Mild Cognitive Impairment
Quality Measurement Set

Approved by the Mild Cognitive Impairment Quality Measurement Work Group on January 17, 2019. Approved by the AANI Quality and Safety Subcommittee on January 26, 2019. Approved by AANI Practice Committee on February 11, 2019. Approved by AANI Board of Directors on March 5, 2019.

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Contents

Work Group Members

Chair – American Academy of Neurology
Norman L. Foster, MD

American Academy of Neurology
Linda A. Hershey, MD, PhD
Ajay Sood, MD, PhD
Meredith Wicklund, MD
Melissa Yu, MD

Alzheimer's Association
Mary Foss
Monica Moreno
Carol Poole

American Academy of Physician Assistants
Rebecca Logan, PA-C, MPAS

American Geriatric Society
Joseph W. Shega, MD
Niranjan Thothala, MD, MRCP (UK), MBA

American Psychiatric Association
Steve Koh, MD, MPH, MBA

Inter Organizational Practice Committee
American Academy of Clinical Neuropsychology (AACN),
Society for Clinical Neuropsychology/Division 40 of the American Psychological Association,
National Academy of Neuropsychology (NAN),
American Board of Professional Neuropsychology (ABN), and
American Psychological Practice Organization (APAPO)
Mark W. Bondi, PhD, ABPP-CN

American Academy of Neurology *Facilitators - non-voting work group members*
Rohit Das, MD, FAAN
David Wang, DO, FAHA, FAAN

American Academy of Neurology *Staff*
Amy Bennett, JD
Gina Gjorvad
Katie Hentges
Erin Lee
Karen Lundgren, MBS
Becky Schierman, MPH

Importance and Prevalence of Mild Cognitive Impairment

Defining Mild Cognitive Impairment

Mild Cognitive Impairment (MCI) is a syndrome rather than a disease. "MCI" is a term used to describe acquired objective cognitive deficits insufficiently severe to affect most usual daily activities. For purposes of this document the term "MCI" is used as a catchall phrase for diseases and disorders that cause acquired cognitive deficits not affecting a person's usual activities. MCI does not necessarily represent a progressive dementia syndrome. Deficits have been observed or experienced for three months or more. MCI generally corresponds to the term "mild neurocognitive disorder" used in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5).

Prevalence and Impact of Mild Cognitive Impairment

The prevalence of MCI increases as individuals age and is common in older populations. The AAN 2017 MCI guideline assessed the prevalence of MCI and cognitive impairment worldwide. MCI prevalence was 6.7% for those aged 60–64 years, 8.4% for those aged 65–69 years, 10.17% for those aged 70–74 years, 14.8% for those aged 75–79 years, 25.2% for those aged 80–84 years, and 37.6% for those aged 85 years and older.[i]

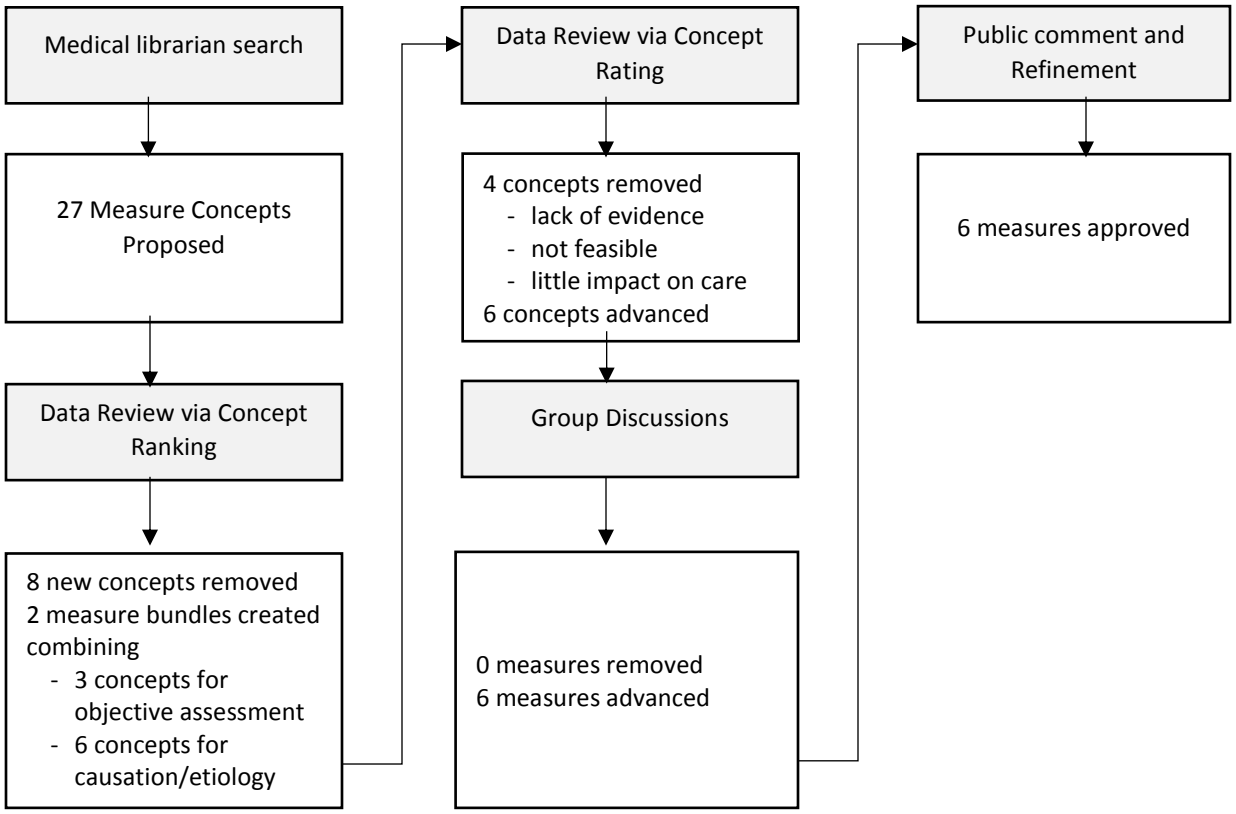
Ton, et al. studied financial burden and healthcare utilization and found patients with aMCI found increasing financial burden due to lower annual household income and higher medical expenditures relative to those with normal cognition.[ii] Zhu et al., estimated that annual direct medical costs for a person with MCI was $6,499 compared to $2,969 for those without MCI.[iii]

Measure Development Process

The American Academy of Neurology Institute (AANI) charged this work group with developing new measures focused on improving outcomes for patients with MCI. The AANI identified non-voting facilitators from the Quality and Safety Subcommittee and Practice Committee to serve as methodological support and guide the work group to consensus decisions. A subject matter chair was identified. A call for work group volunteers was made through the AAN, the Alzheimer's Association and professional organizations relevant to MCI. Work group members were selected based on review of disclosure statements, subject matter expertise, and measure development experience. The work group includes physician, advanced practice provider, advocacy, patient, and care partner representatives from professional associations and patient advocacy organizations to ensure measures developed included input from all members of the healthcare team and other relevant stakeholders. All work group members are required to disclose relationships with industry and other entities to avoid actual, potential, or perceived conflicts of interest. Disclosures are listed in Appendix A. Seated work group members were instructed to abstain from voting on individual measure concepts if a conflict was present.

The AANI measure development process involves a modified Delphi review by the work group to reach consensus on measures to be developed prior to a 21-day public comment and following public comment further refinement.[iv]

Below is an illustration of the measure development process from proposals, discussion, research, evaluation, to approval.



A comprehensive search to identify published guidelines, measures, and consensus recommendations in the National Guidelines Clearinghouse, the National Quality Measures Clearinghouse, PubMed, MEDLINE, EMBASE, and the Cochrane Library occurred identifying 1,932 potential articles from 2013 to project launch in late 2017. The work group winnowed results to 227 articles of interest and of these seven guidelines and 32 systematic reviews or meta-analyses were identified.

The measures in this set are being made available without any prior testing. The AAN encourages testing of this measurement set for feasibility and reliability by organizations or individuals positioned to do so. Select measures will be beta tested once the set has been released. Testing is required prior to submission to CMS for consideration in Quality Payment Program's (QPP) Merit-based Incentive Payment System (MIPS) and the National Quality Forum for possible endorsement. The measurement set will be reviewed for updates triennially.

2018 Mild Cognitive Impairment Measurement Set
The work group approved six measures listed in the table below. There is no requirement that all the measures in the measurement set be used. Clinicians and treatment teams are encouraged to identify the one or two measures that would be most meaningful to their patient populations and implement those measures to drive performance improvement in practice. Data should be collected for an initial benchmark period, and results used to drive meaningful changes to identify and improve performance and overall care provided to patients with MCI.

Annual Cognitive Health Assessment for Patients 65 years and Older
Cognitive and Functional Assessment for Patients with Mild Cognitive Impairment (MCI) or Memory Loss
MCI Diagnosis Disclosed and Counseled on Treatment Options
Assessment and Treatment of Factors Contributing to MCI
Avoidance of Anticholinergic Medications for Patients with MCI
Education Provided to Care Partners of Patients with MCI

Other Potential Measures
The work group proposed 27 measure concepts addressing causation, cognitive and functional evaluation, diagnostic imaging and testing, disclosure of diagnosis, medications, neuropsychological testing, management, legal planning, care partner concerns, the role of exercise, enrollment in clinical trials, quality of life, and ongoing treatment and follow-up.

The AANI encourages work groups to focus development of measure concepts that are feasible, meaningful to quality improvement efforts, and address a known treatment gap. Ultimately the work group cannot develop all appropriate concepts due to resource limitations and efforts to reduce reporting burden for clinicians. The work group eliminated 8 proposed new concepts following a prioritization ranking. Those concepts were: clinical trial, exercise, legal planning, quality of life, and follow-up. The work group noted that there was opportunity to support use of existing measures already developed to address some of the proposed concepts rather than develop new measures specific to MCI. The work group recommends use of the following measures for this population to supplement the above MCI specific measures developed by the work group:

- CMS Advance care planning for patients 65 years and older
- AAN Advance care planning for patients 18 years and older with a primary neurologic disorder diagnosis
- CMS Maltreatment Screening
- AAN Axon Registry quality of life PROMIS measure

Following ranking, the work group bundled cognitive and functional assessment into one measure and bundled concepts into a causation or differential diagnosis measure. The work group rated measures on evidence, feasibility, and link to improved outcomes, and eliminated additional measures prior to discussion (See measure development graphic above). These concepts were:

- Counseling regarding supplements
- Counseling regarding acetylcholinesterase inhibitors and/or memantine
- Care planning visits

Although, the eliminated measures were not included in this measurement set, they are high-value concepts that will be retained for future measurement set updates as more evidence may support development or a treatment gap in care at that time.

