Nurse Practitioner Screening Practices for Mild Cognitive Impairment in the Older Adult

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Nurse Practitioner Screening Practices for Mild Cognitive Impairment in the Older Adult

Margaret McIlwain

Georgia College and State University
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>5</td>
</tr>
<tr>
<td>Chapter I</td>
<td>6</td>
</tr>
<tr>
<td>Introduction</td>
<td>6</td>
</tr>
<tr>
<td>Problem Statement</td>
<td>8</td>
</tr>
<tr>
<td>Clinical Questions</td>
<td>8</td>
</tr>
<tr>
<td>Theoretical Framework</td>
<td>9</td>
</tr>
<tr>
<td>Chapter 2</td>
<td>12</td>
</tr>
<tr>
<td>Review of Literature and Synthesis</td>
<td>12</td>
</tr>
<tr>
<td>Demographic Characteristics and Risk Factors of MCI</td>
<td>12</td>
</tr>
<tr>
<td>Diagnostic Category of MCI</td>
<td>13</td>
</tr>
<tr>
<td>Benefits of Early Screening</td>
<td>15</td>
</tr>
<tr>
<td>Problems of Early Screening</td>
<td>16</td>
</tr>
<tr>
<td>Prevalence of Screening for Cognitive Impairment in Primary Care</td>
<td>17</td>
</tr>
<tr>
<td>Barriers to Screening in Primary Care</td>
<td>17</td>
</tr>
<tr>
<td>Screening Tools</td>
<td>18</td>
</tr>
<tr>
<td>Treatment of MCI and Dementia</td>
<td>20</td>
</tr>
<tr>
<td>Pharmacological Interventions</td>
<td>21</td>
</tr>
<tr>
<td>Treatment of Co-Morbidities</td>
<td>21</td>
</tr>
<tr>
<td>Cognitive Interventions</td>
<td>22</td>
</tr>
<tr>
<td>Caregiver Interventions</td>
<td>23</td>
</tr>
<tr>
<td>Exercise</td>
<td>23</td>
</tr>
<tr>
<td>Screening Algorithm</td>
<td>24</td>
</tr>
<tr>
<td>Guidelines</td>
<td>25</td>
</tr>
</tbody>
</table>
NP SCREENING PRACTICES FOR MILD COGNITIVE IMPAIRMENT

US Preventive Services Task Force recommendations 25
Systematic review for the US Preventive Task Force, October 2013 26
National Guideline Clearinghouse Practice Guidelines 27

Chapter 3

Project Description 29
Problem Statement 29
Clinical Questions 30
Methods 30
Recruitment 30
Inclusion Criteria 31
Exclusion Criteria 31
Sample 31
Survey Instrument 32
Protection of Human Subjects 33
Informed Consent 33
Data Analysis 34

Chapter 4

Results 37
Description of Sample 38
Screening Practices 39
Knowledge of Mild Cognitive Impairment 40
Barriers to Screening 41
Personal Involvement 41
Correlations 42
Protocol and Algorithm Evaluation 42
Chapter 5

Conclusions and Implications 44

Discussion of Evidence Based Questions 44

Screening of MCI 44

Barriers 46

MCI Practice Protocol and Treatment Algorithm 47

Implications of the Study 48

Limitations 48

Strengths of the Study 49

Recommendations for Future Study 49

Conclusions 50

References 52

Tables 67

Table 1 Comparison of Screening Tools for MCI 67

Table 2 Participant Characteristics 68

Table 3 Barriers to Screening 69

Table 4 Correlations Spearman Rank 70

Appendices 71

Appendix A Postcard invitation 71

Appendix B Letter for Implied Consent 72

Appendix C Survey Instrument 73

Appendix D MCI Practice Protocol and Evaluation Algorithm 77
Abstract

Nurse practitioners (NPs/APRNs) who provide primary care services may be the first line providers in situations where adults present with symptoms of memory loss and forgetfulness. Though protocols are available for evaluating dementia, specific guidelines for evaluating early cognitive changes, Mild Cognitive Impairment (MCI), are lacking. This descriptive research project assesses the knowledge, current screening methods, and barriers to screening for MCI by nurse practitioners (APRNs) in the state of Georgia. One hundred and thirty two NPs participated in the survey. Forty-five percent of the participants were unfamiliar with the diagnostic category of MCI. Of the major barriers identified, fifty eight percent of APRNs identified not having enough time, thirty-four percent were unsure of the best screening methods, and twenty percent of participants were unsure of protocols. Using Spearman rho correlation, MCI screening was significantly correlated with completion of continuing education (CEUs) for both MCI ($rs = .245, p < .006$) and dementia ($rs = .243, p < .006$). The Spearman’s rho revealed a statistically significant relationship between MCI screening and routinely screening for depression ($rs = .478, p < .000$). The second stage of this project was to develop practice protocols for MCI. A practitioner panel was recruited from the participants in the initial survey. The protocol and evaluation algorithm is presented and discussed.
Chapter 1 Background and Significance of Proposed project/Intervention

Introduction

Alzheimer’s Dementia (AD) is an irreversible neurodegenerative disease characterized by progressive memory deficits that interfere with daily functioning (Roberts et al., 2008). According to the World Health Organization (2012), dementia is considered a major public health problem of epidemic portion, affecting more than 35.6 million people worldwide. Approximately 5.5 million people in the United States have Alzheimer’s Dementia or a related dementia (WHO, 2012). Alzheimer disease is the sixth leading cause of death in the United States (Thies & Bleiler, 2013). The disease impacts individuals and families and has been estimated to cost the U.S. health care system in 2012 an estimated $200 billion, including $140 billion in costs to Medicare and Medicaid (Alzheimer's Association, 2012). As the number of older adults increase in proportion to the total U.S. population, it can be expected that these costs will increase exponentially. This number is expected to increase to an estimated 16 million by 2050 because of the United States aging population (Thies & Bleiler, 2013).

Mild cognitive impairment (MCI) is described as an intermediate stage of memory disorder, involving more substantial memory and cognitive decline than normal aging changes but less than the onset of dementia symptoms with its major pathologic changes (Defranceso et al., 2010; Roberts et al., 2008). It is estimated that 12-15% of MCI patients progress yearly to AD compared to healthy older adults (Defranceso et al., 2010; Lopez et al., 2012; Peterson, Knopman, & Boeve, 2009). Because MCI represents a significant risk factor for the development of AD, older adults need to be screened early so that interventions can be started to delay and possibly slow the potential progression to AD (Reardon & Halverson, 2013; Roberts et
al., 2008). With the passage of the Affordable Care Act of 2010, a new Medicare benefit requires an assessment of cognitive functioning in the older adult (Jeffrey, 2012; Patient Protection and Affordable Care Act of 2010). Primary care nurse practitioners are expected to identify and appropriately treat cognitive disorders as well as other underlying diseases and provide the appropriate patient referrals for services and specialists. Primary care nurse practitioners need to identify brief screening methods that have good sensitivity and specificity for cognitive disorders. Additional education for nurse practitioners will be needed that focuses on evidence based practice guidelines outlining appropriate treatments, resources, and referrals available to patients and families. MCI practice guidelines will be vital to maintain and reduce health care costs under the new Affordable Care Act. Screening, diagnosis, and treatment are important because delaying nursing home placement for even one year could represent a savings of $80,000 in nursing home costs (Genworth Executive summary, 2013).

Currently clinicians do not readily diagnose dementia during clinic visits using routine history and physical examination. More than 76% of persons with dementia, including many with mild but some with moderate dementia, have never received a diagnosis of dementia from a physician or nurse practitioner (Boustani, Peterson, Hanson, Harris, & Lohr, 2003; Lin, O’Connor, Rossom, Perdue, & Eckstrom, 2013). The lack of diagnosis of dementia suggests insufficient current screening practices by primary care providers. The reason for the inadequacy of screening is uncertain and may be associated with multiple factors such as time constraints during visits, unawareness of current screening guidelines, insufficient knowledge of available screening instruments, and uncertainty by providers in the administration and evaluation of these screening instruments. No research was identified that addressed the reason for lack of diagnosis or screening by primary care nurse practitioners.
Problem Statement or Purpose

The purpose of this clinical project was to identify the need and advocate for nurse practitioners to assess individuals in primary care for MCI. Nurse practitioners who are providing primary care services are the first line providers in situations where adults present with symptoms of memory loss and forgetfulness. The study investigated the knowledge, current screening practices, and barriers to screening for Mild Cognitive Impairment in the older adult population, aged 65 and older by nurse practitioners in the state of Georgia. Since the recently passed Affordable Care Act requires yearly screening as part of the Wellness benefit for Medicare, clinicians will need guidelines to insure quick and efficient methods of screening, guidelines of treatment, and when to refer to specialists. Screening for MCI provides an initial step towards progression of a correct diagnosis of MCI.

The first step in this translational project was to investigate the knowledge, barriers, and screening methods used in clinical settings by nurse practitioners. From this data, practice guidelines were developed, and in phase II, interested NPs from the survey were asked to provide feedback and implement the newly developed protocol. There is a lack of information for NPs to adequately screen for the diagnostic category of Mild Cognitive Impairment that often precedes the diagnosis of dementia. This diagnostic category of MCI provides a target time to initiate further evaluation of underlying medical conditions and to provide treatment in the vulnerable older adult population.

Clinical Questions to be Addressed

Evidence based practice questions for this study include four areas of interest. The questions are:
1. What percentage of nurse practitioners currently screen for Mild Cognitive Impairment yearly in the older adult population aged 65 and older?

2. What current screening practices for cognitive impairment are used to screen the older adult, aged 65 and older?

3. What barriers do nurse practitioners identify in providing adequate screening for MCI in the older adult population?

4. Which practice variables best explain the level of MCI screening of nurse practitioners?

**Theoretical Framework**

Everett Roger’s Change Theory, diffusion of innovations was utilized as the conceptual framework for this project. The theory provides a framework to promote the multilevel change process necessary to affect change by addressing the inequities in screening and encouraging the use and adoption of a new practice guideline or critical pathway (Rogers, 1965). Mild cognitive impairment is a fairly new diagnostic category and many nurse practitioners may be unfamiliar with MCI. The identification and assessment of the nurse practitioner’s knowledge of mild cognitive impairment, current screening practices performed, and the perceived barriers to screening are important areas to address in developing current practice guidelines for clinicians.

