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Descriptive and Predictive Characteristics for Mild Cognitive Impairment (MCI) and Functional Cognition: An Evidence-Based Practice Project

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Descriptive and Predictive Characteristics for Mild Cognitive
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An Evidence-Based Practice Project

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Keywords: mild cognitive impairment, mild neurocognitive disorder, functional cognition, occupational therapy, descriptive, predictive, characteristics, risk factors

Table of Contents

Introduction..... 3

- Evidence Based Practice 3
- The EBP Project 3
- The EBP Process 3
- Four EBP Projects: Mild Cognitive Impairment and Functional Cognition 4
- EBP Practical Dilemma: Mild Cognitive Impairment and Functional Cognition..... 4
- Appraisals of Best Evidence, Themes, and Recommendations 5
- References 7

EBP Question 10

Executive Summary 11

- Minnesota Occupational Therapy Association Continuing Education Presentation..... 11
- Themes 16
- Summary and Implications for Practice 20
- Table of EBP Resources 22
- References 25

Appendix A. Initial Appraisals 33

Introduction

Evidence Based Practice

Evidence based practice is defined as the integration of knowledge from professional and clinical expertise, patient/client unique values and circumstances, and best research evidence (Straus, Richardson, Glasziou, & Haynes, 2005). The EBP courses in the St. Catherine University occupational therapy programs emphasizes skill building in finding, analyzing, and synthesizing research.

A definition of Evidence-Based Practice (EBP)



(Straus, Richardson, Glasziou & Haynes, 2005)



The EBP Project

Occupational therapy graduate students at St. Catherine University complete an EBP project in partial fulfillment of the requirements for a course on Evidence-Based Practice.

The EBP Process

- Begins with a practice dilemma
- Dilemma is framed as an EBP question and PICO
P (population/problem) I (intervention) C (comparison group) O (outcome(s) of interest)
- Background learning
- Search for the best evidence
- Initial appraisal and critical appraisal of the evidence
- Summary of themes from the evidence
- Recommendations for practice
- Next steps – implementation in practice

Four EBP Projects: Mild Cognitive Impairment and Functional Cognition

1. Descriptive, predictive, and risk factors
2. Perspectives and experiences
3. Screening and assessment
4. Interventions and programs

EBP Practical Dilemma: Mild Cognitive Impairment and Functional Cognition***Hypothetical EBP Case Related to Mild Cognitive Impairment and Functional Cognition***

Juan is a 75- year old male who has been diagnosed with mild cognitive impairment. Juan is in good general health but his family has noticed problems that are typical of functional cognition impairment. The health care agency you work for has seen a growing number of individuals with this diagnosis and is asking occupational therapy to become involved in program development for this population.

You have been asked to provide an in-service to staff on mild cognitive impairment and functional cognition and assist in the development of an evidence-based program for individuals with mild cognitive impairment. You are asked to gather evidence related to:

- Descriptive, predictive, and risk factors
- Perspectives and experiences on the lived experience
- Screening and assessments
- Interventions and programs

Background Information on Mild Cognitive Impairment and Functional Cognition

Functional cognition has been defined as:

- “how an individual utilizes and integrates his or her thinking and processing skills to accomplish everyday activities in clinical and community living environments” (AOTA, n.d.)
- “fundamental to the performance of complex everyday activities, which are more commonly referred to as instrumental activities of daily living (IADL)” (Wesson et al., 2016)

The occupational therapy lens on functional cognition became more important after the passage of the Centers for Medicare & Medicaid Services (CMS) IMPACT Act. The CMS IMPACT Act requires data collection in the “areas of functional status, cognitive status, falls, and skin integrity” (AOTA, 2015). The American Occupational Therapy Association (AOTA) has advocated that CMS collect data on functional cognition (functional status, cognitive status, and changes in functional and cognitive status) (AOTA, 2015). Recent occupational therapy initiatives related to functional cognition have focused on conducting quantitative and qualitative research on functional cognition, developing performance-based assessments on functional cognition, and developing evidence-based interventions to address functional cognition.

Mild cognitive impairment (MCI) is also known as mild neurocognitive disorder, mNCD, in the DSM 5 (American Psychiatric Association, 2013). The prevalence of mNCD is estimated as low as 6-7% (Sachdev, 2015) and as high as 15-20% (Minnesota Board of Aging, 2019). MCI has been defined as:

- "...changes in cognition exceeds the normal, expected changes related to age" (Mehta, 2018, para. 1)
- "...the interim state of cognition beyond that of the normal aging process, yet not sufficient to warrant a diagnosis of dementia" (Caliendo & Hilar, 2018, para. 1)
- "memory impaired, but otherwise functioning well" (Caliendo & Hilar, 2018, para. 1).

Four primary types of MCI have been proposed: amnesic MCI single domain, amnesic MCI multiple domain, non-amnesic MCI single domain, and non-amnesic MCI multiple domain (Peterson, 2009). The criteria for a diagnosis of MCI include subjective memory complaints, objective memory impairment, normal or preserved general cognition, intact activities of daily living, and no presence of dementia (Caliendo & Hilar, 2018). Additional diagnostic criteria include memory loss, language disturbance, attention deficit, and decreased visuospatial skills (Mehta, 2018).

A number of governmental agencies and national organizations have provided MCI resources and programs, including:

- AARP Brain Health and Wellness <https://www.aarp.org/health/brain-health/>
- CDC Healthy Brain Initiative <https://www.cdc.gov/aging/healthybrain/index.htm>
- NIH Cognitive and Emotional Health Project: The Healthy Brain <https://trans.nih.gov/CEHP/>
- AHRQ Practice Guidelines <https://effectivehealthcare.ahrq.gov/topics/cognitive-decline/research-protocol>
- National Academies of Science, Engineering and Medicine <http://nationalacademies.org/hmd/reports/2017/preventing-cognitive-decline-and-dementia-a-way-forward.aspx>
- Alzheimer's Association https://www.alz.org/alzheimers-dementia/what-is-dementia/related_conditions/mild-cognitive-impairment
- HABIT: Healthy Action to Benefit Independence & Thinking <https://www.cityofroseville.com/2727/Activities>
- What is Brain Health? <https://brainhealth.nia.nih.gov/>
- U of MN Nursing ACT Trial (exercise and cognitive training) <https://www.nursing.umn.edu/act-trial>

Appraisals of Best Evidence, Themes, and Recommendations

After searching and finding evidence available from library databases and alternative sources, students conducted an initial appraisal to evaluate the quality and relevance of the evidence and select the best research for further review. Then they conducted critical appraisals of the best formal reviews of primary research (e.g., systematic reviews, meta-analyses) and/or primary/original research studies using the AOTA CAP form (American Occupational Therapy Association, 2016). One of the steps in the CAP process is to evaluate the strength or level of the research design and the types of conclusions that are possible from each design.

Initial Appraisal

- Quality of the evidence
 - type of evidence
 - research design
 - investigator qualifications
 - journal/publication/website
- Relevance of the evidence
 - PICO

Critical Appraisal

- Reviews of primary research
 - systematic reviews, meta-analysis
 - review process and approach
 - consistent and inconsistent findings
- Primary research studies AOTA CAP
 - Level 1: randomized controlled trials
 - Level 2: two groups, nonrandomized/cohort and case control
 - Level 3: nonrandomized, pretest/posttest and cross-sectional
 - Level 4: single subject
 - Level 5: case report

After completing initial and critical appraisals, themes are summarized related to the EBP question and other findings that emerged from the evidence. Recommendations for practice and reflection on participating in an EBP project are identified in the conclusions.

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All EBP Projects are available at <http://sophia.stkate.edu/>.

EBP Question

What are the descriptive and predictive characteristics of individuals, groups, or populations who have or are most at risk for mild cognitive impairment and problems with functional cognition?


Executive Summary
Minnesota Occupational Therapy Association Continuing Education Presentation

Descriptive and Predictive Factors with Mild Cognitive Impairment

Ali Baumgartner, Chelsea Benitz, Jessica Bosacker, Adriel Fredrickson, Tara Grandolfo, Kira Hinz, Alex Jaenke, Lauren Klugherz, Calli Marg

EBP Question

What are the descriptive or predictive characteristics of individuals, groups or populations who have or are most at risk for mild cognitive impairment and problems with functional cognition?



Background Learning



- ⊙ **Mild cognitive impairment (MCI)** is cognitive decline greater than what is expected from normal aging, but not severe enough to be classified as dementia (Mayo Clinic, 2019).
- ⊙ Individual's diagnosed with MCI are at **greater risk to develop Alzheimer's** or another form of dementia, more commonly seen in older adults (Alzheimer's Association, 2019).
- ⊙ MCI can be classified as **amnesic and non-amnesic**. Further classification as single domain or multiple domains, based on how many cognitive impairments experienced (ACC, 2019).
- ⊙ The U.S Food and Drug Administration (FDA) has **not approved any medications** to treat MCI (Alzheimer's Association, 2019).

Examples of Evidence Resources

Governmental & Major Foundations	Alzheimer's Association, CDC, NIA
OT Specific Resources	American Occupational Therapy Association (AOTA), OT Seeker, American Journal of Occupational Therapy (AJOT)
Interprofessional Journals, Databases, Professional Associations	Medscape, University of Michigan Medicine, Mayo Clinic


Examples of Search Process

- ⊙ **Databases Used:**
 - PsychINFO, SumSearch, PubMed, ScienceDirect, Ebsco, Google Scholar, and CINAHL
- ⊙ **Most helpful search strategies:**
 - Mesh Terms, specific keywords, filters, author tracking, using reference list
- ⊙ **Most helpful keywords:**
 - Mild cognitive impairment, functional cognition, older adult, memory, risk factors, definitions, prevalence, incidence, cognitive decline, amnesic and nonamnesic, comorbid diseases

Initial Appraisal of Best Evidence

- ⊙ **Primary Research Studies**
 - 29 articles
- ⊙ **Reviews of Primary Research**
 - 14 articles
- ⊙ **Conceptual/Theoretical Articles**
 - 2 articles



Overview of Critical Appraisals of Best Evidence

Critical Appraisal Papers (CAPs)


- ③ The Financial Burden and Health Care Utilization Patterns Associated with Amnestic Mild Cognitive Impairment (Troyer et al., 2017)
- ③ Everyday Functioning in Mild Cognitive Impairment and its Relationship with Executive Cognitive (Arentz & Borrie, 2016)
- ③ Executive Function and Instrumental Activities of Daily Living in Mild Cognitive Impairment and Alzheimer's Disease (Marshall et al., 2011)



Overview of Critical Appraisals of Best Evidence

Critical Appraisal Papers (CAPs) Continued

- ③ Early Functional Limitations in Cognitively Normal Older Adults Predict Diagnostic Conversion to Mild Cognitive Impairment (Farias et al., 2017)
- ③ Association of Body Mass Index with Amnestic and Non-amnestic Mild Cognitive Impairment Risk in Elderly (Wang et al., 2017)
- ③ Engagement in Instrumental Activities of Daily Living, Social Activities, and Use of Everyday Technology in Older Adults with and without Cognitive Impairment (Nygård & Kottorp, 2014)



Overview of Critical Appraisals of Best Evidence

Reviews of Primary Research

- ③ Sex Differences in the Prevalence and Incidence of Mild Cognitive Impairment: A Meta-Analysis (Wu et al., 2017)
- ③ The Impact of Mild Cognitive Impairment on Gait and Balance: A Systematic Review and Meta-Analysis of Studies Using Instrumented Assessment (Bahureksa et al., 2017)
- ③ The Diagnosis and Management of Mild Cognitive Impairment: A Clinical Review (Langa & Litwin, 2016)



Critical Appraisal 1 and 2:

<p>Everyday Functioning in Mild Cognitive Impairment and its Relationship with Executive Cognition</p> <ul style="list-style-type: none"> • Does performance on daily activities and cognitive tasks change between the normal cognition and the MCI levels? • This study suggests that people with all type of MCI have impairments in functional abilities and those with multiple domain MCI have greater impairment compared to single domain MCI. <p>(Aretouli & Brandt, 2010)</p>	<p>Early Functional Limitations in Cognitively Normal Older Adults Predicts Diagnostic Conversion to Mild Cognitive Impairment</p> <ul style="list-style-type: none"> • Do early functional limitations in cognitively normal older adults indicate a risk for later developing MCI? • Slight decline in task performance relying on memory and executive function may indicate cognitive decline to MCI and be a reason that performance of functional tasks has changed. <p>(Farias et al., 2017)</p>
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Critical Appraisal 3 and 4:

<p>Executive Function and Instrumental Activities of Daily Living in Mild Cognitive Impairment and Alzheimer's Disease</p> <ul style="list-style-type: none"> • What is the relationship between executive function and IADL performance in individuals with MCI, mild AD, and using those with normal cognition as a control group? • Results suggest that executive dysfunction is a key contributor to impairment in IADL performance in individuals with MCI. <p>(Marshall et al., 2011)</p>	<p>Engagement in Instrumental Activities of Daily Living, Social Activities, and Use of Everyday Technology in Older Adults with and without Cognitive Impairment</p> <ul style="list-style-type: none"> • Do those with MCI show a decrease in participation of Instrumental Activities of Daily Living (IADL) and social as compared to those without cognitive function issues, and if so which IADL are showing highest decrease in participation? • Results show that some with MCI have decreased participation in IADLs, especially in areas of outdoor activities and in areas with complicated everyday technology (ET) involved. (Nygård & Kottorp, 2014)
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Critical Appraisal 5 and 6:

<p>The Impact of Mild Cognitive Impairment on Gait and Balance: A Systematic Review and Meta-Analysis of Studies Using Instrumented Assessment</p> <ul style="list-style-type: none"> • Can instrumented assessment of gait and balance parameters discriminate clinically confirmed MCI from cognitively intact adults? • MCI adversely affects gait and balance. These early cognitive changes affects postural control and puts patients at increased risk of balance failures and falls <p>(Bahureksa et al., 2017)</p>	<p>Association of Body Mass Index with Amnestic and Non-Amnestic Mild Cognitive Impairment Risk in Elderly</p> <ul style="list-style-type: none"> • Can BMI be a risk factor for developing aMCI or naMCI? • Results suggest that being underweight only increased the risk of aMCI. Being overweight, obese, or gaining weight increased the risk for both aMCI and naMCI. Those individuals who were overweight or obese, and lost weight, reduced their risk of developing MCI. <p>(Wang et al., 2017)</p>
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Critical Appraisal 3 and 4:

Executive Function and Instrumental Activities of Daily Living in Mild Cognitive Impairment and Alzheimer's Disease

- What is the relationship between executive function and IADL performance in individuals with MCI, mild AD, and using those with normal cognition as a control group?
- Results suggest that executive dysfunction is a key contributor to impairment in IADL performance in individuals with MCI.

(Marshall et al., 2011)

Engagement in Instrumental Activities of Daily Living, Social Activities, and Use of Everyday Technology in Older Adults with and without Cognitive Impairment

- Do those with MCI show a decrease in participation of Instrumental Activities of Daily Living (IADL) and social as compared to those without cognitive function issues, and if so which IADL are showing highest decrease in participation?
- Results show that some with MCI have decreased participation in IADLs, especially in areas of outdoor activities and in areas with complicated everyday technology (ET) involved. (Nygård & Kottorp, 2014)

Critical Appraisal 5 and 6:

The Impact of Mild Cognitive Impairment on Gait and Balance: A Systematic Review and Meta-Analysis of Studies Using Instrumented Assessment

- Can instrumented assessment of gait and balance parameters discriminate clinically confirmed MCI from cognitively intact adults?
- MCI adversely affects gait and balance. These early cognitive changes affects postural control and puts patients at increased risk of balance failures and falls (Bahureksa et al., 2017)

Association of Body Mass Index with Amnestic and Non-Amnestic Mild Cognitive Impairment Risk in Elderly

- Can BMI be a risk factor for developing aMCI or naMCI?
- Results suggest that being underweight only increased the risk of aMCI. Being overweight, obese, or gaining weight increased the risk for both aMCI and naMCI. Those individuals who were overweight or obese, and lost weight, reduced their risk of developing MCI. (Wang et al., 2017)

Critical Appraisal 7 and 8:


Sex Differences in the Prevalence and Incidence of Mild Cognitive Impairment: A Meta-Analysis

- Are there sex differences in amnestic MCI that compare to the patterns of difference in non-amnestic MCI?
- Sex differences were found for non-amnestic MCI, more common in women. Early screening and detection can prevent or slow the progression to AD. Thus giving the individual a longer life of functional occupational performance. (Au et al., 2017)

The Financial Burden and Health Care Utilization Patterns Associated with Amnestic Mild Cognitive Impairment

- How do costs and finances affect individuals with aMCI?
- Progression to AD could cause a more significant financial burden on this population because of the relationship between MCI diagnosis and low socioeconomic status. (Ton et al., 2017)

Critical Appraisal 9:



<https://www.med.cabwustoday.com/articles/315-123.pdf>

The Diagnosis and Management of Mild Cognitive Impairment: A Clinical Review

- What evidence has been presented on the diagnosis, treatment, prognosis, and guidelines for care of MCI?
- Implications of cognitive decline and MCI are important to consider and will require that healthcare providers be skilled in detecting and managing these conditions. (Langa & Levine, 2014)

Theme 1: Descriptors of MCI

- ⊙ A review of the literature examined sex differences, domains or types, and prevalence of mild cognitive impairment.
- ⊙ MCI can include a decline in memory, thinking, judgement, and language (Nehme's Association, 2020; Mayo Clinic, 2021)
- ⊙ Two major types of MCI: (Au et al., 2017; University of Michigan Medicine, 2019)
 - amnestic: affects memory
 - non-amnestic: affects thinking, more commonly diagnosed in women
- ⊙ 10-20% of individuals 65 and older experience MCI (Langa & Levine, 2014)

Theme 2: Predictive Characteristics

- ⊙ Predictive characteristics of MCI include physical and cognitive impairments, and low SES.
- ⊙ MCI is associated with a decline in gross motor functioning that impacts an individual's ability to balance, ambulate, and control posture, which increases fall risk (Bahureksa et al., 2017)
- ⊙ Decline of cognitive skills
 - Slow, linear: immediate recall, visuo-spatial
 - Stable, to steep decline: delayed recall, spacial & working memory
- ⊙ A relationship was found between MCI diagnosis and low socioeconomic status (Ton et al., 2017)

Theme 3: Modifiable Risk Factors

There are several modifiable and non-modifiable factors that impact the risk of developing mild cognitive impairment (MCI) and the progression from MCI to Alzheimer's Disease (AD).

Modifiable factors include:

<ul style="list-style-type: none"> ⊙ Metabolic syndrome ⊙ Amount and types of medications an individual may take 	<ul style="list-style-type: none"> ⊙ BMI ⊙ Low level of education ⊙ Vascular conditions (i.e. diabetes, stroke, CHD, hypertension)
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(Carroll & Turkheimer, 2018; Han et al., 2017; Langa & Levine, 2014; Parkrats et al., 2015; Ratti, Tang, Marik, Meenan, & Luchinger, 2017; Wang et al., 2017)

Theme 3 Continued: Non-Modifiable Risks & Risk Reduction

Non-Modifiable Factors include:

- ⊙ Gender
- ⊙ Age
- ⊙ Stroke
- ⊙ Prior critical illness (i.e. sepsis)
- ⊙ Allele composition (Langa & Levine, 2014; Wang et al., 2017)




https://www.sciencephoto.com/visuals/1046494/stock-photo-of-people-exercising-together-in-a-gym-14-140

Risk Reduction:

- ⊙ Aerobic Exercise
- ⊙ Prevention of modifiable comorbid conditions
- ⊙ Increased Mental Activity (Carroll & Turkheimer, 2018; Langa & Levine, 2014; Ratti et al., 2017; Wang et al., 2017)

Theme 4: Impact on IADLs

Frequency and Quality of IADL performance can be impacted by MCI.



https://www.shutterstock.com/visual/elderly-people

- ⊙ MCI impacts the frequency of participation and performance in IADLs (Rajarat & Kottorp, 2014)
 - Less participation in social engagements and in IADLs that require higher cognitive capacity (Aretouli & Brandt, 2010; Nygård & Kottorp, 2014)
- ⊙ Those with MCI and executive function problems exhibited lower performance more frequently (Aretouli & Brandt, 2010; Marshall et al., 2011)
- ⊙ Diagnostic definition needs to be challenged; Health professional more aware of earlier decline

Considerations for OT and Interprofessional Programs

- ⊙ MCI impacts **gross motor functioning**, which impairs an individual's ability to balance, ambulate, postural control, and IADL performance.
- ⊙ Individuals with MCI often exhibit challenging behaviors.
- ⊙ An individual may struggle with sequencing and timing tasks due to **memory impairments** and may also experience decreased participation in IADLs.

Summary and Reflection

- ⊙ By finding the most current and quality evidence, we are better equipped to provide high-quality care for our clients.
- ⊙ Modifiable risk factors, such as BMI and hypertension can play an important role in reducing the risk of MCI.
- ⊙ There is a need for more research in the field of MCI and functional cognition to gain a better understanding of the descriptive and predictive factors.