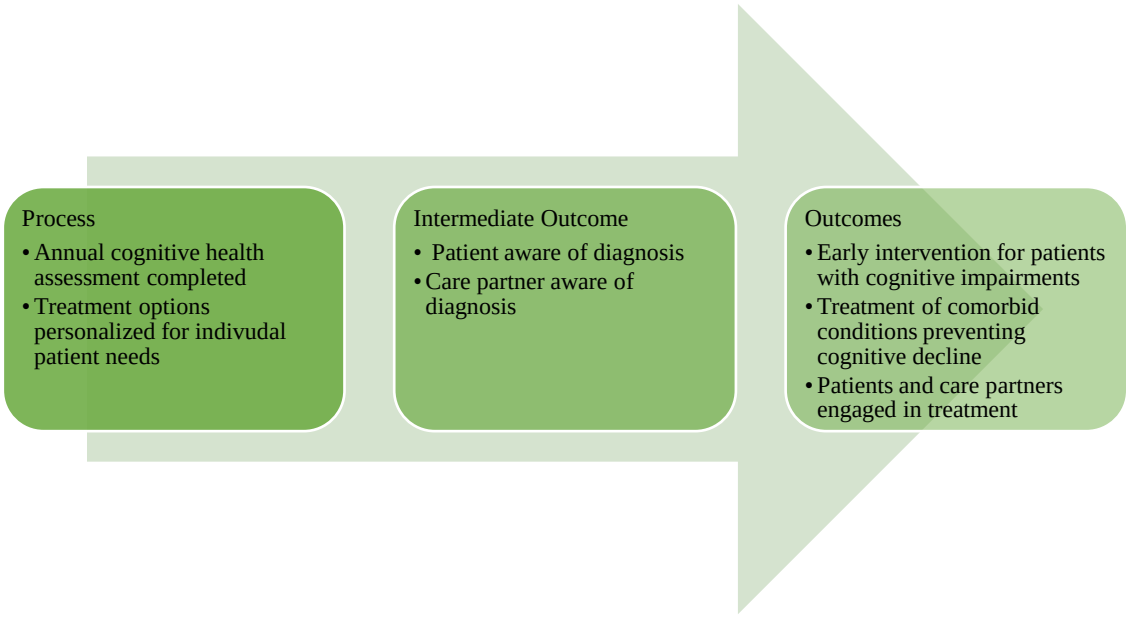
Additional Measures for Patients with MCI
The AANI has developed additional measures that may be of interest to clinicians and teams treating patients with MCI. All AANI measures are available for free at: https://www.aan.com/policy-and-guidelines/quality/quality-measures2/quality-measures/

2018 MCI Measure Specifications

Annual Cognitive Health Assessment for Patients 65 years and older

Measure Title	Annual Cognitive Health Assessment for Patients 65 years and Older	
Description	Percentage of patients aged 65 and older who had cognition assessed.	
Measurement Period	January 1, 20xx to December 31, 20xx	
Eligible Population	**Eligible Providers**	Medical Doctor (MD), Doctor of Osteopathy (DO), Neuropsychologist (PhD, PsyD), Psychologist (PhD, PsyD), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN)
	Care Setting(s)	Outpatient Care
	Ages	Age 65 and older
	Event	Office visit
	Diagnosis	All patients
Denominator	Patients aged 65 and older	
Numerator	Patients who had cognition assessed* within the measurement period. Patients who had cognition assessed* at least once during the measurement period. *Cognition assessed is defined as use of one of the following validated objective tools (Users are encouraged to review possible copyright and use requirements prior to administration, as well as, ability to have the informant(s) potentially complete the validated tool. The tools are not necessarily equal and interchangeable. Clinician judgment is needed in selecting and interpreting the appropriate tool.): • Montreal Cognitive Assessment (MoCA)(1), • Mini-Mental State Examination (MMSE)(1-2), • Memory Impairment Screen (MIS)(1), • Saint Louis University Mental Status examination (SLUMS)(3), • Mini-Cog©(4), • Clinical Dementia Rating (CDR)(5), • Self-Administered Gerocognitive Examination (SAGE) (6), or • Neuropsychological assessment results. To perform well on this measure, the following key phrases are suggested for collection in a registry. These key phrases should be recorded within the measurement period: • "Order for referral for neuropsychological assessment", • "Neuropsychological results discussed/counseled/reviewed with patient", • "MoCA [OR SLUMS, MMSE, MIS, CDR, Mini-Cog, SAGE, or neuropsychological] results reviewed", OR • "MoCA [OR SLUMS, MMSE, MIS, CDR, SAGE, Mini-Cog] results" followed by numerical score • Presence of CPT code on encounter date or within the measurement period for neuropsychological testing would meet the measure: 96116, 96136, 96138, 96146	
Required Exclusions	• Prior diagnosis of Mild Cognitive Impairment • Prior diagnosis of dementia (See Appendix B for complete diagnostic codes)	
Allowable Exclusions	• Patient declines cognitive health assessment on date of encounter • On date of encounter, patient is not able to participate in a cognitive health assessment, including non-verbal patients, delirious, comatose, severely aphasic, severely developmentally delayed, severe visual or hearing impairment and for those patients, no knowledgeable informant available. • Patient previously had a cognitive assessment in the measurement period and prior results noted.	

	To perform well on this measure, we suggest using key phrases for collection in a registry. These key phrases should be recorded on the encounter date: • "Patient unable to communicate, no informant present" • "Patient unable to understand task" • "Patient declines cognitive assessment tool" • "Informant declines cognitive assessment" • "Patient refuses cognitive assessment tool" • "Informant refuses cognitive assessment" • "Care partner [OR spouse, informant, caregiver] declines cognitive assessment" • "Patient screened and results noted." • "Patient previously assessed for cognitive impairment and results present."
Allowable Exclusion Inclusion Logic	Allowable exclusions can only help measure performance. If a patient has an allowable exclusion but is found to meet the numerator that patient is included in the count to meet the measure.
Exclusion Rationale	Patients with prior diagnoses of MCI and dementia are excluded from the measure to prevent duplicative measurement in the calendar year. These patients are subject to other screening and assessment measures. (See Harmonization with Existing Measures below.) Patients or informants need to be able and willing to complete assessment for the assessment results to be valid. Additionally, patients previously assessed in the measurement period may be excluded if prior results are noted to reduce duplicative assessments.
Measure Scoring	Percentage
Interpretation of Score	Higher Score Indicates Better Quality
Measure Type	Process
Level of Measurement	Provider
Risk Adjustment	Not applicable for process measure.
For Process Measures Relationship to Desired Outcome	From AAN MCI Guideline: "Clinicians should assess for MCI with validated tools in appropriate scenarios (Level B). Clinicians should evaluate patients with MCI for modifiable risk factors, assess for functional impairment, and assess for and treat behavioral/neuropsychiatric symptoms (Level B)."(7)

	The Alzheimer's Association notes, "Informal observation alone by a physician is not sufficient (i.e., observation without a specific cognitive evaluation."(8) 
Opportunity to Improve Gap in Care	Opportunity exists to improve the recognition of MCI through routine screening of cognitive health in older adults who because of their age are at high risk.(8,9) The work group restricted the measure to patients over the age of 65, but encourages clinicians to screen all at-risk patients for MCI. The work group also notes an informant may help in identification of at-risk patients along with thorough cognitive assessment. Physicians fail to recognize about 50% of patients in their practice with significant cognitive deficits, missing an opportunity to offer appropriate evaluation and treatment.(10) Depending solely on a complaint is insufficient because patients may not recognize or report worsening memory problems to their physicians.(11) Although, there is conflicting evidence on the benefits of cognitive impairment screening for older adults, there is growing support for the assessment of patients over the age of 65 years old and the benefits of this screening.(12-13)
Harmonization with Existing Measures	Although numerous cognitive screening measures exist for disease-specific conditions (such as multiple sclerosis, Parkinson's disease, dementia, and stroke), a cross-cutting measure is needed for all patients over the age of 65 years old for baseline assessment for MCI. Current measures focused on cognitive screening are listed below for clinician consideration when identifying the best measure to meet your population needs: • Percentage of actively enrolled home-based primary care and palliative care patients who received an assessment of their cognitive ability. • Percentage of patients, regardless of age, with a diagnosis of dementia for whom an assessment of cognition is performed and the results reviewed at least once within a 12-month period. • Cognitive Assessment for patients with MS: https://www.aan.com/siteassets/home-page/policy-and-guidelines/quality/quality-measures/17mscognitive_impairement_pg.pdf • Cognitive impairment following a stroke: https://www.aan.com/siteassets/home-page/policy-and-guidelines/quality/quality-measures/17srcognitiveimpairement_pg.pdf • PD Cognitive Impairment or Dysfunction: https://www.aan.com/siteassets/home-page/policy-and-guidelines/quality/quality-measures/17pdcognitiveimpairement_pg.pdf
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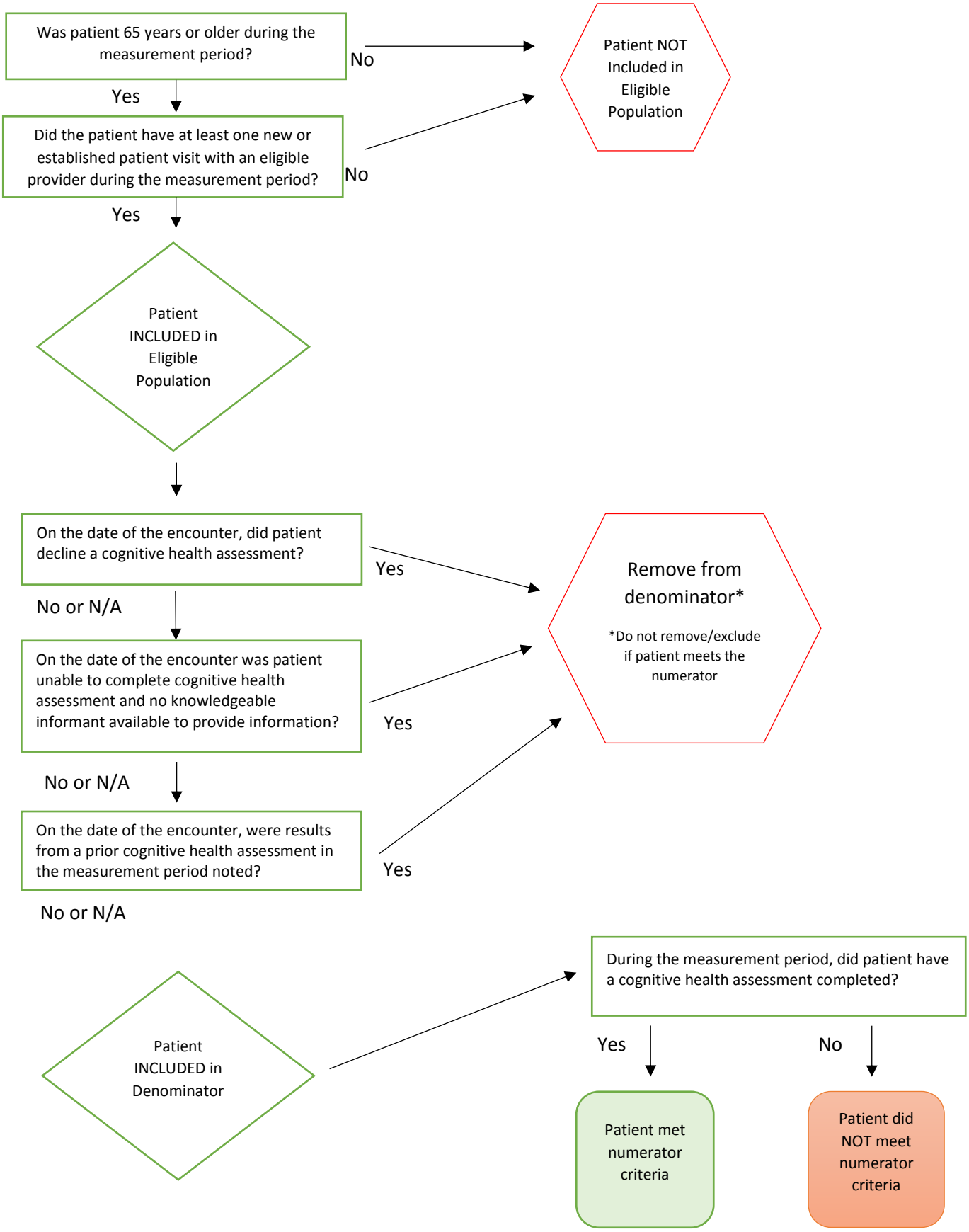
Flow Chart Diagram: Annual Cognitive Health Assessment for Patients 65 years and Older