Roger’s theory describes the patterns of innovations/idea/program adoption, explains the mechanism, and assists in predicting whether and how a new invention/idea/program will be successful. Originally published in 1963, it is a descriptive tool providing guidance as to how to promote the rate of innovation/program adoptions (Orr, 2003).
Everett Roger’s theory is a broad based theory consisting of constructs from psychology and sociology and has been used in health care, business, and informatics. The five stages of change theory occur through a social system in a five-step process:

1. Awareness: the targeted population (nurse practitioners) must develop an awareness or knowledge base of the idea/program/protocol (MCI, screening method).

2. Interest: the population/clinicians develop an attitude toward the idea/program/practice protocol (positive or negative).

3. Evaluation: population/clinicians decide whether to engage in the choice or use/adopt the program/protocol.

4. Interpretation: population/clinicians implement the idea/program/protocol.

5. Adoption: population/clinicians confirm that the idea/program/protocol will be provided (Orr, 2003; Rogers, 1965).

As more people or clinicians are exposed to an idea successfully, diffusion occurs strengthening the impact of the idea. For example, at the individual level, adopting a health behavior idea/innovation usually involves a lifestyle change. At the organizational level, it may involve starting a program or changing regulations. At a community level, exposure or diffusion can include using the media or advancing policies (Cain & Mittman, 2002). According to Rogers (1965), a number of factors determine how quickly, and to what extent, an innovation will be adopted and diffused. Diffusion is used to study the adoption of a health behavior and programs
NP SCREENING PRACTICES FOR MILD COGNITIVE IMPAIRMENT

by health practitioners. Diffusions of innovations that promote health requires multilevel change that usually takes place in diverse settings, through different strategies (Cain & Mittman, 2002).
Chapter 2 Review of Literature and Synthesis

A review of the literature was conducted of English articles searching on the key words of mild cognitive impairment, prevalence, screening, barriers, primary care, nurse practitioner, clinical practice guidelines, and treatments in electronic databases. Databases included CINAHL, Medline, Cochrane library, PROQUEST Nursing and Allied Health Sources, and PsychArticles. Additional sources were identified in bibliographies of inclusion articles.

Demographic characteristics and risk factors of MCI

The prevalence rate for MCI varies from different population studies in different countries. Based on Windblad’s clinical consensus criteria established in 2004, the prevalence in the older adult of MCI in the United States is reported from 21.8% to 28.3% (Katz et al., 2012; Manly et al., 2005; Manly et al., 2008; Peterson et al., 2010). Austria reports a similar MCI prevalence rate to the United States of 24% (Fincher et al., 2007). China’s prevalence rate from population studies is estimated from 12.7% to 21.3% (Nie et al., 2011; Xu et al., 2014). Busse, Hensel, Guhne, Angermeyer, and Reidel-Heller (2006) report Germany’s MCI prevalence rate of 17.2% with a high MCI prevalence rate in France estimated at 42% (Aetero et al., 2008).

More recent research findings from the Memory and Medical Care Study population study in 2011 with community-dwelling older adults, demonstrated a faster rate of cognitive decline in MCI for African Americans when compared to non-African Americans (Lee et al., 2011). Other population studies have revealed higher dementia rates in African Americans when compared to Caucasians (Folstein, Basset, Anthony, Romanoski & Nestadt, 1991; Heyman et al., 1991; Schwartz et al., 2004; Zsembik & Peek, 2001). In the Einstein Aging Study (2012),
there appeared to be little difference in MCI prevalence between men (22.2%) and women (21%) (Katz et al., 2012).

Several epidemiological studies have investigated the identification of MCI as a risk factor towards development of Alzheimer’s dementia and found that dementia symptoms became present in MCI patients in about two to three years before conversion (Ganguli, Dodge, Shen, & DeKosky, 2004; Lopez et al., 2012; Roberts et al., 2008; Roberts et al., 2010). These cohort studies suggest that the opportunity to identify MCI cases may be limited to begin therapies if not identified early to treat underlying conditions for those patients who are more at risk to convert to Alzheimer’s Dementia. Earlier treatment of vascular risk factors and management of contributing underlying medical conditions may slow the progression, which has important implications for the development of further preventive and interventional therapies. Since increasing age is a risk factor for dementia, studies have suggested the importance of routinely screening for cognitive changes over time (Ashford et al., 2008; Ganguli et al., 2004). The Medicare Annual Wellness visit will insure yearly cognitive evaluations for the older adult.

**Diagnostic Category of MCI**

In 2004, the initial MCI standard diagnostic criteria was established at the international workshop on Mild Cognitive Impairment in Stockholm (Winblad et al., 2004). The established clinical consensus criteria included evidence of cognitive deterioration for age evidenced by cognitive task performance and/or subjective complaints of memory decline by patient and/or informant. The patient was not demented but not at the same cognitive level for persons in the same age group, had preserved activities of daily living, and minimal to no impairment of complex instrumental activities of daily living (Winblad et al., 2004).
Patients identified with the diagnosis of MCI experience a mild decline in one or more areas such as problems with “memory, attention, executive functioning, or visuospatial abilities” (Albert et al., 2011, p.271). Basic activities of daily living and general intellectual functioning remain intact. There may be minimal impairment of instrumental activities of daily living such as managing finances, managing medications, driving, or grocery shopping (Aretouli & Brandt, 2010; DeVriendt et al., 2012; Wadley, Okonkwo, Crowe, & Ross-Meadows, 2008). These patients often complain of memory problems and do not have any impairment in social function (Feldman & Jacova, 2005; Gauthier et al., 2006; Peterson et al., 2010). The criteria for MCI falls into two clinical subtypes of amnestic MCI (aMCI) and non-amnestic (naMCI) which has been differentiated primarily for research purposes (Peterson et al., 2009). Amnestic MCI patients present with memory impairment and non-amnestic patients present with impairment in a non-memory area such as problems with attention, executive function, visuospatial ability, or language (Ganguli et al., 2004; Gauthier et al., 2006; Peterson et al., 2009).

The Diagnostic and Statistical Manual (DSM-IV) criteria for dementia of the Alzheimer’s type involves memory impairment and difficulties in one of the following areas: aphasia (language problems), apraxia (impaired motor ability), agnosia (failure to recognize known objects), or deterioration in executive function (complex tasks such as balancing a checkbook) (American Psychiatric Association, 2000). Dementia refers to a “syndrome that includes a deterioration of at least two cognitive functions, including memory, language, visuospatial perception, and executive function” (Kiral, Ozge, Sungar, & Tasdelen, 2013, p. 89). According to Kiral et al. (2013), as the disease progresses, neuropsychiatric symptoms appear along with the memory impairment. Overall, the onset of dementia is gradual for most patients.
Yanhong, Chandra, & Venkatesh (2013) provided a systematic review of the neuropsychological deficits associated with MCI and the clinical importance for treatment (Level I evidence). There is a wide range of deficits in memory and executive functioning in patients with MCI. It is evident that more studies are needed to continue to identify specific impairments that define MCI. As noted, MCI is associated with an increased risk of progressing to dementia and continues to warrant specific diagnostic criteria.

Benefits of Early Screening

The importance of early screening for cognitive impairment is reinforced from the requirement for screening as part of the annual Medicare Wellness visit (Cordell et al., 2013; Jeffrey, 2012). From a cost perspective, initial screening can be inexpensive but the evaluation of underlying contributing factors may be costly depending on the provider (Borson et al., 2013; Jeffery, 2012). The data on improvement of patient outcomes is lacking either because the outcomes were not measured, the study design was lacking, or there have been limited studies specifically evaluating persons with MCI (Boustani et al., 2003; Lin, O’Connor, Rossom, Perdue, & Eckstrom, 2013; Lin et al., 2013). Identifying conditions that are treatable such as B12 deficiency, folic acid deficiency, hypothyroidism, and depression that may contribute to cognitive changes in the older adult are beneficial to early screening (Borson et al., 2013; Clarfield, 2003; Cotter, Clark, & Karlawish, 2003). According to Peterson et al. (2009), most investigators believe that providers should treat underlying disease processes early and not wait until functional impairment is noted. Failing to recognize early cognition changes in clients may result in their performing at-risk behaviors such as operating machinery, driving difficulties, and cooking (Ashford, 2008; Lin, Vance, Gleason, & Heidrich, 2012).
Problems of Early Screening

Receiving a dementia diagnosis could have potential problems such as promoting increased anxiety and depression with fears of a patient being able to remain independent. Worry about losing one’s independence may include issues about continued job security, driving privileges, social isolation from friends, or denial of insurance (Boustiani et al., 2011; Fowler et al., 2012; Holsinger et al., 2011). According to Bouson et al. (2013), the potential harms do not come from screening itself, but to the conditions uncovered or inaccurate interpretation of the information obtained through screening. Potential problems from misdiagnosis of dementia can be reduced with repeated screening (Lin et al., 2013). More importantly would be the development of appropriate guidelines for additional evaluations, appropriate referrals, and follow-up for early screening practices in those individuals who are screened for MCI.

In the recent review of the evidence for the U.S. Preventive Services Task Force, no studies were found to confirm or rebut harms to screening (Lin et al., 2013). If clinicians are concerned with the occurrence of false positives from screening, tools with a high specificity rate should be used.

According to the U.S. Preventive Services Task Force, despite potential problems of screening, there is some benefit for caregiver interventions and for medication treatment for AD. Medication trials continue with mixed results for MCI to determine if there is a small benefit of acetylcholinesterase inhibitors for treatment of MCI. There is some evidence to support cognitive stimulation as a treatment for persons with MCI and mild to moderate dementia (Lin et al., 2013).
Prevalence of Screening for Cognitive Impairment in Primary Care

In reviewing the existing literature, there were no studies investigating the prevalence of screening methods used by nurse practitioners in primary care settings for cognitive impairment. There were no studies specifically investigating the knowledge of advanced practice nurses in screening the older adult and the use of the diagnostic category of MCI. MCI is a rather new diagnostic category with a billing code established in October, 2008 in the International Classification of Diseases, 9th revision, Clinical Modification (Center for Disease Control and Prevention, 2011). This diagnostic code may be unfamiliar to primary care nurse practitioners if not employed in specialty memory clinics or with neurology services who may evaluate dementia patients frequently.