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Themes

Introduction

The themes identified general characteristics of mild cognitive impairment (MCI), predictive factors associated with MCI, modifiable and non-modifiable risk factors, and functional cognition and instrumental activities of daily living.

General Characteristics of Mild Cognitive Impairment

A review of the literature examined sex differences, domains or types, and prevalence of mild cognitive impairment. Mild cognitive impairment (MCI) is defined as cognitive decline that is greater than what is expected from normal aging, but is not as severe as the decline associated with dementia. MCI can include a decline in memory, language, thinking, and judgement (Alzheimer's Association, 2019; Mayo Clinic, 2019). Studies show 10%-20% of individuals 65 and older experience MCI (Langa & Levine, 2014). Similarly, individuals with lower education, lower SES, single marital status, poor functional status, heart disease, or stroke are more at risk to be diagnosed with MCI (Ton et al., 2017). Additionally, these populations often experience irritability and aggression, anxiety, and apathy (Mayo Clinic, 2019). The two major types of MCI include amnesic, which affects memory, and nonamnesic, which affects memory and thinking ability and is more commonly diagnosed among women when compared to men (Au et al., 2017; University of Michigan Medicine, 2019).

Predictive Factors Associated with Mild Cognitive Impairment

Predictive characteristics of MCI include physical and cognitive impairments, and low socioeconomic status (SES). MCI is associated with a decline in gross motor functioning that impacts an individual's ability to balance, ambulate, and control posture, which increases fall risk (Bahureksa et al., 2017). Cognitively, individuals with MCI may have a decreased understanding of their health status and finances (Han, Boyle, James, Yu, & Bennett, 2015). According to a systematic review, 15-20% of MCI cases show improved cognition after diagnosis, however the remaining cases are at risk for future cognitive decline including progression to AD. (Langa & Levine, 2014). Progression to AD could cause a more significant financial burden on this population because of the relationship between MCI diagnosis and low SES (Ton et al., 2017). It is important for clinicians and other health professionals to be able to recognize slight declines in performance of tasks that rely on memory and executive function because it may indicate cognitive decline (Farias et al., 2017). The nature of MCI decline varies for different cognitive domains. Cognitive skills such as immediate recall, visuo-spatial abilities, and inhibition tend to have a slower, linear decline while delayed recall, spatial memory, and working memory may stay stable, but then quickly decline during the change from normal cognition to MCI (Baumgart et al., 2015). However, it should be noted that individuals with MCI who manage comorbid conditions have an increased chance of reverting back to normal cognition if they are of younger age when diagnosed, have more years of education, higher baseline cognitive function, and diagnosed with non-amnesic single type MCI (Langa & Levine, 2014).

Modifiable and Non-Modifiable Risk Factors

There are several modifiable and non-modifiable factors that impact the risk of developing mild cognitive impairment and the progression from MCI to Alzheimer's Disease

(AD). Risk factors that are linked to MCI are similar to the risk factors of AD (Alzheimer's Association, 2019). Some modifiable factors include BMI, metabolic syndrome (Langa & Levine, 2014; Wang et al., 2017), lower education level (Carroll & Turkheimer, 2018; Han et al., 2017; Langa & Levine, 2014;), Vitamin D deficiency, sleep-disordered breathing, prior critical illness (e.g., sepsis) (Langa & Levine, 2014), the amount of medication taken, and memory complaints (Pankratz et al., 2015). Additional modifiable factors include vascular conditions such as diabetes, coronary heart disease, stroke, and hypertension (Langa & Levine, 2014; Wang et al., 2017; Reitz, Tang, Manly, Mayeux, & Luchsinger, 2007). Several studies addressed ways to reduce the risk of MCI and the progression to AD, such as higher education level, higher cognitive ability, hypertension prevention and treatment, and aerobic exercise (Langa & Levine, 2014; Carroll & Turkheimer, 2018; Reitz et al., 2007; Wang et al., 2017). Some non-modifiable factors include age, gender, and allele composition (Langa & Levine, 2014; Wang et al., 2017). The Apolipoprotein E (APOE) e4 allele is a risk factor for progression to AD, and progression from normal cognition to MCI (Langa & Levine, 2014; Wang et al., 2017).

Functional Cognition and Instrumental Activities of Daily Living

A review of the literature indicated that the frequency and quality of performance of IADLs is impacted in individuals with MCI. Current diagnostic criteria for identifying those with MCI assumes that IADLs of those with MCI are virtually intact; however, research indicates that MCI does, in many individuals, impact the frequency of participation in many IADLs as well as how well they are performed (Nygård & Kottorp, 2014). As compared to those who do not show cognitive impairment, studies show that frequency of participation in social engagements is decreased in those with MCI along with both indoor and, especially, outdoor IADLs (Nygård & Kottorp, 2014). IADLs that require high cognitive capacity, such as handling appointments,

keeping track of belongings, and managing finances and medication, are shown to have less participation and increased difficulty with completion (Aretouli & Brandt, 2010). While not everyone with MCI shows these deficits, individuals with executive dysfunction and those with multiple domain MCI exhibited these characteristics more frequently (Aretouli & Brandt, 2010; Marshall et al., 2011).

Summary and Implications for Practice

The research showed several factors that impact the risk of developing MCI. It is important to know these to determine who may be at greatest risk and in what ways a proactive approach can be taken. Some of these risk factors are modifiable, so recognizing what lifestyle changes can be made, such as managing weight or hypertension, can play an important role in reducing the risk of MCI. Additionally, some predictive characteristics may include a disruption of physical or cognitive capabilities and having a low SES. The frequency and quality of performance of IADLs may also be impacted in individuals with MCI.

For clinical practice, it is important for healthcare professionals to notice slight declines in performance that require memory, attention, and executive functioning. These symptoms may indicate cognitive decline and require further investigation. Additionally, it is important to notice cognitive decline in individuals without a diagnosis of MCI or dementia in order to make appropriate referrals if needed. After detection of MCI by a medical doctor, intervention should be implemented as soon as possible to increase an individual's chance to revert back to normal cognition and to decrease progression to a form of dementia such as Alzheimer's Disease (AD). Financially, individuals with moderate and severe AD spend significantly more on medical expenses than those with an MCI. Therefore, it is essential to proactively treat an MCI so that clients and the healthcare system do not face the financial burden that comes with AD.

Implications for occupational therapists working with individuals with MCI include a need to be aware of decline in gross motor functioning that impacts individuals' ability to balance, ambulate, control posture, and complete IADLs. Interventions for individuals with MCI should not only just include cognitive activities but also physical supports. Furthermore, it is important to understand that many individuals with MCI often experience irritability, aggression,

anxiety, and apathy. This is applicable when intervening with a client in a treatment session to know how they may react to challenges. Lastly, it is important to know that an individual may struggle with sequencing and timing tasks because they may have memory impairments, therefore an occupational therapist should take this into consideration when planning treatment interventions. This is a prime example of when an occupational therapist should utilize the “just right challenge,” which takes into consideration the client’s strengths and areas of need.

A strength of current research is that it has brought attention to the importance of recognizing and diagnosing MCI as early as possible so it can be managed in a way that controls its progression. Additionally, knowing risk factors that have been uncovered by research, health professionals and the general public can pay special attention to the modifiable factors that put a person at risk of developing MCI. A limitation to current evidence on our PICO topic is that there is an imbalance of research on aMCI and nMCI. There was often too small of a sample size to determine a meaningful difference between the types. Furthermore, there is limited information that draws a defined line between similarities and differences between these two types. On the other hand, there are also many research articles that do not specially identify whether they are investigating specifically aMCI or nMCI, which can lead readers to false assumptions or inconclusiveness. There is also a need for future research to be conducted to determine a standard treatment plan for individuals who are diagnosed with MCI.

As occupational therapists, it is essential to be aware of the differences in domains and risk factors associated with MCI. By understanding the risk factors and domains of MCI, we are more equipped to identify cognitive changes and the impact on occupational performance and participation.

Table of EBP Resources

Table 1.

Governmental and Foundation Resources that Address Mild Cognitive Impairment/Functional Cognition

Title/Name	Brief Description	Source
Alzheimer's Association	Mild cognitive impairment (MCI) Includes mild cognitive impairment (MCI) information, causes and risks, symptoms, treatment, and diagnosis. https://www.alz.org/alzheimers-dementia/what-is-dementia/related-conditions/mild-cognitive-impairment?utm_source=google&utm_medium=paidsearch&utm_campaign=google_grants&utm_content=types_of_dementia&gclid=EA1aIQobChMI67vwzdyn4AIViIbACh3KZwzJEAA YASAAEgLQyfD_BwE	Alzheimer's Association https://www.alz.org/
Mayo Clinic	Includes mild cognitive impairment symptoms, causes, diagnosis, and treatment. https://www.mayoclinic.org/diseases-conditions/mild-cognitive-impairment/symptoms-causes/syc-20354578	Mayo Clinic https://www.mayoclinic.org/
University of Michigan Medicine	Includes a definition of mild cognitive impairment, diagnosis, symptoms, prognosis, and treatment options. https://www.uofmhealth.org/brain-neurological-conditions//mild-cognitive-impairment	University of Michigan Medicine https://uofmhealth.org
Medline Plus Mild Cognitive Impairment	Mild cognitive impairments (MCI) Gives summary and links to diagnosis/testing, prevention/risk, related issues, statistics/research, clinical trials, journal articles, patient handouts, and expert opinions. https://medlineplus.gov/mildcognitiveimpairment.html	Medline Plus https://medlineplus.gov/
National Institute on Aging	What is Mild Cognitive Impairment? Includes definition, symptoms, and diagnosis of MCI. Also includes a personal story of a person living with MCI. https://www.nia.nih.gov/health/what-mild-cognitive-impairment	National Institute on Aging https://www.nia.nih.gov

Table 2.

Occupational Therapy Resources that Address Mild Cognitive Impairment and Functional Cognition

Title	Brief Description	Source
Canadian Journal of Occupational Therapy	Described as “providing a forum for leading-edge occupational therapy scholarship that advances theory, practice, research, and policy” https://journals.sagepub.com/doi/pdf/10.1177/000841749306000304	Canadian Journal of Occupational Therapy https://journals.sagepub.com/home/cjo
AJOT: American Journal of Occupational Therapy	Official publication of AOTA Publishes peer reviewed research for occupational therapists to use best practice https://ajot.aota.org/article.aspx?articleid=2247276&resultClick=3	AJOT: American Journal of Occupational Therapy https://www.ajot.aota.org
American Occupational Therapy Association	Described as representing “the interests and concerns of occupational therapy practitioners and students of occupational therapy and to improve the quality of occupational therapy services” https://www.aota.org/Advocacy-Policy/Federal-Reg-Affairs/Medicare/Guidance/role-OT-assessing-functional-cognition.aspx	American Occupational Therapy Association https://www.aota.org
The American Occupational Therapy Foundation	Described as “building knowledge to support evidence-based occupational therapy” https://www.aotf.org/About-AOTF/BioDetail/functional-cognition	The American Occupational Therapy Foundation https://www.aotf.org
The Occupational Therapy Journal of Research	International journal with peer-reviewed articles about occupational therapy.	The American Occupational Therapy Foundation https://journals.sagepub.com/oc/otjb/current

Table 3.

Interdisciplinary Journals, Databases, Professional Associations that Address Mild Cognitive Impairment and Functional Cognition

Title	Brief Description	Source
The Lancet	The Lancet is a weekly peer-reviewed general medical journal. It is prestigious and a well-known general medical journal	https://www.thelancet.com/
The American Journal of Alzheimer's Disease & Other	The American Journal of Alzheimer's Disease & Other is a peer-reviewed journal related to dementia and neurology. It is published by SAGE Publications.	https://journals.sagepub.com/home/aja
Medline	This database is comprised of thousands of peer-reviewed journals pertaining to biomedical topics.	https://web.a.ebscohost.com/ehost/search/advanced?vid=0&sid=aa1c3a8b-d0ab-435e-83b4-a3517ed4e296%40sdc-v-sessmgr01
PsycINFO - American Psychological Association	This database provides literature from the field of psychology.	https://www.apa.org/pubs/databases/psycinfo/index
CINAHL Nursing Journal Databases	An index of journal articles about nursing, allied health, biomedicine, and healthcare	https://www.ebscohost.com/nursing/products/cinahl-databases

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Appendix A. Initial Appraisals

Type of article	Overall Type: Primary Research Study Specific Type: Descriptive
APA Reference	Gutman, A.S., Amarantos, K., Berg, J., Aponte, M., Gordillo, D., Rice, C.,...Schluger, Z. (2018). Home safety fall and accident risk among prematurely aging, formerly homeless adults. <i>American Journal of Occupational Therapy</i> , 72, 1-9. doi:10.5014.2018.028050
Abstract	“OBJECTIVE. Homelessness prematurely ages people. A large subgroup of formerly homeless adults between ages 40 and 64 yr have health conditions similar to or worse than people categorized as elderly. Little is known about the impact of this group’s chronic health conditions on their ability to safely function in supportive housing. METHOD. Home safety visits were carried out with 25 formerly homeless adults, ages 40–64 yr, now residing in supportive housing. RESULTS. Participants had physical, cognitive, and mental health problems that significantly interfered with their ability to perform daily life skills, safely function in an apartment, and manage chronic health conditions. Home safety hazards included cluttered walking paths, the presence of steps, and the lack of grab bars and nonskid flooring. CONCLUSION. The homeless population would benefit from aging specialists, such as occupational therapists, who could help people to maintain and function more safely in their homes. Without such services, this population may be at risk for home safety events leading to hospitalization and mortality.” (p. 1)
Author	Credentials: PhD, OTR, FAOTA Position and Institution: Professor of Rehabilitation and Regenerative Medicine, Programs in Occupational Therapy, Columbia University Medical Center Publication History in Peer-Reviewed Journals: moderate
Publication	Type of publication: scholarly Publisher: American Journal of Occupational Therapy (AJOT) Other: Official journal of AOTA
Date and Citation History	Date of publication: 2018 Google Scholar Cited By: 876 (does not directly relate to MCI, but instead the scope of OT in general)
Stated Purpose or Research Question	“The purpose of this study was to assess the home safety of 25 formerly homeless adults who reside in supportive housing and are age 40 or older” (p. 2)
Author’s Conclusion	“Although the 25 participants in this study had a mean age of 57.64, the amount and severity of their health concerns more closely resembled those of adults age 65 and older—a finding that supports the literature suggesting that homelessness highly correlates with premature aging” (p. 6)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Moderate Rationale: I feel that the literature review used to create the study more closely relates to our PICO question because it discusses the effect on cognition and how homelessness can be a risk factor for decreased cognition. However, the study itself does not pertain to the PICO question.
Overall Quality of Article	Overall Quality of Article: Good Rationale: I feel this article is good, due to the combination of the authors credentials, amount of times she’s been cited, date of publication, and the publisher. She has many quality credentials and was published in other academic journals. Her work consistently pertains to the field of occupational therapy, so she’s not changing subjects frequently.

Type of article	Overall Type: Primary Research Specific Type: Cross Sectional
APA Reference	Ton, T.G.N., DeLeire, T., May, G.S., Hou, N., Tebeka, G.M., Chen, E., & Chodosh, J. (2017). The financial burden and health care utilization patterns associated with amnesic mild cognitive impairment. <i>Alzheimer's & Dementia</i> , 13, 217-224. doi:10.1016/j.jalz.2016.08.009
Abstract	“Introduction: Individuals with amnesic mild cognitive impairment (aMCI) are at elevated risk of developing Alzheimer’s disease (AD) dementia. Methods: With data from the Aging, Demographics, and Memory Study, we used the Clinical Dementia Rating Sum of Boxes classifications to conduct a cross-sectional analysis assessing the relationship between cognitive state and various direct and indirect costs and health care utilization patterns. Results: Patients with aMCI had less medical expenditures than patients with moderate and severe AD dementia (P .001) and were also significantly less likely to have been hospitalized (P 5.04) and admitted to nursing home (P .001). Compared to individuals with normal cognition, patients with aMCI had significantly less household income (P 5 .018). Discussion: Patients with aMCI had lower medical expenditures than patients with AD dementia. Poor cognitive status was linearly associated with lower household income, higher medical expenditures, higher likelihood of nursing and home care services, and lower likelihood of outpatient visits.” (p. 217)
Author	Credentials: PhD Position and Institution: Precision Health Economics, Los Angeles, CA Publication History in Peer-Reviewed Journals: low
Publication	Type of publication: scholarly Publisher: Alzheimer’s & Dementia Other: Official journal of the Alzheimer’s Association
Date and Citation History	Date of publication: 2017 Google Scholar Cited By: 7 related to cognitive decline
Stated Purpose or Research Question	“This study seeks to add to the literature on the various costs and health care utilization patterns of those patients in comparison to cognitively normal and patients diagnosed with AD” (p. 217)
Author’s Conclusion	“The households of individuals with aMCI or AD dementia face increasing financial burden through two pathways. These findings, along with the findings that this financial burden is associated with cognitive status, suggest that early identification of aMCI can assist individuals in planning for current and future financial burden associated with AD” (p. 223)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Strong Rationale: One aspect of our PICO question relates to how the government should be concerned about MCI. I think the study performed provides good background information for addressing how the government could get involved in the assistance for people with MCI.
Overall Quality of Article	Overall Quality of Article: Good Rationale: The date of the article is fairly recent, leading me to believe it is accurate information. The author also has impressive credentials, and has been cited in other work related to cognitive decline. The publisher is a trusted scholarly source.

Type of article	Overall Type: Review of Research Studies Specific Type: Literature review
APA Reference	Carroll, S. & Turkheimer, E. (2018). Midlife risk factors for late-life cognitive decline. <i>Developmental Review</i> , 48, 201-222. doi:10.1016/j.dr.2018.01.001
Abstract	“Cognitive aging is a distinct process of gradual change in cognitive function throughout the lifespan, with the most pronounced decline occurring in memory and reaction time during old age (Blazer, Yaffe, & Karlawish, 2015). A multitude of factors in midlife predict subsequent cognitive decline. This paper reviews research from five areas of midlife functioning that are associated with late-life cognitive impairment, ranging from mild decline to clinical manifestations of dementia. Within each area, risk and protective factors are discussed, and particular emphasis is placed on the ways in which these factors interact with the APOE genotype, a well- validated risk factor for cognitive decline (Poirier et al., 1993).” (p. 201)
Author	Credentials: PhD Position and Institution: Department of Psychology, University of Virginia Publication History in Peer-Reviewed Journals: low
Publication	Type of publication: Scholarly Publisher: Developmental Review Other: Journal for cognition and behavior articles
Date and Citation History	Date of publication: 2018 Google Scholar Cited By: 0
Stated Purpose or Research Question	“The focus of this review is on midlife risk factors that predict cognitive decline decades later. Because cognitive decline is best characterized as part of the normal aging process, we primarily review longitudinal studies of cognitive aging samples of healthy adults, though we also discuss research in which mild cognitive impairment and late-onset Alzheimer’s disease are included as outcomes” (p. 201)
Author’s Conclusion	“The five domains of midlife functioning discussed in this paper predict cognitive performance decades later. While some risk and protective factors independently predict performance, others interact with the APOE genotype to shape cognitive change in old age, ranging from mild, age-related declines in fluid abilities to clinical impairments resulting from dementia” (p. 222)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Strong Rationale: This article analyzes the characteristics that can predict whether individuals will experience cognitive decline later in life. The main focus of our PICO question are the descriptive and predictive characteristics of people who experience MCI, so there is a direct connection.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: Due to the lack of citations and low publications of the author I am questioning how credible the article is. The date is very recent, however I have never heard of the publishing journal before. Otherwise, the content appears to be reliable and valid.