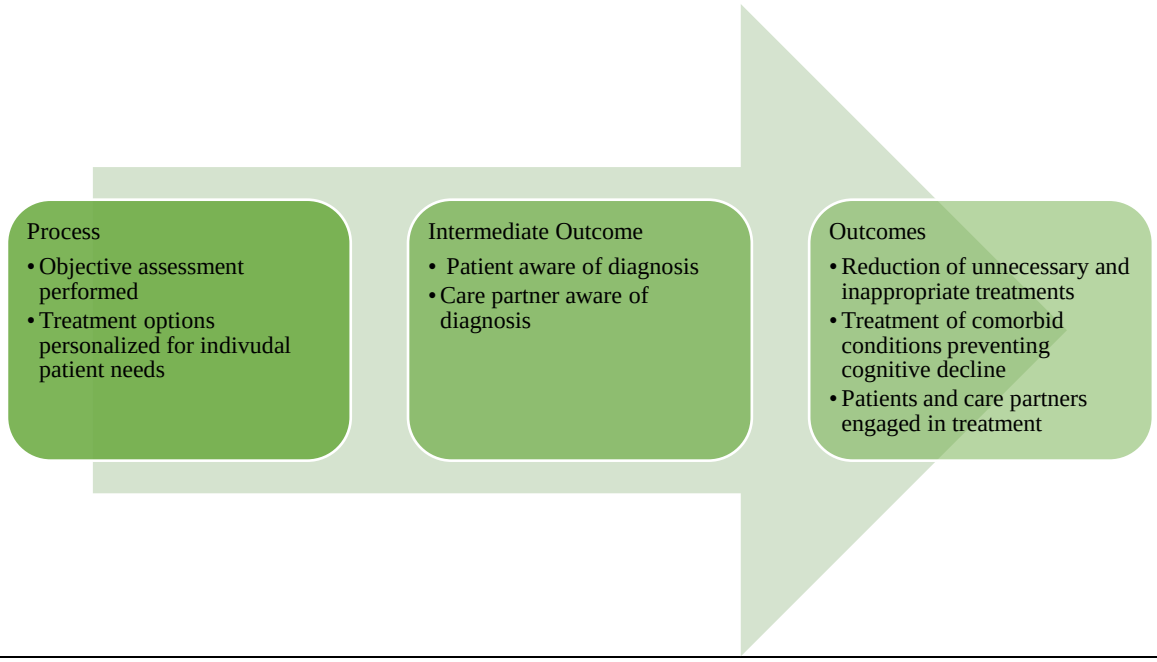


Code System	Code	Code Description
		Age 65 years and older
		AND
CPT	99201-99205	Office or Other Outpatient Visit - New Patient (E/M Codes)
CPT	99212-99215	Office or Other Outpatient Visit - Established Patient (E/M Codes)
CPT	99241-99245	Office or Other Outpatient Consultation – New or Established Patient
CPT	99483	Cognitive Impairment and Care Plan Assessment
		AND
ICD-9		All
ICD-10		All

Cognitive and Functional Assessment for Patients with Mild Cognitive Impairment (MCI) or Memory Loss

Measure Title	Cognitive and Functional Assessment for Patients with MCI and Memory Loss	
Description	Percentage of patients with MCI or memory loss who received a cognitive and functional assessment.	
Measurement Period	January 1, 20xx to December 31, 20xx	
Eligible Population	**Eligible Providers**	Medical Doctor (MD), Doctor of Osteopathy (DO), Neuropsychologist (PhD, PsyD), Psychologist (PhD, PsyD), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN)
	Care Setting(s)	Outpatient Care
	Ages	Age 18 and older
	Event	Office visit
	Diagnosis	Memory Loss or Mild Cognitive Impairment (See code list below)
Denominator	Patients with diagnosis of memory loss or Mild Cognitive Impairment.	
Numerator	A. Patients who had cognition assessed* at least once during the measurement period. *Cognition assessed is defined as use of one of the following validated objective tools (Users are encouraged to review possible copyright and use requirements prior to administration, as well as, ability have informant(s) potentially complete the screening tool. The tools are not necessarily equal and interchangeable. Clinician judgment is needed in selecting and interpreting the appropriate tool.): • Montreal Cognitive Assessment (MoCA)(1), • Mini-Mental State Examination (MMSE)(1-2), • Memory Impairment Screen (MIS)(1), • Saint Louis University Mental Status examination (SLUMS)(3), • Mini-Cog©(4), • Clinical Dementia Rating (CDR)(5),or • neuropsychological assessment results. To perform well on this measure, the following key phrases are suggested for collection in a registry. These key phrases should be recorded within the measurement period: • "Order for referral for neuropsychological assessment", • "Neuropsychological results discussed/counseled/reviewed with patient", • "MoCA [OR SLUMS, MMSE, MIS, CDR, Mini-Cog, or neuropsychological] results reviewed", OR • "MoCA [OR SLUMS, MMSE, MIS, CDR, Mini-Cog] results" followed by numerical score • Presence of CPT code on encounter date or within the measurement period for neuropsychological testing would meet the measure: 96116, 96136, 96138, 96146	
	B. Patients who had an assessment^ of functional status involving a knowledgeable informant at least once during the measurement period. ^Assessment is defined as use of the • Lawton Instrumental Activities of Daily Living scale(6,7), • Barthel ADL Index(8), • Katz Index of Independence in Activities of Daily Living (9), or • Functional Activities Questionnaire (FAQ)(6,10), • Everyday Cognition (ECog)(11), or • Performance Assessment of Self-Care Skills (PASS) test (12).	

	To perform well on this measure, we suggest using key phrases for collection in a registry. These key phrases should be recorded on the encounter date, as IADL or ADL alone insufficient: • "IADL or ADL" followed by (X out of 6) • "ADL" followed by ["independent" OR "dependent"] • "Lawton [OR Barthel, Katz, FAQ, ECog, PASS] results reviewed", OR • "Lawton [OR Barthel, Katz, FAQ, ECog, PASS] followed by numerical score"
	C. Patients who had both a cognition and functional status assessment at least once during the measurement period.
Required Exclusions	• Patients diagnosed with dementia (See Appendix B for complete diagnostic codes)
Allowable Exclusions	• Patient unable to speak and no knowledgeable informant available to provide information. For component A only: • Patient declines to complete a cognitive health assessment tool. • Patient previously had a cognition assessment in the measurement period and prior results noted. For component B only: • Knowledgeable informant declines to complete a functional status assessment. To perform well on this measure, we suggest using key phrases for collection in a registry. These key phrases should be recorded on the encounter date: • For both components o "Patient unable to communicate, no informant present" o "Patient unable to understand task" • For Component A only o "Patient declines cognitive assessment tool" o "Care partner declines cognitive assessment tool" o "Patient refuses cognitive assessment tool" o "Care partner refuses cognitive assessment tool" • "Patient screened and results noted." o "Patient previously assessed for cognitive impairment and results present." • For Component B only o "Informant declines functional status assessment" o "Care partner [OR spouse, informant, caregiver] declines functional status assessment" o "Informant refuses functional status assessment" o "Care partner [OR spouse, informant, caregiver] refuses functional status assessment"
Allowable Exclusion Inclusion Logic	Allowable exclusions can only help measure performance. If a patient has an allowable exclusion but is found to meet the numerator that patient is included in the count to meet the measure.
Exclusion Rationale	Patients or informants need to be able and willing to complete assessment for the assessment results to be valid. Patients who have dementia should be screened for cognition, however, to reduce unintended consequences of duplicative reporting they are excluded from this measure. Individuals with dementia should receive cognitive screening, and clinicians are encouraged to utilize MIPS #281 (Dementia cognition measure).

Measure Scoring	Percentage
Interpretation of Score	Higher Score Indicates Better Quality
Measure Type	Process
Level of Measurement	Provider
Risk Adjustment	Not applicable for process measure.
For Process Measures Relationship to Desired Outcome	From AAN MCI Guideline: "Clinicians should assess for MCI with validated tools in appropriate scenarios (Level B). Clinicians should evaluate patients with MCI for modifiable risk factors, assess for functional impairment, and assess for and treat behavioral/neuropsychiatric symptoms (Level B). Clinicians should monitor cognitive status of patients with MCI over time (Level B)."(13) 
Opportunity to Improve Gap in Care	Although we have focused our listings on cognitive screening measures, we do not wish to convey a sense of false equivalency between the various cognitive screens listed and more comprehensive neuropsychological assessment strategies. We acknowledge cognitive screening measurement strategies are limited by generally low sensitivity and specificity rates, whereas gold standard neuropsychological test batteries are more sensitive and specific.(14-16) For example, Chan, et al. have shown that 22% of acute stroke patients scored in the normal range on the MoCA, although 78% of these 'normal' patients were impaired on more comprehensive neuropsychological assessment.(17) Olson, et al. have also shown one-third of brain tumor patients diagnosed as cognitively impaired on comprehensive neuropsychological assessment obtained a perfect or near perfect MMSE score (29 or 30 out of 30). MoCA fared poorly as well.(18) Cognitive screens, or combinations of rating scales and screens like that used in common MCI criteria,(19) leads to misdiagnosis in both directions - false positive and false negative errors - relative to gold standard neuropsychological testing. 'Misses' or false negative errors would be expected in a primary care setting with its reliance on very limited cognitive screening, and conventional MCI criteria leads to large false-positive (33%) as well as some false-negative (7%) errors.(20-22) The work group recommends referral to neuropsychology when indicated by the results of screening tests, and believes there are opportunities to improve direct comparisons of