Barriers to Screening in Primary Care

Several studies have identified barriers to early diagnosing of dementia by physicians. Physician concerns that are reported in the literature are time required for testing and counseling, and concerns about the stigma associated with the diagnosis for patients and families (Boustani et al., 2011; Bradford, Kunik, Schulz, William, & Singh, 2009; Justiss et al., 2009). Primary care physicians may fail to diagnose early cognition changes because of failure to use efficient screening tools and underreporting of symptoms by family members (Valcour, Masaki, Curb, & Blanchette, 2000).

Additional studies have looked at barriers to screening for depression and a variety of other medical conditions, however, no studies specifically address screening for MCI and nurse practitioners. In screening patients for depression, clinicians identified the importance of having clear protocols available for follow-up. Advanced practice nurses identified limited time in
screening for depression, limited provider training, knowledge and lack of useful screening instruments as barriers to depression screening (Burman, McCabe, & Pepper, 2005; Goldsmith, 2007). In medical screening for colonoscopies, clinicians including nurse practitioners, identified barriers to screening as a lack of time and patient reluctance to screening as barriers (Feely, Cooper, Foels, & Mahoney, 2009). Advanced practice nurses have consistently identified time limits as a barrier to screening patients for skin cancer (Loescher, Harris, & Curiel-Lewandrowski, 2011).

Considering these identified barriers to screening, having clear protocols, specific guidelines as when to refer, and having useful efficient screening tools can contribute to reinforcing the need for primary care clinicians to screen for early cognitive changes. Several studies have identified the need for practitioners, physicians and nurses, to identify early subtle cognitive changes in clients (Elliott, Horgas, & Marsiske, 2008; Roberts et al., 2010).

**Screening Tools**

There are brief instruments that can be used in primary care to detect dementia and in considering their use for identifying early cognitive changes such as in MCI, higher specificity and sensitivity is suggested. Regardless of the etiology of dementia, several instruments have sensitivity and specificity rates greater than 80%. The following screening tools are available for use with MCI screening.

Although there is no one suggested screening tool for MCI, there are several tools that are sensitive to detect early cognitive changes when clients score within the normal range of the Mini Mental Status Exam (MMSE). The MMSE is the screening test most frequently used for dementia (Cordell et al., 2013). However, the MMSE is not sensitive enough for screening those
with early cognitive changes and those patients will be missed for further work-up (Grober, Hall, Liptom, & Teresi, 2008; Holsinger et al., 2012; Stewart, O'Riley, Edelstein, & Gould, 2012).

The Montreal Cognitive assessment (MoCA) is a screening tool designed to test for MCI with a high sensitivity rate of 90% and a specificity rate of 87% (Cordell et al., 2013; Cullen, O’Neill, Evans, Coen, & Lawlor, 2007; Nasreddine et al., 2005). This tool is specific in identifying early cognitive changes in those individuals who perform in the normal range of the Mini Mental Status Exam (MMSE). The MoCA assesses orientation, concentration, attention, memory-short term and working, visuospatial ability, executive function, and language (Cordell et al., 2013; Cullen et al., 2007; Nasreddine et al., 2005). The test can be administered in 10 minutes with a maximum score of 30 and a score of 25 or lower indicating below normal. The test is free and can be accessed at www.mocatest.org.

The DemTect is also an easy to administer screening tool and is sensitive for identifying early cognitive changes. It has a sensitivity rate of 80% and a higher specificity rate of 92% (Cullen et al., 2007; Kalbe et al., 2004). Five tasks are measured including memory of word list, delayed recall, word fluency, reverse of digits, and transcribing numbers. With a maximum score of 18, scoring for MCI is from 9 to 12 points (Cullen et al., 2007; Kalbe et al., 2004).

The Memory and Executive Screening (MES) has a high sensitivity rate of 87% and specificity rate of 91% in identifying early cognitive changes and the tool appears to be less affected by education. The test does not require any reading or writing skills. The MES assesses delayed recall, delayed memory, learning ability, executive function, and category fluency test. The total possible score is 100 points with a score of 62–75 indicating probable MCI, dementia correlated with a score of less than 62 (Guo, Zhou, Quian-hau, Wang, & Hong, 2012).
The AB Cognitive Screen (ABCS) was shown to be more sensitive when compared to the Mini Mental Status Exam (MMSE) in identifying early dementia changes (Grober et al., 2008). This tool evaluates five cognitive areas: orientation, registration, delayed recall, clock drawing and word fluency with a total score of 135 and 104 points indicating MCI (Molley, Standish, & Lewis, 2005). The instrument has a sensitivity rate of 83% and a specificity rate of 91% (Molley et al., 2005). This short screening tool was designed to differentiate normal cognitive changes from MCI and dementia.

The St. Louis University Mental Status (SLUMS) is an 11 item screening tool that is easy to administer and assesses several cognitive domains including attention, calculation, immediate and delayed recall, animal naming, abstract thinking and visuospatial skill. It is more sensitive than the MMSE in identifying mild neurocognitive disorder. It has been studied in the Veteran’s population and has a sensitivity rate of 98–100% and specificity 98–100 for dementia with adjustment for education but also has a cut off of 25 denoting mild neurocognitive disorder (Tariq, Tumosa, & Chibnall, 2006). The SLUMS takes approximately 7 minutes to administer with a maximum score of 30 points. Though the test needs to be studied in non-veteran populations, it is recommended to practitioners by the Alzheimer’s Association for use in detecting early neurocognitive changes (Cordell et al., 2013; Goy, Kansagara, & Freeman, 2010; Tariq, et al., 2006; Stewart, O'Riley, Edelstein, & Gould, 2012). A comparison list of screening tools for MCI is included in Table 1.

Treatment of MCI and Dementia

In consideration of treatment for MCI and dementia, this project is focused on the screening of early cognitive changes in the older adult to identify and improve initial evaluation and treatment for MCI. As noted, not all patients with positive screens for MCI will convert to
Alzheimer’s Dementia. This early identification will alert providers to those clients at risk, and to initiate further medical and neuropsychological work-up to insure appropriate diagnosis, and to treat underlying conditions that affect cognition. Though outcome data is limited in studies with MCI patients, continued research with this specific population is occurring and is providing ongoing important clinical treatment data.

In treating dementia, a number of pharmacological and non-pharmacological interventions have been available for clients and families. Nondrug interventions for clients include cognitive stimulation, exercise, identifying polypharmacy and the possibility of adverse side effects, nutritional education, and increased socialization (Geda et al., 2010; Holt, Stiltner, & Wallace, 2009).

**Pharmacological Interventions.** Recent review of multiple drug studies demonstrated evidence for the treatment of Alzheimer’s Dementia patients with cholinesterase inhibitors such as donepezil, rivastigmine, and galantamine found that these medications were beneficial by improving cognition in patients for up to three years. Additional positive benefits and outcomes from these medications was the improvement of physical functioning as evidenced by the improved performance of activities of daily living (ADLs) (Lin et al., 2013). The benefits for MCI patients are unclear because of the small number of studies but the trials did show a statistically significant benefit for donepezil and galantamine on improved cognition. With the use of these medications, there was no benefit in the progression to MCI at one and three years (Lin et al., 2013).

**Treatment of Co-Morbidities.** The co-morbidity of medical conditions is important to identify when screening clients for mild cognitive impairment. Anemia has been identified as a
predictor of dementia progression and can be easily identified and treated (Blossom, Stephan, Brayne, Savva, & Matthews, 2011). Underlying contributing factors such as B12 deficiency, hypothyroidism, and depression, which can affect cognition, and are all treatable conditions, may improve cognition if identified early and treated appropriately (Blazer, 2009; Borson et al., 2013; Clarfield, 2003). Both depression and cardiovascular diseases (CVDs) are risk factors for cognitive impairment which need to be assessed and managed (Barnes, Alexopoulos, Lopez, Williamson, & Yaffe, 2006). Vascular risk factors, such as hypertension, smoking, cerebrovascular disease, diabetes mellitus, and atrial fibrillation, are also associated with late-life cognitive decline (DeCarli et al., 2001; Kivipelto et al., 2001; Solfrizzi et al., 2004). All of these risk factors need to be assessed and managed if indicated.

**Cognitive Interventions.** Stott & Spector (2010) provided a systematic review, examining and evaluating memory interventions for MCI (Level I evidence). Though ten studies were identified, there was no consistent evidence to support only one intervention. The studies provided some evidence that memory interventions such as memory strategies, i.e., mnemonic learning, computerized memory training can improve scores on pre and posttests (Hampstead et al., 2008; Scott, & Spector, 2010). Patient mood, measured in three of the intervention studies, did improve in all three which suggested a secondary benefit of providing some sense of control and self-efficacy in participants’ lives when experiencing MCI. There is some evidence that it can be helpful to teach internal and external memory strategies to people with MCI (Greenaway et al., 2008; Hampstead et al., 2008; Troyer, 2001; Troyer, Murphya, Anderson, Moscovitchade, & Craikde, 2008). Cognitive stimulation can also improve and reduce the decline of global cognitive function in MCI patients at 6 and 12 months (Lin et al., 2013). The Advanced Cognitive Training for Independent and Vital Elderly (ACTIVE) study demonstrated that
cognitive training benefits were evident after ten years of initial reasoning and speed training (Rebok et al., 2014). These findings suggest that cognitive training as an intervention may help the older adult maintain and improve cognitive abilities. These long lasting benefits of cognitive training will promote independence by sustaining activities of daily living.

**Caregiver Interventions.** Interventions geared towards caregivers including caregiver support, case management, can improve caregiver burden (Lin et al., 2013). These interventions included education about the condition and/or caregiving, caregiver training and skills to deal effectively with dementia-related behaviors, and formal avenues of support such as respite services, support groups. Earlier identification through screening identifying those at risk will provide earlier avenues for dissemination of information about the condition to patients and families, support groups, and advanced planning opportunities.

**Exercise.** The strongest evidence of lifestyle changes that may reduce the incidence of AD is exercise. Three trials researching the benefits of exercise suggested a benefit in cognition in MCI patients and persons with dementia at 12 and 18 months (Lin et al., 2013). Regular exercise lowers specific brain markers in the brain, including reduced CSF tau and increased CSF amulod, all markers of decreased AD risk (Liang et al., 2010). Both aerobic training (AT) and resistance training (RT) enhance cognitive performance and functional plasticity, the ability of the brain to change and adapt, in healthy, community-dwelling seniors (Nagamatsu et al., 2012; Stelka, 2013). Exercise is a promising strategy for combating cognitive decline.