Type of article	Overall Type: Review of Research Articles Specific Type: Meta-Analysis
APA Reference	Au, B., Dale-McGrath, S., & Tierney, C.M. (2017). Sex differences in the prevalence and incidence of mild cognitive impairment: A meta-analysis. <i>Ageing Research Reviews</i> , 35, 176-199. doi:10.1016/j.arr.2016.09.005
Abstract	<p><i>Objective:</i> More women have Alzheimer's disease (AD) than men. Understanding sex differences in mild cognitive impairment (MCI) may further knowledge of AD etiology and prevention. We conducted a meta-analysis to examine sex differences in the prevalence and incidence of MCI, which included amnestic and non-amnestic subtypes.</p> <p><i>Method:</i> Systematic searches were performed in July 2015 using MEDLINE/PubMed, Scopus, and PsycINFO for population-or community-based studies with MCI data for men and women. Random-effects model were used.</p> <p><i>Results:</i> Fifty-six studies were included. There were no statistically significant sex differences in prevalence or incidence of amnestic MCI. There was a significantly higher prevalence ($p=0.038$), but not incidence, of non-amnestic MCI among women. There were no sex differences in studies that combined Epidemiology both subtypes of MCI.</p> <p><i>Conclusion:</i> The only statistically significant finding emerging from this study was that women have a higher prevalence of non-amnestic MCI. To better understand sex differences in the preclinical stages of dementia, studies must better characterize the etiology of the cognitive impairment." (p. 176)</p>
Author	Credentials: Master of Science (MSc) Position and Institution: Primary Care Research Unit, Sunnybrook Health Sciences Centre Publication History in Peer-Reviewed Journals: moderate
Publication	Type of publication: Scholarly Publisher: Ageing Research Reviews Other: Publishing aging related research
Date and Citation History	Date of publication: 2017 Google Scholar Cited By: 68
Stated Purpose or Research Question	"We conducted a meta-analysis to examine sex differences in the prevalence and incidence of MCI, which included amnestic and non-amnestic subtypes" (p. 176)
Author's Conclusion	"We did not observe any significant sex differences in the prevalence or incidence of MCI when amnestic and non-amnestic subtypes were combined. The results of our meta-analysis showed that there was a lower prevalence of non-amnestic MCI among men, which corresponds to a higher prevalence among women" (p. 196)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Strong Rationale: Our PICO is directly related to prevalence and incidence in correspondence with characteristics. I think gender is an important factor when considering who could be or is at most risk for developing MCI.
Overall Quality of Article	Overall Quality of Article: Good Rationale: The publish date is within the past 5 years, leading me to believe the information is current. The author has good credentials from a reliable institution and has other publications related to the field of mild cognitive impairment.

Type of article	Overall Type: Review of Research Articles Specific Type: Evidence Review
APA Reference	Kilian, J. & Kitazawa, M. (2018). The emerging risk of exposure to air pollution on cognitive decline and Alzheimer's disease: Evidence from epidemiological and animal studies. <i>Biomedical Journal</i> , 41, 141-162. doi:10.1016/j.bj.2018.06.001
Abstract	"As incidence of Alzheimer's disease (AD) and other neurodegenerative diseases rise, there is increasing interest in environmental factors which may contribute to disease onset and progression. Air pollution has been known as a major health hazard for decades. While its effects on cardiopulmonary morbidity and mortality have been extensively studied, growing evidence has emerged that exposure to polluted air is associated with impaired cognitive functions at all ages and increased risk of AD and other dementias in later life; this association is particularly notable with traffic related pollutants such as nitrogen dioxide, nitrous oxide, black carbon, and small diameter airborne solids and liquids known as particulate matter. The exact mechanisms by which air pollutants mediate neurotoxicity in the central nervous system (CNS) and lead to cognitive decline and AD remain largely unknown. Studies using animal and cell culture models indicate that amyloid-beta processing, antioxidant defense, and inflammation are altered following the exposure to constituents of polluted air. In this review, we summarize recent evidence supporting exposure to air pollution as a risk for cognitive decline at all ages and AD at later lifetime. Additionally, we review the current body of work investigating the molecular mechanisms by which air pollutants mediate damage in the CNS. Understanding of the neurotoxic effects of air pollution and its constituents is still limited, and further studies will be essential to better understand the cellular and molecular mechanisms linking air pollution and cognitive decline." (p. 141)
Author	Credentials: PhD Position and Institution: Center for Occupational and Environmental Health, Department of Medicine, University of California, Irvine Publication History in Peer-Reviewed Journals: low
Publication	Type of publication: Scholarly Publisher: Biomedical Journal Other: Publishes articles in all fields of clinical and biomedical sciences
Date and Citation History	Date of publication: 2018 Google Scholar Cited By: 66
Stated Purpose or Research Question	"In this review, we summarize recent evidence supporting exposure to air pollution as a risk for cognitive decline at all ages and AD at later lifetime. Additionally, we review the current body of work investigating the molecular mechanisms by which air pollutants mediate damage in the CNS" (p. 150)
Author's Conclusion	"The studies presented above represent a strong foundation for the case of PM and other air pollutants as key risk factors for AD and other neurodegenerative disease etiologies. Epidemiological studies provide evidence for risk association of PM exposure with reduced cognitive abilities across the age spectrum, with exposure at older ages having the strongest and most consistent effects" (p. 157)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Moderate Rationale: The information provided in the article does point at risk factors for development of MCI and possibly AD, but I think it may delve a little too deep into the biomedical aspect.
Overall Quality of Article	Overall Quality of Article: Good Rationale: The article was published recently and in a reputable scholarly journal, with other citations. The author does not have many other publications, but the institution is reputable.

Type of article	Overall Type: Review of research study Specific Type: Systematic review study
APA Reference	Cooper, C., Sommerlad, A., Lyketsos, C. G., & Livingston, G. (2015). Modifiable predictors of dementia in mild cognitive impairment: A systematic review and meta-analysis. <i>American Journal of Psychiatry</i> , 172(4), 323-334. doi:10.1176/appi.ajp.2014.14070878
Abstract	“Objective: Public health campaigns encouraging early help seeking have increased rates of mild cognitive impairment (MCI) diagnosis in Western countries, but we know little about how to treat or predict dementia outcomes in persons with the condition. Method: The authors searched electronic databases and references for longitudinal studies reporting potentially modifiable risk factors for incident dementia after MCI. Two authors independently evaluated study quality using a checklist. Meta-analyses were conducted of three or more studies. Results: There were 76 eligible articles. Diabetes and prediabetes increased risk of conversion from amnesic MCI to Alzheimer’s dementia; risk in treated versus untreated diabetes was lower in one study. Diabetes was also associated with increased risk of conversion from any-type or nonamnesic MCI to all-cause dementia. Metabolic syndrome and prediabetes predicted all-cause dementia in people with amnesic and any-type MCI, respectively. Mediterranean diet decreased the risk of conversion to Alzheimer’s dementia. The presence of neuropsychiatric symptoms or lower serum folate levels predicted conversion from any-type MCI to all-cause dementia, but less formal education did not. Depressive symptoms predicted conversion from any-type MCI to all-cause dementia in epidemiological but not clinical studies. Conclusions: Diabetes increased the risk of conversion to dementia. Other prognostic factors that are potentially manageable are prediabetes and the metabolic syndrome, neuropsychiatric symptoms, and low dietary folate. Dietary interventions and interventions to reduce neuropsychiatric symptoms, including depression, that increase risk of conversion to dementia may decrease new incidence of dementia.” (p. 323)
Author	Credentials: Ph.D., M.R.C.Psych Position and Institution: From the Division of Psychiatry, University College London; and the Department of Psychiatry and Behavioral Sciences, Johns Hopkins Bayview Medical Center, Baltimore. Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer-reviewed article Publisher: Psychiatry Online Other: Official journal of the American Psychiatric Association
Date and Citation History	Date of publication: 2015 Cited By: 191
Stated Purpose or Research Question	“In this study we synthesized evidence from longitudinal observational studies regarding modifiable risk factors that predict conversion to dementia in people with MCI” (p. 323).
Author’s Conclusion	“In our recent review of randomized controlled trials (6), we found no consistent evidence that any intervention prevents conversion from MCI to dementia. The findings of this systematic review suggest that managing diabetes and components of the metabolic syndrome and dietary interventions are logical targets for future trials” (p. 332).
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Moderate relevance PICO: Directly related to the descriptive factors of MCI, but targeted more toward the progression of dementia than MCI.
Overall Quality of Article	Overall Quality of Article: Good Quality Rationale: Established author. Reputable journal and publisher. Published within the last 5 years.

Type of article	Overall Type: Review of research study Specific Type: Clinical review study (Systematic review form)
APA Reference	Langa K. M., & Levine D. A. (2014). The diagnosis and management of mild cognitive impairment: a clinical review. <i>Journal of the American Medical Association</i> , 312(23), 2551-61. doi:10.1001/jama.2014.13806.
Abstract	<p>“IMPORTANCE: Cognitive decline is a common and feared aspect of aging. Mild cognitive impairment (MCI) is defined as the symptomatic predementia stage on the continuum of cognitive decline, characterized by objective impairment in cognition that is not severe enough to require help with usual activities of daily living. OBJECTIVE: To present evidence on the diagnosis, treatment, and prognosis of MCI and to provide physicians with an evidence-based framework for caring for older patients with MCI and their caregivers. EVIDENCE ACQUISITION: We searched PubMed for English-language articles in peer-reviewed journals and the Cochrane Library database from inception through July 2014. Relevant references from retrieved articles were also evaluated. FINDINGS: The prevalence of MCI in adults aged 65 years and older is 10% to 20%; risk increases with age and men appear to be at higher risk than women. In older patients with MCI, clinicians should consider depression, polypharmacy, and uncontrolled cardiovascular risk factors, all of which may increase risk for cognitive impairment and other negative outcomes. Currently, no medications have proven effective for MCI; treatments and interventions should be aimed at reducing cardiovascular risk factors and prevention of stroke. Aerobic exercise, mental activity, and social engagement may help decrease risk of further cognitive decline. Although patients with MCI are at greater risk for developing dementia compared with the general population, there is currently substantial variation in risk estimates (from <5% to 20% annual conversion rates), depending on the population studied. Current research targets improving early detection and treatment of MCI, particularly in patients at high risk for progression to dementia. CONCLUSIONS AND RELEVANCE: Cognitive decline and MCI have important implications for patients and their families and will require that primary care clinicians be skilled in identifying and managing this common disorder as the number of older adults increases in coming decades. Current evidence supports aerobic exercise, mental activity, and cardiovascular risk factor control in patients with MCI.” (p. 2551)</p>
Author	<p>Credentials: MD, PhD Position and Institution: Division of General Medicine, Veterans Affairs Center for Clinical Management Research, Institute for Social Research, Institute of Gerontology, Institute of Gerontology Institute for Healthcare Policy and Innovation Publication History in Peer-Reviewed Journals: Extensive</p>
Publication	<p>Type of publication: Scholarly peer-reviewed article Publisher: American Medical Association (AMA) Other: Official journal of American Medical Association</p>
Date and Citation History	<p>Date of publication: 2014 Cited By: 303</p>
Stated Purpose or Research Question	“To present evidence on the diagnosis, treatment, and prognosis of MCI, and to provide physicians with an evidence-based framework for caring for older MCI patients and their caregivers” (p. 2551).
Author’s Conclusion	“Cognitive decline and MCI have important implications for patients and their families, and will require that primary care clinicians be skilled in identifying and managing this common disorder as the number of older adults increases in coming decades. Current evidence supports aerobic exercise, mental activity, and cardiovascular risk factor control in patients with MCI” (p. 2552).
Overall Relevance to PICO or EBP Research Question	<p>Overall Relevance to PICO: Strong Rationale: Directly related to descriptive and predictive factors of those with MCI or at risk for MCI.</p>
Overall Quality of Article	<p>Overall Quality of Article: Good Rationale: Established author. Reputable journal and publisher. Published within the last 5 years.</p>

Type of article	Overall Type: Primary Research Study Specific Type: Epidemiological study
APA Reference	Lopez-Anton, R., Santabárbara, J., De-la-Cámara, C., Gracia-García, P., Lobo, E., Marcos, G., Pirez, G., Saz, P., Haro, J. M., Rodríguez-Mañas, L., Modrego, P. J., Dewey, M. E., & Lobo, A. (2014). Mild cognitive impairment diagnosed with the new DSM-5 criteria: Prevalence and associations with non-cognitive psychopathology. <i>Acta Psychiatrica Scandinavica</i> , 131(1), 29-39. doi:10.1111/acps.12297
Abstract	“Objective: To contrast the prevalence of mild cognitive impairment (MCI) as diagnosed using DSM-5 criteria (DSM5-MCI) with MCI as diagnosed using Petersen's criteria (P-MCI) and to explore the association of both with non-cognitive psychopathological symptoms (NCPS). Method: A two-phase epidemiological screening was implemented in a population-based sample of individuals aged 55+ (n = 4803). The Geriatric Mental State (GMS) was the main psychopathological instrument used, and AGECAT was used to make psychiatric diagnoses. Research psychiatrists diagnosed DSM5-MCI and P-MCI using operational criteria. Logistic regression models were then used to investigate the association of MCI with anxiety and depression and with NCPS. Results: Weighted prevalence of DSM5-MCI and P-MCI was, respectively, 3.72% and 7.93% for the aged 65+. NCPS were common in both MCI categories, but negative-type symptoms such as ‘anergia’ and ‘observed slowness’ were considerably more frequent among persons with DSM5-MCI. Anxiety and depression diagnostic categories were associated with both P-MCI and DSM5-MCI, but affective-type symptoms were mainly associated with P-MCI. Some negative-type symptoms were inversely associated with P-MCI, and no association was observed with DSM5-MCI. Conclusion: The prevalence of DSM5-MCI was half that of P-MCI. Negative-type NCPS were more frequently and typically associated with DSM5-MCI.” (p. 29)
Author	Credentials: Unavailable Position and Institution: Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM), Ministry of Science and Innovation Publication History in Peer-Reviewed Journals: Moderate
Publication	Type of publication: Scholarly peer reviewed journal Publisher: Wiley Online Other: N/A
Date and Citation History	Date of publication: 2015 Cited By: 46
Stated Purpose or Research Question	“To contrast the prevalence of mild cognitive impairment (MCI) as diagnosed using DSM-5 criteria (DSM5-MCI) with MCI as diagnosed using Petersen's criteria (P-MCI) and to explore the association of both with non-cognitive psychopathological symptoms (NCPS)” (p. 30).
Author's Conclusion	“The prevalence of DSM5-MCI was half that of P-MCI. Negative-type NCPS were more frequently and typically associated with DSM5-MCI” (p. 31).
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Limited Rationale: This study focused on comparing diagnosis criteria between the DSM-5 and Peterson's criteria. However, it also discussed incidence of MCI which has relevance to the descriptive part of our EBP question.
Overall Quality of Article	Overall Quality of Article: Good Rationale: Reputable journal and publisher. Published within the last 5 years.

Type of article	Overall Type: Primary research study Specific Type: Descriptive study
APA Reference	Jak, A., Preis, S., Beiser, A., Seshadri, S., Wolf, P., Bondi, M., & Au, R. (2016). Neuropsychological criteria for mild cognitive impairment and dementia risk in the Framingham heart study. <i>Journal of the International Neuropsychological Society</i> , 22(9), 937-943. doi:10.1017/S1355617716000199
Abstract	“Objectives: To refine mild cognitive impairment (MCI) diagnostic criteria, we examined progression to dementia using two approaches to identifying MCI. Methods: A total of 1203 Framingham Heart Study participants were classified at baseline as cognitively normal or MCI (overall and four MCI subtypes) via conventional Petersen/Winblad criteria (single cognitive test impaired per domain, >1.5 SD below expectations) or Jak/Bondi criteria (two tests impaired per domain, >1 SD below norms). Cox proportional hazards models were constructed to examine the association between each MCI definition and incident dementia. Results: The Petersen/Winblad criteria classified 34% of participants as having MCI while the Jak/Bondi criteria classified 24% as MCI. Over a mean follow-up of 9.7 years, 58 participants (5%) developed incident dementia. Both MCI criteria were associated with incident dementia [Petersen/Winblad: hazards ratio (HR) = 2.64; p-value=.0002; Jak/Bondi: HR=3.30; p-value <.0001]. When both MCI definitions were included in the same model, only the Jak/Bondi definition remained statistically significantly associated with incident dementia (HR=2.47; p-value=.008). Multi-domain amnesic and single domain non-amnesic MCI subtypes were significantly associated with incident dementia for both diagnostic approaches (all p-values <.01). Conclusions: The Jak/Bondi MCI criteria had a similar association with dementia as the conventional Petersen/Winblad MCI criteria, despite classifying ~30% fewer participants as having MCI. Further exploration of alternative methods to conventional MCI diagnostic criteria is warranted. (JINS, 2016, 22, 937–943)” (p. 937)
Author	Credentials: PhD Position and Institution: VA San Diego Healthcare System, Department of Psychiatry Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Author Manuscript Publisher: Cambridge University Press Other: Official Journal of the International Neurological Society
Date and Citation History	Date of publication: 2016 Cited By: 21
Stated Purpose or Research Question	“Therefore, to continue to refine diagnostic and prediction models, we examined progression to dementia in the Framingham Heart Study (FHS) via two diagnostic approaches to MCI: the conventional Petersen/ Winblad criteria and the Jak/Bondi actuarial neuropsychological method ” (p. 3).
Author’s Conclusion	“In conclusion, the Petersen/Winblad and Jak/Bondi criteria resulted in a similar strength of association with incident dementia, despite the Jak/Bondi criteria classifying approximately 30% fewer participants as having MCI. The Petersen/Winblad criteria may be over-inclusive, resulting in a tendency for false positive errors. Given the psychological burden of receiving an MCI diagnosis, it is important to identify sensitive and reliable MCI criteria to best identify high-risk cognitive profiles” (p. 8).
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Moderate Rationale: This study looked at ways to identify MCI and the progression from MCI to dementia. The authors discussed the Petersen/Winblad and Jak/Bondi criteria for incidence of dementia following MCI and noted that it is important to further research cognitive profiles that are at risk for MCI. This relates to the predictive aspect of our EBP questions, however, it may be better suited for the group focusing on management, prognosis, and diagnosis.
Overall Quality of Article	Overall Quality of Article: Good Rationale: Established author. Reputable journal. Published within the last 5 years.

Type of article	Overall Type: Primary Research Study Specific Type: Quantitative predictive study
APA Reference	Marshall, G. A., Rentz, D. M., Frey, M. T., Locascio, J. J., Johnson, K. A., Sperling, R. A., Alzheimer's Disease Neuroimaging Initiative (2011). Executive function and instrumental activities of daily living in mild cognitive impairment and Alzheimer's disease. <i>Alzheimer's & dementia: the journal of the Alzheimer's Association</i> , 7(3), 300-308.
Abstract	“Background Impairment in instrumental activities of daily living (IADL) leads to early loss in productivity and adds significant burden to caregivers. Executive dysfunction is thought to be an important contributor to functional impairment. The objective of this study was to investigate the relationship between executive function and IADL in a large cohort of well characterized normal older controls (NC), mild cognitive impairment (MCI) and mild Alzheimer’s disease (AD) patients, separately as well as across the entire sample, while accounting for demographic, cognitive, and behavioral factors. Methods Subjects with baseline clinical datasets (n=793) from the Alzheimer’s Disease Neuroimaging Initiative (ADNI) study (228 NC, 387 MCI, 178 AD) were included in the analyses. A multiple regression model was used to assess the relationship between executive function and IADL. Results A multiple regression model, including diagnosis, global cognitive impairment, memory performance, and other covariates demonstrated a significant relationship between executive dysfunction and IADL impairment across all subjects (R ² =0.60, p<0.0001 for model; Digit Symbol, partial β =-0.044, p=0.005; Trail making Test B – A, quadratic relation, p=0.01). An analysis using MCI subjects only also yielded a significant relationship (R ² =0.16, p<0.0001 for model; Digit Symbol, partial β =-0.08, p=0.001). Conclusions These results suggest that executive dysfunction is a key contributor to impairment in IADL. This relationship was evident even after accounting for degree of memory deficit across the continuum of cognitive impairment and dementia.” (p. 300)
Author	Credentials: MD Position and Institution: Center for Alzheimer Research and Treatment, Department of Neurology, Brigham and Women’s Hospital Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer-reviewed article Publisher: Alzheimer’s Association Other: Official journal of the Alzheimer’s Association
Date and Citation History	Date of publication: 2011 Cited By: 222
Stated Purpose or Research Question	“The objective of this study was to investigate the relationship between executive function and IADL in a large cohort of well characterized subjects, including normal older controls (NC), MCI, and mild AD patients” (p. 301).
Author’s Conclusion	“These results demonstrate a significant relationship between executive dysfunction and IADL impairment independent of diagnosis, global cognitive impairment, memory performance, depression, and apathy. Moreover, executive dysfunction was linearly or quadratically related to IADL impairment within each diagnostic group (NC, MCI, and mild AD)” (p. 306).
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Moderate Rationale: Directly relevant to functional cognition portion of EBP question because the study focuses on correlation between executive dysfunction and IADL impairment.
Overall Quality of Article	Overall Quality of Article: Good Rationale: Established author. Reputable journal. Published within the last 10 years.

