the small group model maintains motivation and demonstrates a protective response (Gates & Sachdev, 2014; Train the Brain Consortium, 2017). Engagement in cognitively stimulating activities in mid-late life has been linked to decreasing incidence of MCI (Krell-Roesch, et al., 2019). Stated simply, daily physical, mental, and social stimulation combined have a positive effect on cognition.

OTs provide cognitive rehabilitation including global learning strategies, specific functional skills training, use of external aids, and cognitive retraining during functional activities (AOTA, 2017). OTs are also skilled in providing functional cognitive assessment, articulating how cognitive deficits impact functional performance (Wesson & Giles, 2019). Based on the current evidence for the most effective treatment of MCI, which includes physical, mental, and social stimulation, OTs in conjunction with the nursing and support staff, are equipped to provide this treatment and will benefit from a standardized protocol to screen, assess, and treat MCI.

CHAPTER THREE – Description of the Program

Mild cognitive impairment (MCI) is an important target for intervention for individuals with heart failure, progressive disorders, and hospitalized patients in acute care. Despite the reported rates of impaired cognition, MCI, and dementia in hospitalized populations, studies suggest cognitive impairments continue to be often unidentified or overlooked. There are several factors contributing to the underdiagnosis of MCI in acute care, including lack of specific guidelines for screening, assessment, and treatment of MCI in acute care and the role of OT in addressing MCI. The aim of this chapter is to describe a proposed solution to address MCI and cognitive impairments in the acute care setting. The solution includes a multidisciplinary approach to providing cognitive screening and stimulation, in conjunction with a standardized OT protocol to assess and treat cognitive impairment in acute care.

Program Description

The proposed program entitled, *The Multidisciplinary Approach for Mild Cognitive Impairment (MCI)*, aims to optimize and standardize the approach to treating patients with or at risk for mild cognitive impairment in the acute care setting. The program will consist of three key components: 1) educating nurses on how to assess for MCI and cognitive impairments, including how to provide cognitive stimulation daily and when to consult occupational therapy to optimize care, 2) standardizing an approach for occupational therapists on how to assess and treat MCI and cognitive impairment in acute care and 3) increasing awareness of OT's role within an interdisciplinary team to address MCI and cognitive impairments in acute care.

Part One: Interprofessional Collaboration with Nurses

The goals of the education include education nurses a standardized protocol involving use of a cognitive screening tool and cognitive stimulation packets. Cognitive stimulation is defined as “a range of group activities and discussions aimed at general enhancement of cognitive and social functioning” (Clare & Woods, 2004, p. 387). A higher frequency of cognitive stimulation has been shown to decrease the risk of developing MCI (Krell-Roesch, et al., 2019). Nurses, with frequent and consistent interaction with patients, are well equipped to provide cognitive stimulation for all patients. The details of the nursing-led cognitive stimulation program are as follows:

1. Nurses will attend a mandatory 30-minute in-service with education on MCI, use of a brief cognitive screening tool, how to use the cognitive stimulation packet, and how to initiate a consult for OT if the patient is cognitively impaired. This in-service is led by an occupational therapist.
    a. Prior to this in-service, a meeting will be held with the nurse managers and attending physicians to communicate the relative advantage, compatibility of cognitive stimulation with established workflow, and ease of use of the cognitive screening tool and cognitive stimulation packets.
2. The units will be provided with a quick-tip handout for using the cognitive screening tool, including what threshold is appropriate for an OT consult (see *Appendix A*).
3. The nurses will be expected to orient patients and family members to the cognitive stimulation packets, which will be laminated and placed in each room.

4. The cognitive screen will be administered upon admission and discharge by the nurse.
5. Cognitive stimulation activities will be completed with patients one time per shift.
6. Based on results on the cognitive screen, a consult for OT will be requested.

Part Two: Standardizing approach to MCI for occupational therapists

After an OT referral is placed due to an abnormal score on the cognitive screen, the OTs will then perform a functional cognitive assessment. Specific functional cognitive assessments are not dictated in this protocol; however, the OTs should use their clinical reasoning to determine the ideal assessment for each patient. Based on the results of the assessment, OTs will provide functional cognitive rehabilitation through a variety of treatment ideas, listed in the protocol. As stated by AOTA (2017), occupational therapists can provide cognitive rehabilitation including global learning strategies, specific functional skills training, use of external aids, and cognitive retraining during functional activities. Functional cognition is defined as "the ability to use and integrate thinking and performance skills to accomplish complex everyday tasks" (Giles, et al., 2017, p. 1). MCI impacts the ability to perform complex everyday tasks like financial management, medication management, and return to work due to impaired executive functioning. It is important to note that the OTs will not be diagnosing MCI, rather identifying patients who have mild, moderate, or severe cognitive deficits. This protocol will help to identify patients who have deficits consistent with MCI that may have otherwise been overlooked. The details of the standardized protocol to assess and treatment MCI and cognitive impairment in acute care are as follows, which are outlined in *Figure 3-1*:

1. After receiving an OT consult due to a patient's performance on the nursing cognitive screening tool, OTs will perform a functional cognitive assessment during evaluation.
2. During the evaluation, OTs will reorient patient and family members to cognitive stimulation packet present in the room, which was initiated by the RN.
3. Based on the results of the functional cognitive assessment and the cognitive deficits, the OT will develop a treatment plan to address these deficits, if appropriate.
   a) If a patient is mildly impaired, based on the scoring of the cognitive assessment, and ADL or IADL performance is not impacted, it is appropriate to encourage the patient to continue completing cognitive stimulation activities daily and refer to outpatient OT and outpatient neuropsychology for further follow up.
   b) If a patient has mild, moderate, or severe deficits that impact ADL or IADL performance, it is appropriate to keep the patients on caseload for treatment.
4. If the patient has deficits in executive functioning, the following activities are recommended:
   a) Grocery shopping planning activity
   b) Medication management task
   c) Financial management shopping activity
5. If the patient has deficits in memory, the following activities are recommended:
   a) Memory matching game
   b) Story recall

c) n-back task

6. If the patient has deficits in attention, the following activities are recommended:
   a) Mazes
   b) Serial 7s
   c) Sorting of objects into categories
7. If the patient has deficits in visuospatial skills, the following activities are recommended:
   a) Mazes
   b) Word searches
   c) Find the differences/similarities in photos
8. If the patient has deficits in language, the OT will ask for a speech language pathology consult.

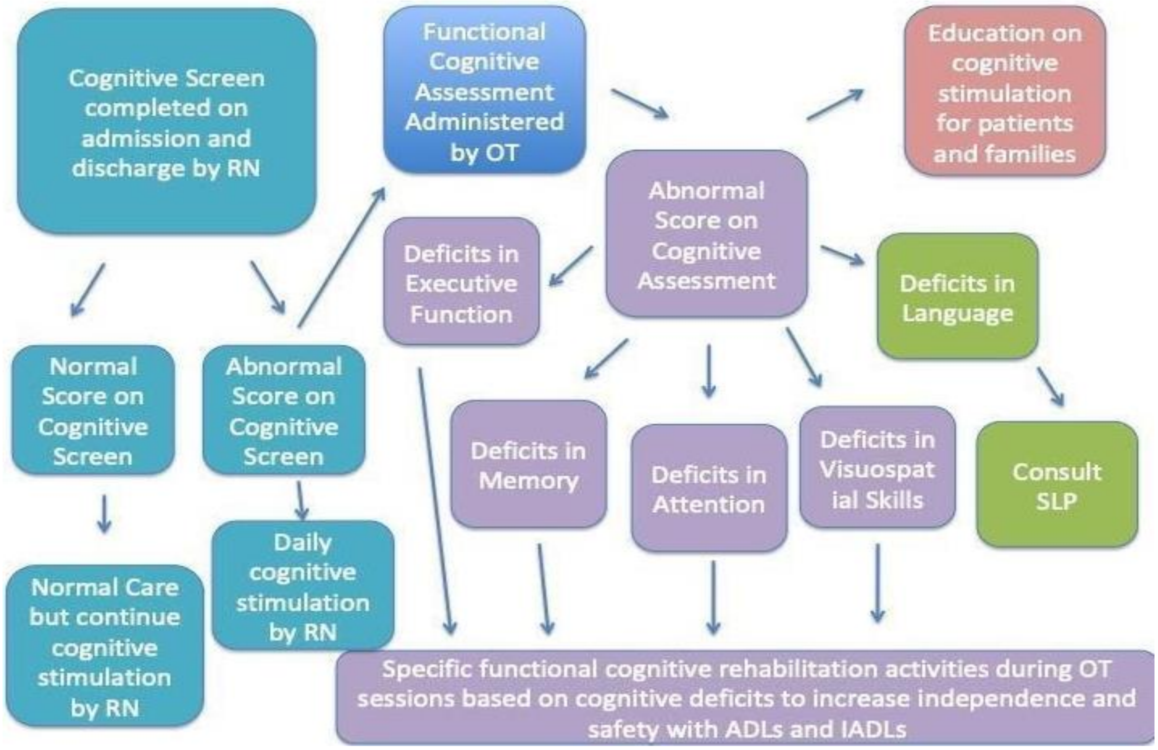


Figure 3-1. Visual model depicting program protocol

Incorporation of Theory into Program

The educational component is vital to the acceptance and implementation of this protocol. Influenced by Knowle's Adult Learning Theory, the following concepts described the table will be applied to the educational materials.

Table 3-1. Summary of key elements of Knowles's Adult Learning Theory and their connection to specific protocol features

Key element	**Brief description of key element**	**Application to doctoral project**
What, Why, How	Adults need to know why they are learning something	Educational PowerPoint and lecture on the prevalence of MCI, common diagnoses with MCI, and impact of MCI on ADLs/IADLs/quality of life, etc.
Self-concept	Adults have a maturing self-concept and desire to be self-directed in their learning	Reflection on use and comfort with standardized or unstandardized cognitive screening tools and treatment in acute care
Experience	Recognition of the experience adults bring to situations is important and facilitation of peer interaction is important	Peer and group discussion on what has and hasn't worked in the past when screening for and treating MCI in acute care
Problem-Centered	Adults are motivated to learn information that can help them perform better in their life role	After problems with current practice are identified during group discussion, there will be an introduction of the standardized protocol for screening and treatment of MCI. This provides the occupational therapists with the tools they need to address the problem with MCI. Practice with the standardized protocol will utilize case studies and role-playing.
Intrinsic motivation	Adults are motivated by intrinsic factors like increased job satisfaction, self-esteem, etc.	With a greater understanding of MCI and practice using the standardized protocol, the occupational therapists should have increased self-efficacy and feelings of competence to address MCI, hopefully resulting in increased job satisfaction while improving patient outcomes.

Expected Outcomes

This program will include resources for nurses and OTs, data for several different outcomes, and expected short, intermediate, and long-term outcomes. Resources created for this program include:

1. two educational in-services on screening, assessment, and treatment of MCI, one for nurses and one for OTs
2. cognitive stimulation packet for nurses
3. quick tips reference sheet for nurses
4. case example for OTs

Data will be collected on the number of (1) nurses and OTs trained, (2) patients receiving the cognitive screen, (3) new OT consults generated, and (4) cognitive impaired patients. Short-term outcomes include increased knowledge of MCI and cognitive treatment in acute care by nurses and OTs and increased use of cognitive stimulation packets and standardized protocols. Intermediate outcomes include evaluating the compliance for use of the cognitive screening tool for nurses and standardized protocol for OTs. Long-term outcomes include a finalized protocol to be used during a randomized control trial to evaluate the effectiveness of a multidisciplinary approach to addressing MCI and cognitive impairment in acute care. Details of the expected outcomes can be found in *Figure 4-1*.

Examples of Activities

The program consists of two educational in-services, a cognitive screening tool and cognitive stimulation packet for nurses, and a standardized protocol to be used with patients who have cognitive deficits for the OTs. The nursing in-services, led by an OT, is 30 minutes in length (Appendix C). After the in-service, the nurses will be provided with a quick tips sheet on using the cognitive screening tool (Appendix A). The cognitive stimulation packets will be placed in every patients' room for easy access. The OT educational in-service will be 2 hours in length. This educational in-service is also led by an OT. During the 2-hour in-service, OTs will be educated on latest MCI research (causes, impact on IADLs, cost on healthcare system, etc.), the nursing driven cognitive stimulation and screening (and how to support nurses), and the standardized protocol. Case examples with discussion questions will be utilized during the 2-hour in-service. An example of a case example can be found in Appendix B. After the initial education on MCI using a PowerPoint presentation, the OTs will break into small groups for discussion using the case example (Appendix B). After the small group discussions, the groups will join to discussion the case example. The OTs will be provided with copies of the standardized protocol after the in-service, with an additional copy saved on a shared computer drive for electronic access.

CHAPTER FOUR – Evaluation Plan

Program Scenario and Stakeholders

The aim of this chapter is to describe the evaluation plan for a proposed educational program and feasibility study to address mild cognitive impairment in the acute care setting entitled *Multidisciplinary Approach for Mild Cognitive Impairment (MCI)*. The program is an educational course that aims to educate occupational therapists (OTs) and nurses on a multidisciplinary approach to provide cognitive stimulation, in conjunction with a standardized occupational therapy (OT) protocol to screen, assess, and treat cognitive impairment in acute care.