	sensitivity and specificity rates of various cognitive screens and some cognitive testing, both to one another as well as to gold standard neuropsychological assessment. Marshall, et al. noted, "IADL impairment leads to early loss of independence and the ability to be an active member of society, while shifting many daily responsibilities to care partners and increasing their burden."(23) By screening for IADL and ADL impairment on a routine basis, clinicians will be able to identify deficits and offer treatment solutions. It is anticipated that routine screening will improve rates of interventions. Further, Jefferson, et al. noted that assessing ADLS alone may not be sensitive to identify early functional changes related to MCI and additional cognitive impairment screening was indicated.(24) Ciro, et al. assessed performance of IADLs using the Performance Assessment of Self-Care Skills (PASS) test and showed that this more sensitive test could distinguish amnestic MCI patients from age-matched controls.(25) Although current performance rates for cognitive and functional impairment are not known, the work group believes there is opportunity for improvement.
Harmonization with Existing Measures	No known similar measures for patients with MCI or memory loss.
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22. Edmonds EC, Eppig J, Bondi MW, et al., for the Alzheimer's Disease Neuroimaging Initiative. Heterogeneous cortical atrophy patterns in MCI not captured by conventional diagnostic criteria. Neurology. 2016;87:2108-2116
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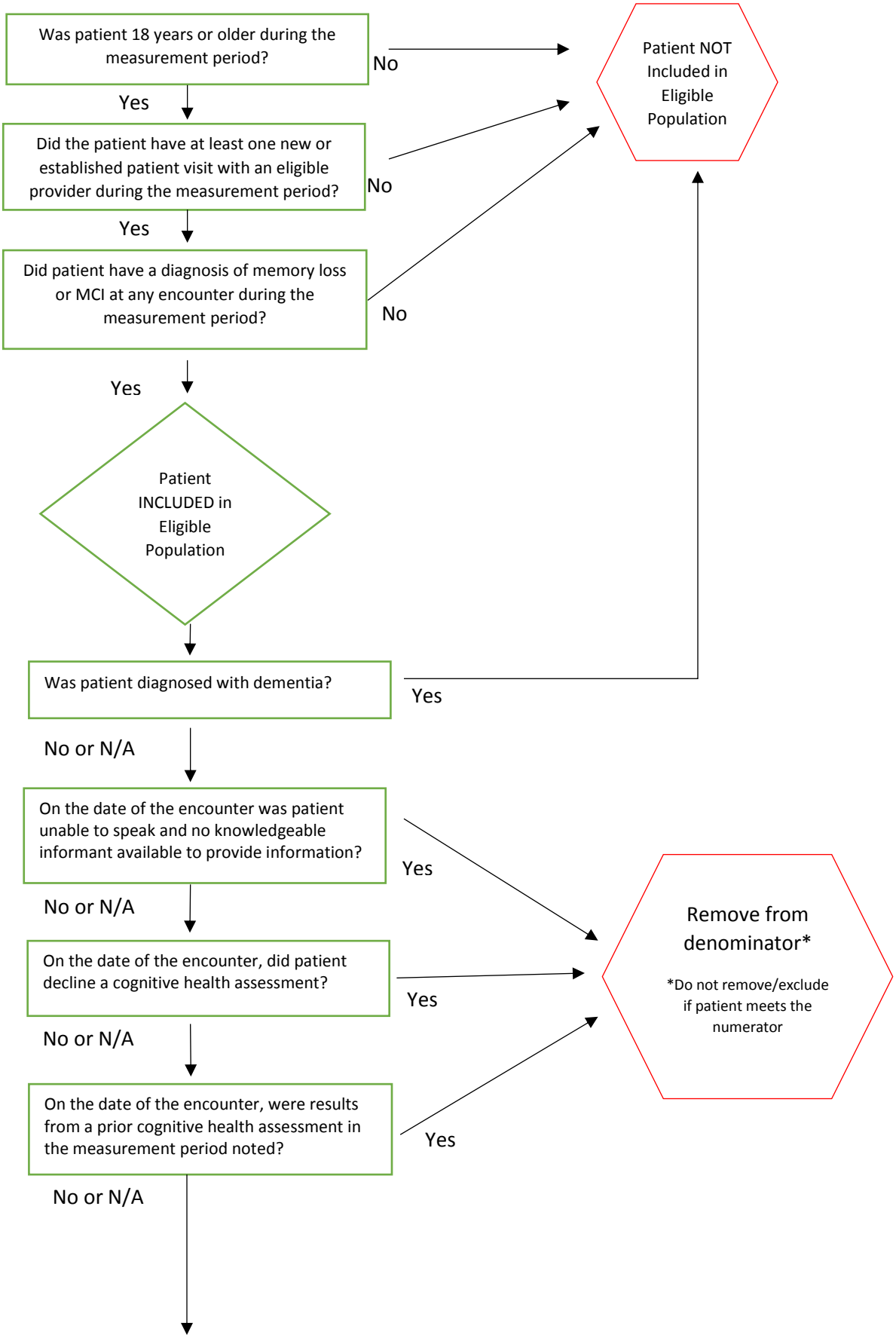
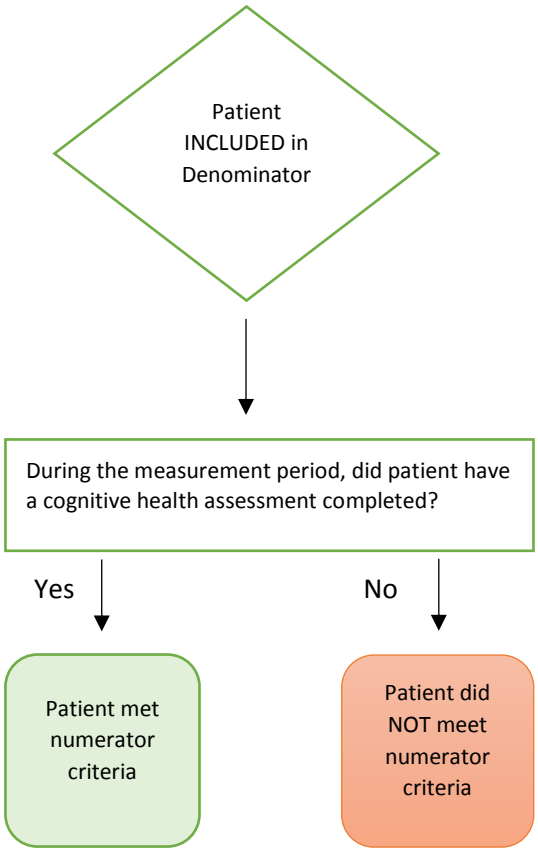
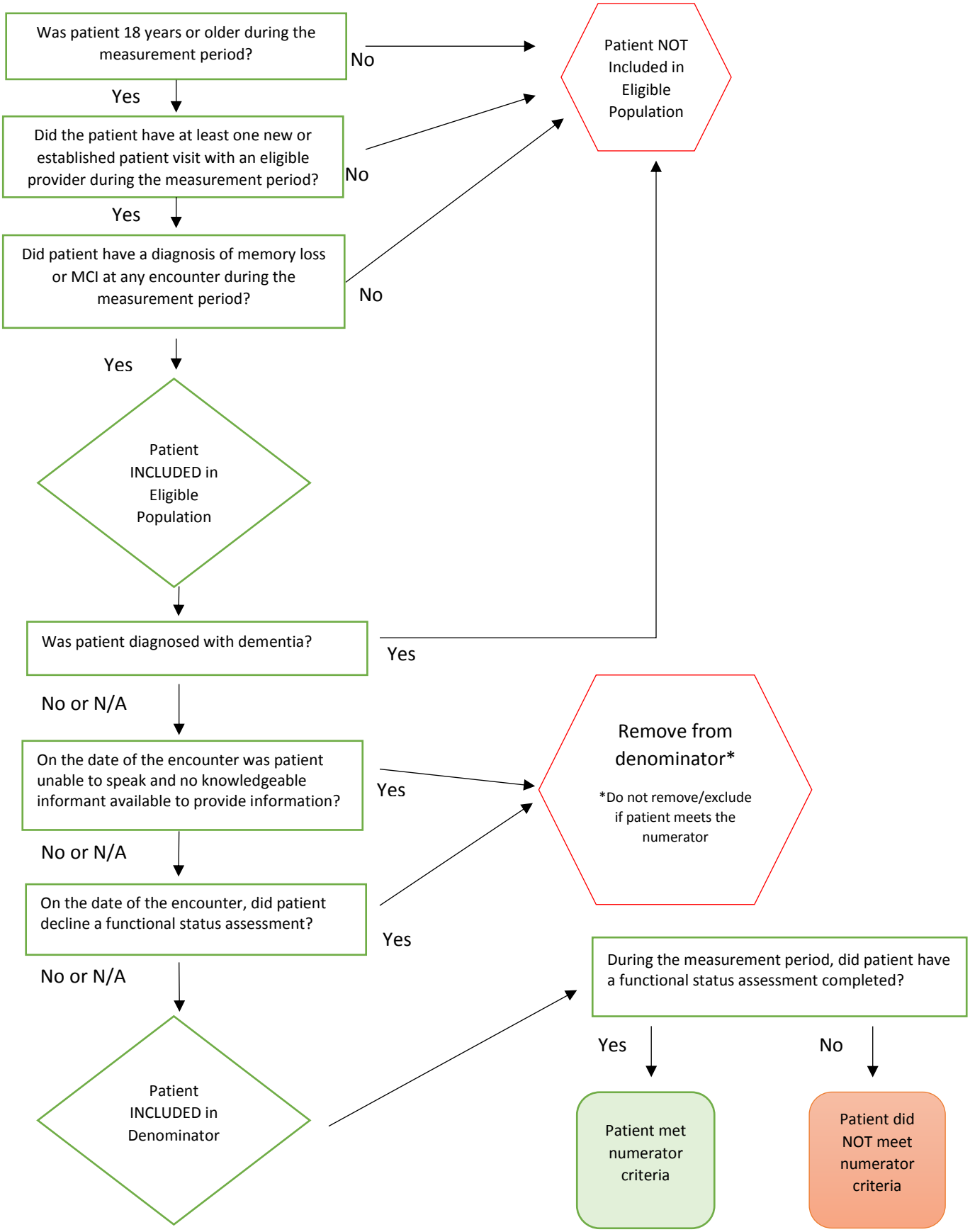
Flow Chart Diagram: Component A Cognitive and Functional Assessment for Patients with MCI and Memory Loss

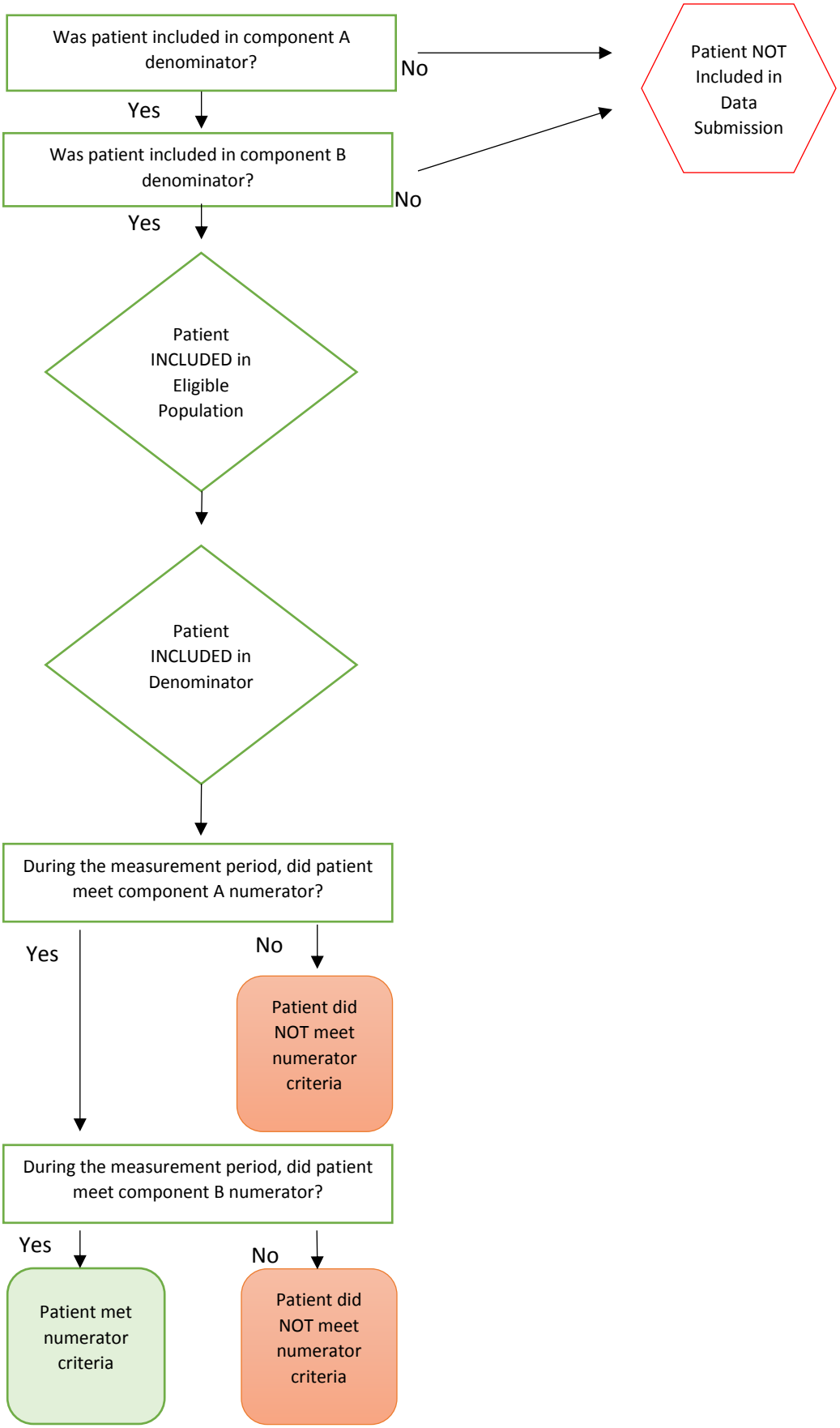




Flow Chart Diagram: Component B Cognitive and Functional Assessment for Patients with MCI and Memory Loss