Type of article	Overall Type: Primary Research Study Specific Type: Quantitative, Longitudinal
APA Reference	Farias, S. T., Lau, K., Harvey, D., Denny, K. G., Barba, C., & Mefford, A. N. (2017). Early functional limitations in cognitively normal older adults predict diagnostic conversion to mild cognitive impairment. <i>Journal of the American Geriatrics Society</i> , 65(6), 1152-1158. doi:10.1111/jgs.14835
Abstract	<p>“OBJECTIVES: To examine whether specific types of early functional limitations in cognitively normal older adults are associated with subsequent development of mild cognitive impairment(MCI), as well as the relative predictive value of self versus informant report in predicting diagnostic conversion to MCI.</p> <p>DESIGN: As a part of a longitudinal study design, participants underwent baseline and annual multidisciplinary clinical evaluations, including a physical and neurological examination, imaging, laboratory work, and neuropsychological testing.</p> <p>SETTING: Data used in this study were collected as part of longitudinal research at the University of California, Davis Alzheimer's Disease Center.</p> <p>PARTICIPANTS: Individuals diagnosed as having normal cognition at study baseline who had an informant who could complete informant-based ratings and at least one follow-up visit (N = 324).</p> <p>MEASUREMENTS: Participants and informants each completed the Everyday Cognition Scale (ECog), an instrument designed to measure everyday function in six cognitively relevant domains.</p> <p>RESULTS: Self- and informant-reported functional limitations on the ECog were associated with significantly greater risk of diagnostic conversion to MCI (informant: hazard ratio (HR) = 2.0, 95% confidence interval (CI) = 1.3-3.2, P = .002), with self-report having a slightly higher hazard (HR = 2.3, 95% CI = 1.4-3.6, P < .001). When controlling for baseline cognitive abilities, the effect remained significant for self- and informant-reported functional limitations.</p> <p>CONCLUSION: Deficits in everyday memory and executive function domains were the strongest predictors of diagnostic conversion to MCI. Detection of early functional limitations may be clinically useful in assessing the future risk of developing cognitive impairment in cognitively normal older adults.” (p. 1152)</p>
Author	Credentials: Sarah Tomaszewski Farias, PhD Position and Institution: Associate professor of neurology at UC Davis and Director of Neuropsychology Services at the Neuroscience Clinic of UC Davis Publication History in Peer-Reviewed Journals: <i>Extensive</i>
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: The American Geriatrics Society
Date and Citation History	Date of publication: 2017 Cited By: 19
Stated Purpose or Research Question	“. . . goals of this study are: 1) to evaluate whether early functional limitations among NC older adults are associated with increased risk of developing MCI, 2) determine whether there are particular types of functional limitations associated with increased risk of MCI, and 3) evaluate the relative predictive value of self- versus informant- reported functional abilities in predicting conversion to MCI” (p. 1154)
Author's Conclusion	“Deficits in everyday memory and executive function domains were the strongest predictors of diagnostic conversion to MCI. Detection of early functional limitations may be clinically useful in assessing the future risk of developing cognitive impairment in cognitively normal older adults” (p. 1152).
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Strong Rationale: This article suggests that there are warning signs that MCI may be developing in an individual. It is important to know warning signs that lead to MCI.
Overall Quality of Article	Overall Quality of Article: <i>Good</i> Rationale: Established author. Reputable journal and publisher. Published within the last 10 years.

Type of article	Overall Type: Primary research study Specific Type: Correlational
APA Reference	Han, S. D., Boyle, P. A., James, B. D., Yu, L., & Bennett, D. A. (2015). Poorer financial and health literacy among community-dwelling older adults with mild cognitive impairment. <i>Journal of Aging and Health</i> , 27(6), 1105-1117. doi:10.1177/0898264315577780
Abstract	“OBJECTIVE: Literacy is an important determinant of financial and health outcomes in old age, and cognitive decline has been linked with lower literacy. We tested the hypothesis that mild cognitive impairment (MCI) is associated with poorer financial and health literacy. METHOD: Participants (n = 730) from the Rush Memory and Aging Project were given a clinical evaluation and an assessment of total, financial, and health literacy. Regression was used to examine whether MCI was associated with lower literacy. In secondary analyses, we investigated the association of particular cognitive systems with literacy. RESULTS: MCI was associated with lower total, financial, and health literacy. An interaction was observed such that higher education reduced the effect of MCI on total and financial literacy. Multiple cognitive systems were associated with literacy in participants with MCI, and semantic memory accounted for the most variance. DISCUSSION: Persons with MCI exhibit poorer financial and health literacy, and education mitigates this effect.” (p. 1105)
Author	Credentials: S. Duke Han, PhD, ABPP Position and Institution: Specialist of the American Board of Professional Psychology in clinical neuropsychology, Director of Neuropsychology Clinics and Training in the VA Long Beach Healthcare System, and an Associate Professor of Behavioral Sciences and Conjoint Associate Professor of Neurological Sciences in the Rush Alzheimer's Disease Center of Rush University Medical Center Publication History in Peer-Reviewed Journals: <i>Extensive</i>
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: Sage Publications
Date and Citation History	Date of publication: 2015 Cited By: 14
Stated Purpose or Research Question	“Thus, we hypothesized that persons with mild cognitive impairment (MCI) would show poorer financial and health literacy compared with non-cognitively impaired older adults” (p. 1106).
Author’s Conclusion	“Persons with MCI exhibit poorer financial and health literacy, and education mitigates this effect” (p.1105).
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Strong Rationale: This article brings to light more risk factors for developing MCI and may point to a way to prevent it in the future.
Overall Quality of Article	Overall Quality of Article: <i>Good</i> Rationale: Established author. Reputable journal and publisher. Published within the last 10 years.

Type of article	Overall Type: Primary research study Specific Type: Quantitative descriptive
APA Reference	Farias, S. T., Mungas, D., Reed, B. R., Harvey, D., Cahn-Weiner, D., & Decarli, C. (2006). MCI is associated with deficits in everyday functioning. <i>Alzheimer Disease & Associated Disorders</i> , 20(4), 217-223. doi:10.1097/01.wad.0000213849.51495.d9
Abstract	“The purpose of the present study was to examine the types of impairments in everyday function that accompany mild cognitive impairment (MCI). Data for this study was collected from 434 individuals consecutively evaluated at a university-based Alzheimer’s Center. A total of 96 participants were diagnosed with MCI, 105 were cognitively normal, and 233 had dementia. Informant ratings of participants’ abilities were obtained across different functional domains reflecting everyday abilities related to memory, language, visual spatial abilities, planning, organization, and divided attention. As expected, the demented group was significantly more impaired than the healthy control and MCI groups across all of the functional domains. The MCI group also showed significantly more functional impairment relative to healthy controls in all of the functional domains. Examination of the effect sizes as a measure of the magnitude of functional impairment in the MCI groups relative to controls showed that the greatest degree of impairment occurred within the Everyday Memory domain. The current findings suggest that individuals with MCI demonstrate deficits in a wide range of everyday functions but that the magnitude of these changes is greatest for those functional abilities that rely heavily on memory.” (p. 217)
Author	Credentials: Sarah Tomaszewski Farias, PhD Position and Institution: Associate professor of neurology at UC Davis and Director of Neuropsychology Services at the Neuroscience Clinic of UC Davis Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: Lippincott Williams & Wilkins
Date and Citation History	Date of publication: 2006 Cited By: 244
Stated Purpose or Research Question	“The purpose of the present study was to examine the types of impairments in everyday function that accompany mild cognitive impairment (MCI)” (p.217).
Author’s Conclusion	“The current findings suggest that individuals with MCI demonstrate deficits in a wide range of everyday functions but that the magnitude of these changes is greatest for those functional abilities that rely heavily on memory.” (p. 217)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Moderate Rationale: May relate more heavily to the group researching lived experience, but it is useful to know that memory impairments may be causing a portion of the deficits that are associated with MCI.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: Established author. Reputable journal and publisher. Not published within the last 10 years. Cited by many other articles.

Type of article	Overall Type: Primary research study Specific Type: Quantitative, prospective longitudinal
APA Reference	Chen, Y., Denny, K. G., Harvey, D., Farias, S. T., Mungas, D., Decarli, C., & Beckett, L. (2017). Progression from normal cognition to mild cognitive impairment in a diverse clinic-based and community-based elderly cohort. <i>Alzheimers & Dementia</i> , 13(4), 399-405. doi:10.1016/j.jalz.2016.07.151
Abstract	<p>“INTRODUCTION: Investigation of the conversion rates from normal cognition (NC) to mild cognitive impairment (MCI) is important, as effective early intervention could potentially prevent or substantially delay the onset of dementia. However, reported conversion rates differ across studies and recruitment source. Our study examined predictors of conversion from NC to MCI in a racially and ethnically diverse sample drawn both from community and clinic recruitment sources.</p> <p>METHODS: Rates and predictors of conversion were assessed in an ongoing prospective longitudinal study at University of California, Davis, Alzheimer’s Disease Center from 2000 to 2015. Participants (n = 254) were recruited through a clinic (5%) and community sample (95%). They were clinically confirmed as cognitively normal at baseline and followed up to seven years. Recruitment source, demographic factors (age, gender, race/ethnicity, year of education, APOE ε4 positive), cognitive measures (SENAS test scores), functional assessments (CDR sum of boxes), and neuroimaging measures (total brain volume, total hippocampal volume, white hyperintensity volume) were assessed as predictors of conversion from cognitively normal to mild cognitive impairment using proportional hazards models.</p> <p>RESULTS: Of 254 participants, 62 (11 clinic, 51 community) progressed to MCI. The clinic-based sample showed an annual conversion rate of 30% (95% CI 17%-54%) per person-year, whereas the community-based sample showed a conversion rate of 5% (95% CI 3%-6%) per person-year. Risk factors for conversion include clinic-based recruitment, being older, lower executive function and worse functional assessment at baseline, and smaller total brain volume.</p> <p>DISCUSSION: Older adults who sought out a clinical evaluation, even when they are found to have normal cognition, have increased risk of subsequent development of MCI. Results are consistent with other studies showing subjective cognitive complaints are a risk for future cognitive impairment, but extend such findings to show that those who seek evaluation for their complaints are at particularly high risk. Moreover, these individuals have subtle, but significant differences in functional and cognitive abilities that, in the presence of concerns and evidence of atrophy on by brain imaging, warrant continued clinical follow-up. These risk factors could also be used as stratification variables for dementia prevention clinical trial design.” (p. 399)</p>
Author	Credentials: Yingjia Chen, M.Sc, MPH, PhD Position and Institution: Postdoctoral fellow of neurology in the Possin Lab at UCSF. Publication History in Peer-Reviewed Journals: extensive
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: Elsevier, Inc
Date and Citation History	Date of publication: 2017 Cited By: 22
Stated Purpose or Research Question	“Our study examined predictors of conversion from NC to MCI in a racially and ethnically diverse sample drawn both from community and clinic recruitment sources.” (p. 399)
Author’s Conclusion	“Older adults who sought out a clinical evaluation, even when they are found to have normal cognition, have increased risk of subsequent development of MCI. Results are consistent with other studies showing subjective cognitive complaints are a risk for future cognitive impairment, but extend such findings to show that those who seek evaluation for their complaints are at particularly high risk.” (p. 400)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Strong Rationale: The study aimed to find predictors of MCI onset from normal cognition in diverse groups since previous studies have found conflicting data.
Overall Quality of Article	Overall Quality of Article: <i>Good</i> Rationale: Established author. Reputable journal and publisher. Published within the last 10 years.

Type of article	Overall Type: Primary research study Specific Type: Quantitative, longitudinal
APA Reference	Lau, K. M., Parikh, M., Harvey, D. J., Huang, C., & Farias, S. T. (2015). Early cognitively based functional limitations predict loss of independence in instrumental activities of daily living in older adults. <i>Journal of the International Neuropsychological Society</i> , 21(09), 688-698. doi:10.1017/s1355617715000818
Abstract	“Older adults with early forms of neurodegenerative disease are at risk for functional disability, which is often defined by the loss of independence in instrumental activities of daily living (IADLs). The current study investigated the influence of mild changes in everyday functional abilities (referred to as functional limitations) on risk for development of incident functional disability. A total of 407 participants, who were considered cognitively normal or diagnosed with mild cognitive impairment (MCI) at baseline, were followed longitudinally over an average 4.1 years (range=0.8-9.2 years). Informant-based ratings from the Everyday Cognition (ECog; Farias et al., 2008) and the Instrumental Activities of Daily Living (Lawton & Brody, 1969) scales assessed the degree of functional limitations and incident IADL disability, respectively. Cox proportional hazards models revealed that more severe functional limitations (as measured by the Total ECog score) at baseline were associated with approximately a four-fold increased risk of developing IADL disability a few years later. Among the ECog domains, functional limitations in Everyday Planning, Everyday Memory, and Everyday Visuospatial domains were associated with the greatest risk of incident functional disability. These results remained robust even after controlling for participants' neuropsychological functioning on tests of executive functions and episodic memory. Current findings indicate that early functional limitations have prognostic value in identifying older adults at risk for developing functional disability. Findings highlight the importance of developing interventions to support everyday abilities related to memory, executive function, and visuospatial skills in an effort to delay loss of independence in IADLs.” (p. 688)
Author	Credentials: none Position and Institution: San Francisco VA Medical Center Publication History in Peer-Reviewed Journals: moderate to low
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: Cambridge University Press
Date and Citation History	Date of publication: 2015 Cited By: 18
Stated Purpose or Research Question	“Based conceptually on the Disablement Process Model, as well as on the empirical work emphasized above, the present study examined the degree to which functional limitations measured at study baseline are associated with the risk of the later development of functional disability in IADLs” (p. 690).
Author's Conclusion	“Current findings indicate that early functional limitations have prognostic value in identifying older adults at risk for developing functional disability” (p. 688).
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Limited Rationale: The focus is more on lived experience and physical functioning of people with age-related cognitive decline rather than factors that identify cognitive decline itself. This may work better for another group.
Overall Quality of Article	Overall Quality of Article: <i>Moderate</i> Rationale: Author not established. Reputable journal and publisher. Published within the last 10 years.

Type of article	Overall type: Primary research study Specific type: Longitudinal study
APA Reference	Brodaty, H., Heffernan, M., Kochan, N. A., Draper, B., Trollor, J. N., Reppermund, S., . . . Sachdev, P. S. (2013). Mild cognitive impairment in a community sample: The Sydney memory and ageing study. <i>Alzheimer's & Dementia: The Journal of the Alzheimer's Association</i> , 9(3), 317.e1. doi:10.1016/j.jalz.2011.11.010
Abstract	“Background: Mild cognitive impairment (MCI) is associated with an increased dementia risk. This study reports incidence of MCI subtypes, rates of progression to dementia, and stability of MCI classification. Methods: We examined 873 community-dwelling adults aged 70 to 90 years over 2 years as part of an ongoing population-based longitudinal study, the Sydney Memory and Ageing Study. Neuropsychological testing assessed five cognitive domains, and a diagnosis of no cognitive impairment, MCI, or dementia (follow-up only) was made according to published criteria. Results: The incidence of MCI was 104.6 (95% confidence interval: 81.6–127.7) per 1000 person-years, with higher incidence in men (men, 156.8; women, 70.3). Incidence rates for single-domain amnestic, multiple-domain amnestic, single-domain nonamnestic, and multiple-domain nonamnestic MCI were 47.7, 7.9, 45.0, and 3.9 per 1000 person-years, respectively. The 2-year rate of progression from MCI at baseline to dementia was 4.8%, being highest for multidomain amnestic MCI (9.1%). Of those with MCI at baseline, 28.2% reverted to no cognitive impairment at follow-up. Sensitivity analyses by redefining criteria for cognitive impairment did not affect stability of diagnosis, although changing the threshold of domain impairment reduced baseline MCI prevalence from 36.7% to 5.7% and incidence to 23.5, and increased 2-year progression rate from MCI to dementia to 14.3%. Conclusions: Incidence rates for MCI are higher than previously reported, particularly in men and for single-domain MCI; rates for amnestic and nonamnestic MCI were comparable. Multidomain amnestic MCI was the most likely subtype to progress to dementia, but overall, the diagnosis of MCI, particularly single-domain MCI, shows considerable instability” (p. 311)
Author	Credentials: MBBS (Syd), MD (UNSW), DSc (UNSW), FRACP, FRANZCP, FAHMS Position and Institution: Primary Dementia Collaborative Research Centre, School of Psychiatry, University of New South Wales, New South Wales, Australia; Brain and Ageing Research Program, School of Psychiatry, Faculty of Medicine, University of New South Wales, New South Wales, Australia Publication history in Peer-Reviewed Journals: Extensive ~858
Publication	Type of publication: scholarly peer-reviewed journal Publisher: Elsevier
Date and Citation History	2013 Google Scholar Cited by: 103
Stated Purpose or Research Question	“This study reports 2-year incidence rates for four MCI subtypes and overall MCI in an elderly community sample without dementia or cognitive impairment at baseline. Additionally, stability of MCI classifications over a 2-year period and conversion to dementia are examined.” (p. 311)
Author’s Conclusion	“This study showed that MCI is highly incident in a population of community-dwelling older Australians, with rates varying by MCI subtype and sex. The major difference among MCI subtypes was that older people with multiple domain amnestic MCI were most likely to progress to dementia. However, MCI in a population sample is not a stable diagnosis, with reversion to NCI more common than progression overall and for most subtypes.” (p. 316)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to EBP Research Question: High Rationale: Directly relates to subtypes and outcomes.
Overall Quality of Article	Overall Quality of Article: Good Rationale: Established author. Reputable journal and publisher. Cited in many other journals. Published within the last 10 years. Large sample size.

Type of article	Overall type: Review of Research Specific type: Evidence review
APA Reference	Bárrios, H., Narciso, S., Guerreiro, M., Maroco, J., Logsdon, R., & De Mendonça, A. (2013). Quality of life in patients with mild cognitive impairment. <i>Aging & Mental Health, 17</i> (3), 287-292. doi:10.1080/13607863.2012.747083
Abstract	“In the past 10 years, there has been a virtual explosion in the literature concerning the construct of mild cognitive impairment. The interest in this topic demonstrates the increasing emphasis on the identification of the earliest features of cognitive disorders such as Alzheimer disease and other dementias. Mild cognitive impairment represents the earliest clinical features of these conditions and, hence, has become a focus of clinical, epidemiologic, neuroimaging, biomarker, neuropathological, disease mechanism, and clinical trials research. This review summarizes the progress that has been made while also recognizing the challenges that remain. During the past decade, a major transition in the clinical characterization of cognitive disorders has taken place. Many of the prodromal stages of conditions such as frontotemporal dementia and dementia with Lewy bodies have been recognized, and we can now make the clinical diagnosis at an earlier stage in the disease process. At the same time, there has been a growing interest in the prodementia phase of these conditions because of suggestions that we may be able to identify the earliest clinical features of these illnesses before functional impairment is evident. Toward this end, the construct of mild cognitive impairment (MCI) has evolved to capture this prodementia phase of cognitive dysfunction. Most investigators believe that if we wait for functional impairment and perhaps even mild cognitive symptoms to emerge, it may be too late to treat the underlying disease process. Ideally, we would like to be able to prevent or postpone the disease process by intervening early. If a disease-modifying therapy or effective lifestyle intervention were available, we would want to intervene as soon as possible, but these treatments are not on the immediate horizon. As such, the construct of MCI serves a useful purpose as a clinical stage in which meaningful interventions can take place. Mild cognitive impairment may be an intermediate step on the way to primary prevention, but it remains important for formulating research hypotheses.” (p. 287)
Author	Credentials: Unavailable Position and Institution: University of Lisbon; Head of Dementia Departments at Hospital do Mar, Lisboa, Portugal Publication history in Peer-Reviewed Journals: ~15
Publication	Type of publication: scholarly academic peer-reviewed scientific journal Publisher: Routledge
Date and Citation History	2013 Google Scholar Cited by: 57
Stated Purpose or Research Question	“Compare the QoL in MCI patients with controls without cognitive impairment, and ascertain whether there are differences in the reports of QoL made by the subjects and by their informants.” (p. 287)
Author’s Conclusion	“The QoL is affected at early stages of cognitive decline. The QoL reported by patients with MCI is better than the opinion of their informants, similarly to what is known in Alzheimer’s disease patients. QoL appears to be an important domain to be evaluated in aging studies.” (p.287)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to EBP Research Question: High Rationale: Directly relates to predictive factors of MCI.
Overall Quality of Article	Overall Quality of Article: Moderate to Good Rationale: Established author. Reputable journal and publisher. Published within the last 10 years. But used questionnaires are a small group sample size of 50 individuals.