The proposed program aims to optimize and standardize the approach to treating patients with or at risk for MCI in the acute care setting. The program will consist of three key components: 1) educating nurses to screen for MCI and provide cognitive stimulation 2) standardizing an approach for OTs to assess and treat MCI and cognitive impairment in acute care and 3) increasing the awareness of OT's role within an interdisciplinary team to address MCI and cognitive impairments in acute care. A prospective cohort study design will be used to assess the feasibility of the standardized protocol related to OT and nursing outcome measures after presentation of the education component of the program.

There are several key stakeholders who will benefit from the program including nurses, OTs, directors of rehabilitation, hospital executives, nursing managers, patients, and patient's family members. Nurses and OTs will benefit from education to increase their confidence and competency to address the needs of patients with MCI. Patients with

MCI will likely benefit from the cognitive stimulation and cognitive rehabilitation to address their executive functioning deficits and increase independence with instrumental activities of daily living (IADLs), such as medication management, with the goal of decreasing hospital readmissions. The directors of rehabilitation will benefit from an increase in OT consults, increasing departmental revenue. Hospital readmissions are often cited as a contributing factor to rising healthcare costs and the Centers for Medicare and Medicaid Services (CMS) now penalizes hospitals for unplanned hospital readmissions within 30 days for heart failure, coronary artery bypass graft surgery, acute myocardial infarction, pneumonia, hip or knee arthroplasty, and chronic obstructive pulmonary disease (CMS, 2020; Jencks, et al., 2009). With an effective intervention in place to address MCI and reduce hospital readmissions within 30 days, hospital executives and nurse managers should see decreased penalties and improved quality care resulting in positive patient outcomes.

With an effective intervention in place to address MCI and reduce hospital readmissions within 30 days, hospital executives and nurse managers should see decreased penalties and improved quality care resulting in positive patient outcomes.

After the education portion of the program is complete, the feasibility study will actively involve nurses’, OTs’, and patient participation. The nurse will be responsible for administering the cognitive screening upon patient admission and discharge, consulting OT based on the score of cognitive screens, and engaging the patient in cognitive stimulation using the cognitive stimulation packet daily. The OT will be responsible for implementing the standardized protocol when consulted, including use of a functional cognitive assessment and specific treatment ideas designed to address the patient's identified deficits. The patients, nurses, and OTs are all active users of the program and data will be gathered to assess nursing and OT outcomes related to usage. Because this is a feasibility study, patient outcomes will not be collected at this time.

Based on the program evaluation research findings, the program will be modified to increase feasibility and usability. Gathering qualitative and quantitative data from the nurses and OTs will inform the research findings and determine next steps in the research process. The stakeholders interested in these results include those delivering the program (nurses and OTs), those using the program (nurses, OTs, and patients), and those funding the program (nurse managers, director of rehabilitation, and hospital executives). Modifications to the program design will be the responsibility of the OT using data collected from the feasibility study and in conjunction with feedback from key stakeholders (nursing managers, director of rehabilitation, etc.). The future of the program ultimately lies with ability to secure funding and support from the nurse managers, director of rehabilitation, and hospital executives.

Vision for the Program Evaluation Research

The goal of the program evaluation research is to determine the effectiveness and feasibility of an educational program designed to increase nursing and OT use of a standardized protocol to address MCI and cognitive impairments in acute care. Based on the results of the program evaluation, modifications will be made in preparation to complete a randomized control trial (RCT) to evaluate the effectiveness of the proposed program on patient outcomes. In the long term, the program will help bring increased awareness of OT’s role while also standardizing OT practice related to assessment and treatment of MCI and cognitive impairment in acute care.

Engagement of Stakeholders

Success of the program involves key stakeholder support. Stakeholder support will be gathered through a confirmatory process that will serve to gain consensus among stakeholders for goals of the feasibility study and determine which outcome measures are important to assess. The confirmatory process is described below. To ensure continued engagement from the stakeholders, weekly updates will be sent regarding the study.

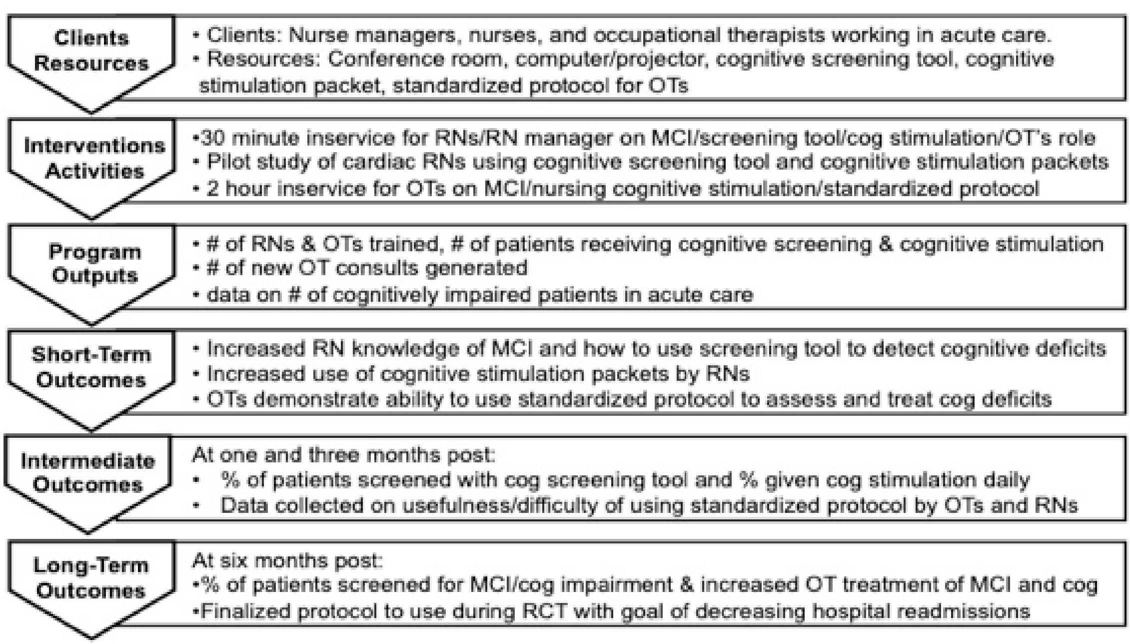
The confirmatory process will determine which program evaluation results that stakeholders find relevant and important prior to beginning the study. These may include the percentage of patients receiving the cognitive screen and cognitive stimulation by nurses, the percentage of patients that are cognitively impaired based on the RN screen and the OT assessments, the number of new OT consults generated based on the protocol, and the overall feasibility of the program. Based on the results of the pilot study, the key stakeholders may use this information to publish results in an academic journal and in hospital-wide communication. Results from the study may also generate support for funding of a future RCT to evaluate the effectiveness of the program.

Support from key stakeholders comes in many forms including diffusion of information, logistical support, and financial support. Stakeholders support the program is essential to ensure that a consistent message is communicated to all staff involved. Logistical support will be provided in the form of access to statisticians and statistical software. Financial support will involve reduced productivity requirements for the OT leading the project.

Simplified Logic Model for Use with Stakeholders

The activities, outputs, and outcomes comprising the program *The Multidisciplinary Approach for Mild Cognitive Impairment (MCI*), are shown below in *Figure 4.1*. The program involves both education and intervention components. The educational component involves a 30-minute in-service for nurses and a 2-hour in-service for occupational therapists with instruction on the screening, assessment, and treatment of MCI. The intervention will be a feasibility study conducted using prospective cohort design. Program outputs include the number of nurses and occupational therapists trained, number of new OT consults generated, and data on the number of cognitive impaired patients on the unit. Short-term, intermediate, and long-term outcomes are described in *Figure 4-1* below.

Figure 4-1. Simplified logic model for *The Multidisciplinary Approach for MCI*



Preliminary Exploration and Confirmatory Process

The confirmatory process with key stakeholders is essential to the success of the program. The specific stakeholders for this program include the directors of rehabilitation, nurse managers, attending physicians, OTs, and nurses. A consensus among the stakeholders will be gathered using both in person and telephone meetings. All information regarding the study will be provided before the first meeting to give the stakeholders time to review and prepare comments and concerns. The following information will be provided: a one-page executive summary of the program, a logic model depicting the program evaluation plan, a one page document detailing pertinent research articles and rationale, and a detailed budget.

To keep the discussion on topic and the feedback manageable, the stakeholders attending the meeting will be limited to the directors of rehabilitation, nurse managers, and one representative from the OTs and nurses. A conference room will be reserved for these meetings; however, there will be a conference call line that attendees can dial into to increase ease of attendance. The meetings will be held at a consistent time, to ensure momentum for the project and continued planning for the research. Meeting minutes will be sent out through email after each meeting to ensure continuity and organization during the confirmatory process. Once a consensus on the study design and the dependent variables is established, the study will begin.

Program Evaluation Research Questions by Stakeholder Group

Table 4-1 lists the program evaluation research questions, both qualitative and quantitative, that will be used to design and evaluate the proposed program. A variety of stakeholder groups were accounted for including nurses, OTs, and hospital administrators. Additionally, questions are directed towards the American Occupational Therapy Association (AOTA) to ensure the proposed project is aligned with the mission of the OT profession.

Table 4.1. *Types of research questions that will be answered through the program evaluation data and by the study.*

Stakeholder or Stakeholder Group	**Program Evaluation Research Questions**
Nurses and OTs actively involved in program delivery	***Qualitative:*** · Was the information presented on MCI relevant? · Was the information presentation too easy or too complicated? · Was the instruction sufficient for the participants to begin using the cognitive screen/cognitive stimulation packet/standardized OT protocol with patients? · Were some aspects of the program more or less useful? · Is there anything that should be changed to improve program content or delivery? ***Quantitative:*** · Did participants gain needed skills consistent with program goals, measured by number of patients receiving cognitive screen/cognitive stimulation/standardized OT protocol? · Did recipients of the intervention significantly improve in terms of desired performance consistent with program goals (use of cognitive screen, cognitive stimulation packet, use of standardized cognitive protocol, etc.)?
Administration and management (Nurse manager, director of rehab, attending physicians)	***Qualitative:*** Does the content of the program match organizational goals? Is the course delivery format suitable for nursing and occupational therapy practitioners? Were any problems or issues reported? ***Quantitative:*** Can the research data be used to demonstrate improved quality of care provided to recipients of the intervention (i.e., number of patients identified with cognitive impairment and receiving treatment)? Are outcomes consistent with the proposed theoretical justification? Is delivery of the program more costly than other means of delivery? What were the rates of program participation from OTs and RNs? Did these rates show statistical improvement after 1-week post and 4-weeks post in-service?

Funding agencies, advocacy organizations, including AOTA	***Qualitative:*** - Do participants report increased understanding of the distinctive role of occupational therapy in provision of services relevant to the project (i.e., OT's role in cognition in acute care)? - Are participants confident that they will be able to advocate for the role of occupational therapy as a change agent in areas relevant to the project, demonstrated through increased OT referrals and standardized OT assessment and treatment of cognition? - Are the long-term goals of the project, to complete a randomized control trial (RCT) to assess patient outcomes related to the project, realistic and achievable? - Will the project increase awareness of developments in the field? ***Quantitative:*** - Will the research data demonstrate the importance of the role of OT for providing services relevant to the project? - In light of the health care system in acute care, is the program justified based on study findings? - Will findings demonstrate that the course content matches the knowledge needed to close the clinical gap the project is addressing?

Research Design

The program evaluation research will use both a formative and summative design. This is to ensure that both the program process and program outcomes are effective. The data gathered using these designs is essential, as modifications may need to be made to ensure program feasibility and effectiveness before conducting an RCT in the future.

The formative design for the program evaluation research will be descriptive and exploratory, using administration of a short-mixed methods survey (Likert scale survey questions and short answer questions). Immediately after presentation of the educational in-service, RNs and OTs will complete a survey assessing the usefulness, relevance, and difficulty associated with the educational in-service and use of the study protocol activities (i.e., administering cognitive screening tool, using the standardized OT protocol, etc.). Additional questions will assess preparedness to use the education and open-ended questions asking participants to detail desired changes.

Using the results of this formative data, the administration will answer qualitative questions regarding appropriateness of education for nurses and OTs, problems experienced during research study implementation, and alignment with hospital goals. These questions will be explored both before the study is implemented (e.g. Confirmatory Process described above) and after the study has concluded during a series of in person and virtual meetings. The results of the qualitative data will inform future study design for a planned RCT. Formative data results will be further explored during writing and publication of the results in an academic, peer-reviewed journal.

The summative design for the program evaluation will use quantitative methodology. The proposed program will be evaluated through an observational study design. The goal of this design is to establish correlation among the program's educational instruction and use of standardized protocol to address MCI in the acute setting. The data gathered from OTs and nurses will be examined separately, as the in-services differ in content. Specific statistical analyses will be described below.