Maintaining a healthy BMI, body mass index, which is a measure of body fat based on height and weight, also plays a role in general and cognitive health. Several research studies demonstrate an association between being overweight with an increased risk of dementia.
NP SCREENING PRACTICES FOR MILD COGNITIVE IMPAIRMENT

(Narendran, Frankle, Mason, Muldoon, & Moghaddam, 2012; Xu et al., 2011). Weight management and nutrition are important lifestyle changes to prescribe in managing vascular risk factors.

With the initial screening efforts routinely administered during the annual visit, a patient’s life style changes can be discussed with an emphasis on the importance of maintaining and improving neurocognitive or brain health. Educational information can be presented with healthier changes identified specific to the patient for improvement of cognition. Numerous lifestyle factors are now being seriously considered by researchers and clinicians because of the limited drug treatments available to slow the progression and lack of treatments to modify the disease (Caracciolo, Weili, Collins, & Fratigliion, 2014; Lin et al., 2013; Stetka, 2013).

**Screening Algorithm.** The most recent recommendations from a systematic review, for the required annual cognitive screening, is the development of a visit algorithm for the older adult during the Annual Medicare Wellness visit (Cordell et al., 2013). The group developed a step-wise approach to screen and evaluate for cognition status suggesting several screening tools to assess dementia symptoms. In addition, the second step would be to review the Health Risk Assessment that looks at subjective memory complaints or concerns, ADLs and IADLs. This algorithm provides guidelines for clinicians of when to order further testing or when to refer (Cordell et al., 2013). Expert guidelines have recommended along with the US Preventive Services Task Force preventive task force to evaluate persons with any memory complaints or concerns by informants (Boustani et al., 2003; Cordell et al., 2013). Early identification of memory difficulties with documentation by a provider, may improve follow-up and medical care. This time also serves as a beginning to discuss with patients who represent a population at risk
for Alzheimer’s dementia about neurocognitive health (Cordell et al., 2013; Feil, MacLean, & Sultzer, 2007).

It is evident from the synthesis of the literature that more outcome studies need to be completed. More research is indicated in this evolving but very important area of early screening. With the increased prevalence of dementia occurring in this country, the timeliness of screening is vital for earlier treatment of risk factors and treatment of underlying medical conditions.

Though more research is needed, possible benefits of earlier detection of MCI include promoting better management of risk factors, delaying functional decline, providing education and advanced planning for patients and families, delaying nursing home placement, and identifying clients for inclusion in evolving drug and intervention trials (Elliott, Horga, & Marsiske, 2008 [Level VI]; Roberts et al., 2010 [Level VI]; Stephan, Brayne, Savva, & Matthews, 2011 [Level IV]).

**Guidelines**

Several agencies have recommended guidelines for cognitive screening based on evidence. The focus of this project is screening for MCI, a risk factor for Alzheimer’s Dementia. Recommendations from the US Preventive Services Task Force, the recent synthesis for the US Preventive Services Task Force 2013, and the National Guideline Clearinghouse Practice guidelines, best practices, are included.

**US Preventive Services Task Force recommendations.** The initial review by the US Preventive Services Task Force (2003) found insufficient evidence in benefits for early detection and treatment of dementia. The report did not recommend for or against routine dementia
screening (Level I evidence). The report did indicate that assessment for cognitive function is indicated when impairment was suspected. Patients who presented with memory complaints need to be screened. Often patients with MCI present with memory impairment.

**Systematic review for the US Preventive Services Task Force (USPSTF), October, 2013.** The systematic review for the 2013 US Preventative Services Task Force found screening improved limited benefits of outcomes for caregivers. However, the USPSTF concluded that there is insufficient current evidence to determine the balance in benefits and harms of screening for cognitive impairment (Lin et al., 2013). The reviewers reported that consensus groups and expert guidelines “clearly believes that early diagnosis positively impacts important decision-making that ultimately will lead to improve patient outcomes and reduced future costs” though there was no empirical evidence that screening improved decision making of patients or families (Lin et al., 2013, p. 66). Their review is generally consistent with previous screening recommendations, all persons who present with cognitive complaints, self-reported or through an informant, should be screened for cognitive impairment (Lin et al., 2013). However, the reviewers did report that experts agree that early detection of cognitive changes may be beneficial to “optimize” medical treatments of underlying disorders, provide education about the condition, encourage important decisions for planning for the future, and providing appropriate referrals to needed services, all improving patient outcomes (Lin et al., 2013; Prince, Bryce, & Ferri, 2011). They also reported the importance clinically to identify risk factors of persons at high risk for cognitive impairments (Lin et al., 2013).

From the recent systematic review (2013), studies validate that brief instruments can adequately screen for dementia. Six instruments were identified in more than one study to detect
MCI. No studies were found to substantiate or disclaim harms to screening (Lin, O’Connor, Rossom, Perdue, & Eckstrom, 2013).

**National Guideline Clearinghouse Practice guidelines.** Clinical practice guidelines available to practitioners for cognitive assessment in the National Guideline Clearinghouse, was recently updated in 2012. Though the target population in the guideline is hospitalized older adults, the practice protocol provides a standard to screen and evaluate cognitive function in the hospital as well as on the first visit to a new provider, and subsequently could be used in a variety of settings such as family practice, long-term care, and assisted living. The guidelines are included in the evidenced based geriatric nursing protocols for best practice that are intended to be used by any practitioner (Milisen, Braes, & Foreman, 2012).

These initial research studies reinforce the need to develop protocols to screen for mild cognitive impairment in the older adult aged 65 and older in primary care. The Affordable Care Act requires assessment of cognitive functioning as part of the annual Medicare wellness visit. It would be important to assess current screening methods, knowledge of mild cognitive impairment, barriers to screening, and screening concerns to assist in developing MCI practice protocols for nurse practitioners. Primary care nurse practitioners are pivotal in providing initial screening, evaluation and treatment of vascular risk factors, treatment of co-morbid medical conditions, and providing timely referrals for the older adult.

Though treatments and protocols are available for dementia, protocols for screening and evaluation for mild cognitive impairment are limited. As evidenced in the literature, screening tools are available that are sensitive and specific for mild cognitive impairment; but they are used inconsistently or not at all in primary care. Risk factors that contribute to cognitive changes need
to be assessed and underlying contributing conditions treated. Though pharmacological treatment for MCI patients is inconclusive, the literature supports modest benefits from cognitive interventions, treatment of co-morbidities, and continued monitoring of at risk patients.
Chapter 3 Project Description

The purpose of this chapter is to describe the methods used. It will begin with the purpose of the study, description of phase one and phase two, research questions identified, sample criteria, description of the survey instrument, and the application of Roger’s theoretical framework.

This project was a clinical practice-based inquiry that in phase I determined the knowledge, current screening practices, and barriers to screening of older adults for MCI by primary care nurse practitioners. This needs assessment provided data to assist in developing a MCI screening protocol and evaluation treatment algorithm for nurse practitioners. After the development of the MCI screening protocol, in phase II of the project, participants who indicated an interest in the study were invited to participate in evaluating the implementation of the MCI protocols in their practice. Members of the pilot study were also invited to implement the MCI screening protocol and use of the evaluation algorithm in their practice. A practitioner panel was developed that consisted of those NPs who agreed to provide feedback on the MCI practice protocol.

Problem Statement or Purpose

Since the recently passed Affordable Care Act requires yearly screening as part of the Wellness benefit for Medicare, clinicians need guidelines to insure quick and efficient methods of screening, guidelines of treatment, and when to refer to specialists. Screening for MCI provides an initial step towards progression of a correct diagnosis of MCI.

There is a lack of information for NPs to adequately screen for the diagnostic category of Mild Cognitive Impairment that often precedes the diagnosis of dementia. This diagnostic
category of MCI provides a target time to initiate further evaluation of underlying medical conditions and to provide treatment in the vulnerable older adult population.

**Clinical Questions to be Addressed**

As presented in an earlier section, the evidence based practice questions for this study include four areas of interest. The questions are:

1. What percentage of nurse practitioners currently screen for Mild Cognitive Impairment yearly in the older adult population aged 65 and older?
2. What current screening practices for cognitive impairment are used to screen the older adult, aged 65 and older?
3. What barriers do nurse practitioners identify in providing adequate screening for MCI in the older adult population?
4. Which practice variables best explain the level of MCI screening of nurse practitioners?

**Methods**

This project is a cross sectional study that utilized a web based survey administered to nurse practitioners (NPs) in the state of Georgia. Participants were drawn from the Georgia Board of Nursing mailing list.

**Recruitment**

All advanced practice nurses on the Georgia Board of Nursing mailing list were mailed a postcard inviting them to participate in the survey. The online link to the survey was included in
the information that was provided about the survey on the postcard (see Appendix A for postcard invitation).

**Inclusion Criteria**

The subjects included in the study are advanced practice registered nurses with a specialty in family practice, gerontology, or adult health who provide care to the older adult population. The nurse practitioners who are currently employed in a variety of primary care settings, clinics, private offices, and public health agencies are included.

**Exclusion Criteria**

Advanced practice nurses in Georgia who do not care for the target population or are not currently working in the role of a nurse practitioner were excluded from the study. Advanced practice nurses who do not reside in Georgia were excluded.

**Sample**

A major concern of the study was generating an appropriate response rate on which to base clinical practice guideline development. Since the Georgia board of nursing does not currently have a list of email addresses of nurse practitioners, a mailed invitation to an online link was sent to NPs. Mailed invitations may not offer the most efficient method to invite and encourage participation. A list of mailing addresses was available for a fee, and re-sending of the invitation to participates is costly. Currently there are 6,172 NPs who are licensed in the state of Georgia (Georgia Board of Nursing, 2014). No information is available regarding the sample size of nurse practitioners who are currently employed in primary care or who provide services to the older adult population.
The response rate for web surveys tends to have lower response rates when compared to other survey modes (Akl, Maroun, Klocke, Montori, & Schunemann, 2005; Leece et al., 2004). The response rate for online surveys overall is approximately 33% as compared to mailed surveys which averaged about a 56% response rate (Nulty, 2008). To address the response rate concern, an additional effort was made by contacting the Georgia United Advanced Practice Registered Nurses (UAPRN) specialty group to provide an invitation on their web site to participate in the survey.