Type of article	Overall type: Primary research study Specific type: Case studies
APA Reference	Brambati SM, Belleville S, Kergoat M, Chayer C, Gauthier S, & Joubert S. (2009). Single- and multiple-domain amnesic mild cognitive impairment: two sides of the same coin? <i>Dementia & Geriatric Cognitive Disorders</i> , 28(6), 541–549. https://doi-org.pearl.stkate.edu/10.1159/000255240
Abstract	<i>“Background:</i> Amnesic mild cognitive impairment (aMCI) is considered a transition stage between normal aging and Alzheimer’s disease (AD). Two main clinical subtypes of aMCI have been identified: (1) single-domain aMCI (aMCI-SD), with isolated episodic memory impairments, and (2) multiple-domain aMCI (aMCI-MD), with episodic memory impairments and deficits in one or more other cognitive domains. <i>Aims:</i> To map the pattern of gray matter (GM) atrophy associated with aMCI-SD, aMCI-MD and mild AD. <i>Methods:</i> A group of aMCI-SD, aMCI-MD characterized by executive function disorders, mild AD and cognitively unimpaired subjects underwent a comprehensive neuropsychological assessment and a high-definition MR brain scan. Voxel-based morphometry analysis was used to characterize the GM tissue loss in each patient group, and the common pattern of GM atrophy in aMCI-SD and aMCI-MD. <i>Results:</i> aMCI-SD and aMCI-MD are characterized by a common pattern of GM atrophy within the medial temporal cortex, predisposing to AD and correlating with the severity of verbal memory symptoms. Moreover, the pattern of GM atrophy observed in aMCI-SD, aMCI-MD and mild AD revealed that, from an anatomical point of view, these three clinical syndromes could represent three severity points along the continuum between normal aging and AD.” (p. 541)
Author	Credentials: Not found Position and Institution: University of Montreal; Department of Psychology Professor Publication history in Peer-Reviewed Journals: Extensive
Publication	Type of publication: scholarly peer-reviewed scientific journal Publisher: Karger Publishers
Date and Citation History	2009 Google Scholar Cited by: 43
Stated Purpose or Research Question	“...map the pattern of gray matter (GM) atrophy associated with aMCI-SD, aMCI-MD and mild AD.” (p. 541)
Author’s Conclusion	“...the pattern of GM atrophy observed in aMCI-SD, aMCI-MD and mild AD revealed that, from an anatomical point of view, these three clinical syndromes could represent three severity points along the continuum between normal aging and AD.” (p.541)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to EBP Research Question: Moderate Rationale: The article discusses descriptive and predictive characteristics of brain matter of people with MCI, but may be more detailed than what our group will go into.
Overall Quality of Article	Overall Quality of Article: Good Rationale: Established author. Reputable journal and publisher. Published within the last 10 years.

Type of article	Overall type: Primary research study Specific type: Pilot randomized clinical trial
APA Reference	Scherder, E.J., Van Paasschen, J., Deijen, J., Van Der Knokke, S., Orlebeke, J., Burgers, I., . . . Sergeant, J. A. (2005). Physical activity and executive functions in the elderly with mild cognitive impairment. <i>Aging & Mental Health</i> , 9(3), 272-280.
Abstract	“The primary goal of the present study was to examine whether in the elderly with mild cognitive impairment (MCI), the effect of physical activity measured directly following treatment, was reflected in an improvement in cognitive functioning in general or in executive functions (EF) in particular. Secondly, this study aimed to compare the effectiveness of two types of intervention, with varying intensities: walking and hand/face exercises. Forty-three frail, advanced elderly subjects (mean age: 86) with MCI were randomly divided into three groups, namely, a walking group (n = 15), a group performing hand and face exercises (n = 13), and a control group (n = 15). All subjects received individual treatment for 30 minutes a day, three times a week, for a period of six weeks. A neuropsychological test battery, administered directly after cessation of treatment, assessed cognitive functioning. The results show that although a (nearly) significant improvement in tasks appealing to EF was observed in both the walking group and the hand/face group compared to the control group, the results should be interpreted with caution. Firm conclusions about the effectiveness of mild physical activity on EF in the oldest old can only be drawn after studies with larger number of subjects.” (p. 272)
Author	Credentials: PhD, Position and Institution: Faculty of Behavioural and Movement Sciences, Clinical Neuropsychology; Vrije Universiteit Amsterdam Publication history in Peer-Reviewed Journals: Extensive ~295
Publication	Type of publication: scholarly academic peer-reviewed journal Publisher: Routledge
Date and Citation History	2005 Google Scholar Cited by: 194
Stated Purpose or Research Question	“...., the primary goal of the present study was to examine whether in the oldest old with MCI, physical activity, measured directly following treatment, improves cognitive functioning in general or EF in particular.” (p. 273) and “...., in the present study the effectiveness of two types of interventions, with two levels of intensity, were examined: walking and hand/ face exercises.” (p.273).
Author’s Conclusion	“In sum, the present findings must be interpreted with great caution. More studies with larger samples are needed before firm conclusions with respect to the effectiveness of mild physical activity on EF in the oldest old with MCI can be drawn.” (p. 279)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to EBP Research Question: Moderate Rationale: This study looked at the predictive characteristics of those with MCI, but part of the focus was on intervention, which does not fall under our research question.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: Established author. Reputable journal and publisher. Published within the last 10 years. Larger sample sizes should be tested.

Type of article	Overall type: Review of Research Specific type: Evidence review
APA Reference	Petersen R.C., Roberts R.O., Knopman D.S., et al. Mild cognitive impairment: Ten years later. <i>Arch Neurol</i> , 66(12), 1447–1455. doi:10.1001/archneurol.2009.266
Abstract	“In the past 10 years, there has been a virtual explosion in the literature concerning the construct of mild cognitive impairment. The interest in this topic demonstrates the increasing emphasis on the identification of the earliest features of cognitive disorders such as Alzheimer’s disease and other dementias. Mild cognitive impairment represents the earliest clinical features of these conditions and, hence, has become a focus of clinical, epidemiological, neuroimaging, biomarker, neuropathological, disease mechanism and clinical trials research. This review summarizes the progress that has been made while also recognizing the challenges that remain.” (p. 1447)
Author	Credentials: PhD; MD Position and Institution: Directs the Mayo Clinic Alzheimer’s Disease Research Center and the Mayo Clinic Study of Aging Publication history in Peer-Reviewed Journals: Extensive ~868
Publication	Type of publication: peer-reviewed medical journal Publisher: American Medical Association
Date and Citation History	2009 Google Scholar Cited by: 1079
Stated Purpose or Research Question	“Mild Cognitive Impairment may be an intermediate step on the way to primary prevention but important for formulating research hypotheses.” (p. 1447) “This review summarizes the progress that has been made while also recognizing the challenges that remain.” (p. 1446)
Author’s Conclusion	“Ultimately, we hope that this work will lead to the development of imaging and biomarkers for the asymptomatic stages of neurodegenerative diseases. That is, by augmenting our knowledge of the role of imaging and measures in the MCI stage, we will be able to validate their utility in predicting the progression to more advanced stages of the disorders and, hence, suggest their further utility by being applied to the asymptomatic stages of the conditions.” (p. 1453)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to EBP Research Question: Moderate Rationale: This discusses how far the research for MCI has come over the past ten years but some of it does not pertain to the research question and some is rather old.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: Established author. Reputable journal and publisher. Published within the last 10 years. Is not primary literature and is getting to be outdated.

Type of article	Overall Type: Primary research study Specific Type: Comparison study
APA Reference	Kim, H.J., Park, J.Y., Seo, S.W., Jung Y.H., Kim, Y., Jang, H.,... Na, D.L. (2019). Cortical atrophy pattern-based subtyping predicts prognosis of amnesic MCI: An individual-level analysis. <i>Neurobiology of Aging</i> , 74, 38-45.
Abstract	“We categorized patients with amnesic mild cognitive impairment (aMCI) based on cortical atrophy patterns and evaluated whether the prognosis differed across the subtypes. Furthermore, we developed a classifier that learns the cortical atrophy pattern and predicts subtypes at an individual level. A total of 662 patients with aMCI were clustered into 3 subtypes based on cortical atrophy patterns. Of these, 467 patients were followed up for more than 12 months, and the median follow-up duration was 43 months. To predict individual-level subtype, we used a machine learning-based classifier with a 10-fold cross-validation scheme. Patients with aMCI were clustered into 3 subtypes: medial temporal atrophy, minimal atrophy (Min), and parietotemporal atrophy (PT) subtypes. The PT subtype had higher prevalence of APOE ε4 carriers, amyloid PET positivity, and greater risk of dementia conversion than the Min subtype. The accuracy for binary classification was 89.3% (MT vs. Rest), 92.6% (PT vs. Rest), and 86.6% (Min vs. Rest). When we used ensemble model of 3 binary classifiers, the accuracy for predicting the aMCI subtype at an individual level was 89.6%. Patients with aMCI with the PT subtype were more likely to have underlying Alzheimer’s disease pathology and showed the worst prognosis. Our classifier may be useful for predicting the prognosis of individual aMCI patients.” (p. 38)
Author	Credentials: MD, PhD Position and Institution: Professor at Hanyang University Medical Center, Department of Neurology Publication History in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: Elsevier Other: <i>Neurobiology of Aging</i> - Nervous system changes during aging or disease associated with age
Date and Citation History	2019 Google Scholar Cited by: 498
Stated Purpose or Research Question	“We categorized patients with amnesic mild cognitive impairment (aMCI) based on cortical atrophy patterns and evaluated whether the prognosis differed across the subtypes. Furthermore, we developed a classifier that learns the cortical atrophy pattern and predicts subtypes at an individual level.” (1st paragraph)
Author’s Conclusion	“Our classifier may be useful for predicting the prognosis of individual aMCI patients.” (last paragraph)
Overall Relevance to PICO	Overall Relevance to PICO: Moderate Relevance PICO: Relates to individuals with aMCI and suggests a possible strategy to predict prognosis of aMCI
Overall Quality	Overall Quality of Article: Fair Quality Established author. Reputable journal and publisher. Publication within last 10 years.

Type of article	Overall Type: Primary research study Specific Type: Comparison study
APA Reference	Sharma, N., Kolekar, M.H., Jha, K., & Kumar, Y. (2018). EEG and cognitive biomarkers based mild cognitive impairment diagnosis. <i>IRBM</i> , 40(2), 113-121. Retrieved from https://doi.org/10.1016/j.irbm.2018.11.007
Abstract	“Objective: Recently, Electroencephalogram (EEG) shows potential in the diagnosis of Alzheimer’s disease and other dementia. We aim to investigate whether EEG and selected cognitive biomarkers can classify mild cognitive impairment (MCI), dementia and healthy subjects using support vector machine classifier in Indian cohort. Methods: Eight EEG biomarkers, power spectral density, skewness, kurtosis, spectral skewness, spectral kurtosis, spectral crest factor, spectral entropy (SE), fractal dimension (FD) were analyzed from 44 subjects in four conditions; eye-open, eye-close, finger tapping test (FTT) and continuous performance test (CPT). FTT and CPT are used to measure motor speed and sustained attention as these cognitive biomarkers are free from the educational barrier. Result: We achieved very good accuracy for each event from 73.4% to 89.8% for three binary classes. We investigated that FTT (84% accuracy), CPT (88% accuracy) were the most efficient events to diagnose MCI from dementia. MCI from control successfully diagnosed with 89.8% accuracy in FTT, 73.4% accuracy in CPT and 84.1% accuracy in eye open resting state. Even though cognitive biomarkers were also adequately diagnosed MCI from other groups. Conclusions: Our classifier findings are consistent with the utmost evidence. Yet, our results are promising and especially newfangled in the case of FTT and CPT from the prior studies. We developed an experimental protocol and proposed a novel technique to classify MCI with efficient biomarkers.” (p. 113)
Author	Credentials: Research Scholar Position and Institution: Visvesvaraya Research Scholar at IIT Patna & a Project Co-Investigator at AIIMS Patna, Indian Institute of Technology, Patn. Publication History in Peer-Reviewed Journals: Fair
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: Elsevier Other: IRBM- The journal of the AGBM (Alliance for engineering in Biology and Medicine/Alliance
Date and Citation History	2019 Google Scholar Cited By: 54
Stated Purpose or Research Question	“We aim to investigate whether EEG and selected cognitive biomarkers can classify mild cognitive impairment (MCI), dementia and healthy subjects using support vector machine classifier in Indian cohort.” (1st paragraph)
Author’s Conclusion	“Our classifier findings are consistent with the utmost evidence. Yet, our results are promising and especially newfangled in the case of FTT and CPT from the prior studies. We developed an experimental protocol and proposed a novel technique to classify MCI with efficient biomarkers.” (last paragraph)
Overall Relevance to PICO	Overall Relevance to PICO: Maximum Relevance PICO: Directly relates to individuals with mild cognitive impairment and describes a proposed method to diagnose individuals with mild cognitive impairment.
Overall Quality	Overall Quality of the Article: Good Quality Established author. Reputable journal and publisher. Publication within last 10 years.

Type of article	Overall Type: Primary research study. Specific Type: Prospective correlational research study
APA Reference	Yaffe, K., Laffan, A.M., Harisson, S.L., Redline S., Spira, A.P., Ensurd, K.E., Ancoli-Israel, S., & Stone, K.L. (2011). Sleep-disordered breathing, hypoxia, and risk mild cognitive impairment and dementia in older women. <i>JAMA</i> , 306(6), 613-619. doi:10.1001/jama.2011.1115
Abstract	<p>“CONTEXT: Sleep-disordered breathing (characterized by recurrent arousals from sleep and intermittent hypoxemia) is common among older adults. Cross-sectional studies have linked sleep-disordered breathing to poor cognition; however, it remains unclear whether sleep-disordered breathing precedes cognitive impairment in older adults.</p> <p>OBJECTIVES: To determine the prospective relationship between sleep-disordered breathing and cognitive impairment and to investigate potential mechanisms of this association. DESIGN, SETTING, AND PARTICIPANTS: Prospective sleep and cognition study of 298 women without dementia (mean [SD] age: 82.3 [3.2] years) who had overnight polysomnography measured between January 2002 and April 2004 in a substudy of the Study of Osteoporotic Fractures. Sleep-disordered breathing was defined as an apnea-hypopnea index of 15 or more events per hour of sleep. Multivariate logistic regression was used to determine the independent association of sleep-disordered breathing with risk of mild cognitive impairment or dementia, adjusting for age, race, body mass index, education level, smoking status, presence of diabetes, presence of hypertension, medication use (antidepressants, benzodiazepines, or nonbenzodiazepine anxiolytics), and baseline cognitive scores. Measures of hypoxia, sleep fragmentation, and sleep duration were investigated as underlying mechanisms for this relationship. MAIN OUTCOME MEASURES: Adjudicated cognitive status (normal, dementia, or mild cognitive impairment) based on data collected between November 2006 and September 2008. RESULTS: Compared with the 193 women without sleep-disordered breathing, the 105 women (35.2%) with sleep-disordered breathing were more likely to develop mild cognitive impairment or dementia (31.1% [n = 60] vs 44.8% [n = 47]; adjusted odds ratio [AOR], 1.85; 95% confidence interval [CI], 1.11-3.08). Elevated oxygen desaturation index (≥ 15 events/hour) and high percentage of sleep time ($>7\%$) in apnea or hypopnea (both measures of disordered breathing) were associated with risk of developing mild cognitive impairment or dementia (AOR, 1.71 [95% CI, 1.04-2.83] and AOR, 2.04 [95% CI, 1.10-3.78], respectively). Measures of sleep fragmentation (arousal index and wake after sleep onset) or sleep duration (total sleep time) were not associated with risk of cognitive impairment. CONCLUSION: Among older women, those with sleep-disordered breathing compared with those without sleep-disordered breathing had an increased risk of developing cognitive impairment.” (p. 613)</p>
Author	<p>Credentials: MD</p> <p>Position and Institution: Professor of Psychiatry, Neurology and Epidemiology, Psychiatry Roy and Marie Scola Endowed Chair, Psychiatry Vice Chair of Research in Psychiatry at University of California San Francisco UCSF</p> <p>Publication History in Peer-Reviewed Journals: Extensive</p>
Publication	<p>Type of publication: Scholarly peer-reviewed journal</p> <p>Publisher: American Medical Association</p> <p>Other: JAMA Psychiatry- Psychiatry, mental health, behavioral sciences, and related fields</p>
Date and Citation History	<p>2019</p> <p>Google Scholar Cited By: 60,660</p>
Stated Purpose or Research Question	“To determine the prospective relationship between sleep-disordered breathing and cognitive impairment and to investigate potential mechanisms of this association.” (1st paragraph)
Author’s Conclusion	“Among older women, those with sleep-disordered breathing compared with those without sleep-disordered breathing had an increased risk of developing cognitive impairment.” (last paragraph)
Overall Relevance to PICO	<p>Overall Relevance to PICO: Good Quality</p> <p>PICO: Directly relates to individuals with mild cognitive impairment and a co-occurring disorder that may be present.</p>
Overall Quality	<p>Overall Quality of Article:</p> <p>Established author. Reputable journal and publisher. Publication within last 10 years.</p>

Type of article	Overall Type: Review of research studies Specific Type: Systematic review and meta-analysis
APA Reference	Bahureksa, L., Najafi, B., Saleh, A., Sabbagh, M., Coon, D., Mohler, M.J., & Schwenk, M. (2017). The impact of mild cognitive impairment on gait and balance: A systematic review and meta-analysis of studies using instrumented assessment. <i>Gerontology</i> , 63(1), 67-83.
Abstract	<p>“BACKGROUND: In addition to cognitive deficits, people with mild cognitive impairment (MCI) can experience motor dysfunction, including deficits in gait and balance. Objective, instrumented motor performance assessment may allow the detection of subtle MCI-related motor deficits, allowing early diagnosis and intervention. Motor assessment under dual-task conditions may increase diagnostic accuracy; however, the sensitivity of different cognitive tasks is unclear. OBJECTIVE: To systematically review the extant literature focusing on instrumented assessment of gait and balance parameters for discriminating MCI patients from cognitively intact peers. METHODS: Database searches were conducted in PubMed, EMBASE, Cochrane Library, PsycINFO and Web of Science. Inclusion criteria were: (1) clinically confirmed MCI; (2) instrumented measurement of gait and/or balance; (3) English language, and (4) reporting gait or balance parameters which could be included in a meta-analysis for discriminating between MCI patients and cognitively intact individuals based on weighted effect size (d). RESULTS: Fourteen studies met the inclusion criteria and reported quantitative gait (n = 11) or postural balance (n = 4) parameters to be included in the meta-analysis. The meta-analysis revealed that several gait parameters including velocity (d = -0.74, p < 0.01), stride length (d = -0.65, p < 0.01), and stride time (mean: d = 0.56, p = 0.02; coefficient of variation: d = 0.50, p < 0.01) discriminated best between MCI and healthy controls under single-task conditions. Importantly, dual-task assessment increased the discriminative power of gait variables wherein gait variables with counting tasks appeared to be more sensitive (range d = 0.84-1.35) compared to verbal fluency tasks such as animal naming (range d = 0.65-0.94). Balance parameters identified as significant discriminators were anterior-posterior (d = 0.49, p < 0.01) and mediolateral (d = -0.34, p = 0.04) sway position in the eyes-open condition but not eyes-closed condition. CONCLUSION: Existing studies provide evidence that MCI affects specific gait parameters. MCI-related gait changes were most pronounced when subjects are challenged cognitively (i.e., dual task), suggesting that gait assessment with an additional cognitive task is useful for diagnosis and outcome analysis in the target population. Static balance seems to also be affected by MCI, although limited evidence exists. Instrumented motor assessment could provide a critical opportunity for MCI diagnosis and tailored intervention targeting specific deficits and potentially slowing progression to dementia. Further studies are required to confirm our findings.” (p. 67)</p>
Author	Credentials: Graduate student at Carnegie Mellon University Position and Institution: Chase Lab at Carnegie Mellon University Publication History in Peer-Reviewed Journals: limited
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: Oxford Academic Other: Gerontology- Regenerative and Technology Section/Systematic
Date and Citation History	2019 Google Scholar Cited By: 1
Stated Purpose or Research Question	“To systematically review the extant literature focusing on instrumented assessment of gait and balance parameters for discriminating MCI patients from cognitively intact peers.” (p. 68)
Author’s Conclusion	“This review provides sound evidence on which parameters should be used in gait and balance assessment, and provides a basis for future studies aiming to further develop, verify, and refine a standardized clinical motor assessment protocol for people with MCI.” (p. 81)
Overall Relevance to PICO	Overall Relevance to PICO: Maximum Relevance PICO: Directly relates to individuals with mild cognitive impairment and diagnoses based on functional mobility.
Overall Quality	Overall Quality of Article: Fair Quality Established graduate student. Reputable journal and publisher. Publication within last 10 years.