A prospective cohort study design will be used. A prospective cohort study was selected as it provides the advantage of gathering data regarding a sequence of events and simultaneously measuring several different variables. It is important to note that the nurses and OTs will be evaluated separately but concurrently. The specifics of this study protocol are described below:

1. Prior to the start of the pilot study, the cognitive screening tool and an additional field for yes/no recording of cognitive stimulation for nursing use will be built into the

electronic medical record (EMR). Documentation is already built for the OTs in the EMR, sufficient for tracking cognitive assessment and treatment of patients.

2. Prior to the start of the study, the total number of OT referrals will be counted over a four-week period.
3. Immediately and four weeks after the educational in-service, the nurses will complete a short survey designed to assess perceived program feasibility including their perceived usefulness, relevance, and difficulty associated with the educational in-service and use of the study protocol activities (i.e., administering the cognitive screening tool).
4. Immediately and four weeks after the OT educational in-service, OTs will complete a short survey designed to assess perceived program feasibility including their perceived usefulness, relevance, and difficulty associated with the educational in-service and use of the study protocol activities
5. On days 7, 14, 21, and 28, data will be collected on frequency of screening for MCI or cognitive impairment, frequency of cognitive stimulation activities performed, and type of cognitive stimulation performed by nurses. Data on frequency will be confirmed by review of documentation in the EMR
6. On days 7, 14, 21, and 28, data will be collected on the frequency of assessment for MCI, frequency of cognitive interventions, and type of cognitive interventions performed by OTs. Data on frequency will be confirmed by review of documentation in the EMR.

7. After the conclusion of the four-week study period, the total number of OT referrals and total number of patients identified with cognitive impairment will be tallied.

Methods

Forty nurses (averaging 2–3 patients per day) and five OTs (averaging 8 patients per day) will be recruited to participate in the study. Inclusion criteria for nurses include working on the cardiac floors and direct patient care. Exclusion criteria for nurses include not working on the cardiac floors and/or administration roles that preclude them from working directly with patients. Nurses will be asked to participate by their nurse manager and receive additional information on benefits of participation during the educational in-service (i.e., benefits of participating as a data collector in an IRB approved research study, etc.). OTs will be excluded if they do not work on the cardiac floors. The study activities will be considered part of normal care, therefore consent of patients will not be required. The cognitive screen is completed by proxy and the patient has the right to refuse participation in completion of cognitive stimulation activities.

Confidentiality will be ensured using a code designation for each participant in the study (OTs, nurses, patients). Once the data is entered onto a spreadsheet on a locked computer drive, the paper data will be shredded. While waiting for data entry, the paper data will be kept in a locked office, inside a locked drawer.

Formative or process research data gathering. The formative data will be gathered using paper-and-pencil surveys in person. The surveys completed by OTs and nurses will include both Likert scale survey questions and short answer questions. Formative data gathering from management will be more informal, with meetings pre and post study to answer qualitative questions regarding appropriateness of education for medical practitioners, problems experienced during research study implementation, and alignment with hospital goals. These questions will be explored during a series of in person and virtual meetings. Meeting minutes will be taken during each encounter with management to ensure documentation of data. This data will also be stored on a locked computer drive.

Formative or process data management and analysis. As described above, verbal responses during meetings with management answering qualitative questions will be transcribed during meeting minutes and stored on a locked computer drive. Data from OT and RN surveys will be transcribed and entered onto a spreadsheet and stored on a locked computer drive. Someone who is trained in coding will perform the data entry. Coding qualitative data is the process of breaking down big data sets, labeling the data, and then putting the data back together for analysis. For this study evaluation, a Priori codes will be developed before examining the data. For example, the short answer survey question asking, “please describe what you liked about the educational in-service”, would be examined for the presence of a Priori codes such as length, comprehensiveness, ease, interest, relevance to my job, etc. Once identified, the data will be entered as a code to be analyzed with the existing data set. The data will be presented in a basic contingency table to illustrate responses to questions on the survey using enumerative methods. Trustworthiness of the findings will be verified with careful record keeping and quality assurance of data completed on every 5th survey.

Summative or outcome research variables and measurement. The dependent variables in this study are as follows:

- Program Feasibility
  - Feasibility from nursing perspective
  - Feasibility from OT perspective
- Preliminary Outcomes
  - Frequency of screening for MCI or cognitive impairment (RN)
  - Frequency of cognitive stimulation activities performed with patients (RN)
  - Type of cognitive stimulation (RN)
  - Number of new OT consults generated based on performance on cognitive screening tool
  - Frequency of assessment for MCI (OT)
  - Frequency of cognitive interventions (OT)
  - Type of cognitive interventions (OT)

The measurement of the dependent variables is described below:

1. Nursing feasibility perspective- Likert and short answer questionnaire
2. OT feasibility perspective- Likert and short answer questionnaire
3. Frequency of screening for MCI or cognitive impairment (RN)- yes/no forced choice (i.e., built into RN flowsheet) answer in EMR (agency record).
4. Frequency of cognitive stimulation activities performed with patients (RN)- yes/no forced choice (i.e., built into RN flowsheet) answer in EMR (agency

record).

5. Type of cognitive stimulation (RN)- Multiple choice click options (i.e., cognitive stimulation packet, orientation activities, other) (agency record)
6. Frequency and type of screening/assessment for MCI or cognitive impairment (OT)- OTs document in OT note results of screen/assessment (if one occurred) (agency record)
7. Frequency and type of specific cognitive activities performed with patients (OT)- OTs document in OT note type of cognitive activities performed (agency record)

Additional data collected include number of patients identified with MCI or cognitive impairment and number of OT consults resulting from abnormal score on nursing cognitive screening during four-week study period.

Summative or outcome data management and analysis. Paper data will be collected from participants, stored in a locked office inside a locked desk, entered into file on a locked computer drive, and then shredded. The EMR will be reviewed to gather data on dependent variables and then entered into a file on a locked computer drive. SPSS will be used for all data analysis. The frequency data collected on days 7, 14, 21, and 28 represent a time series. A regression analysis will be performed to determine the trend for these dependent variables related to frequency. Descriptive statistics will be collected for type of cognitive stimulation activities by nurses, type of cognitive treatment by OTs, and number of cognitive impaired patients.

Disseminating the Findings of Program Evaluation Research

The results of the program evaluation will be disseminated to the direct users of the program, the nurses and OTs, in addition to the stakeholders that participated in the confirmatory process. Dissemination to these individuals is important for several reasons. As the direct users of the program, it is essential that the nurses and OTs understand that their feedback is important and used for program modification. The managers will also be interested in the results as their continued logistical support and expertise is required to complete the next phases of the study including a RCT to determine the effectiveness of the standardized cognitive intervention on patient outcomes.

The program results will be disseminated in different formats based on the audience. As mentioned previously, OTs and nurses have time constraints that make reviewing long reports difficult. A one-page outline that includes visuals of the data, including a pie chart depicting types of cognitive activities completed and bar graphs depicting average ratings of in-service education, will be posted in the OT and nursing break rooms. This one-page outline will also be emailed to all the OTs and nurses. The managers and individuals who participated in the confirmatory process will receive an electronic compelling ten-page report that includes statistical analysis (pie chart, bar graphs, and regression analysis as visuals), verbal summary of results, and recommendations for program modification based on results. Included in this ten-page report will be a stand-alone two-page executive summary for quick reference.

Finally, a research paper will be written and submitted to a peer reviewed journal (i.e. American Journal of Occupational Therapy) for dissemination to the larger OT and allied health community. Emphasis will be placed on the discussion to illustrate the importance of program evaluation and future implications for the research study. It is important to share the results of the program evaluation to receive additional feedback from a larger audience and contribute to the growing body of OT evidence-based research. More information on the dissemination plan can be found in Chapter Six.

Conclusion

Program evaluation is important as it provides the opportunity to strengthen the program, increase feasibility, and improve users' outcomes. The *Multidisciplinary Approach for MCI* will be evaluated using a prospective cohort design, with emphasis on key stakeholders' perceived feasibility and preliminary outcome measures related to compliance. Results of the evaluation plan will be disseminated to the immediate users of the program, in addition to the wider audience of OTs and medical practitioners. A well-executed program evaluation advances the goal of completing a RCT in the future to evaluate the *Multidisciplinary Approach for MCI* program effects on patient outcomes.

CHAPTER FIVE – Funding Plan

Program Description

The proposed program entitled, The Multidisciplinary Approach for Mild Cognitive Impairment (MCI) aims to optimize and standardize the approach to treating patients with or at risk for mild cognitive impairment in the acute care setting. The program will consist of three key components: 1) educating nurses how to assess for MCI and cognitive impairments, including how to provide cognitive stimulation daily and when to consult occupational therapy to optimize care, 2) standardizing an approach for occupational therapists on how to screen, assess, and treat MCI and cognitive impairment in acute care, and 3) increasing nursing and OT confidence and competence to address MCI and cognitive impairments in acute care.

Funding Plan Introduction

The funding plan described in this chapter will address funding for three scenarios: (1) implementing this program in an acute care hospital setting, (2) consultation services to assist with implementation and program evaluation, and (3) dissemination costs. First, the implementation of this program includes the educational courses for nurses and occupational therapists (OTs), all supplemental materials, and general outline for program evaluation. Next, the consultation fees and a budget for the first two years are discussed. Finally, dissemination costs are examined, including conference submissions, academic publications, etc. Additionally, information will be provided on available local resources and potential sources of funding.

Available Local Resources

- Most hospitals have access to meeting spaces that can be reserved for free for training purposes. Hospitals usually employ statisticians that can be available to assist with program evaluation. Most hospital employees will have online access to academic journals through the hospital library, to continue to update and evaluate the program activities as needed.
- Typical acute care rehabilitation departments employ more than one OT, therefore there will be multiple OTs to assist with the implementation of the program.
- Communication with the nursing manager for selected units for program implementation will be important to increase nursing buy-in.
- Occupational therapy students may also be involved with researching additional evidence-based cognitive treatment activities.

Needed Resources: Budget

Program Implementation Costs

The materials developed for this program will be offered at no cost since the purpose of the program is to provide a standardized approach to addressing MCI and cognitive impairments in acute care. The materials included as part of this program are the recorded educational in-services for the nurses (30 minutes) and OTs (2 hours), corresponding PowerPoint presentations, a nursing quick-tips sheet, and procedural flow sheet. These materials will allow an OT to begin implementation of the program at their hospital. Based on the size and budget constraints of each hospital, there are several other expenses to consider. A detailed accounting of the expenses can be found in the Table 5.1. Electronic equipment with projection capability will be required to view the educational in-services and associated PowerPoint presentations. The educational in-services are recorded and provided at no charge to maintain the fidelity of program implementation. Presumably, there will be an OT chosen to lead the program implementation, which will require time spent outside of patient care hours. This can be funded either through decreasing the lead OT's patient care hours or by paying the OT an hourly rate for any additional hours spent working on program implementation. The duties of the lead OT could include consultation with the creator of the program and meetings with the director of rehabilitation and nursing managers prior to beginning implementation. During program implementation, the lead OT will present the recorded educational in-services and be present to answer any additional questions. After the program is implemented, the lead OT could be responsible for leading the program evaluation. An estimated average of six hours per week will be required during the first year and three hours per week during the second year. An additional consideration if the hospital wishes to conduct a program evaluation is the cost of a healthcare statistician. Although the lead OT could complete the statistical analysis for the program evaluation, a healthcare statistician may be able to perform the analysis more efficiently. Finally, the cost of the recommended screening tool and assessments must be considered. AM-PAC Applied Cognitive Inpatient "6-Clicks" Short Form, recommended as the nursing screening tool, may be acquired for no cost if used for research purposes.

It is recommended that participating hospitals initially implement the program as a quality improvement (QI) project or Institutional Review Board (IRB) approved research study. There are several functional cognitive assessments that have an associated cost; however, the hospital can choose which functional cognitive assessments the OTs will use.

Table 5.1 Implementation Costs

Budget Item	Year One	Year Two
Program Materials (nursing in-service, OT in-service, quick-tips sheet, procedural flow sheet)	$0	$0
Electronic equipment to view and display nursing in-service and OT in-service (i.e. computer and projector)	$1000	$0
Lead OT time spent during pre, during, and post implementation (average of 6 hours per week at $42.25 per hour 1st year and average of 3 hours 2nd year)	$13182*	$6591*
Healthcare statistician salary during program evaluation phase (average hourly wage $44.03 per hour)	$1761.20**	$880.60**
AM-PAC Applied Cognitive Inpatient "6-Clicks" Short Form (AM-PAC)	$0 $189	$0 $189
Functional cognitive assessment	varies	varies
Total	$16,132.20	$7660.60

*Cost of OT time spent may be supplemented by reduced patient care hours
**Healthcare statistician recommended but not required to complete program evaluation
*** $0 for academic research and $189 per year for clinical or commercial use

Consultation Services Costs

Consultation services will be customized based on the participating hospital's needs. Consultation could be provided in the preliminary phase through video conferencing or in person involvement during the initial meetings with the director of rehabilitation and the nursing managers when planning program implementation. The creator of this program could also be involved during the educational in-services through video conference or in person. Finally, consultative services could be used during program evaluation and any future modifications to the original program based on the results of the evaluation (see Table 5.2).