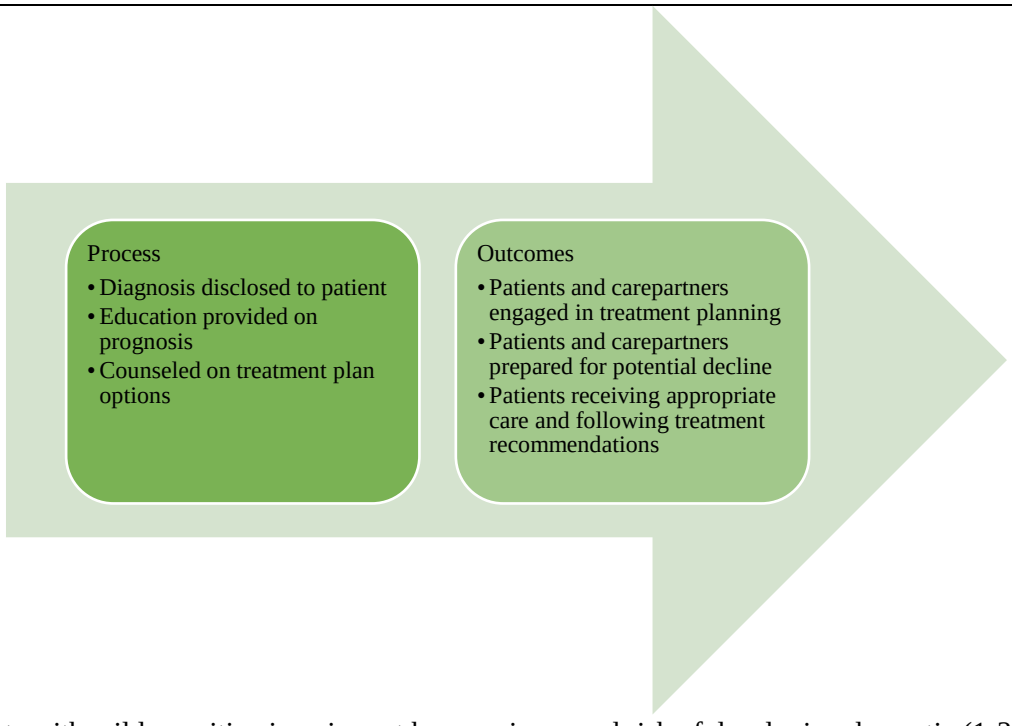
Flow Chart Diagram: Component C Cognitive and Functional Assessment for Patients with MCI and Memory Loss



Code System	Code	Code Description
CPT	99201-99205	Office or Other Outpatient Visit - New Patient (E/M Codes)
CPT	99212-99215	Office or Other Outpatient Visit - Established Patient (E/M Codes)
CPT	99241-99245	Office or Other Outpatient Consultation – New or Established Patient
CPT	99483	Cognitive Impairment and Care Plan Assessment
ICD-9	331.83	Mild cognitive impairment, so stated
ICD-9	294.8	Other persistent mental disorders due to conditions classified elsewhere
ICD-9	294.9	Unspecified persistent mental disorders due to conditions classified elsewhere
ICD-9	310.9	Unspecified mental disorder due to known physiological condition
ICD-9	780.93	Memory Loss
ICD-10	G31.84	Mild cognitive impairment, so stated
ICD-10	F06.8	Mild memory disturbance
ICD-10	R41.3	Other amnesia, (i.e., Amnesia NOS and Memory loss NOS)
ICD-10	S06.-	Cognitive impairment due to intracranial or head injury
ICD-10	I69.01-	Cognitive deficits following nontraumatic subarachnoid hemorrhage
ICD-10	I69.11-,	Cognitive deficits following nontraumatic intracerebral hemorrhage
ICD-10	I69.21-,	Cognitive deficits following other nontraumatic intracranial hemorrhage
ICD-10	I69.31-,	Cognitive deficits following cerebral infarction
ICD-10	I69.81-,	Cognitive deficits following other cerebrovascular disease
ICD-10	I69.91-	Cognitive deficits following unspecified cerebrovascular disease

MCI Diagnosis Disclosed and Counseled on Treatment Options

Measure Title	Mild Cognitive Impairment (MCI) Disclosure of Diagnosis and Counseled on Treatment Options	
Description	Percentage of patients with MCI who had their diagnosis disclosed, were educated on cognitive prognosis, and counseled on treatment plan options at least once in the measurement period.	
Measurement Period	January 1, 20xx to December 31, 20xx	
Eligible Population	**Eligible Providers**	Medical Doctor (MD), Doctor of Osteopathy (DO), Neuropsychologist (PhD, PsyD), Psychologist (PhD, PsyD), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN)
	Care Setting(s)	Outpatient Care
	Ages	Age 18 and older
	Event	Office visit
	Diagnosis	MCI
Denominator	Patients diagnosed with MCI	
Numerator	Patients informed of their MCI diagnosis, educated on cognitive prognosis, and counseled on treatment plan options at least once in the measurement period. To perform well on this measure, the following key phrases are suggested for collection in a registry. These key phrases should be recorded on the encounter date. To meet the measure all three components must be addressed: • Informed of MCI diagnosis o "Patient informed of MCI diagnosis" o "Disclosed MCI diagnosis to patient" o "Diagnosis discussed" o "Dx discussed" • Educated on cognitive prognosis o "Informed of cognitive prognosis" o "Educated on cognitive prognosis" o "Addressed prognosis concerns" • Counseled on treatment plan options o "Developed treatment plan with patient" o "Discussed treatment plan options" o "Counseled on treatment plan options" The following key phrases could be used to meet all three measure components via collection in a registry: • "Diagnosis and treatment options discussed" • "Dx and treatment options discussed" • "Diagnosis and management discussed" • "Dx and management discussed" • "Diagnosis and education provided prior to treatment plan discussion" • "Dx and education provided prior to treatment plan discussion" • "Diagnosis and education provided before treatment plan developed" • "Dx and education provided before treatment plan developed"	
Required Exclusions	None	
Allowable Exclusions	• Patient declines information on their diagnosis. • Patient declines education on cognitive prognosis. • Patient declines counseling on treatment plan options. • Patient is actively suicidal or expressing self-harm statements.	

	To perform well on this measure, the following key phrases are suggested for collection in a registry. These key phrases should be recorded on the encounter date: • "Patient declines information on their diagnosis" • "Patient declines education on cognitive prognosis" • "Patient declines counseling on treatment plan options" • "Patient refuses information on their diagnosis" • "Patient refuses education on cognitive prognosis" • "Patient refuses counseling on treatment plan options" • "Patient is suicidal" • "Patient threatened self-harm"
Allowable Exclusion Inclusion Logic	Allowable exclusions can only help measure performance. If a patient has an allowable exclusion but is found to meet the numerator that patient is included in the count to meet the measure.
Exclusion Rationale	• Patient may decline information on their diagnosis, prognosis, or treatment plan options, and a clinician should not force this information if it is detrimental to patient care. • An exclusion is needed, if a patient is actively expressing suicidal ideation or self-harm and further discussion of their diagnosis, prognosis, or treatment plan options could be a detriment to care.
Measure Scoring	Percentage
Interpretation of Score	Higher Score Indicates Better Quality
Measure Type	Process
Level of Measurement	Provider
Risk Adjustment	Not applicable for process measure.
For Process Measures Relationship to Desired Outcome	 Patients with mild cognitive impairment have an increased risk of developing dementia (1-3). Patients and care partners who are informed of their diagnosis and receive education and

	counseling regarding prognosis and available treatment plans will be more likely to follow recommendations and plan for future changes and potential decline.
Opportunity to Improve Gap in Care	From AAN MCI 2017 Guideline: "Clinicians should discuss diagnosis, prognosis, long-term planning, and the lack of effective medicine options (Level B)"(1). Approximately 30-40% of dementia patients live alone at the time of their diagnosis.(2) In addition, fewer than 50% of patients with Alzheimer's Disease report being told their diagnosis, and only slightly over 50% of care partners.(4) Knowing one's diagnosis early is important for patients' safety and future planning, tracking and follow up, and to help identify candidates for clinical trials.(4-6)A formal diagnosis also validates patient concerns that their cognitive impairment is not normal for their age. Clinicians interested in additional guidance on counseling elements and best practices are encouraged to review Grill, et al and Nuffield Counsel on Bioethics references. (5, 7) Work group recommends discussion occurs yearly to reflect changes in diagnosis, prognosis, and treatment planning options that may occur over the course of time.
Harmonization with Existing Measures	The AAN has developed a measure addressing disclosure of diagnosis for patients diagnosed with dementia. Available at: https://www.aan.com/policy-and-guidelines/quality/quality-measures2/quality-measures/geriatric-neurology/ A separate measure is needed for patients diagnosed with mild cognitive impairment. There is substantial variation in the denominator warranting a separate measure.
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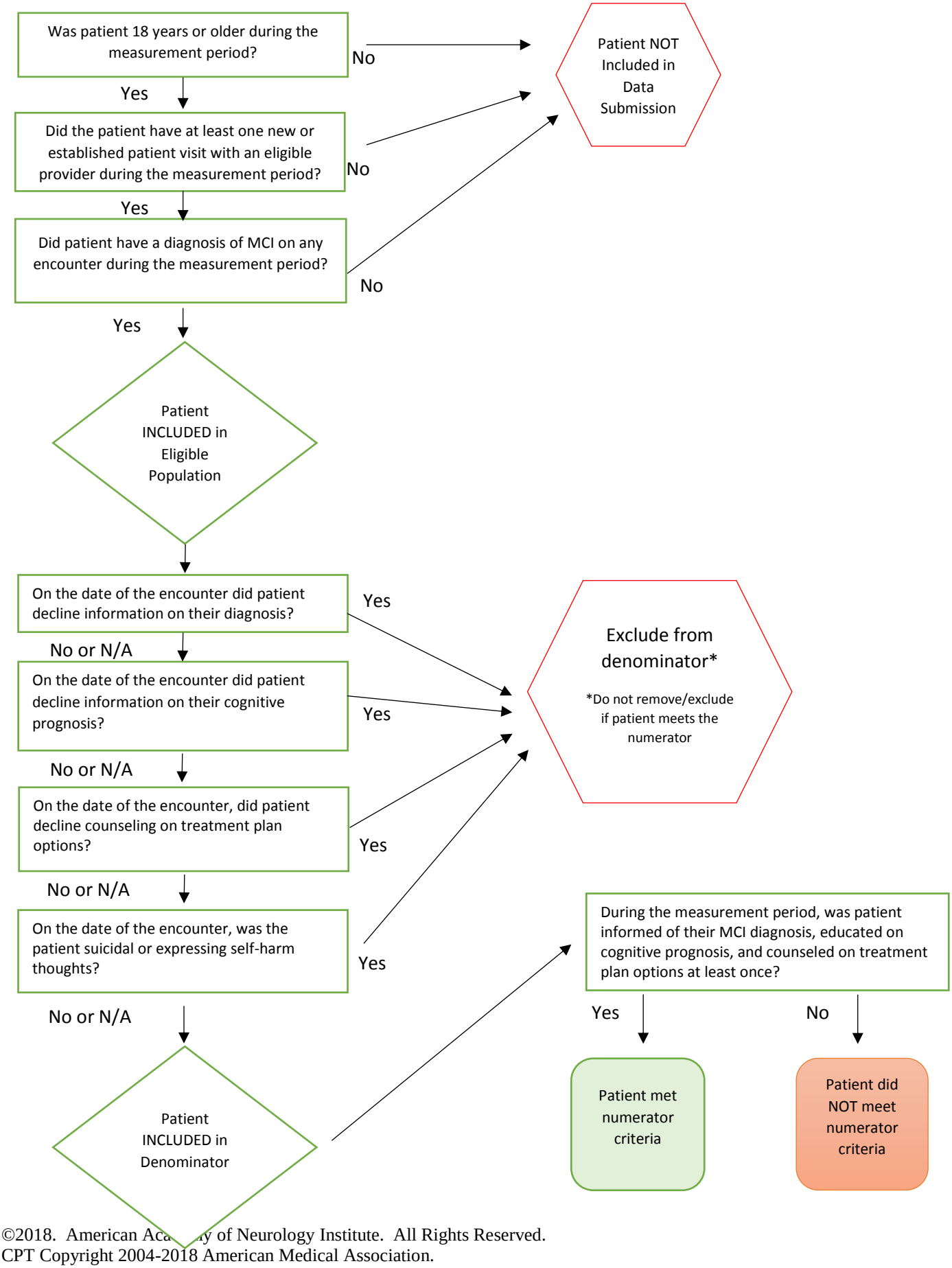
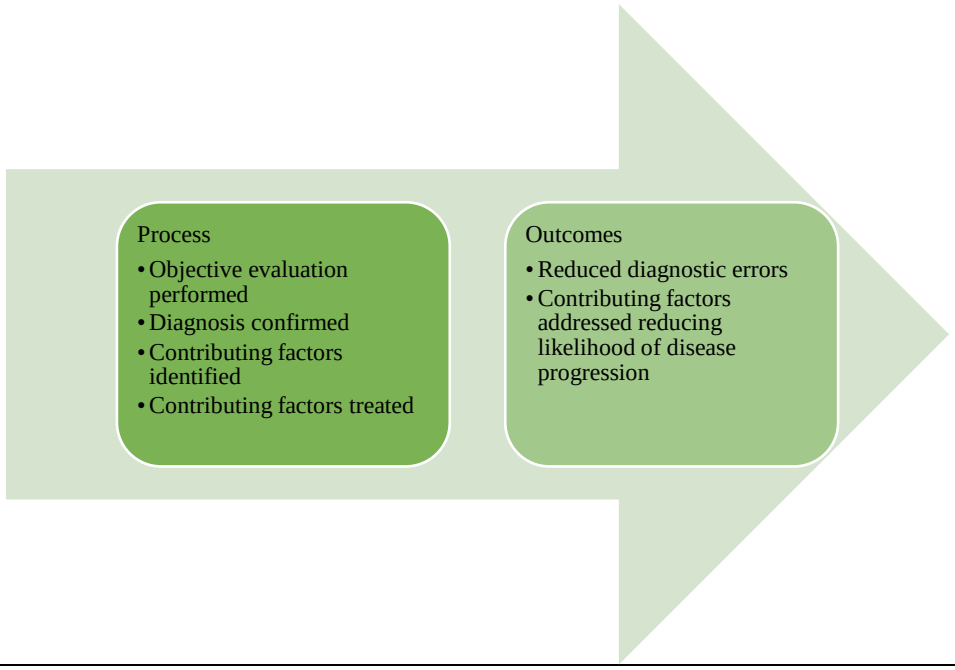
Flow Chart Diagram: MCI Diagnosis Disclosed and Counseled on Treatment Options