**Survey Instrument**

The 19 item survey was developed by the researcher and assesses the nurse practitioners' knowledge, current screening behaviors, and perceived barriers to screening patients for cognitive disorders (See Appendices B and C). This survey focuses on the Awareness Phase of Roger’s Change Theory.

Participant characteristics that were assessed include practice setting, certification, attendance at continuing educational offering related to dementia, and personal family history of dementia or MCI. The following demographic variables were obtained: age, gender, ethnicity, employment status, and years of practice.

Questions were designed for the readability and clarity of advanced practice nurses. The survey was pilot tested on a sample of 10 practicing NPs who provide care to the older adult population. Their feedback was incorporated into the redesign and clarity of the survey questions.
Protection of Human Subjects

An application and request for approval to conduct this research was made with Georgia College and State University’s Institutional Review Board. A waiver for signed consent was requested because the web-based survey research is anonymous with no identifiable information collected from the participants. A letter of implied consent was used in the survey instructions (See Appendix B). The IRB required a modification to insure that the consent form preceded the survey instrument to insure implied consent. There were no foreseeable risks involved in participating in this survey research study other than those encountered in day-to-day life. The results of this survey participation are anonymous.

Informed consent

This study is a web based anonymous survey for nurse practitioners in the state of Georgia. The NPs were mailed an invitation to complete the survey online. A consent form was included with the survey instructions explaining consent, risks and benefits of participating in the survey research. By clicking to begin the survey, implied consent was given. By completing the survey and submitting, the recipient consents to participate. This constitutes implied consent and no identifiable information was collected from the participants (Refer to Appendix B). In the survey, participants were asked if they would like to receive a copy of the protocols and if they may be interested in following the screening guidelines in their practice. They may choose to disclose their email address to the researcher and will no longer be anonymous. This data is password protected and will be locked at the Macon Graduate Center for a period of three years.
Data Analysis

Statistical analysis was performed using SPSS, version 21. Descriptive statistics was used. For categorical data, frequencies and cross tabulations were performed. The association among variables was assessed using Spearman Rank correlation.

After data analysis, this information was used to begin to address the multilevel change process necessary to affect change by addressing the inequities in screening and encouraging the use and adoption of a new practice guideline or critical pathway (Rogers, 1965). The five stages of Roger’s change theory was used to complete the following stages of the project:

1. Increased Awareness: The information was used to target the population (nurse practitioners) and help to develop an awareness or knowledge base of the idea/program/protocol (MCI, screening method). The survey will increase awareness for screening practices for MCI and identified the need for protocols.

2. Interest in screening protocol: the nurse practitioners/clinicians develop an attitude toward the idea/program/practice protocol (positive or negative). From those nurse practitioners who have an initial interest in the study, an email address was requested. Those interested also have a choice of contacting the researcher for additional information and to answer questions from the awareness that is generated. From that individual contact, the nurse practitioners were invited to participate in using the screening tools and protocols. From the interactions with those interested, attitudes about the survey, screening tools and potential practice protocols were initially determined.
3. Evaluation: The nurse practitioners will decide whether to engage in the choice to participate in the protocol development. From the information disseminated from contacting those interested in the protocols, they will be asked to participate further in the use of the screening instruments/protocols to provide assessment and feedback.

4. Interpretation: The nurse practitioners will implement the idea. If agreed, the interested nurse practitioners will implement the screening tools and use the practice protocols in their practice. Feedback will help with the refinement of the practice protocols and will be invaluable in continuing to improve the efficiency and usefulness of the protocols. Phase II of feedback from protocol use in the project is continuing and feedback is ongoing.

5. Adoption: Nurse practitioners will confirm if the idea is working. As dissemination occurs among those using the screening tools and practice protocols successfully, use of the protocols will strengthen the adoption process. Adoption is more likely to occur within the practice settings. Effective and efficient use of the screening instruments and protocols will continue to strengthen the adoption process (Rogers, 1965; Orr, 2003).

Roger’s change theory provides a theoretical framework to assist in promoting change in clinical practice. How can one effect change in practitioners to “buy in” early in a program to screen older adults for mild cognitive impairment? By addressing the five stages of change theory, the process helps to identify through a logical process the prediction if a new idea/screening methods will be successful. Diffusion expands the number of people who are
exposed to the idea, and is strengthened by the successful implementation of the screening
measures for MCI and use of the protocols (Rogers, 1965).

Use of the protocols by NPs in primary care will validate the administration of the
evidenced based screening tools and usefulness of the MCI evaluation algorithm. As more NPs
effectively screen, identify, and treat underlying causes of cognition changes in the older adult,
protocol use will be strengthened and more practitioners will be exposed to the tools and
algorithm promoting adoption among practitioners.
Chapter 4

Results

The purpose of this clinical project is to identify the need and advocate for nurse practitioners to assess the older adult in primary care for MCI. MCI is a risk factor for the development of Alzheimer’s Dementia and more than 75% of patients with mild to moderate dementia are not diagnosed in primary care. There may be knowledge gaps in identifying early cognitive changes in the older adult by nurse practitioners. The Affordable Care Act requires an evaluation of cognition in the older adult during the annual Medicare Wellness visit. The NP will need sensitive and specific screening tools that can be used efficiently in the primary care setting as well an evaluation protocol for MCI which is lacking in the literature. As stated in Chapter 1, the research questions which addressed the purpose of this descriptive study are:

1. What percentage of nurse practitioners currently screen for Mild Cognitive Impairment yearly in the older adult population aged 65 and older?

2. What current screening practices for cognitive impairment are used to screen the older adult, aged 65 and older?

3. What barriers do nurse practitioners identify in providing adequate screening for MCI in the older adult population?

4. Which practice variables best explain the level of MCI screening of nurse practitioners?

In phase I of the project, through the web based survey, the knowledge, current screening practices, and barriers to screening for MCI in the older adult population, aged 65 and older, by nurse practitioners in the state of Georgia were assessed. From this initial survey data and
NP SCREENING PRACTICES FOR MILD COGNITIVE IMPAIRMENT

literature review, initial practice protocols were developed (See appendix D for MCI protocol and evaluation algorithm). In phase II of the project, interested NPs in the survey who disclosed their email address or contacted the researcher were sent the proposed MCI practice protocol and evaluation algorithm for implementation and feedback. The initial stage of Phase II is complete; however, feedback of protocol use is still being invited.

The survey data were first examined for error and inconsistencies and then analyzed using frequencies and correlations. Descriptive statistics and correlations were used to answer the clinical questions. Questions 1-3 were answered using frequencies and percentages, question 4 was answered using correlation. Data assumptions were met for use of the Spearman Rank correlation. The following section describes the respondent samples, presents frequencies of screening practices, and correlates variables associated with MCI screening.

Description of Sample

A total of 5,306 postcards were mailed to Georgia nurse practitioners, sixty six postcards were returned by the postal service as undeliverable and 132 APRNs responded to the survey with a 2.52% response rate. The researcher received 5 emails from APRNs who did not participate in the study because they were not currently practicing as NP or did not treat older adults. These were subtracted from the initial postcard mailings reducing the mailed sample (N) to 5235 nurse practitioners. One hundred forty (140) respondents initially agreed to participate in the study, eight did not complete the survey, with a dropout rate of 5.7%. The total sample (N) is 132. Of the 132 respondents, 27% (n=35) identified themselves as adult NPs, 65% (n=85) identified themselves as family NPs (FNPs), 8% (n=10) identified themselves as geriatric/gerontological (GNPs), and 2 % (n=3) did not respond. Ninety nine (99%, n=131)
respondents indicated they were board certified with 84% (n=111) employed full-time and 16% (n=21) employed as part-time working in a variety of practice settings including 42.4% (n=56) working in primary care settings, 11.3% (n=15) in acute care clinics, 11% (n=14) working in hospitals, 5% (n=6) employed in long term care facilities, 4% (n=5) in public health centers, and 4% (n=5) working in retail care clinics.

The sample of respondents were overwhelmingly female and the racial majority were Caucasian with other ethnicities represented. Specifically, of the 132 participants, 8% (n=11) were male and 92% (n=121) were female. The racial distribution of the sample consisted of 80% Caucasian (n=105), 16% African American (n=21), 2% (n=2) Hispanic and 3% (n=4) identified as other. Thirty-five percent (n=46) of participants had less than five years in practice, 37% (n=49) had between five and fifteen years of practice experience, and 27% (n=36) had greater than 15 years in practice. The age distribution consisted of 4% (n=5) were less than 30 years of age, 42% (n=55) were between the ages of 30-49, 45% (n=60) fell between 50-65 years of age, and 9% (n=12) were over the age of 65 (See Table 2, for demographic descriptions).

**Screening practices**

When asked about screening practices, 50% (n=64) of the participants reported screening for cognitive impairment routinely in the older adult and 65% (n=83) reported routinely assessing for depression in the older adult. When screening for dementia 97% (n=120) were familiar with the Mini Mental Status Exam (MMSE), 37% (n=46) were familiar with Mini-Cog Memory, 11% (n=14) Memory Impairment Screen (MIS), 12% (n=15) were familiar with Montreal Cognitive Assessment (MoCA), no respondents were familiar with the DemTect tool, 2% (n=2) were familiar with the General Practitioner Assessment of Cognition (GPC), 15%
(n=18) were familiar with Short Test of Mental Status (STMS), 8% (n=10) were familiar with Alzheimer Dementia Screen for Primary Care, 1% (n=1) was familiar with Primary care AB Cognitive Screen, 1% (n=1) was familiar with Memory and Executive Screen and 6% (n=8) were familiar with the Six Item Screener (SIS).

Participants were also asked about routinely screening for depression because depression in older adults may present as cognitive impairment. Twenty percent (n=25) of respondents were not familiar with depression screening tools. Of those who screened for depression, 53% (n=68) were familiar with the Beck Depression Inventory (BDI), 34% (n=44) were familiar with the Geriatric Depression Scale (34%), 5% (n=6) were familiar with Cornell Scale for Depression in Dementia (CSDD), and 37% (n=47) were familiar with the Patient Health Questionnaire (PHQ).

Thirty two percent (n=41) of respondents reported that they did not screen for MCI. Of those practitioners who screen for MCI, 58% (n=74) use the Mini Mental Status Exam (MMSE), 19% (n=24) use the Mini-Cog Memory Impairment Screen (MIS), 3% (n=4) use the Montreal Cognitive Assessment (MoCA), 8% (n=10) indicated other tools including clock test, animal naming, St. Louis University Mental Status (SLUMS), and family input.