Table 5.2 Consultation Services Costs
Year One and Two

Service	Fee
Individual consultation services	$100/per hour of consultation for implementation (via phone, video, or in person)
Travel beyond 50-mile radius	Reimbursement for travel and lodging

Dissemination Costs

The overall goal of standardizing the approach to addressing MCI and cognitive impairments in acute care is to facilitate a multidisciplinary approach to a complex problem impacting patient outcomes while increasing nursing and OT competence and confidence to treat MCI. With this goal in mind, this program will be disseminated by several different means, including posters or short courses at conferences, articles in peer-reviewed journals, and by word of mouth. Details about specific dissemination methods can be found in Chapter Six. The largest cost associated with dissemination is attendance at national conferences. Conference registration, travel, and lodging for both the American Occupational Therapy Association (AOTA) Conference and MCI Symposium cost about $1700, however this cost is worthwhile considering the exposure garnered at these events. A breakdown of the dissemination costs can be found in the table below.

Table 5.3 Dissemination Costs

Budget Item	AOTA Conference	MCI Symposium
Conference Registration	$451	$450
Poster printing	$189	$189
Handout printing	$10	$10
Travel	$550	$550
Lodging and Food	$500	$500
Total	$1701	$1700

Potential Funding Sources

Typically, funding for the implementation of this type of program would be included from an occupational therapy standpoint in the acute care rehabilitation services budget as a quality improvement (QI) project and from a hospital-wide standpoint with a budget dedicated to improving patient outcomes. Occasionally, funding may not be available due to limited or strained budgets based on a variety of factors. If this is the case, there are many potential sources of funding for this program and its activities. Table 5.4 describes potential funding sources for both implementation and dissemination of this program.

Table 5.4 Potential Funding Sources

Funding Type	Funding Source and Description	Implementation or Dissemination
Foundation grant	James S. McDonnell Foundation grants “Collaborative Activity Awards”. These grants are focused on initiating interdisciplinary work in the areas of studying complex systems and understanding human cognition. Research focused on understanding human cognition includes activities such as “applying approaches and knowledge from cognitive psychology or cognitive science to important problems in education, training, or rehabilitation” (Understanding Human Cognition, para 5).	Implementation and Dissemination
Foundation grant	The McKnight Endowment Fund grants “Memory and Cognitive Disorders Awards”. This grant is focused on supporting translational research related to memory and cognition that will improve human health.	Implementation and Dissemination
Foundation Grant	The Alzheimer’s Foundation is a non-profit agency that is the largest non-profit funder of Alzheimer’s research. The Alzheimer’s foundation has several grants and dedicated funding sources to support research related to brain health and prevention of dementia.	Implementation and Dissemination
Non-profit grant	The Patient-Centered Outcomes Research Institute is a non-profit institute created through the 2010 Patient Protection and Affordable Care Act. This institute funds comparative clinical effectiveness research and methods to improve patient care. This institute currently funded 13 studies related to dementia and cognitive impairment.	Implementation and Dissemination

Non-profit grant	The American Occupational Therapy Foundation (AOTF) is a non-profit organization focused on advancing the science of occupational therapy to support people's full participation in meaningful life roles and activities. The AOTF awards Interventional Research Grants which are meant to lay the groundwork for larger studies and implementation of evidence-based interventions in occupational therapy.	Implementation and Dissemination
Personal Capital	Use funds from personal salary for dissemination opportunities.	Dissemination

Funding Conclusion

The Multidisciplinary Approach for MCI aims to be a feasible and affordable method to educate nurses and OTs on how to treat MCI and cognitive deficits in acute care in a standardized manner. Whether an OT works in a large research hospital or smaller community hospital, this chapter details how to leverage local resources, define expected costs to leadership, utilize consultative services, and find potential sources of funding to enable wide-spread use of this program.

CHAPTER SIX – Dissemination Plan

The proposed program entitled, The Multidisciplinary Approach for Mild Cognitive Impairment (MCI), aims to optimize and standardize the approach to treating patients with or at risk for mild cognitive impairment in the acute care setting. The program will consist of three key components: 1) educating nurses how to assess for MCI and cognitive impairments, including how to provide cognitive stimulation daily and when to consult occupational therapy (OT) to optimize care, 2) standardizing an approach for occupational therapists on how to screen, assess, and treat MCI and cognitive impairment in acute care, and 3) increasing awareness of occupational therapy's role within an interdisciplinary team to address MCI and cognitive impairments in acute care.

Dissemination Plan

Goals of Dissemination

The goal of this program is to provide a standardized method to manage MCI and cognitive impairments in acute care, while also increasing the awareness of OT's role in this area within an interdisciplinary team. To achieve this goal, dissemination of this program will include print media, face-to-face discussions, and presentations at national conferences. In the short-term, the program, including its advantages and results, will be shared with hospital administrators to ensure support from these key stakeholders. Engagement and support from hospital administrators should also ensure more success when disseminating results to the larger medical community and a national audience. To address the long term-goals of providing a standardized method for use beyond one hospital, it is essential to publish the protocol and results in academic peer reviewed journals (i.e. American Journal of Occupational Therapy) and in periodicals that reach a wider OT audience (i.e. OT Practice). Presentation at state and national conferences, both within the OT community, i.e. American Occupational Therapy Association National Conference, and category specific to the topic, i.e. MCI Symposium, will continue to widen the audience of possible program users. Dissemination of this program will increase the medical communities' awareness of a feasible protocol, likely leading to increased implementation of this program by OTs at their own hospitals.

Target Audience and Key Messages

The primary audience for this program is occupational therapists. There are several secondary audiences including hospital administrators, nurses, and nurse managers. Key messages will be tailored for these audiences that will result in an action plan.

Key Messages

Occupational Therapists:

1. OTs have an essential role in the assessment and treatment of cognitive impairment related functional performance of activities of daily living (ADLs) and instrumental activities of daily living (IADLs) and management of MCI and cognitive

impairment in individuals with cardiac dysfunction and other chronic health conditions (Giles, 2017; Norris, 2017; Wesson & Giles, 2019).

2. A standardized, multidisciplinary protocol to screen, assess, and treat MCI and cognitive impairments will increase the feasibility and ease of use for such a program in acute care, despite the time constraints that exist. The screening protocol designed for nurses will capture a greater number of patients with cognitive deficits that would benefit from OT assessment and treatment to facilitate a safer discharge.

3. This program is designed to be implemented by OTs; however, the implementation will require the support of hospital administrations, nurse managers, and nurses to ensure its fidelity and success.

Nurses:

1. Nurses have a vital role in screening for cognitive impairment, with nursing guidelines established by McDougall (2017) recommending the establishment of a cognitive baseline and monitoring for changes in cognition during hospitalization.

2. The screening tool used in this protocol takes less than 60 seconds to administer and is completed by proxy.

3. Pre-made cognitive stimulation packets will be available for use. Cognitive stimulation is defined as the participation in activities that aim to improve cognitive and social functioning (Clare & Woods, 2004). In general, observation studies have found that cognitively stimulating activities may have a protective effect on cognitive reserve or

slow down cognitive decline (WHO, 2019). Using the pre-made cognitive stimulation packet, engaging in cognitive stimulation with your patients may take less than 5 minutes per shift.

4. If a patient is identified as having a cognitive impairment based on the screening tool, a referral to occupational therapy should be placed.

Nurse Managers

1. Impaired cognition occurs frequently in adults admitted to acute care hospitals and is correlated with the increased risk of hospital readmissions (Amini, et al., 2019; Cameron, et al., 2017). Unplanned hospital readmissions are often cited as a contributing factor to rising healthcare costs and the use of this program may decrease risk of hospital readmission.

2. This standardized protocol considers the time constraints of the nurses and the unit budgets. Building the screening tool into the electronic medical record will encourage increased compliance with its use. The cognitive stimulation will be delivered using the pre-made, laminated packets, that can be cleaned easily and stored on a hook in patients' rooms.

3. Support from management is essential for this program's success. Performing audits on nursing compliance for use of the screening tool and cognitive stimulation protocol will increase use until it becomes fully incorporated into the unit workflow.

Hospital Administrators

1. This program is an interdisciplinary approach to identifying and treating hospitalized in- patients who have a cognitive impairment. This is important because impaired cognition has been identified as one of the factors influencing hospital readmissions.

2. This program was created by an occupational therapist and is intended to be implemented by an occupational therapist. Occupational therapy has been identified as the only spending category, out of 19 distinct categories, to reduce hospital readmissions due to the profession's distinct focus on the functional and social needs of patients (Rogers, et al, 2016). This is likely due to occupational therapists having a unique skill set for assessing and improving functional abilities related to cognitive domains.

3. This program was designed to have a minimal cost (associated with licensing of the screening and assessment tools), while positively influencing patient outcomes.

Sources/Messengers

There are several key alliances that will be beneficial to form that will strengthen the dissemination efforts for this program. Efforts will be focused on partnering with key figures and associations within OT including Helene Smith-Gabai, PhD, OTR/L, BCPR, and Suzanne Holm, OTD, OTR/L, BCPR, the editors of Occupational Therapy in Acute Care, and the Rehabilitation & Disability Special Interest Section (SIS). An addition to an existing chapter or a new chapter in Occupational Therapy in Acute Care would be an excellent way to increase the influence of the program's use. Additionally, the Rehabilitation & Disability SIS will be a useful tool to network with peers who share a similar interest in addressing cognition in acute care. This SIS could also serve as a networking opportunity to communicate with OT leaders at other hospitals who may implement this program at their hospitals.

In addition to key OT alliances, it is important to consider the multidisciplinary team using this program including nurses, nurse managers, and hospital administrators. The American Academy of Neurology (AAN) publishes practice guidelines for mild cognitive impairment. Practice guidelines like this are respected by members of the multidisciplinary team. Pieces of this program, if found effective in randomized control trials, could be included as a part of these guidelines when they are updated.

Dissemination Activities

Electronic Media

The electronic media materials included as part of this program are the recorded educational in-services for the nurses (30 minutes) and OTs (2 hours) and the corresponding PowerPoint presentations. The content of these in-services and PowerPoint presentations are described in previous chapters. These materials will allow OTs to begin implementation of the program at their hospital. The educational in-services are recorded and provided at no charge to maintain the fidelity of program implementation. Both the OTs and nurses will have access to the video recording and PowerPoint content after the initial presentations. The video and electronic PowerPoint presentations will be created first, as they are necessary for program implementation. The creator of this program will be responsible for the content of the in-services and PowerPoint, however occupational therapy students on Level II Fieldwork will participate in the editing process.

Written Information

The program will be disseminated to occupational therapists through publication in a peer-reviewed academic journal (i.e. AJOT) and publications in non-peer reviewed journals (i.e. OT Practice). The goal of publication in a peer-reviewed journal is to detail the standardized protocol and the results of the evaluation to enable replication at other hospitals. Publications in non-peer reviewed journals would provide the rationale, theoretical framework, and strategies of the program to target key stakeholders with the goal of increasing OTs confidence and usability when introducing this program at their hospitals. The writing and submission of these publications will be completed first to reach a larger OT audience in the shortest amount of time. The creator of this program will be responsible for writing these publications; however support will be garnered from peers for editing and the review of the manuscript before submission to these journals.

In the short term, written information will be provided in the form of an executive summary and fact sheet to key stakeholders who have been active in the program evaluation. These documents will inform stakeholders of the results of the program evaluation and overall program structure, which these stakeholders may share with their colleagues at other hospitals. Additionally, a quick tips sheet (Appendix A) was created as a reference sheet for nurses to use when administering cognitive screening tool and completing the cognitive stimulation activities that are part of the program protocol.

Person-to-Person Contact

Person-to-person dissemination will occur during in person discussions with key stakeholders, during consultative services and during conference presentations. In person discussions with key stakeholders are necessary to achieve the short-term goal of disseminating results of the program to hospital administrators. During these in person discussions, the stakeholders will be provided with an executive summary and fact sheet detailing the key points of the program and its results. The consultative services available are described in Chapter Five. The consultative services are important to address barriers to program implementation and can be customized based on the hospital's unique needs. Consultative services are available for OTs, nurse managers, and hospital administrators.

National conference presentations, preferably in a short course format, will be pursued. The AOTA National Conference provides a platform for presentation of and feedback on the program. Although the program is successful at one hospital, this venue provides opportunities to gather feedback about implementation in other hospitals, while also inspiring OTs to see how this program could fit their hospitals' needs. A short course at AOTA would involve presentation on rationale, theoretical framework, detailed protocol, and results from initial evaluation. Additionally, to increase awareness of this program and OT's role within the larger medical community, it is important to pursue a short course at a conference that specifically targets providers interested in cognitive impairment. The MCI Symposium is a national conference that has multidisciplinary attendance and therefore increases dissemination of this program to potential key stakeholders (i.e. hospital administrators, nurse managers, etc.). The creator of this program will be responsible for conference submission and presentation, while also engaging in consultative services when needed. These activities will be the final focus of dissemination efforts, as the electronic media and written information will create awareness about the program and enable initial usability, while person-to-person will focus on a targeted audience and modification and support of program use as needed.