Code System	Code	Code Description
CPT	96116	Neurobehavioral status exam
CPT	96136, 96138, 96146	Neuropsychological testing
CPT	99201-99205	Office or Other Outpatient Visit - New Patient (E/M Codes)
CPT	99212-99215	Office or Other Outpatient Visit - Established Patient (E/M Codes)
CPT	99241-99245	Office or Other Outpatient Consultation – New or Established Patient
CPT	99483	Cognitive Impairment and Care Plan Assessment
ICD-9	331.83	Mild cognitive impairment, so stated
ICD-10	G31.84	Mild cognitive impairment, so stated

Assessment and Treatment of Factors Contributing to Mild Cognitive Impairment

Measure Title	Assessment and Treatment of Factors Contributing to Mild Cognitive Impairment (MCI)	
Description	Percentage of patients with MCI who were evaluated and treated for contributing factors.	
Measurement Period	January 1, 20xx to December 31, 20xx	
Eligible Population	**Eligible Providers**	Medical Doctor (MD), Doctor of Osteopathy (DO), Neuropsychologist (PhD, PsyD), Psychologist (PhD, PsyD), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN)
	Care Setting(s)	Outpatient Care
	Ages	All
	Event	Office visit
	Diagnosis	Mild Cognitive Impairment
Denominator	Patients diagnosed with Mild Cognitive Impairment.	
Numerator	Patients who have had treatment for contributing behavioral and psychiatric symptoms, hearing and vision deficits, sleep disturbances, neurologic diseases, OR medical illnesses following a comprehensive neuropsychological assessment * to determine potential contributing factors. To perform well on this measure, the following key phrases are suggested for collection in a registry. These key phrases should be recorded on the encounter date: • "Patient does not have any contributing behavioral health [OR hearing and vision deficits, sleep disturbances, neurologic diseases, OR medical illnesses] factor identified." • "Patient was treated for behavioral and psychiatric symptoms [OR hearing and vision deficits, sleep disturbances, neurologic diseases, OR medical illnesses]." • "Patient is receiving treatment for behavioral and psychiatric symptoms [OR hearing and vision deficits, sleep disturbances, neurologic diseases, OR medical illnesses]." • "Patient was referred to a specialist for further treatment." (For example, psychiatry, psychology, ENT, sleep specialist, Occupational Therapy, Physical Therapy) *The work group declined to delineate the required components of a comprehensive cognitive evaluation to determine cause due to concerns such a definition would require burdensome documentation changes by clinicians and the need to individualize patient evaluations depending upon the clinical context. A comprehensive neuropsychological assessment is always warranted, given its demonstrated improvements in diagnostic accuracy, stability, and prediction of progression over cognitive screening measurement strategies (1-3), and clinicians are encouraged to perform or refer the appropriate testing necessary to identify putative causes of the diagnosis. A comprehensive set of examination procedures includes a detailed history, neurological examination, neuropsychological examination, laboratory testing, and brain imaging. As with the dementia syndrome, in an evaluation often multiple causes and contributing factors are identified that may account for the mild cognitive impairment syndrome. Cognitive domains of memory, language, visuospatial, attentional and executive functions should be assessed. Common causes of MCI include disorders that also cause dementia including Alzheimer's disease pathology, frontotemporal degeneration, Lewy body disease (including Parkinson's disease), cerebrovascular disease, traumatic brain injury, substance abuse and medications, HIV infection, medical conditions, depression, anxiety, hypothyroidism, B12 deficiency, and often multiple etiologies. The goal is to interpret and weigh all evidence to arrive at a confident understanding of causation that can guide treatment. Any single procedure is considered insufficient. In the course of the evaluation, contributing factors would be identified and treated.	
Required Exclusions	• Patients without a diagnosis of MCI	
Allowable Exclusions	• Patient declines or is not adherent to treatment for contributing factor.	

	To perform well on this measure, the following key phrases are suggested for collection in a registry. These key phrases should be recorded on the encounter date: • "Patient declines treatment for contributing…" • "Patient refuses treatment for contributing…" • "Patient declines treatment for underlying…" • "Patient refuses treatment for underlying…" • "Patient continues to decline treatment for contributing…""
Allowable Exclusion Inclusion Logic	Allowable exclusions can only help measure performance. If a patient has an allowable exclusion but is found to meet the numerator that patient is included in the count to meet the measure.
Exclusion Rationale	Patient willingness to receive treatment is required, and as a result, if a patient declines or refuses treatment for a contributing factor an exclusion from the measure is appropriate.
Measure Scoring	Percentage
Interpretation of Score	Higher Score Indicates Better Quality
Measure Type	Process
Level of Measurement	Provider
Risk Adjustment	Not applicable for process measure.
For Process Measures Relationship to Desired Outcome	From AAN MCI Guideline: "For patients diagnosed with MCI, clinicians should perform a medical evaluation for MCI risk factors that are potentially modifiable.(Level B)"(4) The AAN guideline notes that some cases of MCI are associated with reversible causes such as sleep apnea, depression and other medical conditions.(4) Also, behavioral/psychiatric symptoms are common in MCI and may be associated with greater functional impairment.(4) Further the guideline recommends, "For patients diagnosed with MCI, clinicians should perform serial assessments over time to monitor for changes in cognitive status (Level B)."(4) It follows that after assessment of contributing factors treatment should be provided to address and reduces these concerns limiting impact on cognitive impairment symptoms. Additionally, AAN guidelines are available for the diagnosis of dementia provides guidance for cognitive evaluation.(5) 

Opportunity to Improve Gap in Care	This measure was developed after extensive conversation on a proposal to develop a measure assessing comprehensive evaluation. Evaluation and diagnostic measures pose a challenge as they may requiring searching for the lack of something, such as lack of a diagnosis or missed opportunities. The work group noted extensive potential burdens on a clinician to generate data and lack of current EHR technology to readily pull evaluation data from a text note without changing clinician documentation practices. The comprehensive cognitive evaluations required for MCI and for dementia are similar. Appropriate testing can include advanced brain imaging methods (such as FDG and amyloid PET, dopamine SPECT, quantitative brain MRI) and specialized CSF and genetic testing, depending upon the clinical context such as presenting symptom, onset, rapidity of clinical course, medical illnesses, family history, neuropsychological and neurological findings. As a result, the work group chose to focus on treatment of identified contributing factors. This measure assumes a comprehensive neuropsychological assessment has been completed, and the work group encourages all clinicians to fully assess causation and contributing factors that explain MCI symptoms. The work group notes that such cognitive evaluations with gold standard neuropsychological tests demonstrate comparable utility vis-à-vis other biomarker strategies. (2,6, 7) The next update of the measurement set will revisit this concept of comprehensive cognitive evaluation for future development. The estimates of patients who have reversable forms of mild cognitive impairment vary.(8-10) For patients with reversable comorbid conditions treatment should be provided. *Behavioral Health* Cognitive impairment is often a feature of severe and persistent mental illness.(9) Some causes of MCI such as depression may be reversible as a result it is important behavioral health disorders be treated.(4, 8-10) Symptoms of depression can be seen early on among those who develop signs of MCI.(11,12) At autopsy, greater numbers of amyloid plaques and neurofibrillary tangles have been identified in the hippocampi of Alzheimer patients who have had a life-long history of depression, compared to non-depressed AD patients.(14) *Hearing and Vision Deficits* Hearing loss is common and can contribute to memory and cognitive complaints; it affects performance on cognitive assessment, and is potentially correctable, at least in part.(4,6) Hearing loss increases with age (15), and the American Speech-Language-Hearing-Association recommends a hearing test every three years after the age of 50.(16) A meta-analysis by Wei et al. found that hearing impairment is associated with a higher risk of MCI and dementia among older adults.(17) Lin concluded that hearing loss is independently associated with accelerated cognitive decline.(18) Visual loss is common in older people and may cause memory and cognitive complaints; it affects performance on cognitive assessment and is potentially correctable, at least in part.(4,6) Chen et al. found that vision impairment is associated with lower cognitive function.(19) The American Academy of Ophthalmology recommends comprehensive eye exam every one to three years for those aged 55 to 64, and every year or two after the age of 65.(20) *Sleep disorders* There is a link between sleep disturbances, such as insomnia, sleep disordered breathing, excessive daytime sleepiness, sleep-related movement disorder, circadian rhythm sleep disorder, and others, and an increased risk of dementia.(21, 22). Sleep disturbances can cause memory disturbance and treating them may improve symptoms.(4,8,10) *Neurologic Diseases* Cognitive impairment is a sensitive indicator of brain dysfunction and occurs in many types of neurological diseases including vascular, autoimmune, traumatic, neurodegenerative, infectious