Knowledge of Mild Cognitive Impairment

When participants were asked how familiar they were with the diagnostic category of MCI, 16% (n=20) reported being very familiar, 40% (n=51) responded somewhat familiar, and 45% (n=58) indicated that they were not familiar with MCI. Thirty four (n=45) of respondents had completed continuing education (CEUs) specific for Mild Cognitive Impairment (MCI) in
the past five years with 89% (n=39) of those completing 1-15 CEU credits, 7% (n=3) completing 16-30 CEU credits, and 2% (n=1) completing greater than 30 CEU credits.

Forty one percent (n=54) had completed continuing education in other dementia screening specific for Alzheimer’s Dementia, multi-infarct dementia, Lewy Body dementia in the past five years. Ninety-four percent (n=49) completed 1-15 CEU credits, 4% (n=2) completed 16-30 CEUs.

**Barriers to Screening**

When participants were asked to identify barriers to screening, 58% (n=75) reported not having enough time, 33% (n=43) reported being unsure of best screening methods, 19% (n=25) reported not having enough staff, 15% (n=20) reported that screening tools were too difficult to administer efficiently, 20% (n=26) were unsure of protocols, and 20% (n=26) reported no barriers to screening. Fifteen percent (n=19) reported other reasons identified as barriers including lack of follow up for results, no clear guidelines in practice of what to do with test results, cultural inconsistencies, language definitions, patient reluctance, and must be government approved (See Table 3 for a summary of identified barriers to screening).

**Personal Involvement**

Finally, respondents were asked if they had a personal experience with a family member having dementia. Fifty nine percent (n=77) of participants indicated they had personal experience of a family member with dementia.
Correlations.

Analysis of the data was performed using SPSS, version 21. Correlations were compared on the variables of MCI screening, age, specialty, years in practice, knowledge of MCI, continuing education credits (CEUs), screening for depression, and personal experience of a family member with dementia. Of all the variables correlated, only the following variables were statistically significant. The Spearman’s rho revealed a statistically significant relationship of MCI screening with completion of continuing education (CEUs) for both MCI ($r_s = .245, p < .006$) and dementia ($r_s = .243, p < .006$). Those who completed CEUs for MCI and Dementia were more likely to report that they screened for MCI. The Spearman’s rho revealed a statistically significant relationship between MCI screening and routinely screening for depression ($r_s = .478, p < .000$). Those participants who were familiar and screened for MCI were more likely to screen for depression. Having experience with a family member having dementia was not significantly associated with MCI screening (See Table 4 for correlational data).

Protocol and Algorithm Evaluation.

In phase II of the project, additional data was collected about the interest of participants in administering and providing feedback about the practice protocols that would be developed for MCI. A systematic review of evidence of screening for and evaluation of mild cognitive impairment in the older adult was performed to develop a screening and evaluation protocol for MCI (See appendix D for MCI protocol and evaluation algorithm). During the pilot study, five nurse practitioners agreed to follow the developed MCI screening and evaluation protocols providing feedback. All five NPs reported the protocol was easy to follow, liked the information provided on the screening tools, and liked the inclusion of the evaluation of recommended blood
work studies. For each NP, the MoCA tool was administered to five patients during routine physical exams. The NPs reported the ease of administration and scoring of the instrument improved with use, initially requiring more time, but much less so as they became familiar with the instrument and scoring. From the screening, one patient was referred to neurology and one patient was found to have a medical condition contributing to cognitive changes. The St. Louis University Mental Status (SLUMS) was administered to two patients and practitioners found the tool to be easy and efficient to use, taking less than seven minutes to administer and score.

Twenty two respondents from the survey indicated interest in administering and providing feedback about the screening tools suggested in the practice protocols by providing their email addresses to the researcher. A copy of the MCI screening protocol and evaluation algorithm were sent to all interested participants inviting their feedback. Six responses have been received thus far, all positive comments, agreeing to use the protocols and treatment algorithm as a guideline for screening and initial evaluation of cognitive impairment in older adults. One email was undeliverable at the address given on the web survey resulting in 21 emails sent to interested APRNs. This second phase of the study consisting of feedback from use of the screening protocol and evaluation algorithm is still ongoing. From the participation thus far, dissemination of the MCI screening and evaluation protocol is occurring with potential adoption in the future as more patients present with memory complaints or for their Medicare annual visit.
Chapter 5  Conclusions and Implications

Discussion of Evidence Based Questions

This descriptive study assessed the knowledge, current screening practices, and identified barriers by Georgia nurse practitioners for screening of MCI in the older adult. From the areas assessed, practice protocols were developed for use in primary care. In phase II of the study, nurse practitioners interested in the development of practice protocols, were invited to comprise a panel to implement the newly developed screening protocol and evaluation algorithm in their practice providing feedback. Though the initial feedback of the implementation of the protocols has been received, phase II of the project is ongoing to assess dissemination and adoption phases of Roger’s change theory.

This section discusses the implications of the results presented in the previous chapter. The first question relates to MCI screening practices, perceived barriers to screening, and practice variables related to MCI screening. Next are recommendations related to the findings, limitations, strengths of the study, implications of the study, and areas for future research discussed. Each research question is listed with a discussion that follows.

Screening of MCI

What percentage of nurse practitioners currently screen for Mild cognitive Impairment (MCI) yearly in the older adult population aged 65 and older?

Fifty percent of APRNs in this study screen for cognitive impairment with 32% report they do not screen for MCI. Almost half of the respondents were unfamiliar with the diagnostic category of MCI which may be a factor in MCI screening. APRNs may not separate MCI from
other dementia screening which indicates that additional education efforts would help to increase the understanding and screening for MCI.

For participants in the study, the implications of these data indicate that there are APRN knowledge gaps of Mild Cognitive Impairment (MCI) and screening for cognitive impairments in the older adult. People who have not received training or continuing education for dementia, or more specifically, for MCI are not screening. The importance of continuing education and exposure to information about MCI was shown to be important for practitioners to screen in their practice. The number of older adults are increasing in the United States with the aging of the Baby Boomer population. With the implementation of the Affordable Care Act 2010 and the required assessment of cognition during the Medicare Annual Wellness visit, the expected screening and management of dementia and more specifically MCI will be increasing. Having tools specific and sensitive for MCI as well as an MCI evaluation protocol for guidelines are important. Though specific guidelines are available for assessing dementia such as Alzheimer’s Dementia, specific guidelines for assessing and evaluating MCI are lacking. Earlier identification of cognition changes would promote more timely evaluations of treatable dementias and appropriate referrals.

**What current screening practices for cognitive impairment are used to screen the older adult, aged 65 and older?**

A variety of screening tools are used to screen the older adult for dementia and MCI. The MMSE is the tool most frequently reported to screen for both dementia and MCI followed by the Mini-Cog. Both of these instruments are indicated for dementia screening but are not specific or sensitive enough to screen for early cognitive changes as in MCI (Grober, Hall, Liptom, &
Identification of tools with a high sensitivity and specificity rate indicated for MCI is important to ensure consistent screening efforts in primary care.

**Barriers**

**What barriers do nurse practitioners identify in providing adequate screening for MCI in the older adult population?**

The majority of respondents (58%) identified not having enough time as a major barrier to screening, followed by unsure of best screening methods (34%). Twenty percent of the APRNs/NPs were unsure of protocols, nineteen percent reported not having enough staff, and sixteen percent identified that the screening tools were too difficult to administer efficiently. It is interesting that twenty percent reported having no barriers to screening. The obvious is that time is the major barrier indicating that quick and efficient screening methods should be adopted. From the identification of barriers, a need for the development of protocols was indicated to insure screening and appropriate follow-up (See Table 4 for summary of NP barriers to screening). Specifically NPs identified a lack of clear guidelines.

**Which practice variables best explain the level of MCI screening of nurse practitioners?**

Only the completion of educational CEUs for dementia and MCI correlate with increased screening for both MCI and dementia. The APRNs that participated in continuing education units (CEUs) specific for MCI (rs = .245, p < .006) and other dementias (rs = .243, p < .006) correlated significantly with increased screening efforts of the older adult. Knowledge of MCI and screening for depression were strongly correlated to an increase in screening for MCI.
Educational programs are needed to increase screening efforts for MCI in the older adult. No other practice variable correlated with increased screening for the older adult.

It is very concerning and important to note that 20% of respondents were unfamiliar with depression screening tools. A core competency in nurse practitioner curriculum is healthcare screening measures which should include screening strategies and tools for depression. Graduate schools of nursing may need to evaluate the competencies being addressed to insure this valuable screening content is included. Only the completion of educational CEUs for dementia and MCI correlate with increased screening for both MCI and dementia. Educational programs are needed to increase screening efforts for MCI and depression in the older adult.

MCI Practice Protocol and Treatment Algorithm

Since dementia protocols are readily available, efforts in this study were focused on the development of MCI protocols for use in primary care. Older adults are more likely to initially present for yearly Medicare Wellness visits which now includes cognitive evaluations or will present to their primary care provider with complaints of memory difficulties. From the research data, the developed MCI screening protocol and treatment algorithm addressed the barriers, identified evidenced based sensitive screening methods, and provided initial medical evaluation guidelines including when to refer to neurology or memory disorder specialty clinics for further evaluation. The protocol provides the provider with free to use, sensitive and specific MCI screening tools and web resources for depression screening. Additional evidenced based lifestyle changes which offer some limited benefit in patients with MCI are also included in the protocol (See Appendix D for protocol and evaluation algorithm).
Implications of the Study

From the assessment of the identified barriers in the study and in the development of the practice protocol, two evidence-based screening tools, the Montreal Cognitive Assessment (MoCA) and Saint Louis University Mental Status (SLUMS), are suggested for use in primary care. Both screening tools are easy to administer taking 10 minutes or less and are free for use. The SLUMS test can also be administered by ancillary personnel with minimal training reducing the time needed by APRNs for direct screening. Both screening tools had a 90% or greater specificity and greater than 80% specificity for MCI. Having efficient and sensitive tools as well as practice guidelines are necessary to promote screening practices for MCI particularly in a busy primary care office.