Table 6.1 Electronic Media Dissemination Budget

Electronic Media Dissemination Budget

Budget Item: Electronic Media	Cost
Filming educational in-services	$0
Adobe Premiere Rush for editing educational in-service recording	$119.88
Cloud storage of educational in-service recordings	$0
PowerPoint presentation	$0
Total	$119.88

Table 6.2 Written Information Dissemination Budget

Budget Item: Written Information	Cost
Writing articles	$0
Article submission to academic journals	$0
Publication in academic journals	$0
Total	$0

Table 6.3 Person to Person Dissemination Budget

Budget Item: Person to Person	AOTA Conference	MCI Symposium	Consultative Services
Conference Registration	$451	$450	
Poster printing	$189	$189	
Handout printing	$10	$10	
Travel	$550	$550	
Lodging and Food	$500	$500	
Video conferencing (Skype or Zoom)			$0
Travel beyond 50-mile radius for consultative services			Reimbursed by consulting hospital
Total	$1701	$1700	$0

The total budget for this dissemination plan totals $1820.88.

Evaluation

Evaluating the success of this dissemination plan will include ensuring the program has reached its intended users, identifying measurable outcomes based on the dissemination activity, and a plan for how to use impact data to guide new plans for dissemination. For electronic media, it is simple to know whether the intended users have received the content. When the recorded educational in-services and PowerPoint are accessed from the cloud storage, a notification will automatically be generated. For written information, success will be measured by acceptance into academic (both peer and non-peer reviewed) journals. Beyond acceptance, success can be measured by the impact factor of the article in the peer reviewed journal. Additionally, any positive letters to the editors in other periodicals that mention the program and its use should be counted as a success. Person to person dissemination is more difficult to measure objectively. Number of attendees at a short course or tweets about the program at a national conference is a good indicator that the message has reached its intended users. Success can also be measured by an increase in appropriate OT consults for cognitive impairment. Finally, data from all these dissemination activities will be collected and analyzed to determine future dissemination plans.

Dissemination Conclusion

Dissemination efforts of this program, The Multidisciplinary Approach for MCI, are focused on occupational therapists, nurses, nurse managers, and hospital administrators through written, electronic, and face-to-face methods. Dissemination of this program is essential to its success. With more OTs implementing this program, the greater the opportunity for critical evaluation and refinement. This will ultimately lead to an improved and thoroughly tested program that will benefit patient care.

CHAPTER SEVEN - Conclusion

The COVID-19 pandemic has shed new light on the importance of occupational therapy (OT) in acute care, particularly in addressing cognitive impairment related to delirium. While a difficult time for healthcare workers and society as a whole, now is the time for OT to push forward with innovative and evidence-based treatments to address cognitive impairment in acute care. It remains to be seen how this pandemic will affect the incidence of mild cognitive impairment (MCI) seen in the general public and in those hospitalized. The Multidisciplinary Approach for MCI serves as a protocol to identify and treat patients with MCI or other cognitive deficits that may have been overlooked.

The Multidisciplinary Approach for MCI requires that every patient be screened for cognitive deficits by nurses using a quick and user-friendly screening tool. This enables nurses to identify a greater number of patients who are appropriate for OT intervention and serves as another avenue of collaboration with OTs. Daily opportunities for cognitive stimulation with the nurses using the cognitive stimulation packets will ensure that outside of OT sessions, hospitalized patients are still receiving beneficial mental stimulation. Though it may appear prescriptive, the standardized protocol for OT's should serve as a starting point, allowing for guided clinical reasoning and client-centered intervention planning to address cognitive deficits. By communicating the results of the functional cognitive assessments and the impact of the cognitive deficits on activities of daily living (ADLs) and instrumental activities of daily living (IADLs) to the interdisciplinary medial team, the awareness of OT's important role will increase.

The focus of this project was on the initial education and feasibility of the protocol however the potential impact of its use in the future is encouraging. It is clear that OTs are using functional cognitive assessments in acute care however the consistency and practice from one OT to another varies widely. The Multidisciplinary Approach for MCI will take the guesswork out of both how to assess and treat cognitive impairment in acute care. The specific activities and resources will empower OTs to use standardized methods that will return patients to engaging in meaningful occupations that may have been impaired due to their cognitive deficits.

The Multidisciplinary Approach for MCI should be used and evaluated at various hospitals. The more the program is used and evaluated, with the results shared with the OT community, the greater the impact the program can have on OTs, patients, and the healthcare community as a whole.

Appendix A

Nursing Quick Tips for Cognitive Screening and Cognitive Stimulation

Introduction

Mild cognitive impairment (MCI) is an important target for intervention for individuals with heart failure, progressive disorders, and hospitalized patients in acute care. MCI has an estimated prevalence rate of 18.9% in the general population and 25-80% in individuals with heart failure and a progression rate to Alzheimer's disease (AD) or other dementia as high as 12-15% per year (Peterson, et al., 1999; Peterson, et al., 2014).

Cognitive Screening Tool

The AM-PAC Applied Cognitive Inpatient Short Form (AM-PAC): The AM-PAC is scored based on how much difficulty a person would have completing six different cognitive tasks (such as medication management, understanding familiar conversation), ranging from unable to do the task (0 points) to no difficulty completing the task (4 points). The AM-PAC is scored out of a possible 24 points. This screen takes less than 60 seconds on average to complete and is administered by proxy, with the nurse scoring the AM-PAC based on observations of the patient.

Using the AM-PAC

1. Score the AM-PAC upon admission and discharge.
2. Enter scores into AMPAC-Cog onto nursing flow sheet in electronic medical record.
3. If a patient scores below 18 on the AM-PAC, consult OT.

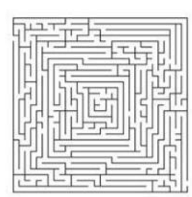
Cognitive Stimulation

Engagement in cognitively stimulating activities is associated with a reduced risk of developing MCI in older adults and may benefit global cognition, quality of life and communication for adults with MCI or dementia (Kim, et al., 2014; Krell-Roesch, et al., 2019). Using the cognitive stimulation packet with your patients 1x each shift should provide these benefits. Document the completion of these activities in the nursing flow sheet. Please encourage the patient and family members to use activities in cognitive stimulation packet throughout the day.

Examples of Cognitive Stimulation from Cognitive Stimulation Packet

Simple Commands

1. Look up
2. Look down
3. Stick out your tongue
4. Look at the door



Appendix B

Case Example 1.1 J.D., a patient with heart failure

Background and Occupational Profile:
The patient is a 65-year old male (J.D.) with a past medical history of hypertension (HTN), diabetes mellitus type 2 (DM2), chronic kidney disease (CKD), and congestive heart failure (CHF) who presents to the hospital with volume overload. The patient is admitted as an inpatient to the cardiac medicine floor from the heart failure clinic with symptoms of volume overload including weight gain (patient is up 8kg over baseline weight), swelling in bilateral lower extremities, and fatigue. This is the second time J.D. has been admitted for volume overload during the past 3 months. J.D. reported independence with ADLs and functional mobility at baseline, with good family support. J.D. takes several medications including a diuretic, beta blocker, and insulin that he must take daily, along with attending outpatient dialysis 3 times a week for his CKD. J.D.'s nurse completed the cognitive screening upon admission and consulted OT based on an abnormal score.

Initial Discussion Questions:
1. What cognitive deficits would you anticipate and why?
2. What occupations do you expect are impacted by these cognitive deficits?

Additional Information:
Patients like J.D. are typically in the hospital for one or two weeks while they are diuresed to take off the extra fluid. Volume overload is a primary issue for patients with congestive heart failure and is managed through medication and lifestyle factors such as diet and exercise. When patients are readmitted frequently for volume overload, it is an important focus of occupational therapy (OT) intervention to assess competence with medication management, in addition to any underlying cognitive deficits, ADL impairment and functional mobility performance. Most medication non-compliance is unintentional (i.e. forgetfulness and running out of medications) and therefore provides an opportunity for targeted OT intervention (Schwartz & Smith, 2017). Additionally, there is an association between CHF and ability to complete IADLs such as medication management. CHF patients frequently report receiving assistance for IADLs and have decreased functional independence associated with increased risk of mortality and rehospitalization (Alosco, et al., 2013). In the acute care setting, OT is often consulted only when patients like J.D. have difficulty with ADLs and functional mobility, therefore it is essential that OTs evaluate the patients holistically and include questions or an objective assessment of medication management in their evaluation.

Assessment Discussion Questions:
1. What are some functional cognitive assessments that you could use for J.D.?
2. Are there any specific assessments that you could use to examine independence with medication management?

Assessment Selection, Overview and Rationale:
There are several functional cognitive assessments that may be appropriate for use including the Cognitive Assessment of Minnesota (CAM), Executive Function Performance Test (EFPT), Brief Cognitive Assessment Tool (BCAT), Kohlman Evaluation of Living Skills (KELS), etc. Maintaining compliance with an extensive medication list and dialysis schedule requires strong executive functioning, problem solving, and memory skills. For this example, the Hopkins Medication Schedule will be used to assess medication management performance. It is important to use an objective assessment to evaluate ability to manage medications as medications are usually the first line of defense against chronic diseases such as CHF (Carlson, et al., 2005). The Hopkins Medication Schedule is an objective test of a patient's ability to understand and implement a medication routine with >1 medications (Carlson, et al., 2005). This assessment contains 2 sections including a written assessment that requires the patient to fill out a daily schedule with hypothetical prescriptions (Part A) and a performance based task where the patient uses the same hypothetical prescriptions to fill a pillbox (Part B). The total score is out of 13. Part A measures impairments in memory and Part B examines learning and executive functioning. Part B simulates a real-life scenario and can give OTs an insight into a patient's abilities. Using the results of Part A and B of the Hopkins Medication Schedule together will give an OT objective data on a patient's deficits in attention, memory, sequencing, organization, and problem solving directly related to medication management. J.D. scores an 8/13 on the assessment, demonstrating impaired attention, and executive functioning. Results of the assessment will be shared with the medical team physicians, case managers, and social workers.

Intervention Planning Questions:
1. What are some examples of functionally based cognitive goals for J.D.?
2. Using the standardized protocol, what are some activities that would be appropriate to use with J.D.?
3. What are some additional approaches or interventions that you would use with this patient?

Description of the Intervention:
Using the standardized protocol as a guide, a medication management task is appropriate to address J.D.'s executive functioning deficits, while mazes or word searches can be used to address his attention deficits. The nurses will continue to provide cognitive stimulation 1x per shift during J.D.'s admission. Mazes, word searches, and other activities to target attention are relatively easy to use with patients. Structuring a medication management task takes more planning and thought.

Medication Management Task Questions:
1. How will you structure a medication management task to address J.D.'s executive functioning deficits?
2. What are some examples of compensatory strategies to address difficulty with medication management?

To structure a medication management task as a functional cognitive treatment, the OT may use the Multicontext (MC) Approach, to improve global cognition. Functional cognition is defined as “the ability to use and integrate thinking and performance skills to accomplish complex everyday tasks” (Giles, et al., 2017, p. 1). The MC Approach provides guidelines for facilitating self-monitoring, strategy use, and self-regulatory skills to address functional-cognitive deficits that impair IADL performance and is appropriate for use with individuals who have MCI (Steinberg & Zlotnik, 2019). Using horizontal activities, the OT will engage J.D. in purposeful activity related to the goal of medication management each session. Horizontal transfer activities are structured to with tasks that “display decreasing levels of physical or conceptual similarity to the original learning situation” (Steinberg & Zlotnik, 2019, p. 221). For example, J.D. is given a list of items to find on a class schedule and then a television program schedule, with the OT assessing for strategy generation, error recognition, and application of strategies. The activity progress to using a written menu and then finally a medication management schedule. Figure 1 illustrates an example of this approach.

EXHIBIT 20.2. **Sample Multicontext Horizontal Activities Across Treatment Sessions: Basic (Search and Locate)**

All activities require: finding and locating information from a 10-item list
Typical performance error: loses track of information on the list (e.g., forgets items or loses place)
Sample strategy to control performance error across all activities: verbal rehearsal of key words during searching (talking aloud, whispering, or using internal dialogue)
Sample directions across activities: "Remember the first 3 items from the list and see whether they are in or on the . . ."