Type of article	Overall Type: Review of research studies Specific Type: Systematic review and meta-analysis
APA Reference	Ismail, Z., Elbayoumi, H., Fischer, C.E., Hogan, D.B., Millikin, C.P., Schweizer, T., Mortby, M.E., Smith, E.E., Patten, S.B., & Fiest, K.M. (2017). Prevalence of depression in patients with mild cognitive impairment: A systematic review and meta-analysis. <i>JAMA Psychiatry</i> , 74(1), 58-67. doi:10.1001/jamapsychiatry.2016.3162.
Abstract	<p>“IMPORTANCE: Depression is common in individuals with mild cognitive impairment (MCI) and may confer a higher likelihood of progression to dementia. Prevalence estimates of depression in those with MCI are required to guide both clinical decisions and public health policy, but published results are variable and lack precision. OBJECTIVE: To provide a precise estimate of the prevalence of depression in individuals with MCI and identify reasons for heterogeneity in the reported results. DATA SOURCES: A search of literature from database inception to March 2016 was performed using Medline, Embase, and PsycINFO. Hand searching of all included articles was performed, including a Google Scholar search of citations of included articles. STUDY SELECTION: Articles were included if they (1) were published in English, (2) reported patients with MCI as a primary study group, (3) reported depression or depressive symptoms using a validated instrument, and (4) reported the prevalence of depression in patients with MCI. DATA EXTRACTION AND SYNTHESIS: All abstracts, full-text articles, and other sources were reviewed, with data extracted in duplicate. The overall prevalence of depression in patients with MCI was pooled using a random-effects model. Heterogeneity was explored using stratification and random-effects meta-regression. MAIN OUTCOMES AND MEASURES: The prevalence of depression in patients with MCI, reported as a percentage with 95% CIs. Estimates were also stratified by population source (community-based or clinic-based sample), method of depression diagnosis (clinician-administered, informant-based, or self-report), and method of MCI diagnosis (cognitive vs global measure and amnestic vs nonamnestic). RESULTS: Of 5687 unique abstracts, 255 were selected for full-text review, and 57 studies, representing 20 892 patients, met all inclusion criteria. The overall pooled prevalence of depression in patients with MCI was 32% (95% CI, 27-37), with significant heterogeneity between estimates ($I^2 = 90.7\%$). When stratified by source, the prevalence of depression in patients with MCI in community-based samples was 25% (95% CI, 19-30) and was 40% (95% CI, 32-48) in clinic-based samples, which was significantly different ($P < .001$). The method used to diagnose depression did not significantly influence the prevalence estimate, nor did the criteria used for MCI diagnosis or MCI subtype. CONCLUSIONS AND RELEVANCE: The prevalence of depression in patients with MCI is high. A contributor to heterogeneity in the reported literature is the source of the sample, with greater depression burden prevalent in clinic-based samples.” (p. 58)</p>
Author	Credentials: MD Position and Institution: Hotchkiss Brain Institute, University of Calgary, behavioral neurology and neuropsychiatry Publication in Peer-Reviewed Journals: Extensive
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: American Medical Association Other: JAMA Psychiatry- Psychiatry, mental health, behavioral sciences, and related fields
Date and Citation History	2019 Google Scholar Cited By: 2,392
Stated Purpose or Research Question	“To provide a precise estimate of the prevalence of depression in individuals with MCI and identify reasons for heterogeneity in the reported results.” (2nd paragraph)
Author’s Conclusion	“The prevalence of depression in patients with MCI is high. A contributor to heterogeneity in the reported literature is the source of the sample, with greater depression burden prevalent in clinic-based samples.”
Overall Relevance to PICO	Overall Relevance to PICO: Maximum Relevance PICO: Directly relates to individuals with mild cognitive impairment and a co-occurring disorder that may be present.
Overall Quality	Overall Quality of Article: Good Quality Established author. Reputable journal and publisher. Publication within last 10 years.

Type of article	Overall Type: Primary Research Study Specific Type: Epidemiological, regression
APA Reference	Michaud T. L., Su, D., Siahpush, M., & Murman, D. L. (2017). The risk of incident mild cognitive impairment and progression to dementia considering mild cognitive impairment subtypes. <i>Dement Geriatr Cogn Disord Extra</i> , 7(1), 15-29. doi: 10.1159/000452486
Abstract	“ <i>Background:</i> It remains unclear how demographic and clinical characteristics are related to the risk of incident mild cognitive impairment (MCI) by its subtypes. Moreover, the contribution of the subtypes of incident MCI to the progression to dementia remains puzzling. <i>Methods:</i> We used data collected by the National Alzheimer Coordinating Center. Our analysis sample included cognitively normal subjects at baseline. The associations were examined using competing-risks survival regression models and Cox proportional hazards models. <i>Results:</i> About 16.3% of subjects developed incident MCI of whom 15.8% progressed to Alz-heimer disease (overall mean follow-up of 4.3 years). The risk of incident amnesic MCI (aMCI) was greater in subjects with 1 copy (subhazard ratio [SHR]: 1.23; 95% CI: 1.00–1.50) or 2 copies (SHR: 2.14; 95% CI: 1.49–3.05) of the APOE ε4 allele than in those who had no ε4 allele. Multiple-domain aMCI patients were more likely to progress to dementia than single-domain aMCI patients (hazard ratio: 2.14; 95% CI: 1.28–3.58). <i>Conclusions:</i> Cognitively normal subjects with an APOE ε4 allele had a higher likelihood of developing aMCI and the MCI subtype was associated with the dementia subtype. Our findings provide important information about practical indicators for the prediction of cognitive decline” (p. 15)
Author	Credentials: PhD Position and Institution: University of Nebraska Medical Center Publication History in Peer-Reviewed Journals: 140
Publication	Type of publication: scholarly journal Publisher: Extra Dementia and Geriatric Cognitive Disorders Other: Karger
Date and Citation History	2017 Google Scholar Cited By: 13
Stated Purpose or Research Question	“Accordingly, the objectives of the confirmatory study, using a convenience sample from the National Alzheimer’s Coordinating Center (NACC), were twofold: (1) to examine the characteristics of cognitively normal subjects who developed incident MCI by subtypes over time; and (2) to determine the association between subtypes of incident MCI and the progression to different types of dementia.” (p. 16)
Author’s Conclusion	“We did not find an association between MCI subtypes and the risk of AD after adjusting for other covariates. However, subjects with aMCI and impaired in multiple domains were more likely to convert to dementia than subjects with aMCI and impaired in a single domain.” (p. 25)
Overall Relevance to PICO	Overall Relevance to PICO: Moderate Relevance PICO: Explains progression on MCI for different types and relevance to dementia.
Overall Quality	Overall Quality of Article: Moderate Quality Author not as well known, article not cited often, recent date

Type of article	Overall Type: Primary Research Design Specific Type: Quantitative retrospective study
APA Reference	Wang, F., Zhao, M., Han, Z., Li, D., Zhang, S., Zhang, Y., . . . Lei, P. (2017). Association of body mass index with amnestic and non-amnestic mild cognitive impairment risk in elderly. <i>BMC Psychiatry</i> , 17(7), 1-7. doi:10.1186/s12888-017-1493-x
Abstract	“Background: Previous studies focused on the relationship between body mass index and cognitive disorder and obtained many conflicting results. This study explored the potential effects of body mass index on the risk of mild cognitive impairment (amnestic and non-amnestic) in the elderly. Methods: The study enrolled 240 amnestic mild cognitive impairment patients, 240 non-amnestic mild cognitive impairment patients and 480 normal cognitive function controls. Data on admission and retrospective data at baseline (6 years ago) were collected from their medical records. Cognitive function was evaluated using Mini- Mental State Examination and Montreal Cognitive Assessment. Results: Being underweight, overweight or obese at baseline was associated with an increased risk of amnestic mild cognitive impairment (<i>OR</i> : 2.30, 95% <i>CI</i> : 1.50 ~ 3.52; <i>OR</i> : 1.74, 95% <i>CI</i> : 1.36 ~ 2.20; <i>OR</i> : 1.71, 95% <i>CI</i> : 1.32 ~ 2.22, respectively). Being overweight or obese at baseline was also associated with an increased risk of non-amnestic mild cognitive impairment (<i>OR</i> : 1.51, 95% <i>CI</i> : 1.20 ~ 1.92; <i>OR</i> : 1.52, 95% <i>CI</i> : 1.21 ~ 1.97, respectively). In subjects with normal weights at baseline, an increased or decreased body mass index at follow-up was associated with an elevated risk of amnestic mild cognitive impairment (<i>OR</i> : 1.80, 95% <i>CI</i> : 1.10 ~ 3.05; <i>OR</i> : 3.96, 95% <i>CI</i> : 2.88 ~ 5.49, respectively), but only an increased body mass index was associated with an elevated risk of non-amnestic mild cognitive impairment (<i>OR</i> : 1.71, 95% <i>CI</i> : 1.16 ~ 2.59). Conclusions: Unhealthy body mass index levels at baseline and follow-up might impact the risk of both types of mild cognitive impairment (amnestic and non-amnestic).” (p. 1)
Author	Credentials: PhD Position and Institution: Department of Materials Science and Engineering, City University of Hong Kong Publication History in Peer-Reviewed Journals: extensive
Publication	Type of publication: Peer-reviewed journal Publisher: BMC Psychiatry Other:
Date and Citation History	2017 Google Scholar Cited By: 2
Stated Purpose or Research Question	“Therefore, we conducted a retrospective observational study enrolling nearly 1000 subjects to clarify the potential effects of baseline disorder and the follow-up changes of BMI on the risk of aMCI and nAMCI in elderly people.” (p. 2)
Author’s Conclusion	“This study revealed that being overweight or obese may be an independent risk factor for aMCI and nAMCI, as was weight gain in people who originally had a normal weight. Being underweight was another independent risk factor for aMCI but not for nAMCI. Furthermore, weight loss in overweight/obese people and normal weight people might separately exert protective and pathogenic effects on aMCI.” (p. 6)
Overall Relevance to PICO	Overall Relevance to PICO: Moderate Relevance PICO: This article is related to risk factors that may influence the prognosis of different types of MCI. I also showed differences in the types of MCI.
Overall Quality	Overall Quality of Article: Good Quality The author has done extensive research, however, this article has not been cited often. It is a recent study.

Type of article	Overall Type: Primary Research Design Specific Type: Quantitative, longitudinal cohort
APA Reference	Pankratz, V. S., Roberts, R. O., Mielke, M. M., Knopman, D. S., Jack, C. R., Geda, Y. E., . . . Petersen, R. C. (2015). Predicting the risk of mild cognitive impairment in the Mayo Clinic Study of Aging. <i>Neurology</i> , <i>84</i> (14), 1433-1442. doi:10.1212/wnl.0000000000001437
Abstract	<p>“OBJECTIVE: We sought to develop risk scores for the progression from cognitively normal (CN) to mild cognitive impairment (MCI).</p> <p>METHODS: We recruited into a longitudinal cohort study a randomly selected, population-based sample of Olmsted County, MN, residents, aged 70 to 89 years on October 1, 2004. At baseline and subsequent visits, participants were evaluated for demographic, clinical, and neuropsychological measures, and were classified as CN, MCI, or dementia. Using baseline demographic and clinical variables in proportional hazards models, we derived scores that predicted the risk of progressing from CN to MCI. We evaluated the ability of these risk scores to classify participants for MCI risk.</p> <p>RESULTS: Of 1,449 CN participants, 401 (27.7%) developed MCI. A basic model had a C statistic of 0.60 (0.58 for women, 0.62 for men); an augmented model resulted in a C statistic of 0.70 (0.69 for women, 0.71 for men). Both men and women in the highest vs lowest sex-specific quartiles of the augmented model’s risk scores had an approximately 7-fold higher risk of developing MCI. Adding APOE ε4 carrier status improved the model (p = 0.002).</p> <p>CONCLUSIONS: We have developed MCI risk scores using variables easily assessable in the clinical setting and that may be useful in routine patient care. Because of variability among populations, validation in independent samples is required. These models may be useful in identifying patients who might benefit from more expensive or invasive diagnostic testing, and can inform clinical trial design. Inclusion of biomarkers or other risk factors may further enhance the models.” (p. 1433)</p>
Author	Credentials: PhD Position and Institution: Professor of Internal Medicine, University of New Mexico Publication History in Peer-Reviewed Journals: extensive
Publication	Type of publication: Peer-reviewed journal Publisher: American Academy of Neurology Other: Neurology journal
Date and Citation History	2015 Google Scholar Cited By: 47
Stated Purpose or Research Question	“In the present study, we focused on developing an algorithm that uses these variables to predict the risk of transitioning from cognitively normal (CN) to MCI.” (p. 1433)
Author’s Conclusion	“Individuals with self-reported memory complaints and those with diabetes were at higher risk of MCI. Markers of general health, including number of medications and slow gait, were also associated with risk of MCI” (p. 1438-1439)
Overall Relevance to PICO	Overall Relevance to PICO: Moderate Relevance PICO: This study gives information on risk factors, general health, the development of MCI, and demographics of people with MCI.
Overall Quality	Overall Quality of Article: Good Quality Author has an extensive amount of work and this article is cited by many other articles. It is also a recent article.

Type of article	Overall Type: Primary Research Studies Specific Type: Quantitative general linear study
APA Reference	Nygård, L., & Kottorp, A. (2014). Engagement in instrumental activities of daily living, social activities, and use of everyday technology in older adults with and without cognitive impairment. <i>The British Journal of Occupational Therapy</i> , 77(11), 565-573. doi:10.4276/030802214X14151078348512
Abstract	“Introduction: Little is known about how subtle activity limitations may be manifested and clinically detected in people with mild cognitive impairment, but these people have been found to experience greater challenges with everyday technology use. The aim of this study was to investigate levels and profiles of engagement in activities, and their associations with perceived difficulty in technology use, for people with mild cognitive impairment, and to compare this group to people with Alzheimer’s disease and to controls. Method: Samples with mild cognitive impairment (n = 37), Alzheimer’s disease (n = 37), and controls (n = 44) were included. Based on raw data from the Frenchay Activity Index, a Rasch model was used to generate linear measures. Analysis of variance and differential item functioning were used. Results: The analysis yielded a profile of decreased engagement in specific activities even in mild cognitive impairment. The association between activity engagement and difficulty with everyday technology use was stronger in people with mild cognitive impairment and Alzheimer’s disease than in controls. Conclusion: Taken together, engagement in outdoor activities showed the greatest decrease of all activity types for the group with mild cognitive impairment, suggesting that participation in life outside the home is threatened. The results also suggest that challenges in managing technology are restricting people with cognitive impairment more than they restrict controls” (p. 565)
Author	Credentials: Unknown Position and Institution: Department of Neurobiology, Care Science and Society, Division of Occupational Therapy, Karolinska Institute Publication History in Peer-Reviewed Journals:140
Publication	Type of publication: Peer-reviewed journal Publisher: SAGE journals Other: British Journal of Occupational Therapy
Date and Citation History	2014 Google Scholar Cited By: 16
Stated Purpose or Research Question	“In this study, therefore, we set out to investigate and compare self-rated engagement in different IADLs and social activities in people with MCI, people with Alzheimer’s disease (AD), and people without known cognitive impairments (controls).” (p. 566)
Author’s Conclusion	“The results show that frequency of engagement in lifestyle activities (IADL and social activities) was significantly lower in our sample with MCI than in controls, and not significantly higher than in the sample with AD. These results appeared on a group level, suggesting that frequency of engagement in IADL and social activities in general is sensitive to subtle cognitive decline; that is, engagement in IADL and social activities is likely to be lower in MCI as compared to controls” (p. 570)
Overall Relevance to PICO	Overall Relevance to PICO: Moderate Relevance PICO: This relates to the everyday life of people with MCI and how the condition can affect their occupations, IADLs, and quality of life.
Overall Quality	Overall Quality of Article: Moderate Quality Good stats and tables, author and article are not as well known.

Type of article	Overall Type: Primary Research Studies Specific Type: Correlation
APA Reference	Groeneveld, O., Reijmer, Y., Heinen, R., Kuijf, H., Koekkoek, P., Jansses, J., . . . Biessels, G. (2018). Brain imaging correlates of mild cognitive impairment and early dementia in patients with type 2 diabetes mellitus. <i>Nutr Metab Cardiovasc Dis</i> , 28(12), 1253-1260. doi:10.1016/j.numecd.2018.07.008
Abstract	<p>“Background and aims</p> <p>The risk of mild cognitive impairment and dementia is increased in type 2 diabetes mellitus (T2DM). We aimed to identify the neuroanatomical correlates of mild cognitive impairment (MCI) and early dementia in patients with T2DM, using advanced multimodal MRI. Methods and results: Twenty-five patients (≥ 70 years) with T2DM and MCI ($n = 22$) or early dementia ($n = 3$) were included. The reference group consisted of 23 patients with T2DM with intact cognition. All patients underwent a 3 T MRI. Brain volumes and white matter hyperintensity volumes were obtained with automated segmentation methods. White matter connectivity was assessed with diffusion tensor imaging and fiber tractography. Infarcts and microbleeds were rated visually. Compared to patients without cognitive impairment, those with impairment had a lower grey matter volume (effect size: -0.58, $p=0.042$), especially in the right temporal lobe and subcortical brain regions (effect sizes: -0.45 to -0.91, false discovery rate corrected $p < 0.05$). White matter volume (effect size: -0.47, $p = 0.11$) and white matter connectivity (effect size: 0.55, $p = 0.054$) were also reduced in patients with versus without cognitive impairment, albeit not statistically significant. White matter hyperintensity volumes and occurrence of other vascular lesions did not differ between the two patient groups. Conclusion: In patients with T2DM, grey matter atrophy rather than vascular brain injury appears to be the primary imaging correlate of MCI and early dementia.” (p. 1253)</p>
Author	<p>Credentials: Unknown</p> <p>Position and Institution: Brain Center Rudolf Magnus, Department of Neurology, University Medical Center Utrecht, University Utrecht, Utrecht, The Netherlands</p> <p>Publication History in Peer-Reviewed Journals: 4</p>
Publication	<p>Type of publication: Scholarly peer-reviewed journal</p> <p>Publisher: Nutrition, Metabolism and Cardiovascular Diseases</p> <p>Other:</p>
Date and Citation History	<p>2018</p> <p>Google Scholar Cited By: 0</p>
Stated Purpose or Research Question	“We aimed to identify the neuroanatomical correlates of MCI and early dementia in patients with T2DM, using advanced multimodal MRI.” (p. 1254)
Author’s Conclusion	“Patients with T2DM and MCI or early dementia had more pronounced grey matter atrophy than patients with T2DM with intact cognition. Disruptions in white matter connectivity in patients with cognitive impairment were mild and were topographically unrelated to grey matter atrophy, suggestive of independent underlying pathophysiological processes..” (p. 1259)
Overall Relevance to PICO	<p>Overall Relevance to PICO: Moderate Relevance</p> <p>PICO: This article gives information on brain differences for people with MCI and on how this differs in people with a co-occurring diagnosis of type 2 diabetes.</p>
Overall Quality	<p>Overall Quality of Article: Moderate Quality</p> <p>Author and article not well known, perhaps because of it being so recent. Sample size was small.</p>

Type of article	Overall Type: Primary research study Specific Type: Empirical, longitudinal study
APA Reference	Roberts, R. O., Geda, Y. E., Knopman, D. S., Cha, R. H., Pankratz, V. S., Boeve, B. F., . . . Petersen, R. C. (2012). The incidence of MCI differs by subtype and is higher in men: The Mayo Clinic study of aging. <i>Neurology</i> , 78(5), 342-351. doi: http://dx.doi.org/10.1212/WNL.0b013e3182452862
Abstract	“Objective: Although incidence rates for mild cognitive impairment (MCI) have been reported, few studies were specifically designed to measure the incidence of MCI and its subtypes using published criteria. We estimated the incidence of amnesic MCI (aMCI) and nonamnesic MCI (naMCI) in men and women separately. Methods: A population-based prospective cohort of Olmsted County, MN, residents ages 70-89 years on October 1, 2004, underwent baseline and 15-month interval evaluations that included the Clinical Dementia Rating scale, a neurologic evaluation, and neuropsychological testing. A panel of examiners blinded to previous diagnoses reviewed data at each serial evaluation to assess cognitive status according to published criteria. Results: Among 1,450 subjects who were cognitively normal at baseline, 296 developed MCI. The age- and sex-standardized incidence rate of MCI was 63.6 (per 1,000 person-years) overall, and was higher in men (72.4) than women (57.3) and for aMCI (37.7) than naMCI (14.7). The incidence rate of aMCI was higher for men (43.9) than women (33.3), and for subjects with ≤12 years of education (42.6) than higher education (32.5). The risk of naMCI was also higher for men (20.0) than women (10.9) and for subjects with ≤12 years of education (20.3) than higher education (10.2). Conclusions: <u>The incidence rates for MCI are substantial. Differences in incidence rates by clinical subtype and by sex suggest that risk factors for MCI should be investigated separately for aMCI and naMCI, and in men and women.</u> (PsycINFO Database Record (c) 2016 APA, all rights reserved) (Source: journal abstract)” (p. 342)
Author	Credentials: MB ChB: University of Ghana Medical School, MS: Epidemiology, Biostatistics, Environmental Health Position and Institution: Divisions of Epidemiology, Department of Internal Medicine, College of Medicine, Mayo Clinic Publication History in Peer-Reviewed Journals: <i>Neurological Review</i> , <i>Journal of Urology</i> , <i>Methods in Neuroepidemiology</i> (many articles published)
Publication	Type of publication: Scholarly Publisher: American Academy of Neurology
Date and Citation History	Date of publication: 2012 Cited By: 176
Stated Purpose or Research Question	“Differences in risk of amnesic MCI (aMCI) and nonamnesic MCI (naMCI) in men and women may generate hypotheses about etiologic mechanisms. Thus, we estimated the incidence of MCI and its subtypes using published diagnostic criteria, and investigated some demographic risk factors in a population-based prospective cohort study, the Mayo Clinic Study of Aging (MCSA)” (pg. 342).
Author’s Conclusion	“MCI is a heterogeneous clinical entity with incidence rates that vary substantially by age, sex, and subtype. The MCSA showed a higher incidence of MCI in men compared to women that is contrary to a higher risk of dementia in women reported by some studies and contrary to a similar incidence rate of dementia in men and women observed in this same Olmsted County population” (p. 348)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: <i>Strong</i> Rationale: This had a specific population and was able to draw conclusions based on the outcomes.
Overall Quality of Article	Overall Quality of Article: Good Rationale: This article has been cited many times, is published in a credible journal, by someone who is qualified to do so. The results appear to be useful.