As important, from the findings of this study, increased continuing education opportunities need to be offered for APRNs to improve knowledge of screening and evaluation of cognitive impairments of the older adult. Additional education for APRNs to improve knowledge of depression screening tools is also indicated from the research findings. Use and adoption of the MCI practice protocols by those interested NPs identified in the survey remain an ongoing phase of this study. The initial feedback received from the NPs indicates a useful screening and evaluation protocol to follow in primary care.

Limitations

The major limitations of this study are the small sample size and low response rate. Only mailing addresses were available from the Georgia Board of Nursing which limited recruiting efforts of APRNs/Nurse practitioners. Postcards were returned despite checking for current mailing addresses, and email addresses were not available. The largest number of nurse
practitioners to obtain for this study was through the Georgia Board of Nursing listing. An additional effort was made to increase the response rate by contacting the Georgia UAPRN specialty group with a direct invitation on their website for NPs who care for older adults to participate. Another limitation of this study may be the timing of the collection of data in the busy summer months when people may not be readily accessible (Evaluation research team, 2010). The limited number of weeks for mailings and data collection decreased opportunities to increase response rates such as attending state specialty conference meetings which are held traditionally in the fall.

**Strengths of the Study**

This is the first study to develop a survey instrument to investigate the knowledge, screening tools, and barriers to screening for Mild Cognitive Impairment by nurse practitioners. With the development of practice protocols from the survey results, the dissemination of screening for MCI during the annual Wellness visit will impact the care and outcomes for the older adult.

**Recommendations for Future Study**

Recommendations for further study include improving the low response rate by identifying other avenues for acquiring nurse practitioner listings for sampling such as specialty web sites and social media. Of major importance would be to lobby for the Georgia board of nursing to obtain current email addresses of all licensed APRNs so that continued research efforts could be encouraged with better participation. Including all APRNs in further research who treat the older adults would help to identify trends in screening and evaluation of MCI and dementia.
As the population continues to age and the frequency of MCI and dementia increases, NPs will need to be prepared to use sensitive screening tools specific for MCI and have access to guidelines for evaluation of MCI. Early screening efforts will promote earlier treatment of co-morbid conditions, timely referrals for appropriate diagnosis, and interventions started to possibly slow the progression of MCI to dementia. The ultimate goal is to improve the care of the vulnerable older adult.

Conclusions

Findings from this translational project suggest that only half of the respondents in this survey screen for cognitive impairment with almost fifty percent of APRNs being unfamiliar with the diagnostic category of MCI. Most APRNs who screen for MCI use the Mini Mental Status Exam (MMSE) as a major screening tool. Unfortunately, the MMSE has a ceiling effect and is not specific enough to identify early cognitive changes. Though there were differences in screening methods used, only a small percentage used tools very specific for MCI screening including the MoCA and the SLUMS. The screening and practice protocol developed for this project provides needed guidelines for screening and the initial evaluation of MCI.

Because of the use of a convenience sample, generalizability of the findings to NPs in Georgia is limited. However, the data may indicate patterns in screening frequencies, knowledge of MCI, and barriers to screening in practice.

Development of the MCI protocol and algorithm will provide guidelines for nurse practitioners/APRNs to screen and initially evaluate older adults who present with memory complaints or during the Medicare Annual Wellness visit which requires assessment of cognition. Future use of the protocol and algorithm will validate its usefulness and reliability in
primary care. Earlier identification of MCI can assist in identifying and treating co-morbid conditions, obtaining correct diagnoses, providing patient and family education, and providing more efficient and timely referrals with the ultimate goal of improving patient care outcomes of the older adult.


NP SCREENING PRACTICES FOR MILD COGNITIVE IMPAIRMENT


doi: 10.1212/01.WNL.0000132523.27540.81


### Table 1

**Comparison of Screening Tools for MCI**

<table>
<thead>
<tr>
<th>Screening Tool</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Administration Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montreal Cognitive Assessment (MoCA)</td>
<td>90%</td>
<td>87%</td>
<td>10 minutes</td>
</tr>
<tr>
<td>DemTect</td>
<td>80%</td>
<td>92%</td>
<td>8-10 minutes</td>
</tr>
<tr>
<td>Memory Executive Screening (MES)</td>
<td>87%</td>
<td>91%</td>
<td>7-9 minutes</td>
</tr>
<tr>
<td>AB Cognitive Screen (ABCS)</td>
<td>83%</td>
<td>91%</td>
<td>3-5 minutes</td>
</tr>
<tr>
<td>St. Louis University Mental Status (SLUMS)</td>
<td>92%</td>
<td>81%</td>
<td>7 minutes</td>
</tr>
</tbody>
</table>

Table 2

Participant Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percentage %</th>
<th>Variable</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialty</td>
<td></td>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>Adult</td>
<td>27</td>
<td>African American</td>
<td>16</td>
</tr>
<tr>
<td>Family</td>
<td>65</td>
<td>Caucasian</td>
<td>79</td>
</tr>
<tr>
<td>Gerontological</td>
<td>8</td>
<td>Latin American</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>3</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>Yrs. in Practice</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>92</td>
<td>&lt; 5 years</td>
<td>35</td>
</tr>
<tr>
<td>Male</td>
<td>8</td>
<td>5-15 years</td>
<td>37</td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
<td>&gt; 15 years</td>
<td>28</td>
</tr>
<tr>
<td>&lt; 30 years</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 - 49 years</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 – 65 years</td>
<td>45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65+ years</td>
<td>9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3

*Barriers to Screening*

<table>
<thead>
<tr>
<th>Reported Barriers to Screening (n=130)</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not enough time</td>
<td>58%</td>
</tr>
<tr>
<td>Unsure of best screening methods</td>
<td>33%</td>
</tr>
<tr>
<td>Screening tools too difficult to</td>
<td>15%</td>
</tr>
<tr>
<td>Administer efficiently</td>
<td></td>
</tr>
<tr>
<td>Not enough staff</td>
<td>19%</td>
</tr>
<tr>
<td>Unsure of protocols</td>
<td>20%</td>
</tr>
<tr>
<td>Other</td>
<td>15%</td>
</tr>
<tr>
<td>No barriers</td>
<td>20%</td>
</tr>
</tbody>
</table>
Table 4

_Correlations Spearman Rank_

<table>
<thead>
<tr>
<th>Variable</th>
<th>MCI Screening</th>
<th>MCI CEU’s</th>
<th>Dementia CEU’s</th>
<th>Depression Screening</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCI Screening</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCI CEU’s</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.245**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2 tailed)</td>
<td>.006</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dementia CEU’s</td>
<td></td>
<td>1</td>
<td>.521**</td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.243**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2 tailed)</td>
<td>.006</td>
<td></td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>127</td>
<td>131</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression Screening</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.478**</td>
<td>.247**</td>
<td>.254**</td>
<td></td>
</tr>
<tr>
<td>Sig. (2 tailed)</td>
<td>.000</td>
<td>.005</td>
<td>.004</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>125</td>
<td>128</td>
<td>128</td>
<td></td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level. MCI CEUs = Mild Cognitive Impairment continuing education units; Dementia CEUs=dementia (Alzheimer’s Dementia, multi-infract dementia, Lewy Body dementia) continuing education units.
Appendix A: Postcard Invitation

Are You Screening for Cognitive Impairments?
Calling All Nurse Practitioners!

You are invited to participate in an anonymous, web-based survey regarding your screening practices for cognitive impairments in older adults. This short survey, which is being conducted as part of a graduate research study at Georgia College and State University, will be used to develop new practice protocols.

To participate, please visit:

http://tinyurl.com/og577up

Many Thanks!

Margaret McIlwain
MPH, MSN, FNP-BC, DNP Candidate
Georgia College and State University
Macon Graduate Center
433 Cherry Street
Macon, Georgia 31201
margaret.mcilwain@bobcats.gcsu.edu
NP SCREENING PRACTICES FOR MILD COGNITIVE IMPAIRMENT

Appendix B  Letter for implied consent/Instructions that precede the web survey

You are invited to participate in a web-based online survey on current screening practices for dementia. This is a research project being conducted by Margaret McIlwain, a DNP student at Georgia College and State University. The purpose of the study is to develop practice protocols for screening of mild cognitive impairment in the older adult. The survey should take less than 10 minutes to complete.

PARTICIPATION
Your participation in this survey is voluntary. You may refuse to take part in the research or exit the survey at any time without penalty. You are free to decline to answer any particular question you do not wish to answer for any reason.

BENEFITS
You will receive no direct benefits from participating in this research study. However, your responses may help us learn more about what nurse practitioners need to help them screen for cognitive impairments in a busy practice. From this research, practice guidelines may be developed.

RISKS
There are no foreseeable risks involved in participating in this study other than those encountered in day-to-day life.

CONFIDENTIALITY
Your individual responses will be anonymous and will not be released in any individually identifiable form. Your survey answers will be sent to a link at Qualtrics.com where data will be stored in a password protected electronic format where your responses will remain anonymous. No one will be able to identify you or your answers, and no one will know whether or not you participated in the study. At the end of the survey, you will be asked if you are interested in administering and providing feedback about the screening tools suggested in the practice protocols by contacting me by email at margaret.mcilwain@bobcats.gcsu.edu. If you choose to provide contact information such as your phone number or email address, your survey responses may no longer be anonymous to the researcher. However, no names or identifying information would be included in any publications or presentations based on these data, and your responses to this survey will remain confidential. Research at Georgia College involving human participants is carried out under the oversight of the Institutional Review Board. If you have any questions or concerns that you wish to address to someone other than the investigator, please address questions to Dr. Bradley Koch, GC IRB Chair, CBX 018, GC, (478) 445-0937.

Electronic Consent: Please select your choice below. You may print a copy of this consent form for your records. Clicking on the agree button indicates that you have read the above information. You voluntarily agree to participate. You are 18 years of age or older.