Schedule module	**Schedule module**	**Menu module**	**Schedule module supplementary activities**	**Everyday activities**
Class and activity weekly schedule Sightseeing activities and events schedule	Television program schedule Things to do schedule or calendar	Picture menu Written menu **Business card module** Business cards or name lists	Kitchen cabinets Bathroom Office supply closet	Keeps track of day, time, and pill that needs to be put into medication organizer slot Keeps track of first 3 items from packing list when packing to go home for weekend
Initial task	→	**Similar**	→	**Different**
	Near transfer	**Intermediate**	**Far transfer**	

Figure 1. From *Schedule Activity Module: Functional Cognitive Rehabilitation Activities and Strategy-Based Interventions* (p. 4) by J. Toglia, 2017.

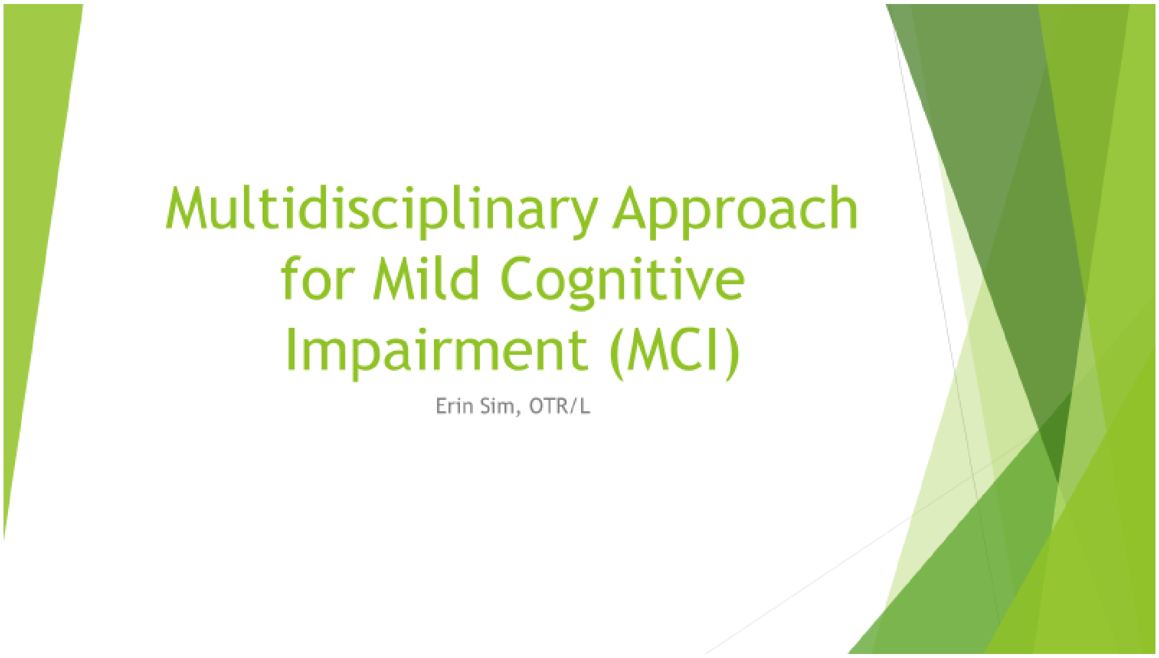
Treatment may also focus on compensatory strategies to address deficits in executive function impacting medication adherence (i.e. setting reminders on phone, making a list, teaching how to use a pill organizer) or education for J.D. and his family on the need for supervision and assistance to complete medication management at home.

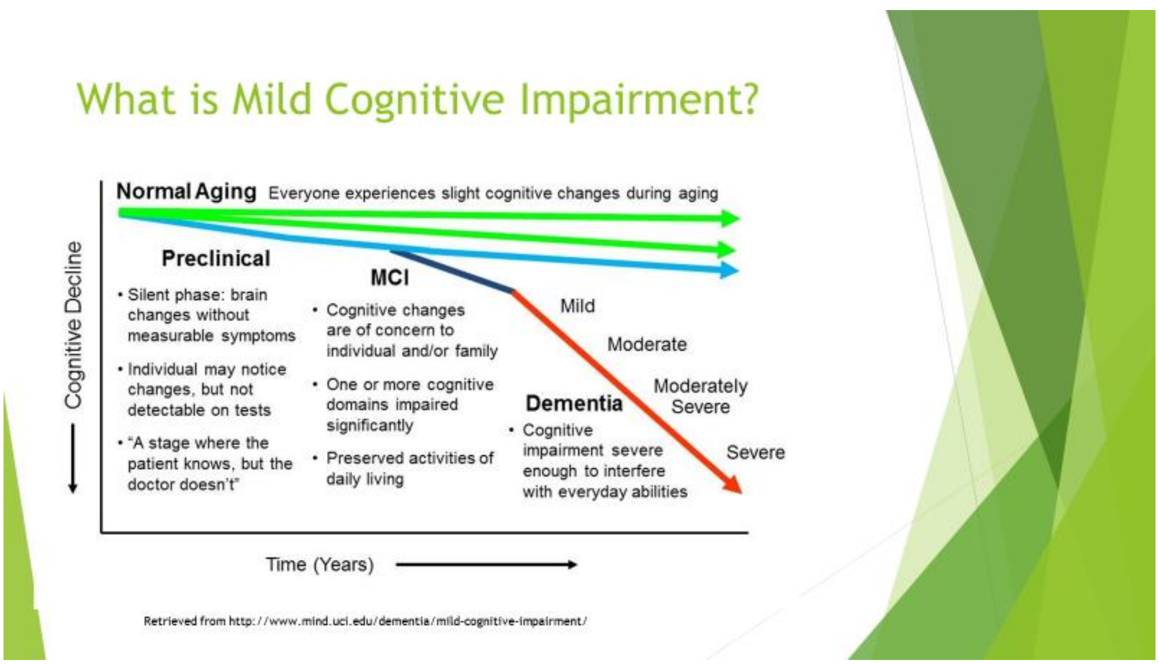
Discharge Planning Questions:
1. Are there other factors related to cognition or performance of occupations that has not been addressed? What are they?
2. What is an appropriate discharge recommendation for J.D.?

Results of the Intervention and Discharge Planning:
Focusing on functional cognitive treatment each session should increase J.D.'s awareness of his deficits and develop strategies to increase independence with medication management and other IADL tasks. Based on J.D.'s progress and length of stay, it will be important to determine appropriate discharge recommendations related to supervision for medication management and remediation for his executive functioning deficits.
Assuming that J.D. is now modified independence with ADLs and functional mobility, an appropriate recommendation may be outpatient OT and supervision for medication management. Additionally, it is important to educate J.D. and any family members on the importance of cognitive stimulation daily, continuing similar activities he completed with the nurses.

Appendix C

The following PowerPoint presentation will be presented as part of the nursing education in-service.





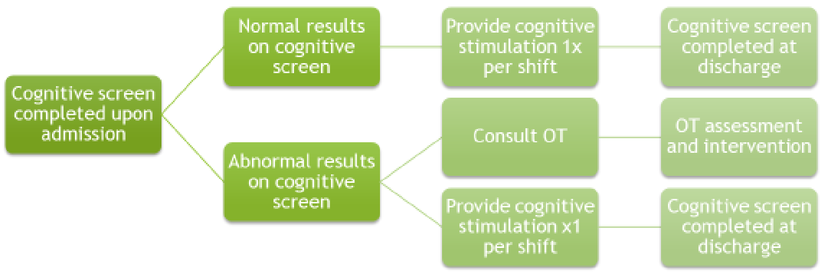
MCI Basics

- Mild cognitive impairment (MCI) occurs frequently and is associated with unplanned hospital readmissions (Petersen et al, 2014; Cameron, et al., 2017; Alagiakrishnan, et al., 2017)
- Important target for intervention but is often overlooked (Amini, et al., 2019; Zhuang, et al., 2019)
- Prevalence
  - 5.0%-36.7% in general population (Gates & Sachdev, 2015)
  - 25% to 80% in individuals with heart failure (Alagiakrishnan, et al., 2017; Cameron, et al., 2017)

The Role of Nursing in MCI

- Establish and cognitive baseline and monitor for changes (McDougall, 2017)
- Frequent and meaningful interaction with patients
- Cognitive stimulation

Multidisciplinary Approach for MCI: Nursing Protocol



Cognitive Screening Tool

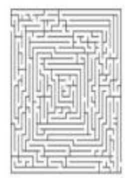
- AM-PAC Applied Cognitive Inpatient Short Form
- Completed by proxy and in less than 60 seconds
- Score AM-PAC upon admission and discharge
- Enter in nursing flow sheets in EMR
- Consult OT if score is <18

Cognitive Stimulation Packets

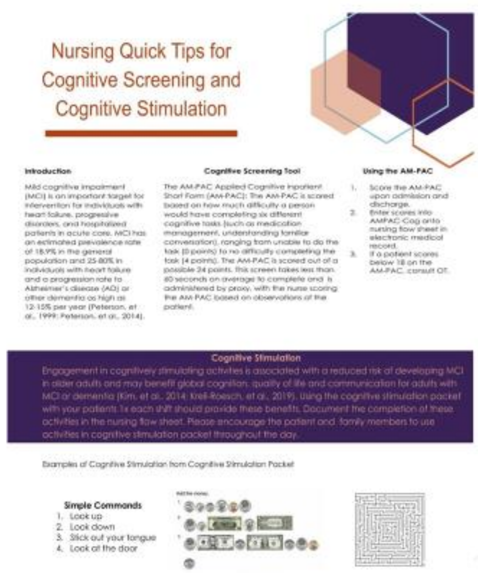
- Use laminated cognitive stimulation packets in rooms 1x per shift
- Examples of activities:

Simple Commands

1. Look up
2. Look down
3. Stick out your tongue
4. Look at the door



Questions?



Nursing Quick Tips for Cognitive Screening and Cognitive Stimulation

Introduction

Mild cognitive impairment (MCI) is an important target for intervention for individuals with heart failure, progressive disorders, and hospitalized patients in acute care. MCI has an estimated prevalence rate of 18.9% in the general population and 25-80% in individuals with heart failure and a progression rate to Alzheimer's disease (AD) or other dementia as high as 12-15% per year (Peterson, et al., 1999; Peterson, et al., 2014).

Cognitive Screening Tool

The AM-PAC Applied Cognitive Inpatient Short Form (AM-PAC): The AM-PAC is scored based on how much difficulty a person would have completing six different cognitive tasks (such as medication management, understanding familiar conversation), ranging from unable to do the task (0 points) to no difficulty completing the task (4 points). The AM-PAC is scored out of a possible 24 points. This screen takes less than 60 seconds on average to complete and is administered by proxy, with the nurse scoring the AM-PAC based on observations of the patient.

Using the AM-PAC

1. Score the AM-PAC upon admission and discharge.
2. Enter scores into AMPAC-Cog onto nursing flow sheet in electronic medical record.
3. If a patient scores below 18 on the AM-PAC, consult OT.

Cognitive Stimulation

Engagement in cognitively stimulating activities is associated with a reduced risk of developing MCI in older adults and may benefit global cognition, quality of life and communication for adults with MCI or dementia (Kim, et al., 2014; Krell-Roesch, et al., 2019). Using the cognitive stimulation packet with your patients 1x each shift should provide these benefits. Document the completion of these activities in the nursing flow sheet. Please encourage the patient and family members to use activities in cognitive stimulation packet throughout the day.