	disorders and in the presence of seizures and space-occupying lesions. While these conditions often cause delirium or dementia, particularly early in the disease course or in more indolent conditions, mild cognitive impairment may occur. Some have received specific designations such as vascular cognitive impairment.(23) Multiple guidelines exist supporting the periodic assessment of cognition for specific neurologic diseases, such as multiple sclerosis (24,25), stroke (26), and Parkinson's disease (27-30), indicating its prevalence and importance in these conditions. *Medical Illnesses* It would seem obvious that treatment should reflect cause and that modifiable factors should be identified and treated.(4,6-8) Several studies have pointed out the importance of treating hypertension, diabetes, obesity and hyperlipidemia in midlife as a way of preventing MCI and dementia in later life (31,32).
Harmonization with Existing Measures	There are no known similar measures
References	• Bondi MW, Edmonds EC, Jak AJ, et al., for the Alzheimer's Disease Neuroimaging Initiative. Neuropsychological criteria for MCI improves diagnostic precision, biomarker associations, and prediction of progression. J Alzheimers Dis 2014;42:275-89. • Edmonds EC, Delano-Wood L, Clark LR, et al., for the Alzheimer's Disease Neuroimaging Initiative. Susceptibility of the conventional criteria for Mild Cognitive Impairment to false positive diagnostic errors. Alzheimers Dement. 2015;11:415-24. • Edmonds EC, Eppig J, Bondi MW, et al., for the Alzheimer's Disease Neuroimaging Initiative. Heterogeneous cortical atrophy patterns in MCI not captured by conventional diagnostic criteria. Neurology. 2016;87:2108-2116. • Petersen RC, Lopez O, Armstrong MJ, et al. Practice guideline update summary: Mild cognitive impairment. Neurology. 2018;90(3):126-135. • Knopman DS, DeKosky ST, Cummings JL, et al. Practice parameter: diagnosis of dementia (an evidence-based review). Report of the Quality Standards Subcommittee of the American Academy of Neurology. Neurology. 2001;56(9):1143-53. • Jedynak BM, Lang A, Liu B, et al. A computational neurodegenerative disease progression score: Method and results with the Alzheimer's Disease Neuroimaging Initiative cohort. NeuroImage. 2012;63:1478-1486. • Richard E, Schmand B, Eikelenboom P, et al., for the Alzheimer's Disease Neuroimaging Initiative. MRI and cerebrospinal fluid biomarkers for predicting progression to Alzheimer's disease in patients with mild cognitive impairment: a diagnostic accuracy study. BMJ Open. 2013;3: e002541. • Burke D, Sengoz A, Schwartz R. Potentially reversible cognitive impairment in patients presenting to a memory disorders clinic. J Clin Neurosci 2000;7:120–123. • Clarfield AM. The Decreasing Prevalence of Reversible Dementias: An Updated Meta-analysis. Arch Intern Med. 2003;163(18):2219-2229. • Grande G, Cucumo V, Cova I, et al. Reversible Mild Cognitive Impairment: The Role of Comorbidies at Baseline Evaluation. Jouranl of Alzheimer's Disease. 2016;51(1):57-67. • Etkin A, Gyurak A, O'Hara R. A neurobiological approach to the cognitive deficits of psychiatric disorders. Dialogues Clin Neurosci. 2013;15(4):419-29. • Richard E, Reitz C, Honig LH, et al. Late-life depression, mild cognitive impairment, and dementia. JAMA Neurol 2013; 70(3):374-382. • Masters MC, Morris JC, Roe CM. "Noncognitive" symptoms of early Alzheimer disease: a longitudinal analysis. Neurology 2015; 84(6):617-622.

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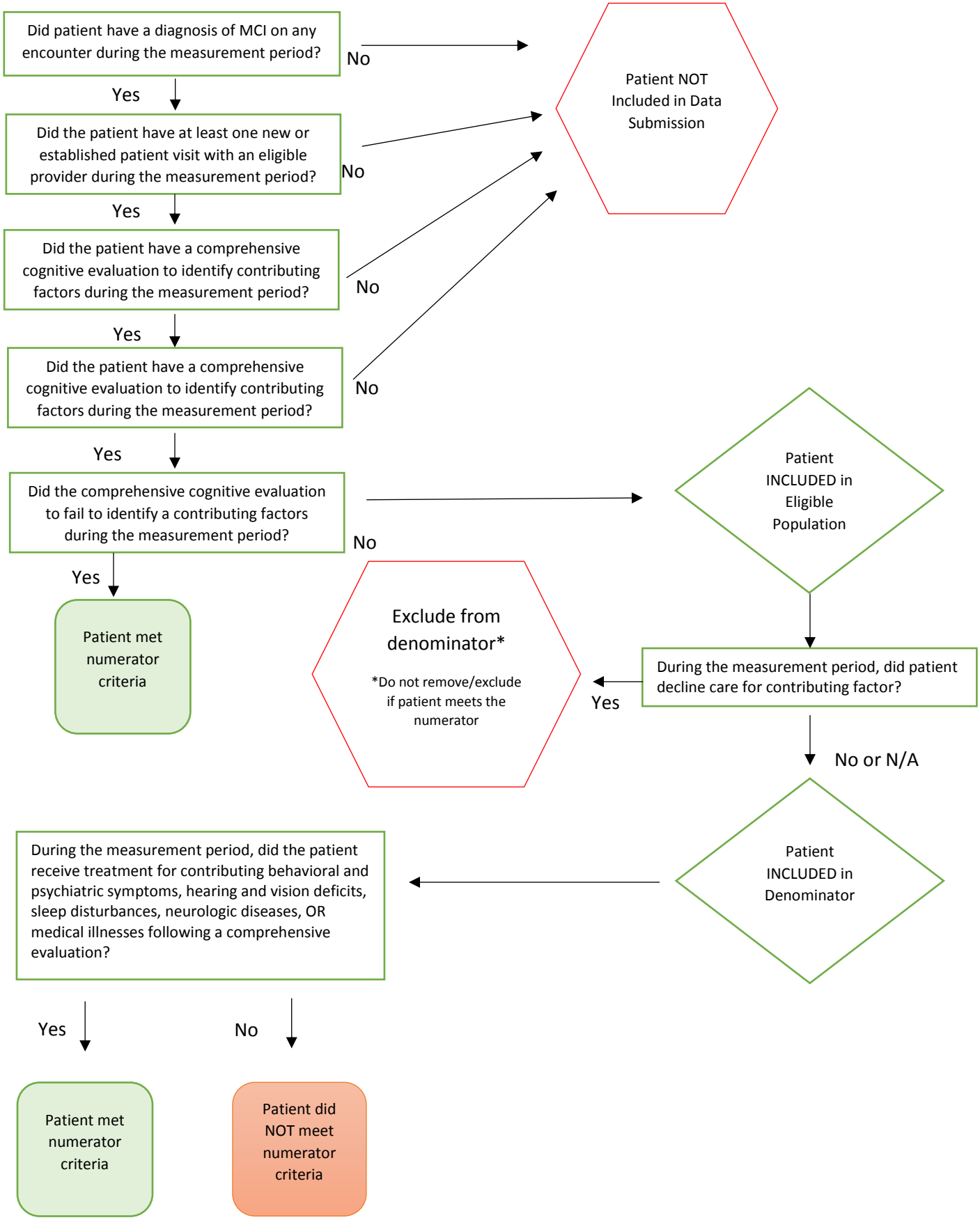
	• Berardelli A, Wenning GK, Antonini A, et al. EFNS/MDS-ES recommendations for the diagnosis of Parkinson's disease. Eur J Neurol. 2013;20(1)16-34. • Sorbi S, Hort J, Erkinjuntti T, et al. EFNS-ENS Guidelines on the diagnosis and management of disorders associated with dementia. European Journal of Neurology 2012; 19:1159-1179. • National Guideline System (SNLG). SNLG Regions – Dementia: Diagnosis and Treatment. 38 p. Publication 2011. Update 2015. • Kivipelto M, Ngandu T, Fratiglioni L, et al. Obesity and vascular risk factors at midlife and the risk of dementia and Alzheimer disease. Arch Neurol 2005; 62(10):1556-1560. [PMID=16216938]. • Whitmer RA, Sidney S, Selby J, et al. Midlife cardiovascular risk factors and risk of dementia in late life. Neurology 2005; 64:277-281. Additional References • Knopman DS, DeKosky ST, Cummings JL, et al. Practice parameter: diagnosis of dementia (an evidence-based review). Report of the Quality Standards Subcommittee of the American Academy of Neurology. Neurology. 2001;56(9):1143-53. • Burke D, Sengoz A, Schwartz R. Potentially reversible cognitive impairment in patients presenting to a memory disorders clinic. J Clin Neurosci 2000;7:120–123.

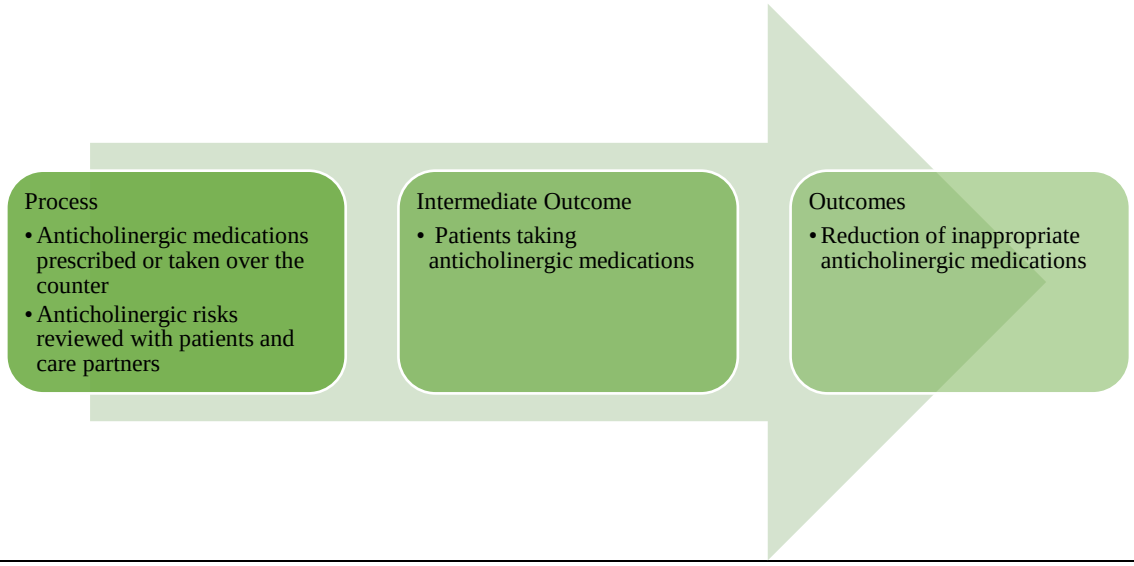
Flow Chart Diagram: Assessment and Treatment of Factors Contributing to MCI



Code System	Code	Code Description
CPT	96116	Neurobehavioral status exam
CPT	96136, 96138, 96146	Neuropsychological testing
CPT	99201-99205	Office or Other Outpatient Visit - New Patient (E/M Codes)
CPT	99212-99215	Office or Other Outpatient Visit - Established Patient (E/M Codes)
CPT	99241-99245	Office or Other Outpatient Consultation – New or Established Patient
CPT	99483	Cognitive Impairment and Care Plan Assessment
ICD-9	331.83	Mild cognitive impairment, so stated
ICD-10	G31.84	Mild cognitive impairment, so stated