Type of article	Overall Type: Primary research study Specific Type: Prospective cohort study
APA Reference	Reitz, C., Tang, M., Manly, J., Mayeux, R., & Luchsinger, J. A. (2007). Hypertension and the risk of mild cognitive impairment. <i>Archives of Neurology</i> , 64(12), 1734-1740. doi:http://dx.doi.org/10.1001/archneur.64.12.1734
Abstract	“Objective: To explore whether hypertension is associated with the risk of mild cognitive impairment (MCI), an intermediate stage of dementia, because there are conflicting data relating hypertension to the risk of Alzheimer disease. Design and Setting: Prospective community-based cohort study conducted in northern Manhattan. Multivariate proportional hazards regression analyses were used, relating hypertension to incident all-cause MCI, amnesic MCI, and nonamnesic MCI in 918 persons without prevalent MCI at baseline followed up for a mean of 4.7 years. Results: There were 334 cases of incident MCI, 160 cases of amnesic MCI, and 174 cases of nonamnesic MCI during 4337 person-years of follow-up. Hypertension was associated with an increased risk of all-cause MCI (hazard ratio, 1.40; 95% confidence interval, 1.06-1.77; P = .02) and nonamnesic MCI (hazard ratio, 1.70; 95% confidence interval, 1.13-2.42; P = .009) after adjusting for age and sex. Both associations were slightly attenuated in models additionally adjusting for stroke and other vascular risk factors. There was no association between hypertension and the risk of amnesic MCI (hazard ratio, 1.10; 95% confidence interval, 0.79-1.63; P = .49). Consistent with this association, hypertension was related with the slope of change in an executive ability score, but not with memory or language score. There was no effect modification of the association between hypertension and MCI by <i>APOEε4</i> genotype or use of antihypertensive medication. Conclusions: <u>A history of hypertension is related to a higher risk of MCI. The association seems to be stronger with the nonamnesic than the amnesic type of MCI in the elderly. These findings suggest that prevention and treatment of hypertension may have an important impact in lowering the risk of cognitive impairment.</u> (PsycINFO Database Record (c) 2016 APA, all rights reserved) (Source: journal abstract)” (p. 1734)
Author	Credentials: MD, University of Muenster, Ph.D., Erasmus University Position and Institution: Associate Professor of Neurology and Epidemiology at Columbia University in New York City Publication History in Peer-Reviewed Journals: Neurology, Biochemical Pharmacology, Archives of neurology (More than 30 publications)
Publication	Type of publication: Scholarly Publisher: American Medical Association
Date and Citation History	Date of publication: 2007 Cited By: 311
Stated Purpose or Research Question	“Our objective in the present longitudinal study was to determine whether hypertension is associated with the risk of incident MCI.” (p. 1374)
Author’s Conclusion	“In this longitudinal analysis of 918 persons, hypertension was associated with an increased risk of all-cause MCI that was mostly driven by an association with an increased risk of NAMCI after adjusting for age and sex” (p. 1737)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Strong Rationale: The question being asked followed all the guidelines, which created a valuable study concerning people with MCI.
Overall Quality of Article	Overall Quality of Article: Moderate Rationale: This is a very credible article from a good source. It has been cited many times. The only problem is that it is from 2007, which is rather old.

Type of article	Overall Type: Primary research study Specific Type: Prospective cohort study
APA Reference	Verghese, J., LeValley, A., Derby, C., Kuslansky, G., Katz, M., Hall, C., . . . Lipton, R. B. (2006). Leisure activities and the risk of amnesic mild cognitive impairment in the elderly. <i>Neurology</i> , 66(6), 821-827. doi:http://dx.doi.org/10.1212/01.wnl.0000202520.68987.48
Abstract	“Objective: To study the influence of leisure activity participation on risk of development of amnesic mild cognitive impairment (aMCI). Methods: The authors examined the relationship between baseline level of participation in leisure activities and risk of aMCI in a prospective cohort of 437 community-residing subjects older than 75 years, initially free of dementia or aMCI, using Cox analysis adjusted for age, sex, education, and chronic illnesses. The authors derived Cognitive and Physical Activity Scales based on frequency of participation in individual activities. Results: Over a median follow-up of 5.6 years, 58 subjects had development of aMCI. A one-point increase on the Cognitive (hazard ratio [HR] 0.95, 95% CI 0.91 to 0.99) but not Physical Activities Scale (HR 0.97, 95% CI 0.93 to 1.01) was associated with lower risk of aMCI. Subjects with Cognitive Activity scores in the highest (HR 0.46, 95% CI 0.24 to 0.91) and middle thirds (HR 0.52, 95% CI 0.29 to 0.96) had a lower risk of aMCI compared with subjects in the lowest third. The association persisted even after excluding subjects who converted to dementia within 2 years of meeting criteria for aMCI. Conclusions: <u>Cognitive activity participation is associated with lower risk of development of amnesic mild cognitive impairment, even after excluding individuals at early stages of dementia.</u> (PsycINFO Database Record (c) 2016 APA, all rights reserved) (Source: journal abstract)” (p. 821)
Author	Credentials: St. Johns Medical College, India, Post-graduate work in neurology and internal medicine, UK Position and Institution: Professor, Department of Medicine, Neurology, Albert Einstein College of Medicine Publication History in Peer-Reviewed Journals: Journal of American Geriatric Society, Neurology, neuropsychology (over 30 articles published)
Publication	Type of publication: Scholarly Publisher: American Academy of Neurology
Date and Citation History	Date of publication: 2006 Cited By: 1752
Stated Purpose or Research Question	“Herein, we extend these findings to examine the influence of leisure activities on the risk of developing aMCI in the same cohort” (p. 1)
Author’s Conclusion	“This prospective study demonstrates that high levels of participation in cognitive leisure activities is associated with reduced risk of aMCI in community-residing older adults, initially free of MCI or dementia.” (p. 5)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Strong Rationale: The question very specific for people with MCI and has a good occupational foundation, due to the foundation in leisure.
Overall Quality of Article	Overall Quality of Article: Good This article seems very credible, with the main author being well published. It has also been cited an incredible amount of time. The only slight concern is that it is rather old.

Type of article	Overall Type: Review of research studies Specific Type: Systematic review
APA Reference	Luck, T., Lupp, M., Briel, S., & Riedel-Heller, S. (2010). Incidence of mild cognitive impairment: A systematic review. <i>Dementia and Geriatric Cognitive Disorders</i> , 29(2), 164-175. doi: http://dx.doi.org/10.1159/000272424
Abstract	“Background/Aims: Subjects with mild cognitive impairment (MCI) constitute a risk population of developing dementia and thus a population of clinical interest. This study reviews recent work on the incidence of MCI in the elderly. Methods: Incidence papers were identified by a systematic literature search. Studies on the incidence of MCI were considered if they identified ‘cognitively mildly impaired’ subjects by application of the MCI criteria, used the ‘person-years-at-risk’ method, and were based on population- or community-based samples. Results: Nine studies were identified. The incidence of amnesic MCI subtypes ranged between 9.9 and 40.6 per 1,000 person-years, and the incidence of non-amnesic MCI subtypes was 28 and 36.3 per 1,000 person-years. Regarding any MCI, incidence rates of 51 and 76.8 per 1,000 person-years were found. A higher risk of incident MCI mainly resulted for higher age, lower education and hypertension. Discussion: The incidence rates of MCI varied widely, and possible risk factors for incident MCI were analysed only to a limited extent. The findings call for an agreement concerning the criteria used for MCI and the operationalisation of these criteria. (PsycINFO Database Record (c) 2016 APA, all rights reserved) (Source: journal abstract)” (p. 164)
Author	Credentials: Bachelor’s degree in Psychology, Doctorate from Universität Leipzig, Senior Researcher at University of Leipzig Position and Institution: Nordhausen University of Applied Sciences, Professor of social psychiatry Publication History in Peer-Reviewed Journals: Age and Ageing, Journal of Affective disorders, Dementia and Geriatric Cognitive Disorders, many articles published.
Publication	Type of publication: Scholarly Publisher: Karger Publishers
Date and Citation History	Date of publication: 2010 Cited By: 197
Stated Purpose or Research Question	“Thus, we aimed to systematically review all published population- or community based studies analysing the incidence of MCI with the following objectives: (i) describing characteristics of the studies (country, sample, observation interval, MCI criteria and their operationalisation, etc.); (ii) comparing findings on MCI incidence rates in consideration of the study characteristics and identified risk factors, and (iii) summarising current research findings and drawing conclusions for future research in this area” (p. 165)
Author’s Conclusion	“Our review shows that findings on the incidence rates of MCI vary widely particularly with regard to the amnesic MCI subtypes” (p. 172)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Strong Rationale: Although this was not a single study, it looked at many studies and drew conclusions based on those. It was focused on a specific population and produced accurate findings.
Overall Quality of Article	Overall Quality of Article: Good Rationale: This is in a reputable journal and written by someone with lots of experience in the field. The conclusions are good and credible.

Type of article	Overall Type: review of research Specific Type: Systematic review, meta-analysis
APA Reference	Chen, C., Hu, Z., Jiang, Z., & Zhou, F. (2018). Prevalence of anxiety in patients with mild cognitive impairment: A systematic review and meta-analysis. <i>Journal of Affective Disorders</i> , 236, 211-221. doi:http://dx.doi.org/10.1016/j.jad.2018.04.110
Abstract	“Background: Prevalence rates of anxiety in patients with mild cognitive impairment (MCI) varied widely across studies and may confer a higher likelihood of progression to dementia. Our aim was to estimate the prevalence of anxiety in MCI and identify reasons for heterogeneity in the reported results. Methods: A computerized search in PubMed, EMBASE, and Psyc INFO for studies on anxiety in MCI was performed up to March 2017. The overall prevalence of anxiety in patients with MCI was pooled using a random-effects model. Heterogeneity was explored using stratification (recruitment resource; method of anxiety diagnosis; method of MCI diagnosis; and region) and random-effects meta-regression. Results: Of 2494 unique abstracts, 290 were selected for full-text review, and 39 studies, representing 10,587 patients, met all inclusion criteria. The overall pooled prevalence of depression in patients with MCI was 21.0% (95% CI, 16.2–26.7) with significant heterogeneity present ($I^2 = 97.2\%$, $p < 0.001$). When stratified by source, the prevalence of anxiety in patients with MCI in community-based samples was 14.3% (95% CI, 9.7–20.5) and was 31.2% (95% CI, 23.6–40.0) in clinic-based samples, which was significantly different ($p < 0.01$). The prevalence of anxiety estimates also differed significantly, when stratification by the method of anxiety diagnosis ($p < 0.01$). However, the criteria used for MCI diagnosis and geographical region did not significantly influence the prevalence estimate. Limitations: We did not consider the usage of anti-anxiety drugs and language bias. Conclusions: <u>The prevalence of anxiety in patients with MCI was common and variability in prevalence of anxiety across studies can be attributed partly to the source of the sample and method of anxiety diagnosis.</u> Further research is needed to identify sources of heterogeneity. (PsycINFO Database Record (c) 2018 APA, all rights reserved) (Source: journal abstract)” (p. 211)
Author	Credentials: (of first author): Could not find, Article associated with Department of Neurology, Second Xiangya Hospital, China Position and Institution: Publication History in Peer-Reviewed Journals: Journal of Affective Disorders, Neurology, not very many articles
Publication	Type of publication: Scholarly Publisher: International Society for Affective Disorders
Date and Citation History	Date of publication: 2018 Cited By: 2
Stated Purpose or Research Question	“Given that inconsistencies are prominent in the current literature, a systematic review and meta-analysis will be useful in determining the best estimate of prevalence currently available and clarifying the reasons for differences in estimates” (pg. 212)
Author’s Conclusion	“The present article confirmed that anxiety was common in patients with MCI, with an overall pooled prevalence of anxiety was 21%” (pg. 218)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: Strong Rationale: The question was crafted in a way that followed PICO, which created a relevant study.
Overall Quality of Article	Overall Quality of Article: <i>Moderate</i> Rationale: The information seems good. This article has not been cited often, which may be because it is so new. It was difficult to find information on the author. This made me draw the conclusion of moderate quality.

Type of article	Overall Type: Primary Research Study Specific Type: Prevalence epidemiological study
APA Reference	Ganguli, M., Dodge, H. H., Shen, C., & Dekosky, S. T. (2004). Mild cognitive impairment, amnestic type: An epidemiologic study. <i>Neurology</i> , 63(1), 115-121. doi:10.1212/01.wnl.0000132523.27540.81
Abstract	“To estimate the prevalence and examine the course of mild cognitive impairment (MCI), amnestic type, using current criteria, within a representative community sample. Retroactive application of MCI criteria to data collected during a prospective epidemiologic study was performed. The subjects were drawn from voter registration lists, composing a cohort of 1,248 individuals with mean age of 74.6 (5.3) years, who were nondemented at entry and who were assessed biennially over 10 years of follow-up. The Petersen amnestic MCI criteria were operationalized as 1) impaired memory: Word List Delayed Recall score of <1 SD below mean; 2) normal mental status: Mini-Mental State Examination score of 25+; 3) normal daily functioning: no instrumental impairments; 4) memory complaint: subjective response to standardized question; 5) not demented: Clinical Dementia Rating Scale score of <1. At the five assessments, amnestic MCI criteria were met by 2.9 to 4.0% of the cohort. Of 40 persons with MCI at the first assessment, 11 (27%) developed dementia over the next 10 years. Over each 2-year interval, MCI persons showed increased risk of dementing (odds ratio = 3.9, 95% CI = 2.1 to 7.2); 11.1 to 16.7% progressed to Alzheimer disease and 0 to 5.0% progressed to other dementias. Over the same intervals, 11.1 to 21.2% of those with MCI remained MCI; of 33.3 to 55.6% who no longer had MCI, half had reverted to normal. In this community-based sample, 3 to 4% of nondemented persons met MCI operational criteria; despite increased risk of progressing to dementia, a substantial proportion also remained stable or reverted to normal during follow-up. Amnestic MCI as currently defined is a high-risk but unstable and heterogeneous group.” (p. 115)
Author	Credentials: MBBS (MD) Position and Institution: Division of Geriatrics and Neuropsychiatry, University of Pittsburgh School of Medicine Publication History in Peer-Reviewed Journals: High
Publication	Type of publication: Scholarly peer-reviewed journal Publisher: AAN publications Other: neurology.org
Date and Citation History	2004 Google Scholar Cited By: 753
Stated Purpose or Research Question	“To estimate the prevalence and examine the course of mild cognitive impairment (MCI), amnestic type, using current criteria, within a representative community sample” (no page).
Author’s Conclusion	“In this community-based sample, 3 to 4% of nondemented persons met MCI operational criteria; despite increased risk of progressing to dementia, a substantial proportion also remained stable or reverted to normal during follow-up. Amnestic MCI as currently defined is a high-risk but unstable and heterogeneous group” (no page).
Overall Relevance to PICO	Overall Relevance to PICO: Moderate Relevance PICO: Directly related to prevalence of MCI, but conclusions do not exhibit significant findings
Overall Quality	Overall Quality of Article: Good Quality Established author. Reputable journal. Publication within last 15 years. However, can only find article on very limited databases.

Type of article	Overall Type: Review of Research Studies Specific Type: Systematic Review / Meta-Analysis
APA Reference	Hu, C., Yu, D., Sun, X., Zhang, M., Wang, L., & Qin, H. (2017). The prevalence and progression of mild cognitive impairment among clinic and community populations: A systematic review and meta-analysis. <i>International Psychogeriatrics</i> , 29(10), 1595-1608. doi:10.1017/s1041610217000473
Abstract	<p>“BACKGROUND: It has been reported that up to 42% of the population aged over 60 are affected by mild cognitive impairment (MCI) worldwide. This study aims to investigate the prevalence and progression of MCI through a meta-analysis.</p> <p>METHODS: We searched Embase and PubMed for relevant literature. Stable disease rate (SR), reversion rate (RR), dementia rate (DR), and Alzheimer's disease rate (AR) were used to evaluate the progression of MCI. The prevalence and progression rates were both obtained by reported percentile and indirect data analysis. Additionally, we carried out sensitivity analysis of each index by excluding some studies due to influence analysis with the most publication bias.</p> <p>RESULTS: Effect size (ES) was used to present adjusted overall prevalence (16%) and progression rates including SR (45%), RR (15%), DR (34%), and AR (28%) of MCI. Compared with clinic-based outcomes, MCI prevalence, SR, and RR are significantly higher in community, while DR and AR are lower. Despite significant heterogeneity found among the studies, no publication bias was observed.</p> <p>CONCLUSIONS: Age and gender were observed to be associated with MCI, in which age was considered as an impact factor for DR. The strong heterogeneity may result from variations in study design and baselines. Standardized MCI criteria were suggested to systematically evaluate MCI in the future.” (p. 1595)</p>
Author	Limited information available. Pudong New District Mental Health Center in Shanghai, China Department of Psychiatric Control & Prevention Publication History in Peer-Reviewed Journals: Low
Publication	Type of publication: Scholarly Publisher: Cambridge University Press Other: International Psychogeriatrics
Date and Citation History	October 2017 Google Scholar Cited By: 48
Stated Purpose or Research Question	“This study aims to investigate the prevalence and progression of MCI through a meta-analysis” (No page).
Author's Conclusion	“Age and gender were observed to be associated with MCI, in which age was considered as an impact factor for DR. The strong heterogeneity may result from variations in study design and baselines. Standardized MCI criteria were suggested to systematically evaluate MCI in the future” (No page).
Overall Relevance to PICO	Overall Relevance to PICO: Moderate PICO: Capitalizes on the relationship of age and MCI. However, does not give specific ages rather generalizes 60+
Overall Quality	Overall Quality of Article: Good/Low Author information is very limited. However, it could be because he is an international author. He could be quite reliable in China as it appears he holds a role at a mental health center.