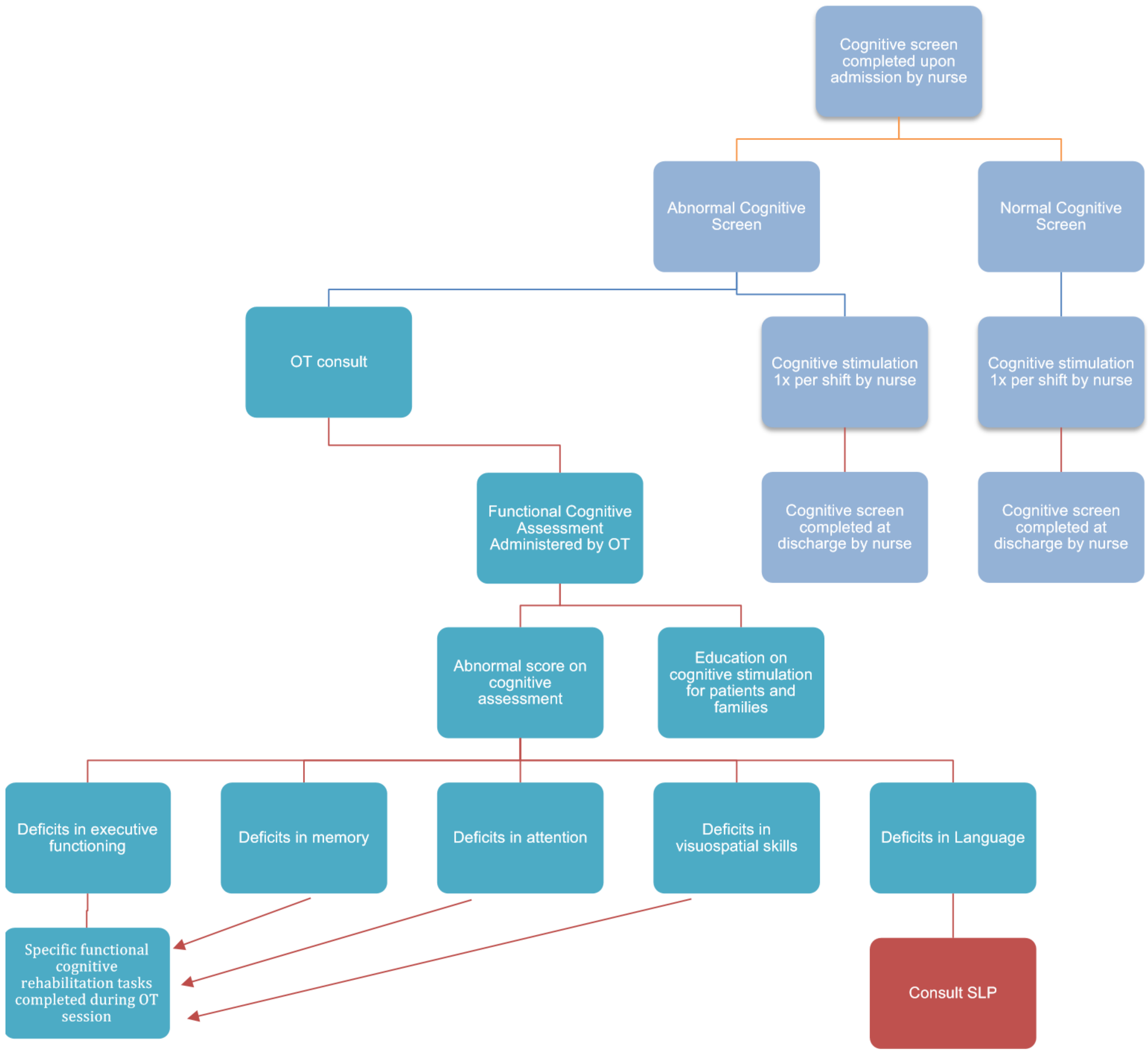
Examples of Cognitive Stimulation from Cognitive Stimulation Packet

Simple Commands

1. Look up
2. Look down
3. Stick out your tongue
4. Look at the door

Appendix D

Multidisciplinary Approach for MCI: Visual Model



EXECUTIVE SUMMARY

Introduction

Impaired cognition occurs frequently in adults admitted to acute care hospitals and is correlated with the increased risk of hospital readmissions (Amini, et al., 2019; Cameron, et al., 2017). Mild cognitive impairment (MCI), along with other moderate to severe cognitive impairments, are important targets for intervention. With an estimated prevalence rate of 18.9% in the general population and 25% to 80% in individuals with heart failure (HF), MCI results in impaired executive functioning, hospital readmissions, and increased utilization of the healthcare system (Alagiakrishnan, et al., 2017; Amini, et al., 2019; Cameron, et al., 2017; Petersen, et al., 2014). MCI is an especially important target for intervention because the progression rate to Alzheimer's disease (AD) or other dementia has been reported to be as high as 12-49% per year, while 1-2% of healthy individuals progress to AD or other dementia a year (Petersen, et al., 1999; Zhuang, et al., 2019). Studies suggest these cognitive impairments are often unidentified or undiagnosed (Amini, et al., 2019; Zhuang, et al., 2019).

Despite the well-recognized effects of MCI and cognitive impairment in the hospitalized population, there are gaps in the research regarding a standardized approach to addressing this problem (Cameron, et al., 2017; Zhuang, et al., 2019). There are questions regarding screening tools, including which measure is most sensitive, which screens are feasible and valid in which settings, how frequently patients should be screened, and how to design specific interventions to improve cognition in hospitalized patients. Occupational therapists have the skill set to assess and provide intervention for

MCI in the acute setting; however, more research is needed to determine the optimal screening procedures and treatment interventions to standardize the approach to addressing cognitive impairment in acute care.

Project Overview

Currently, there are no effective pharmacological interventions that offer a long-term effect on delaying the progression from MCI to dementia. There is however, a growing body of evidence supporting the important role of non-pharmacological interventions in MCI (Hong, et al., 2015; Sherman, et al., 2017). Some non-pharmacological interventions identified include occupational therapy, combined cognitive training and exercise, cognitive training, psychotherapy, and cognitive stimulation (Hong, et al, 2015; Train the Brain Consortium, 2017; WHO, 2019).

OTs provide cognitive rehabilitation including global learning strategies, specific functional skills training, use of external aids, and cognitive retraining during functional activities (AOTA, 2017). OTs are also skilled in providing functional cognitive assessment, articulating how cognitive deficits impact functional performance (Wesson & Giles, 2019). Based on the current evidence for the most effective treatment of MCI, which includes physical, mental, and social stimulation, OTs in conjunction with nurses, are equipped to provide this treatment and will benefit from a standardized protocol to screen, assess, and treat MCI.

The proposed program entitled, The Multidisciplinary Approach for Mild Cognitive Impairment (MCI), aims to optimize and standardize the approach to treating patients with or at risk for mild cognitive impairment in the acute care setting. The program consists of three key components: 1) educating nurses how to assess for MCI and cognitive impairments, including how to provide cognitive stimulation daily and when to consult occupational therapy to optimize care, 2) standardizing an approach for occupational therapists on how to screen, assess, and treat MCI and cognitive impairment in acute care, and 3) increasing awareness of OT's role within an interdisciplinary team to address MCI and cognitive impairments in acute care.

A thorough review of the literature identified four appropriate and meaningful frameworks that guide the education of occupational therapy practitioners to address MCI in acute care. These theories include: the Scaffolding Theory of Aging and Cognition – Revised, Knowles Theory of Adult Learning, Transformative Learning Theory and Kolb's Experiential Learning Theory.

The program consists of two educational in-services (one for nurses and one for OTs), recommendations for a cognitive screening tool, cognitive stimulation packet for nurses, and a standardized protocol to be used by OTs with patients who have cognitive deficits. The goals of the education are to have nurses administer a cognitive screening upon a patient's admission and discharge, and provide cognitive stimulation daily. Cognitive stimulation is defined as "a range of group activities and discussions aimed at general enhancement of cognitive and social functioning" (Clare & Woods, 2004, p. 387). Nurses, with frequent and consistent interaction with patients, are well equipped to provide cognitive stimulation for all patients. The educational in-service for nurses will provide an overview of MCI, use of a brief cognitive screening tool, use of the cognitive stimulation packet, and appropriate initiation of an OT consult if the patient is cognitively impaired.

The educational in-service for OTs will provide education on MCI and how to use functional cognitive assessment and rehabilitation strategies for cognitively impaired patients. Functional cognition is defined as “the ability to use and integrate thinking and performance skills to accomplish complex everyday tasks” (Giles, et al., 2017, p. 1). MCI impacts the ability to perform complex everyday tasks like financial management, medication management, and return to work due to impaired executive functioning. After receiving an OT consult due to a patient’s performance on the nursing cognitive screening tool, OTs will perform a functional cognitive assessment during evaluation. Based on the results of the functional cognitive assessment and the particular cognitive deficits, the OT will develop a treatment plan to address these deficits, if appropriate.

Key Findings

The Multidisciplinary Approach for MCI aims to be a feasible and affordable method to educate nurses and OTs on how to treat MCI and cognitive deficits in acute care in a standardized manner. This program provides two educational in-services, recommendations for a cognitive screening tool, cognitive stimulation packets for nurses, and a standardized protocol to be used by OTs with patients who have an identified cognitive deficit. The program design and it’s elements are guided by cognitive and educational theories and supported by evidence in the literature. The cost of implementing this program includes utilizing available local resources and consideration of the budget for implementation, evaluation, and dissemination. The effectiveness of this program can be measured through several outcomes including the number of (1) nurses and OTs trained, (2) patients receiving the cognitive screen, (3) new OT consults generated, and (4) patients with a cognitive impairment. Short-term outcomes include increased knowledge of MCI and cognitive treatment in acute care by nurses and OTs, and increased use of cognitive stimulation packets and standardized protocols. Intermediate outcomes include evaluating the compliance for use of the cognitive screening tool for nurses and standardized protocol for OTs. Long-term outcomes include a finalized protocol to be used during a randomized control trial to evaluate the effectiveness of a multidisciplinary approach to addressing MCI and cognitive impairment in acute care.

Recommendations

This program is a feasible and affordable way to improve a multidisciplinary approach to addressing MCI in acute care. It is recommended that occupational therapists implement this program in acute care using the materials available, including the educational in-services and recommended cognitive screening tool, while also critically evaluating the program outcomes. Dissemination of this program is essential to its success. Dissemination of the results of this program should be considered for peer reviewed publications, conference presentations, and in face-to-face conversations with the interdisciplinary team. With more OTs implementing this program, there will be greater opportunity for critical evaluation and refinement. This will ultimately lead to an improved and thorough tested program that will benefit patient care.

General Conclusions

In summary, this program is an interdisciplinary approach to identifying and treating hospitalized in patients who have a cognitive impairment. Treating impaired cognition in the acute setting is important as it is identified as one of the factors influencing hospital readmissions. Occupational therapists should implement this program as they have a unique skill set for assessing and improving functional abilities related to cognitive domains. This program was designed to have a minimal cost (associated with licensing of the screening and assessment tools), while positively influencing patient outcomes. In summary, this program provides an innovative approach to standardizing treatment of cognitive impairment in acute care by a multidisciplinary team.

FACT SHEET

Standardizing the screening, assessment, and treatment of mild cognitive impairment in acute care: A multidisciplinary approach

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Introduction to the Problem

- Mild cognitive impairment (MCI) is characterized by impaired executive functioning and can result in hospital readmissions, and increased utilization of the healthcare system (Alagiakrishnan, et al., 2017; Amini, et al., 2019; Cameron, et al., 2017).
- Estimated prevalence rate of 18.9% in the general population and 25-80% in individuals with heart failure and a progression rate to Alzheimer's disease or other dementias as high as 12-15% per year (Petersen, et al., 1999; Petersen, et al., 2014).
- There are gaps in the research regarding a standardized approach to addressing this problem related to occupational therapy (OT) (Cameron, et al., 2017; Zhuang, et al., 2019).

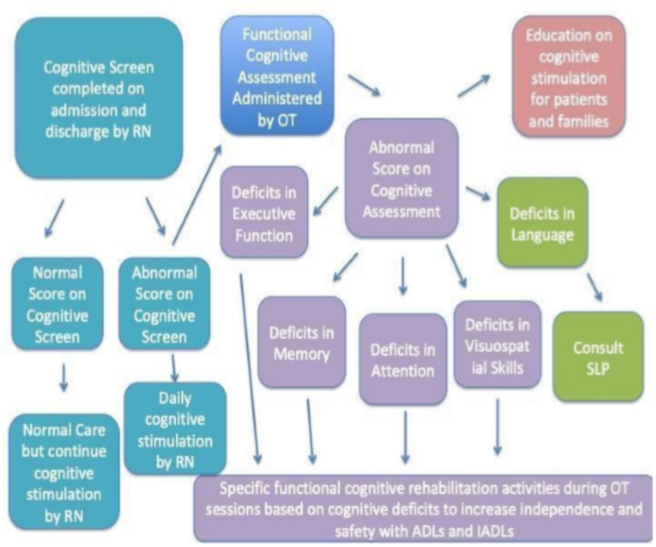
The Multidisciplinary Approach for Mild Cognitive Impairment (MCI)

Goal: to optimize and standardize the approach to treating patients with or at risk for mild cognitive impairment in the acute care setting

Key components:

1. educating nurses how to assess for MCI and cognitive impairments, including how to provide cognitive stimulation daily and when to consult occupational therapy to optimize care
2. standardizing an approach for occupational therapists on how to screen, assess, and treat MCI and cognitive impairment in acute care
3. increasing awareness of OT's role within an interdisciplinary team to address MCI and cognitive impairments in acute care.

Visual model depicting Multidisciplinary Approach for MCI



Program Materials

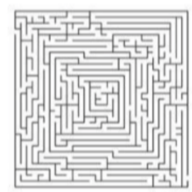
- 2 educational in-services
- Cognitive stimulation packet
- Nursing quick tips sheet
- Standardized protocol for OTs

The Multidisciplinary Approach for MCI aims to be a feasible and affordable method to educate nurses and OTs on how to treat MCI and cognitive deficits in acute care in a standardized manner.

Examples of Cognitive Stimulation from Cognitive Stimulation Packet

Simple Commands

1. Look up
2. Look down
3. Stick out your tongue
4. Look at the door



Implications for Occupational Therapy Practice

- OTs have an essential role in the assessment and treatment of MCI and cognitive impairment that impact ADL and IADL performance in individuals with cardiac dysfunction and other chronic health conditions (Giles, 2017; Wesson & Giles, 2019).
- The Multidisciplinary Approach for MCI will increase the feasibility and ease of use for such a program in acute care. The screening protocol designed for nurses will capture a greater number of patients with cognitive deficits that would benefit from OT assessment and treatment to facilitate a safer discharge.
- With increased use of this program, OTs will increase their visibility within the interdisciplinary team as a key provider in targeting MCI and cognitive impairments in acute care.