(Source: http://iscs.gcsu.edu/forms.htm; http://www.mtu.edu/research/administration/integrity-compliance/review-boards/human-subjects/consent_forms.html)
Appendix C: Survey Instrument: Screening Practices of NPs

Nurse Practitioner Survey

1. Gender:
   Male _____
   Female _____

2. Age group:
   <30 years _____
   30–49 years _____
   50–65 years _____
   65+ years _____

3. Race:
   Caucasian _____
   African American _____
   Hispanic_____  
   Other ________

4. Work Schedule:
   Full time _____
   Part time _____

5. Board Certified:
   Yes _____
   No _____

6. Specialty:
   Family ______
   Adult ______
   Geriatric____
   Other_______

7. Years in Practice:
   <5 _____
   5- 15 _____
   >15 _____

8. Practice Setting:
   Primary Care Office____
   Acute Care Clinic _____
   Hospital_______
   Public Health Center____
   Retail Care Clinic (CVS Minute Clinic, Walgreens) _____
   Other__________
9. Percentage of patients seen for primary care ________
   Percentage of patients aged 65 years and older ________

10. Have you completed any Continuing Education (CEU’s) specific for mild cognitive impairment (MCI) screening in past five years?
    Yes ______
    No ______

    If yes, approximate number of credits earned:
    None ______
    1—15 ______
    15—30 ______
    > 30 ______

11. Have you completed any Continuing Education (CEU’s) in other dementia screening (Alzheimer’s Dementia, multi-infarct dementia, Lewy Body dementia) in the past five years?
    Yes_____  
    No______

    If yes, approximate number of credits earned:
    None _____
    1—15 _____
    15—30 _____
    > 30 _____

12. Do you routinely assess for cognitive impairment in the older adult?
    Yes _____
    No _____

13. Are you familiar with the following instruments that can be used for screening for cognitive impairment/Dementia? Please check all that apply.
    Mini Mental Status Exam (MMSE): Yes_______ No_____  
    Mini-Cog:  Yes_______ No____
    MIS: (Memory Impairment Screen) Yes_______ No______
    MoCA: (Montreal Cognitive Assessment) Yes_______ No______
    Dem Tect:  Yes_______ No______
    GPC: (General Practitioner Assessment of Cognition) Yes_______ No______
    STMS: (Short Test of Mental Status) Yes_______ No______
    Alzheimer Dementia Screen for Primary Care: Yes_______ No______
    AB Cognitive Screen: Yes_______ No______
    Memory and Executive Screen: Yes_______ No______
    Other____________
14. Are you familiar with the diagnostic category of Mild Cognitive Impairment (MCI)?
   Yes, very familiar _____
   Yes, somewhat familiar _____
   No _____

15. Which of the following tools do you use in your practice to screen for Mild Cognitive Impairment (MCI)? Select all that apply.
   None, do not screen: ______
   Mini Mental Status Exam (MMSE): Yes _____ No_____
   Mini-Cog: Yes _____ No_____
   MIS (Memory Impairment Screen): Yes _____ No_____
   MoCA (Montreal Cognitive Assessment): Yes _____ No_____
   Dem Tect: Yes______ No_____
   Other___________

16. Do you routinely assess for depression in the older adult?
   Yes _____
   No _____

17. Are you familiar with the depression screening tools? If yes, please check all that apply.
   Beck Depression Inventory (BDI): Yes _____ No_____
   Geriatric Depression Scale (GDS): Yes _____ No_____
   Cornell Scale for Depression in Dementia (CSDD): Yes _____ No_____
   Patient Health Questionnaire (PHQ): Yes _____ No_____
   Other___________

   If yes, what screening methods do you use?
   Beck Depression Inventory (BDI): Yes_____ No_____
   Geriatric Depression Scale (GDS): Yes_____ No_____
   Cornell Scale for Depression in Dementia (CSDD): Yes_____ No_____
   Patient Health Questionnaire (PHQ): Yes_____ No_____
   Other___________

18. What types of barriers to screening for cognitive impairments have you experienced in your practice?
   Not enough time______
   Unsure of best screening methods_____
   Screening tools too difficult to administer efficiently______
   Not enough staff_____
   Unsure of protocols_____
   Other_________________
   No barriers ______
19. Have you had personal experience of a family member with dementia?
   Yes_____
   No _____

Thank you for your time in completing this survey. Your responses are very important in the development of practice protocols. If you are interested in administering and providing feedback of the screening tools recommended in the practice protocols, please contact me at margaret.mcilwain@bobcats.gcsu.edu. or provide an email address and I will contact you.
Screening for Mild Cognitive Impairment (MCI) in older adults

I. GOAL:
   A. To provide initial screening for early cognitive changes
   B. To monitor cognitive changes in the older adult over time
   C. To monitor treatment response

With the passage of the Affordable Care Act of 2010, a Medicare benefit requires yearly assessment of cognitive functioning in the older adult (Cordell et al., 2013; Patient Protection and Affordable Care Act of 2010). Early screening for MCI is suggested (Borson et al., 2013).

II. Definition:
Mild cognitive impairment (MCI) is described as an intermediate stage of memory disorder, involving more substantial memory and cognitive decline than normal aging changes but less than the onset of dementia symptoms (Defrancesco et al., 2010; Roberts et al., 2008). It is estimated that 12-15% of MCI patients progress yearly to Alzheimer’s Dementia (AD) compared to healthy older adults (Defrancesco et al., 2010; Peterson, Knopman, Boeve, & 2009). MCI represents a significant risk factor for the development of AD. Older adults need to be screened early so that modifiable risk factors can be addressed, underlying conditions that may affect cognition treated, and early referrals can be initiated for appropriate diagnosis (Borson et al., 2013; Roberts et al., 2008).

III. Incidence
The prevalence rate for MCI varies from different population studies. The estimated prevalence of MCI ranges from 3-42% of older adults depending on the definition (Lin, O’Conner, Rossom, Perdue, & Eckstrom, 2013; Ward, Arrighi, Michels, & Cedarbaum, 2012).

IV. Etiology
MCI loss is more cognitive decline than is expected for someone of similar age and does not meet the diagnostic criteria for dementia.

Major subtypes:
   A. Amnestic MCI often converts to AD and has been found to have underlying pathology similar to AD (Markesbery et al., 2006).
   B. Non-Amnestic MCI may have no underlying pathology or be secondary to cerebrovascular disease, Lewy body dementia, frontotemporal dementia. (Parks, Decarli, Jacoby, & Yonelinas, 2010).

V. Clinical Features
A. Memory difficulties, often patients present with complaints of memory loss
B. Disturbance in language such as difficulty in finding appropriate words, naming
C. Disturbance in attention, for example difficulty in following conversations
D. Difficulties in visuospatial skills (disorientation in familiar surroundings)
E. Basic ADLs are intact but patients may have difficulty with more demanding IADLs such as handling finances, driving or shopping (Albert et al., 2011; Aretouli & Brandt, 2010; Gauthier et al., 2006; Wadley, Okonkwo, Crowe, & Ross-Meadows, 2008).

VI. **Screening Tools specific for MCI or Mild neurocognitive Impairment:**
A. MoCA (Montreal Cognitive Assessment) Sensitivity, 90%, specificity 87%, administration time approximately 10 minutes (Nasreddine, Phillips, & Bedirian, 2005).
   Free for use.

B. St. Louis University Mental Status (SLUMS) Sensitivity 92%, specificity 81%, administration time approximately 7 minutes (Tariq, Tumosa, & Chibnall, 2006).
   Free for use.

If MCI screening is positive, assess mental status and screen for depression. Depression is a risk factor for MCI (Blazer, 2009; Gao et al., 2013; Saczynski et al., 2010).

**Suggested screening tool for Depression:** Geriatric Depression Scale, 92% sensitivity 89% specificity (GDS developed by Yesavage et al., 1983).

VII. **Physical Examination**
Corroborate if informant present.
Identify sensory deficits, hearing and vision.
Perform physical exam.

VIII. **Laboratory Studies**
Initial work-up: CBC, B12 level, thiamine, folic acid, thyroid function tests, electrolytes, glucose, BUN/creatinine, liver function tests, U/A. Consider VDRL, HIV, drug screen if risk factors identified (American Geriatrics Society, 2010; Reuben, Herr, Pacala, Pollock, Potter, & Semla, 2011).

IX. **Treatment**
Treat underlying potential causes of cognition changes such as B12 deficiency, anemia, thyroid disease, depression. Treat or refer for identified sensory deficits.

Provide patient education of lifestyle modifications that show some limited benefit:
B. Regular exercise (Liang, Mintun, Fagam, & 2010; Lin et al., 2013; Nagamatsu et al., 2012) Studies report moderate physical exercise such as brisk walking, strength or resistance training, use of exercise machines, aerobics.

C. Cognitive stimulating activities (Hampstead et al., 2008; Lin et al., 2013; Rebok et al., 2014; Stott, & Spector, 2011) Studies suggest mentally stimulating activities such as computer games, computerized memory training, crossword puzzles.

X. **Follow-Up:** Indicated by initial screening, physical examination, treatment of potential causes of cognition changes, and laboratory studies. If any concerns persist, consider neuro-imaging of CT scan of brain or MRI for further evaluation or refer to neurology or memory clinic for early dementia work-up (American Geriatrics Society, 2010).

XI. **Consultation-Referral:** If assessment is positive for MCI after treatment of potential causes, refer to neurology and/or memory clinic for comprehensive neurological evaluation and neuroimaging.

**Resources**

**Recommended Instruments for Assessing Mild Cognitive Impairment (MCI):**
MoCA (Montreal Cognitive Assessment)

St. Louis University Mental Status (SLUMS)

**Recommended Instruments for Assessing Depression in the older adult:**
Geriatric Depression Scale

**References**


Mild Cognitive Impairment (MCI) Screening: MCI Evidence-Based Protocol

**Medicare Annual Wellness Visit**
- History
  - Medical, family, social, medications (OTC, supplements, antihypertensives, pain meds), sleep pattern, consider ETOH and drug history
- Screen for MCI
  - Administer MoCA or SLUMS
    - Concern if MoCA score 25 or less
    - Concern if SLUMS score 21-26
- Physical Exam
  - Assess for sensory deficits
- Initial Diagnostic Work-up:
  - B12, Thiamine, Folate levels, TSH, T4, CBC, electrolytes, Liver function, U/A, glucose
  - Consider VITAMIN D, HbA1c, drug screen if risk factors identified
- **Patient presents or family reports cognitive changes**
- If screen is +
  - Assess mental status
  - Geriatric Depression Scale
- GDS + for Depression treat and re-evaluate mental status in 3-6 months
- MCIScreen negative, evaluate cognitive status next Annual Wellness visit
- Treat any underlying condition and re-evaluate cognitive status
  - If concerns persist, consider MBI or CT of brain or refer to neurology/memory clinic for complete MCI/dementia work-up

McIlwain