Type of article	Overall Type: Conceptual Article
APA Reference	Anderson, N. D. (2019). State of the science on mild cognitive impairment (MCI). <i>CNS Spectrums</i> , 1-10. doi:10.1017/s1092852918001347
Abstract	<p>“Mild cognitive impairment (MCI) represents a transitional stage between healthy aging and dementia, and affects 10-15% of the population over the age of 65. The failure of drug trials in Alzheimer’s disease (AD) treatment has shifted researchers’ focus toward delaying progression from MCI to dementia, which would reduce the prevalence and costs of dementia profoundly. Diagnostic criteria for MCI increasingly emphasize the need for positive biomarkers to detect preclinical AD. The phenomenology of MCI comprises lower quality-of-life, greater symptoms of depression, and avoidant coping strategies including withdrawal from social engagement. Neurobiological features of MCI are hypoperfusion and hypometabolism in temporo-parietal cortices, medial temporal lobe atrophy particularly in rhinal cortices, elevated tau and phosphorylated tau and decreased Aβ42 in cerebrospinal fluid, and brain Aβ42 deposition. Elevated tau can be identified in MCI, particularly in the entorhinal cortex, using positron emission tomography, and analysis of signal complexity using electroencephalography or magnetoencephalography holds promise as a biomarker. Assessment of MCI also relies on cognitive screening and neuropsychological assessment, but there is an urgent need for standardized cognitive tests to capitalize on recent discoveries in cognitive neuroscience that may lead to more sensitive measures of MCI. Cholinesterase inhibitors are frequently prescribed for MCI, despite the lack of evidence for their efficacy. Exercise and diet interventions hold promise for increasing reserve in MCI, and group psychoeducational programs teaching practical memory strategies appear effective. More work is needed to better understand the phenomenology and neurobiology of MCI, and how best to assess it and delay progression to dementia.” (p. 1)</p>
Author	<p>Credentials: PhD Position and Institution: Senior Scientist at Rotman Research Institute in Toronto, Canada Publication History in Peer-Reviewed Journals: extensive</p>
Publication	<p>Type of publication: Scholarly Publisher: Cambridge University Other: CNS Spectrum</p>
Date and Citation History	<p>2019 Google Scholar Cited By: 1060</p>
Stated Purpose or Research Question	<p>“To investigate researchers’ shifted focus toward delaying progression from MCI to dementia, which would reduce the prevalence and costs of dementia profoundly “ (taken from abstract, no full text available).</p>
Author’s Conclusion	<p>“More work is needed to better understand the phenomenology and neurobiology of MCI, and how best to assess it and delay progression to dementia” (taken from abstract, no full text available).</p>
Overall Relevance to PICO	<p>Overall Relevance to PICO: Moderate PICO: This study helps state the general definition and principles of an MCI. However, it does touch on interventions/treatment which is not our PICO.</p>
Overall Quality	<p>Overall Quality of Article: Low Cannot access full text without payment.</p>

Type of article	Overall Type: Theoretical/Conceptual
APA Reference	Searle, S. D., & Rockwood, K. (2015). Frailty and the risk of cognitive impairment. <i>Alzheimer's Research & Therapy</i> , 7(1), 1-6. doi:10.1186/s13195-015-0140-3
Abstract	“Aging occurs as a series of small steps, first causing cellular damage and then affecting tissues and organs. This is also true in the brain. Frailty, a state of increased risk due to accelerated deficit accumulation, is robustly a risk factor for cognitive impairment. Community-based autopsy studies show that frail individuals have brains that show multiple deficits without necessarily demonstrating cognitive impairment. These facts cast a new light on the growing number of risk factors for cognitive impairment, suggesting that, on a population basis, most health deficits can be associated with late-life cognitive impairment. The systems mechanism by which things that are bad for the body are likely to be bad for the brain can be understood like this: the burden of health deficits anywhere indicates impaired ability to withstand or repair endogenous and environmental damage. This in turn makes additional damage more likely. If true, this suggests that a life course approach to preventing cognitive impairment is desirable. Furthermore, conducting studies in highly selected, younger, healthier individuals to provide 'proof of concept' information is now common. This strategy might exclude the very circumstances that are required for disease expression in the people in whom dementia chiefly occurs (that is, older adults who are often in poor health).” (p. 1)
Author	Credentials: MD, FRCPS Position and Institution: Dalhousie University Division of Geriatrics, Department of Medicine Publication History in Peer Reviewed Journals: Low
Publication	Type of publication: Scholarly Publisher: Alzheimer's Research and Therapy
Date and Citation History	2015 Google Scholar Cited By: 94
Stated Purpose or Research Question	“To critically evaluate the claim that frailty is related to cognitive impairment and, second, to suggest implications of this relationship for understanding dementia prevention and treatment and for the design and analysis of clinical trials” (no page).
Author's Conclusion	“Frailty and cognition are related to each other and to aging. The growing list of risk factors for dementia might simply reflect that both health deficit accumulation (frailty) and cognitive impairment are common in late life. Clinical trials in dementia should consider not excluding frail older adults, as frailty appears to drive disease expression and might be needed for the classic neuropathology of dementia to express its deleterious effects” (no page).
Overall Relevance to PICO	Overall Relevance to PICO: Strong PICO: This study helps describe a risk factor for MCI, which is a highlighted topic in our PICO. It supports the idea that frailty should not be a forgotten risk factor of MCI
Overall Quality	Overall Quality of Article: Good The article is pretty recent as it has been published within the last 5 years. However, the Author does not have many other publications. It should be noted that the Publisher is a reputable source.

Type of article	Overall Type: Primary Research Study Specific Type: Quantitative descriptive
APA Reference	Loewenstein D.A., Acevedo A., Small B.J., Agron J., Crocco E., & Duara R. (2009). Stability of different subtypes of mild cognitive impairment among the elderly over a 2- to 3-year follow-up period. <i>Dementia & Geriatric Cognitive Disorders</i> , 27(5), 418–423. https://doi.org/10.1159/000211803
Abstract	<p>“BACKGROUND/AIMS: To investigate the longitudinal stability and progression of different subtypes of mild cognitive impairment (MCI) in older adults. METHODS: We classified 217 individuals with no cognitive impairment (NCI), amnesic MCI (aMCI) based on a single test (aMCI-1) or multiple tests (aMCI-2+), nonamnesic MCI (naMCI) based on a single test (naMCI-1) or multiple tests (naMCI-2+), or amnesic + nonamnesic MCI (a+naMCI), using their baseline neuropsychological test scores, and performed annual follow-up evaluations for up to 3 years. RESULTS: None of the subjects with aMCI-2+ reverted to normal during follow-up, with 50% of these subjects remaining stable and 50% worsening over time. Similarly, less than 20% of subjects with aMCI-2+ and a+naMCI reverted to NCI during the follow-up period, whereas 50% of aMCI-1 and 37% with naMCI-1 reverted to NCI during this same period. CONCLUSION: Reversion to NCI occurs much more frequently when the diagnosis of MCI is based on the results of a single neuropsychological test than when it is based on the results of more memory tests. In epidemiological studies and clinical trials the diagnosis of MCI will likely be more stable if impairment on more than one test is required for amnesic and/or nonamnesic domains.” (p. 418)</p>
Author	Credentials: PhD Position and Institution: Director of Research at Wein Center for Alzheimer’s Disease and Memory Disorder; Professor of Psychiatry and Behavioral Health Science at University of Miami School of Medicine Publication History in Peer-Reviewed Journals: High
Publication	Type of publication: Scholarly (not peer-reviewed) Publisher: Dementia and Geriatric Cognitive Disorders
Date and Citation History	Year: 2009 Google Scholar Cited By: 702
Stated Purpose or Research Question	“The main objective of the current study was to examine the stability or progression of different types of neuropsychological impairment among older community-dwelling adults” (no page).
Author’s Conclusion	“The present study indicates that impairment on one or more tests within a specific cognitive domain predicts continuing cognitive impairment over time” (no page).
Overall Relevance to PICO	Overall Relevance to PICO: Strong PICO: Directly related to prognosis which is included in our PICO. Study examines both types and demonstrates strong statistics
Overall Quality	Overall Quality of Article: Strong Established author. Reputable journal. Longitudinal Study

Type of article	Overall Type: Review of Research Study Specific Type: Clinical review
APA Reference	Langa, K. M., & Levine, D. A. (2014). The diagnosis and management of mild cognitive impairment: A clinical review. <i>JAMA: Journal of the American Medical Association</i> , 312(23), 2551–2561. doi:10.1001/jama.2014.13806
Abstract	“Importance: Cognitive decline is a common and feared aspect of aging. Mild cognitive impairment (MCI) is defined as the symptomatic predementia stage on the continuum of cognitive decline, characterized by objective impairment in cognition that is not severe enough to require help with usual activities of daily living. Objective: To present evidence on the diagnosis, treatment, and prognosis of MCI and to provide physicians with an evidence-based framework for caring for older patients with MCI and their caregivers. Evidence Acquisition: We searched PubMed for English-language articles in peer-reviewed journals and the Cochrane Library database from inception through July 2014. Relevant references from retrieved articles were also evaluated. Findings: The prevalence of MCI in adults aged 65 years and older is 10% to 20%; risk increases with age and men appear to be at higher risk than women. In older patients with MCI, clinicians should consider depression, polypharmacy, and uncontrolled cardiovascular risk factors, all of which may increase risk for cognitive impairment and other negative outcomes. Currently, no medications have proven effective for MCI; treatments and interventions should be aimed at reducing cardiovascular risk factors and prevention of stroke. Aerobic exercise, mental activity, and social engagement may help decrease risk of further cognitive decline. Although patients with MCI are at greater risk for developing dementia compared with the general population, there is currently substantial variation in risk estimates (from <5% to 20% annual conversion rates), depending on the population studied. Current research targets improving early detection and treatment of MCI, particularly in patients at high risk for progression to dementia. Conclusions and Relevance: Cognitive decline and MCI have important implications for patients and their families and will require that primary care clinicians be skilled in identifying and managing this common disorder as the number of older adults increases in coming decades. Current evidence supports aerobic exercise, mental activity, and cardiovascular risk factor control in patients with MCI.” (p. 2551)
Author	Credentials: MD, PhD Position and Institution: Professor Internal Medicine, Gerontology, and Health Management and Policy Division of General Medicine, University of Michigan Publication History in Peer-Reviewed Journals: Google Scholar returned 440 results from the author K.M. Langa. Many of the result titles relating to dementia, cognition, or cog with several being published in the New England Journal of Medicine.
Publication	Type of publication: Scholarly Publisher: <i>Journal of American Medical Association</i>
Date and Citation History	Date of publication: 12/17/2014 Cited By: 303
Stated Purpose or Research Question	“To present evidence on the diagnosis, treatment, and prognosis of MCI, and to provide physicians with an evidence-based framework for caring for older MCI patients and their caregivers.” (p. 1)
Author’s Conclusion	“Cognitive decline and MCI have important implications for patients and their families and will require that primary care clinicians be skilled in identifying and managing this common disorder as the number of older adults increases in coming decades. Current evidence supports aerobic exercise, mental activity, and cardiovascular risk factor control in patients with MCI.” (p. 2)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: <i>Good</i> Rationale: This systematic review discusses the ways in which health care providers can support those with MCI to decrease risk of further cognitive decline. Risk factors for further cognitive decline, as well as various ways to help prevent this are presented within the review.
Overall Quality of Article	Overall Quality of Article: <i>Good</i> Rationale: The author has been involved in a wide variety of research related to the same topic. the journal is reputable, peer reviewed. Published in the last 5 years

Type of article	Overall Type: Primary Research Study Specific Type: Retrospective, longitudinal, observational study
APA Reference	Chen, P., Cheng, S., Lin, H., Lee, C., & Chou, C. (2018). Risk factors for the progression of mild cognitive impairment in different types of neurodegenerative disorders. <i>Behavioural Neurology</i> , 2018, 1-8. doi:10.1155/2018/6929732
Abstract	“Mild cognitive impairment (MCI) is a transitional state between normal aging and early dementia. It has a heterogeneous etiology and clinical course. This study aimed to examine the factors associated with the progression of MCI in different types of dementia disorders. A retrospective, longitudinal, observational study of outpatients with MCI was conducted at a medical center in northern Taiwan. Patient medical records were reviewed, and risk factors were analyzed by multivariate analysis. Among 279 patients with MCI, 163 (58.4%), 68 (24.4%), and 48 (17.2%) were diagnosed with Alzheimer's disease, vascular cognitive impairment, and Lewy body diseases, respectively. During the observation period, 37.2% of patients progressed to dementia. Older age and a higher Clinical Dementia Rating Scale-Sum of Boxes were associated with the risk of progression. Hyperlipidemia was associated with a decreased risk. Converters were more likely to receive an antedementia prescription. Our study suggests the importance of comprehensive clinical profiling, risk factor assessment, and detailed drug history evaluations in improving our understanding and management of dementia subtypes.” (p. 1)
Author	Credentials: MD Position and Institution: Mackay Memorial Hospital, Taipei, Department of Neurology Publication History in Peer-Reviewed Journals: 203 results from google scholar. However, many of the results were not all the correct author, but other authors with the last name Chen. Only a few results were listed with P.H. Chen.
Publication	Type of publication: Scholarly Publisher: Hindawi Publishing Corporation Other: Publisher founded in 1997. Publishes over 250 peer reviewed scientific journals.
Date and Citation History	Date of publication: 6-5-2018 Cited By: 2
Stated Purpose or Research Question	“This study aimed to examine the association between common clinical and neuropsychological factors in later life at the MCI stage and the risk of converting to dementia, with a particular focus on specific dementia disorders.” (p. 2)
Author's Conclusion	“Receiving antedementia agents was significantly associated with conversion in AD” (p. 4) “Female was associated with an increased risk in AD.” (P. 4)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: <i>Moderate</i> <i>Overall, this article gave some information on risk factors associated with progressing from MCI to Alzheimer's. Some of this information will be useful to our topic as we can educate clients and families regarding these risk factors. No information was given regarding ways of decreasing risk factors.</i>
Overall Quality of Article	Overall Quality of Article: <i>Moderate</i> Rationale: <i>Peer reviewed journal. Author has limited publication history. Only cited by 2 other sources but published recently. Reputable publisher.</i>

Type of article	Overall Type: Primary Research Study Specific Type: Cross-sectional analysis
APA Reference	McCann, A., McNulty, H., Rigby, J., Hughes, C. F., Hoey, L., Molloy, A. M., ... Moore, A. (2018). Effect of area-level socioeconomic deprivation on risk of cognitive dysfunction in older adults. <i>Journal of the American Geriatrics Society</i> , 66(7), 1269–1275. doi:10.1111/jgs.15258
Abstract	“OBJECTIVES: To investigate the relationship between area-level deprivation and risk of cognitive dysfunction. DESIGN: Cross-sectional analysis. SETTING: The Trinity, Ulster, and Department of Agriculture (TUDA) study from 2008 to 2012. PARTICIPANTS: Community-dwelling adults aged 74.0 ± 8.3 without dementia (N = 5,186; 67% female). MEASUREMENTS: Adopting a cross-jurisdictional approach, geo-referenced address-based information was used to map and link participants to official socioeconomic indicators of deprivation within the United Kingdom and the Republic of Ireland. Participants were assigned an individual deprivation score related to the smallest administrative area in which they lived. These scores were categorized into comparable quintiles, that were then used to integrate the datasets from both countries. Cognitive health was assessed using the Mini-Mental State Examination (MMSE); cognitive dysfunction was defined as a MMSE score of 24 or less. RESULTS: Approximately one-quarter of the cohort resided within the most-deprived districts in both countries. Greater area-level deprivation was associated with significantly lower MMSE scores; fewer years of formal education; greater anxiety, depression, smoking and alcohol use, and obesity; and more adverse outcomes, including higher blood pressure and diabetes risk. After adjustment for relevant covariates, area deprivation was associated with significantly higher risk of cognitive dysfunction (odds ratio = 1.40, 95% confidence interval = 1.05–1.87, P = .02, for most vs least deprived). CONCLUSION: This analysis combining data from two health systems shows that area deprivation is an independent risk factor for cognitive dysfunction in older adults. Adults living in areas of greatest socioeconomic deprivation may benefit from targeted strategies aimed at improving modifiable risk factors for dementia. Further cross-national analysis investigating the impact of area-level deprivation is needed to address socioeconomic disparities and shape future policy to improve health outcomes in older adults.” (p. 1269)
Author	Credentials: BA, PhD Position and Institution: Professor, Nutrition Innovation Centre for Food and Health, Ulster University, Coleraine, Northern Ireland, United Kingdom. Publication History in Peer-Reviewed Journals: 102 results. Most research pertains to nutrition based topics, but not MCI.
Publication	Type of publication: Scholarly Publisher: <i>Journal of American Gerontological Society</i>
Date and Citation History	Date of publication: 2/12/2018 Cited By: 5
Stated Purpose or Research Question	“To investigate the relationship between area-level deprivation and risk of cognitive dysfunction.” (P. 1269)
Author’s Conclusion	“This analysis combining data from two health systems shows that area deprivation is an independent risk factor for cognitive dysfunction in older adults. Adults living in areas of greatest socioeconomic deprivation may benefit from targeted strategies aimed at improving modifiable risk factors for dementia.” (P. 1269)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: <i>Strong</i> Rationale: <i>Related to predictive characteristics of individuals that may be at risk for MCI.</i>
Overall Quality of Article	Overall Quality of Article: <i>Moderate</i> Rationale: <i>Reputable journal and author. Few peer reviewed journals citing study.</i>

Type of article	Overall Type: Primary Research Study Specific Type: Longitudinal study
APA Reference	Cloutier, S., Chertkow, H., Kergoat, M.J., Gauthier, S., & Belleville, S. (2015). Patterns of cognitive decline prior to dementia in persons with mild cognitive impairment. <i>Journal of Alzheimer's Disease</i> , 47(4), 901–913. doi.org/10.3233/JAD-142910
Abstract	“Only a limited number of studies have investigated the decline of discrete cognitive domains as individuals progress from mild cognitive impairment (MCI) to dementia. Thus, the goal of this longitudinal study was to evaluate the cognitive changes underway during the years preceding a diagnosis of probable Alzheimer's disease (AD), and to compare these changes to those found in MCI participants who do not progress to dementia. Participants were compared as a function of whether they later converted to AD (n=47) or not (n=74). Cognitive change was assessed prior to the conversion year, using that year as a starting point. A combination of polynomial regression analyses and mixed ANOVAs assessed 1) the trajectory of cognitive decline for each domain and 2) the differences between non-progressors and those who had converted to AD. The different cognitive domains demonstrated very different patterns of decline in the group of MCI progressors. A quadratic function, i.e., many years of stable performance followed by a rapid decline just prior to diagnosis, was observed for delayed recall, working memory, and spatial memory. In contrast, a gradual linear decline was observed for immediate recall, executive function, and visuo-spatial abilities. Finally, language in progressors was impaired on all time periods relative to non-progressors, but there was no further change between the first assessments and conversion to AD. Individuals with MCI who progress to AD show abnormal cognition at least two years prior to their dementia diagnosis. The pattern of symptom change observed appears to depend upon the cognitive domain and thus, clinical studies should not assume similar rate of decline across domains. In contrast and, apart from verbal memory, the non-progressors present a performance similar to that of healthy older adults.” (p. 901)
Author	Credentials: PhD candidate Position and Institution: PhD candidate, department of psychology, University of Montreal Publication History in Peer-Reviewed Journals: 3
Publication	Type of publication: Scholarly Publisher: IOS Press Other: Publishes 100 journals and about 75 book titles each year, founded in 1987
Date and Citation History	Date of publication: 5/12/2015 Cited By: 25
Stated Purpose or Research Question	“comprises the three following goals: 1) characterize the evolution of cognitive deficits as a function of whether the MCI persons later progress to dementia or not; 2) determine whether different cognitive domains have distinctive trajectories and sensitivity to change; 3) assess whether decline is linear or follows a more complex trajectory with periods of stability and acceleration, as the plateau model of Twamley et al. [23] would suggest.” (p. 903)
Author's Conclusion	“Cognition declines in individuals with MCI as they progress toward dementia. However, the decline trajectory varies between cognitive domains.” (p. 911)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: <i>Moderate</i> Rationale: <i>Complex article detailing the cognitive transition from MCI to dementia. As our question has to do with characteristics of individuals who are at risk for MCI, this study may focus to heavily on the progression towards dementia to be highly relevant.</i>
Overall Quality of Article	Overall Quality of Article: <i>Moderate</i> Rationale: PhD candidate, limited publication history, article has been cited in subsequent studies.

Type of article	Overall Type: Review of Research Specific Type: Evidence review
APA Reference	Baumgart, M., Snyder, H.M., Carrillo, M.C., Fazio, S., Kim, H., & Johns, H. (2015). Summary of the evidence on modifiable risk factors for cognitive decline and dementia: A population-based perspective. <i>Alzheimer's & Dementia: The Journal of the Alzheimer's Association</i> , 11(6), 718-726. doi:10.1016/j.jalz.2015.05.016
Abstract	“An estimated 47 million people worldwide are living with dementia in 2015, and this number is projected to triple by 2050. In the absence of a disease-modifying treatment or cure, reducing the risk of developing dementia takes on added importance. In 2014, the World Dementia Council (WDC) requested the Alzheimer’s Association evaluate and report on the state of the evidence on modifiable risk factors for cognitive decline and dementia. This report is a summary of the Association’s evaluation, which was presented at the October 2014 WDC meeting. The Association believes there is sufficient evidence to support the link between several modifiable risk factors and a reduced risk for cognitive decline, and sufficient evidence to suggest that some modifiable risk factors may be associated with reduced risk of dementia. Specifically, the Association believes there is sufficiently strong evidence, from a population-based perspective, to conclude that regular physical activity and management of cardiovascular risk factors (diabetes, obesity, smoking, and hypertension) reduce the risk of cognitive decline and may reduce the risk of dementia. The Association also believes there is sufficiently strong evidence to conclude that a healthy diet and lifelong learning/cognitive training may also reduce the risk of cognitive decline.” (p. 718)
Author	Credentials: Bachelors in communications, masters in political science Position and Institution: Senior Director of Government Affairs for the Alzheimer’s Association Publication History in Peer-Reviewed Journals: 74 results. Most related to Alzheimer’s or dementia.
Publication	Type of publication: Popular Publisher: <i>Alzheimer’s and Dementia</i> Other: Owned by Alzheimer’s Association
Date and Citation History	Date of publication: June 2015 Cited By: 362
Stated Purpose or Research Question	“The Association’s task was not to conduct an independent review of all published literature related to risk reduction, but to evaluate the existing reviews, briefly summarize the findings about the existing body of published evidence, and draw conclusions about the current state of the science.” (p. 719)
Author’s Conclusion	“However, the Association also believes there is sufficiently strong evidence, from a population-based perspective, to conclude: (1) regular physical activity and management of cardiovascular risk factors (diabetes, obesity, smoking, and hypertension) have been shown to reduce the risk of cognitive decline and may reduce the risk of dementia; and (2) a healthy diet and lifelong learning/cognitive training may also reduce the risk of cognitive decline.” (p. 722)
Overall Relevance to PICO or EBP Research Question	Overall Relevance to PICO: <i>Moderate</i> Rationale: This article provides a lot of good information regarding risk factors, especially modifiable risk factors.
Overall Quality of Article	Overall Quality of Article: <i>Moderate</i> , Rationale: <i>Journal owned by Alzheimer’s Association, main author employed by Alzheimer’s Association. Author’s background is not related to dementia or science field, rather public policy.</i>