References

Alagiakrishnan, K., Mah, D., Dyck, J. R., Senthilselvan, A., & Ezekowitz, J. (2017). Comparison of two commonly used clinical cognitive screening tests to diagnose mild cognitive impairment in heart failure with the golden standard European Consortium Criteria. *International Journal of Cardiology, 228*, 558–562. doi: 10.1016/j.ijcard.2016.11.193

Amini, R., Chee, K. H., Swan, J., Mendieta, M., & Williams, T. (2019). The Level of Cognitive Impairment and Likelihood of Frequent Hospital Admissions. *Journal of Aging and Health*, *31*(6), 967–988. https://doi.org/10.1177/0898264317747078

Cameron, J., Gallagher, R., & Pressler, S.J. (2017). Detecting and managing cognitive impairment to improve engagement in heart failure self-care. *Current Heart Failure Report, 14* (13). Retrieved from https://doiorg.proxy1.library.jhu.edu/10.1007/s11897-017-0317-0

Giles, G. (2017). Occupational therapy's role in adult cognitive disorders. https://www.aota.org/~/media/Corporate/Files/AboutOT/Professionals/WhatIsOT/PA/Facts/Cognitive-Disorders-Fact-Sheet.pdf

Rogers, A. T., Bai, G. A., Lavin, R. F., & Anderson, G. undefined. (2017). Higher hospital spending on occupational therapy is associated with lower readmission rates. *Medical Care Research and Review*, *74*(6), 668–686. doi: 10.1177/1077558716666981

Petersen, R., Caracciolo, B., Brayne, C., Gauthier, S., Jelic, V., & Fratiglioni, L. (2014). Mild cognitive impairment: A concept in evolution. *Journal of Internal Medicine, 275* (3). Retrieved from https://doi-org.ezp.welch.jhmi.edu/10.1111/joim.12190

Wesson, J. & Giles, G. (2019). Understanding functional cognition. In T.J. Wolf, D.F. Edwards, & G.M. Giles (Eds.), *Functional cognition and occupational therapy: practical approach to treating individuals with cognitive loss* (7-20). Retrieved from library.aota.org

Zhuang, L., Yang, Y., & Gao, J. (2019). Cognitive assessment tools for mild cognitive impairment screening. *Journal of Neurology,* 1-8.

REFERENCES

American Occupational Therapy Association. (2017). The role of occupational therapy in adult cognitive disorders. Retrieved from https://www.aota.org/About-Occupational-Therapy/Professionals/PA/Facts/Adult-Cognitive-Disorders.aspx

Alagiakrishnan, K., Mah, D., Dyck, J. R., Senthilselvan, A., & Ezekowitz, J. (2017). Comparison of two commonly used clinical cognitive screening tests to diagnose mild cognitive impairment in heart failure with the golden standard European Consortium Criteria. *International Journal of Cardiology, 228*, 558–562. doi: 10.1016/j.ijcard.2016.11.193

Amini, R., Chee, K. H., Swan, J., Mendieta, M., & Williams, T. (2019). The Level of Cognitive Impairment and Likelihood of Frequent Hospital Admissions. *Journal of Aging and Health*, *31*(6), 967–988. https://doi.org/10.1177/0898264317747078

Belchior, P., Korner-Bitensky, N., Holmes, M., & Robert, A. (2015). Identification and assessment of functional performance in mild cognitive impairment: A survey of occupational therapy practices. *Australian Occupational Therapy Journal*, *62*(3), 187–196. doi: 10.1111/1440-1630.12201

Bergsteiner, H., Avery, G., & Neumann, R. (2010). Kolb's experiential learning model: Critique from a modelling perspective. *Studies in Continuing Education, 32*(1), 29-46.

Cameron, J., Gallagher, R., & Pressler, S.J. (2017). Detecting and managing cognitive impairment to improve engagement in heart failure self-care. *Current Heart Failure Report, 14*(13). Retrieved from https://doiorg.proxy1.library.jhu.edu/10.1007/s11897-017-0317-0

Čelutkiene, J., Vaitkevičius, A., Jakštiene, S., & Jatužis, D. (2016). Cognitive Decline in Heart Failure: More Attention is Needed. *Cardiac Failure Review, 2*(2). doi: 10.15420/cfr.2016:19:2

Centers for Medicare and Medicaid Services. (2020, February). *Hospital Readmissions Reduction Program.* Retrieved from https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program

Chan, S. (2010). Applications of andragogy in multi-disciplinary teaching and learning. *Journal of Adult Education, 39*, 25-35.

Chandler, M., Parks, A., Marsiske, M., Rotblatt, L., & Smith, G. (2016). Everyday impact of cognitive interventions in mild cognitive impairment: A systematic review and meta-analysis. *Neuropsychology, 26*(3), 225-251. doi: 10.1007/s11065-016-9330-4

Cheng, G., Huang, C., Deng, H., Wang, H. (2012). Diabetes as a risk factor for dementia and mild cognitive impairment: A meta-analysis of longitudinal studies. *Internal Medicine Journal, 42,* 484-491. doi:10.1111/j.1445-5994.2012.02758.x

Chehrehnegar, N., Nejati, V., Shati, M., Esmaeili, M. Rezvani, Z., … Foroughan, M. (2019). Behavioral and cognitive markers of mild cognitive impairment: diagnostic value of saccadic eye movements and Simon task. *Ageing Clinical and Experimental Research, 31*(11), 1591–1600. doi: 10.1007/s40520-019-01121-w

Ciesielska, N., Sokołowski, R., Mazur, E., Podhorecka, M., Polak-Szabela, A., & Kędziora-Kornatowska, K. (2016). Is the Montreal Cognitive Assessment

(MoCA) test better suited than the Mini-Mental State Examination (MMSE) in mild cognitive impairment (MCI) detection among people aged over 60? Meta-analysis. *Psychiatria Polska*, *50*(5), 1039–1052. doi: 10.12740/pp/45368

Clare L. & Woods, R.T. (2004). Cognitive training and cognitive rehabilitation for people with early-stage Alzheimer's disease: A review. *Neuropsychological Rehabilitation, 14*(4):385–401.

Gates N. J. & Sachdev P. (2014). Is cognitive training an effective treatment for preclinical and early Alzheimer's disease? *Journal of Alzheimer's Disease, 42*(4), 551–559.

Giles, G. (2017). Occupational therapy's role in adult cognitive disorders. https://www.aota.org/~/media/Corporate/Files/AboutOT/Professionals/WhatIsOT/PA/Facts/Cognitive-Disorders-Fact-Sheet.pdf

Grace, A. (1996). Striking a critical pose: Andragogy- Missing links, missing values. *International Journal of Lifelong Education, 15*(5), 382-392.

Hong, Y., Jang, E., Hwang, J., Roh, J., Lee, J. (2015). The efficacy of cognitive intervention programs for mild cognitive impairment: A systematic review. *Current Alzheimer's Research, 12*(6), 527-542.

Jackson, T. A., Maclullich, A. M. J., Gladman, J. R. F., Lord, J. M., & Sheehan, B. (2016). Undiagnosed long-term cognitive impairment in acutely hospitalised older medical patients with delirium: a prospective cohort study. *Age and Ageing*, *45*(4), 493–499. doi: 10.1093/ageing/afw064

Jencks, S.F., Williams, M.V., Coleman, E.A. (2009). Rehospitalizations among Patients in the Medicare Fee-for-Service Program. *New England Journal of Medicine, 361*(3), 311–312. doi: 10.1056/nejmc090911

Kolb, A.Y. & Kolb, D. A. (2009). Experiential learning theory: A dynamic, holistic approach to management learning, education, and development. In S.J. Armstrong & C.V. Fukami (Eds.), *The SAGE handbook of management learning, education and development* (42-68). London: Sage

Kolb, D. (1984). *Experiential learning*. Englewood Cliffs, NJ: Prentice-Hall.

Kolb, D.A. & Fry, R. (1975). Toward an applied theory of experiential learning. In C. Cooper (Ed.), *Theories of group process* (33-57), London: John Wiley.

Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy*. Chicago: Follett.

Knowles, M., Holton, E., & Swanson, R. (2015). *The adult learning: The definitive classic in adult education and human resource development* (8th ed.). New York, NY: Routledge.

Krell-Roesch, J., Syrjanen, J., Vassilaki, M., Machulda, M., Mielke, M., ... Geda, Y. (2019). Quantity and quality of mental activities and the risk of incident mild cognitive impairment. *Neurology, 93* (6). doi: 10.1212/WNL.0000000000007897

McDougall, G. (2017). Assessing and preventing cognitive impairment in the elderly. *American Nurses Association Journal, 12* (11). Retrieved from https://www.americannursetoday.com/preventing-cognitive-impairment/

Merizow, J. (1996). Contemporary paradigms of learning. *Adult Education Quarterly, 46*(3), 158-172.

Newman, M. (1993). *The Third Contract: Theory and Practice in Union Trading.* Sydney, Australia: Steward Victor Publishing.

Nilsson, A., Rasmussen, B., & Edvardsson, D. (2013). Falling behind: A substantive theory of care for older people with cognitive impairment in acute settings. *Journal of Clinical Nursing, 22*(11-12). doi: 10.111/jocn.12177

Norris, J. (2018). Cognitive function in cardiac patients: Exploring the occupational therapy role in lifestyle medicine. *American Journal of Lifestyle Medicine*. Retrieved from https://doi.org/10.1177/1559827618757189

O'Caoimh, R., Timmons, S., & Molloy, D. W. (2016). Screening for Mild Cognitive Impairment: Comparison of "MCI Specific" Screening Instruments. *Journal of Alzheimers Disease*, *51*(2), 619–629. doi: 10.3233/jad-150881

Petersen R., Smith G., Waring S., Ivnik R., Tangalos E., & Kokmen E. (1999). Mild cognitive impairment: clinical characterization and outcome. *Archives of Neurology, 56*(3), 303-308.

Petersen, R., Caracciolo, B., Brayne, C., Gauthier, S., Jelic, V., & Fratiglioni, L. (2014). Mild cognitive impairment: A concept in evolution. *Journal of Internal Medicine, 275*(3). Retrieved from https://doi-org.ezp.welch.jhmi.edu/10.1111/joim.12190

Read, S., Comas-Herrera, A., & Grundy, E. (2019). Social Isolation and Memory Decline in Later-life. *The Journals of Gerontology: Series B, 75*(2), 367–376. doi: 10.1093/geronb/gbz152

Reuter-Lorenz, P.A. & Park, D.C. (2014). How does it STAC Up? Revisiting the scaffolding theory of aging and cognition. *Neuropsychology Review*, *24*(3), 355-370. https://doi-org.ezproxy.bu.edu/10.1007/s11065-014-9270-9

Rogers, A. T., Bai, G. A., Lavin, R. F., & Anderson, G. undefined. (2017). Higher Hospital Spending on Occupational Therapy Is Associated With Lower Readmission Rates. *Medical Care Research and Review*, *74*(6), 668–686. doi: 10.1177/1077558716666981

Sanford, A. M. (2017). Mild Cognitive Impairment. *Clinics in Geriatric Medicine*, *33*(3), 325–337. doi: 10.1016/j.cger.2017.02.005

Sherman, D. S., Mauser, J., Nuno, M., & Sherzai, D. (2017). The Efficacy of Cognitive Intervention in Mild Cognitive Impairment (MCI): A Meta-Analysis of Outcomes on Neuropsychological Measures. *Neuropsychology Review*, *27*(4), 440–484. doi:10.1007/s11065-017-9363-3

Sundbøll, J., Horváth-Puhó, E., Adelborg, K., Schmidt, M., Pedersen, L., Bøtker, H. E., … Sørensen, H. T. (2018). Higher Risk of Vascular Dementia in Myocardial Infarction Survivors. *Circulation*, *137*(6), 567–577. doi: 10.1161/circulationaha.117.029127

Train the Brain Consortium. (2017). Randomized trial on the effects of a combined physical/cognitive training in aged MCI subjects: the Train the Brain study. *Scientific Reports*, *7*, 39471. doi:10.1038/srep39471

Wesson, J. & Giles, G. (2019). Understanding functional cognition. In T.J. Wolf, D.F. Edwards, & G.M. Giles (Eds.), *Functional cognition and occupational therapy:*

practical approach to treating individuals with cognitive loss (7-20). Retrieved from library.aota.org

World Health Organization. (2020). *Risk reduction of cognitive decline and dementia: WHO guidelines*. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK542804/

Zhuang, L., Yang, Y., & Gao, J. (2019). Cognitive assessment tools for mild cognitive impairment screening. *Journal of Neurology,* 1-8. doi: 10.1007/s00415-019-09506-7

Zohrabian, A., Kapp, J. M., & Simoes, E. J. (2018). The economic case for US hospitals to revise their approach to heart failure readmission reduction. *Annals of Translational Medicine*, *6*(15), 298–298. doi: 10.21037/atm.2018.07.30

CURRICULUM VITAE

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