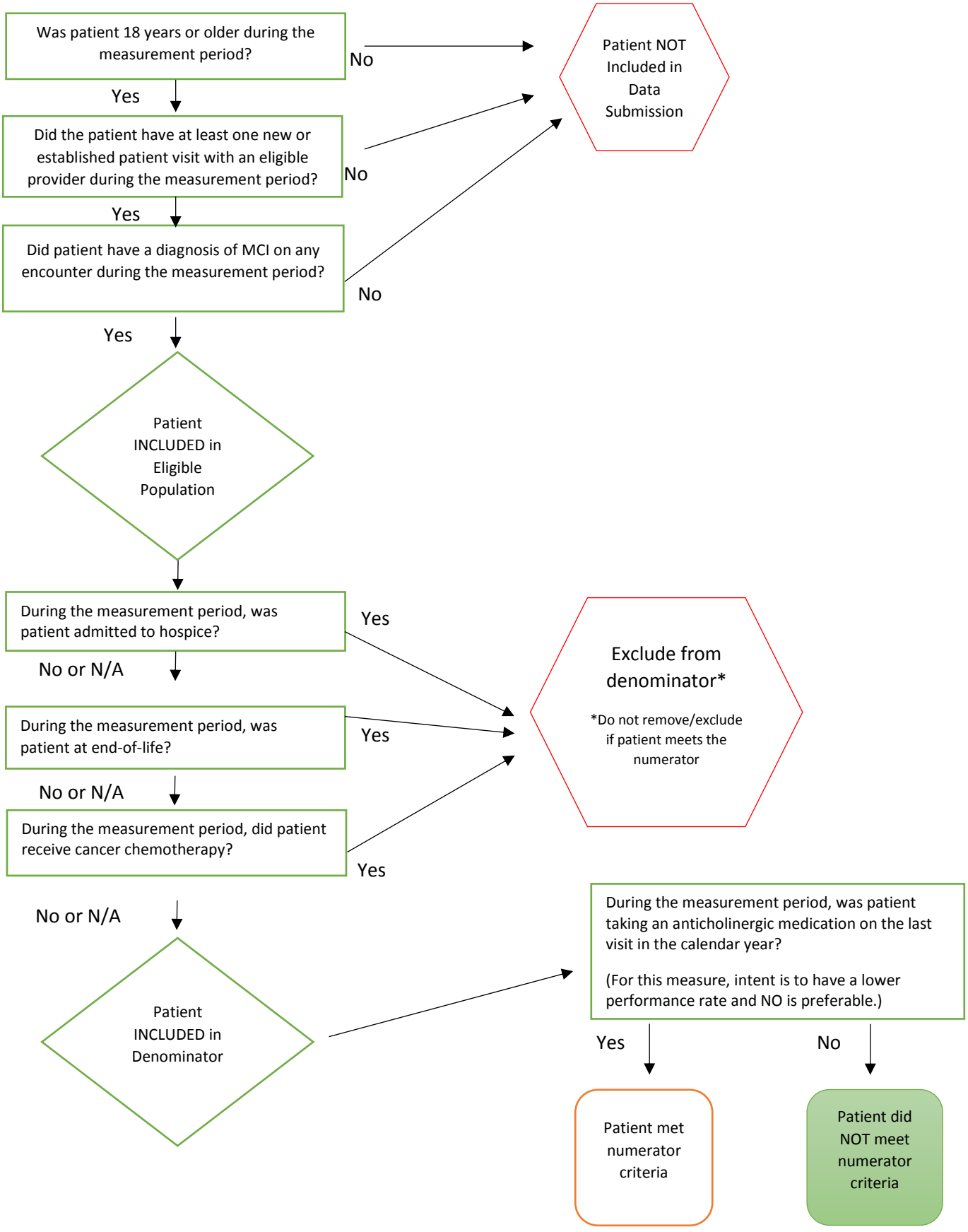
Avoidance of Anticholinergic Medications for Patients with MCI

Measure Title	Avoidance of Anticholinergic Medications for Patients with MCI	
Description	Percentage of patients with MCI who were taking anticholinergic medications in the measurement period. This is an inverse measure where a lower score indicates better quality	
Measurement Period	January 1, 20xx to December 31, 20xx	
Eligible Population	**Eligible Providers**	Medical Doctor (MD), Doctor of Osteopathy (DO), Neuropsychologist (PhD, PsyD), Psychologist (PhD, PsyD), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN)
	Care Setting(s)	Outpatient Care
	Ages	Age 18 and older
	Event	Office visit
	Diagnosis	Mild Cognitive Impairment
Denominator	Patients diagnosed with Mild Cognitive Impairment	
Numerator	Patients who were taking anticholinergic medications* in the measurement period^. ^Measure performance is calculated on the date of the last encounter in the calendar year. This allows for clinicians and patients to adequately discuss and discontinue anticholinergic medications as clinically appropriate. *Anticholinergic medications for this measure(1):	
	• Amitriptyline • Amoxapine • Atropine (excludes ophthalmic) • Belladonna alkaloids • Benztropine • Brompheniramine • Carbinoxamine • Carisoprodol • Chlordiazepoxide • Chlorpheniramine • Chlorpromazine • Chlorzoxazone • Clemastine • Clidinium-Chlordiazepoxide • Clomipramine • Clozapine • Cyclobenzaprine • Cyproheptadine • Darifenacin • Desipramine • Dexbrompheniramine • Dexchlorpheniramine • Dicyclomine • Dimenhydrinate • Diphenhydramine (oral) • Disopyramide • Doxepine >6 mg/d • Doxylamine	• Fesoterodine • Flavoxate • Homatropine (excludes ophthalmic) • Hydroxyzine • Hyoscyamine • Imipramine • Loxapine • Meclizine • Metaxalone • Methocarbamol • Nortriptyline • Olanzapine • Orphenadrine • Oxybutynin • Paroxetine • Perphenazine • Prochlorperazine • Promethazine • Propantheline • Protriptyline • Scopolamine (excludes ophthalmic) • Solifenacin • Thioridazine • Tolterodine • Trifluoperazine • Trihexyphenidyl • Trimipramine • Triprolidine

	• Trospium
Required Exclusions	• Patients without a diagnosis of MCI
Allowable Exclusions	• Patient at end-of-life or admitted to hospice care. • Patient receiving cancer chemotherapy. To perform well on this measure, the following key phrases are suggested for collection in a registry. These key phrases should be recorded on the encounter date: • "Patient admitted to hospice care" • "Patient receiving hospice care" • "Patient receiving end-of-life …" • "Patient receiving cancer chemotherapy" • "Cancer chemotherapy continues"
Allowable Exclusion Inclusion Logic	Allowable exclusions can only help measure performance. If a patient has an allowable exclusion but is found to meet the numerator that patient is included in the count to meet the measure.
Exclusion Rationale	Patients who are at end-of-life or admitted to hospice care and those receiving cancer chemotherapy may require anticholinergic medications, and clinicians should have the option to excludes patients when clinically indicated in these situations.
Measure Scoring	Percentage
Interpretation of Score	Lower Score Indicates Better Quality
Measure Type	Intermediate Outcome
Level of Measurement	Provider
Risk Adjustment	Not applicable for this measure.
For Process Measures Relationship to Desired Outcome	"Use of anticholinergic medications remains a concern because it is associated with impaired cognitive and physical function and risk of dementia."(1) Ruxton et al. systematic review found that drugs with anticholinergic effects may increase the risks of cognitive impairment, falls and all-cause mortality in older adults.(2) 

Opportunity to Improve Gap in Care	The intent of this measure is to identify a baseline or benchmark performance rate for clinicians and over subsequent years reduce the number of patients taking anticholinergic medications. For this measure, a lower performance rate is indicative of higher quality. Zero performance rate is not the goal, as it will be impossible to completely discontinue all anticholinergic medications for patients with MCI. This measure is specified for outpatient use, and it is not the intent to evaluate use of anticholinergic medication use in the short, inpatient care setting. The work group discussed possibility creating additional exclusions for all clinical scenarios were other anticholinergic medications are warranted, but declined to do so given the need for clinician discretion to meet the needs of individual patients. The work group started with the Beers criteria which demonstrates a strong link between anticholinergic medications and risk of development of cognitive impairment. As evidence evolves, the measure will be revisited and additional classes of medications such as benzodiazepines, antipsychotics, and opiates, may be added in future updates. The work group expanded the list of eligible clinicians to include neuropsychologists and psychologists and note that these clinicians may not be prescribing medications. For all clinicians there is an education opportunity that arises at patient visits where anticholinergic medications are identified on the active medication list. Clinicians are encouraged to educate patients and their care partners on the risks of these medications. It is important to take a careful medication history in patients with symptoms and signs of MCI, since many older adults may have memory problems that are due solely to anticholinergic drugs.(3,4) Gray and Hanlon report anticholinergics use is widespread for older adults.(5) In a six-year longitudinal study of 1,652 African American patients Campbell et al. found 53% of the population used a possible anticholinergic medication.(3) When anticholinergic medications cannot be eliminated, a clinician should discuss the possibility of lowering medication dosage to reduce effects when anticholinergic medications to minimize potential adverse risks.(4)
Harmonization with Existing Measures	There are no known similar measures.
References	1. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 Updated Beers Criteria for Potentially Inappropriate Medication use in Older Adults. J Am Geriatr Soc. 2015;63:2227-2246. 2. Ruxton K, Woodman RJ, Mangoni AA. Drugs with anticholinergic effects and cognitive impairment, falls, and all-cause mortality in older adults: A systematic review and meta-analysis. British Journal of Clinical Pharmacology. 2015;80(2):209-220. 3. Campbell NL, Boustani MA, Lane KA, et al. Use of anticholinergics and cognitive impairment in an African American population. Neurology. 2010;75(2):152-159. 4. Gray SL, Anderson ML, Dublin S, et al. Cumulative Use of Strong Anticholinergic sand Incident Dementia. JAMA Intern Med. 2015;175(3):401-407. 5. Gray SL and Hanlon JT. Anticholinergic medication use and dementia: latest evidence and clinical implications. Ther Adv Drug Saf 2016;75(2):217-224.

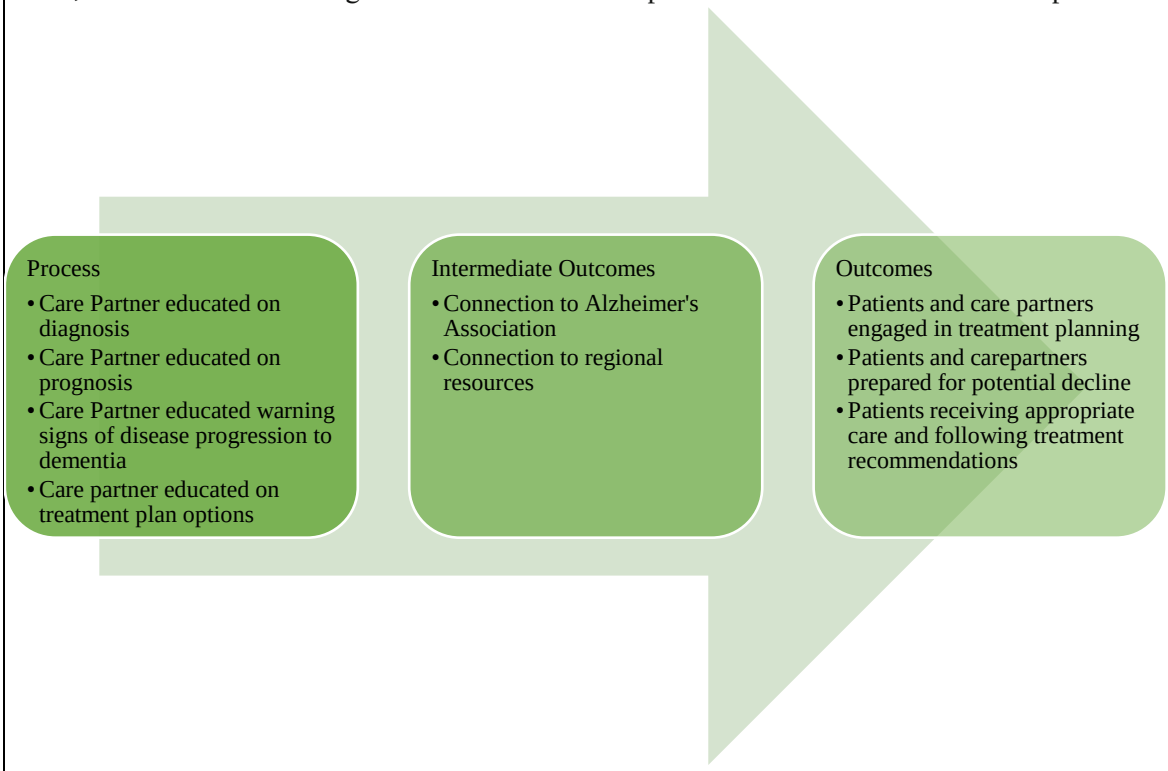
Flow Chart Diagram: Avoidance of Anticholinergic Medications for Patients with MCI



Code System	Code	Code Description
CPT	96116	Neurobehavioral status exam
CPT	96136, 96138, 96146	Neuropsychological testing
CPT	99201-99205	Office or Other Outpatient Visit - New Patient (E/M Codes)
CPT	99212-99215	Office or Other Outpatient Visit - Established Patient (E/M Codes)
CPT	99241-99245	Office or Other Outpatient Consultation – New or Established Patient
CPT	99483	Cognitive Impairment and Care Plan Assessment
ICD-9	331.83	Mild cognitive impairment, so stated
ICD-10	G31.84	Mild cognitive impairment, so stated

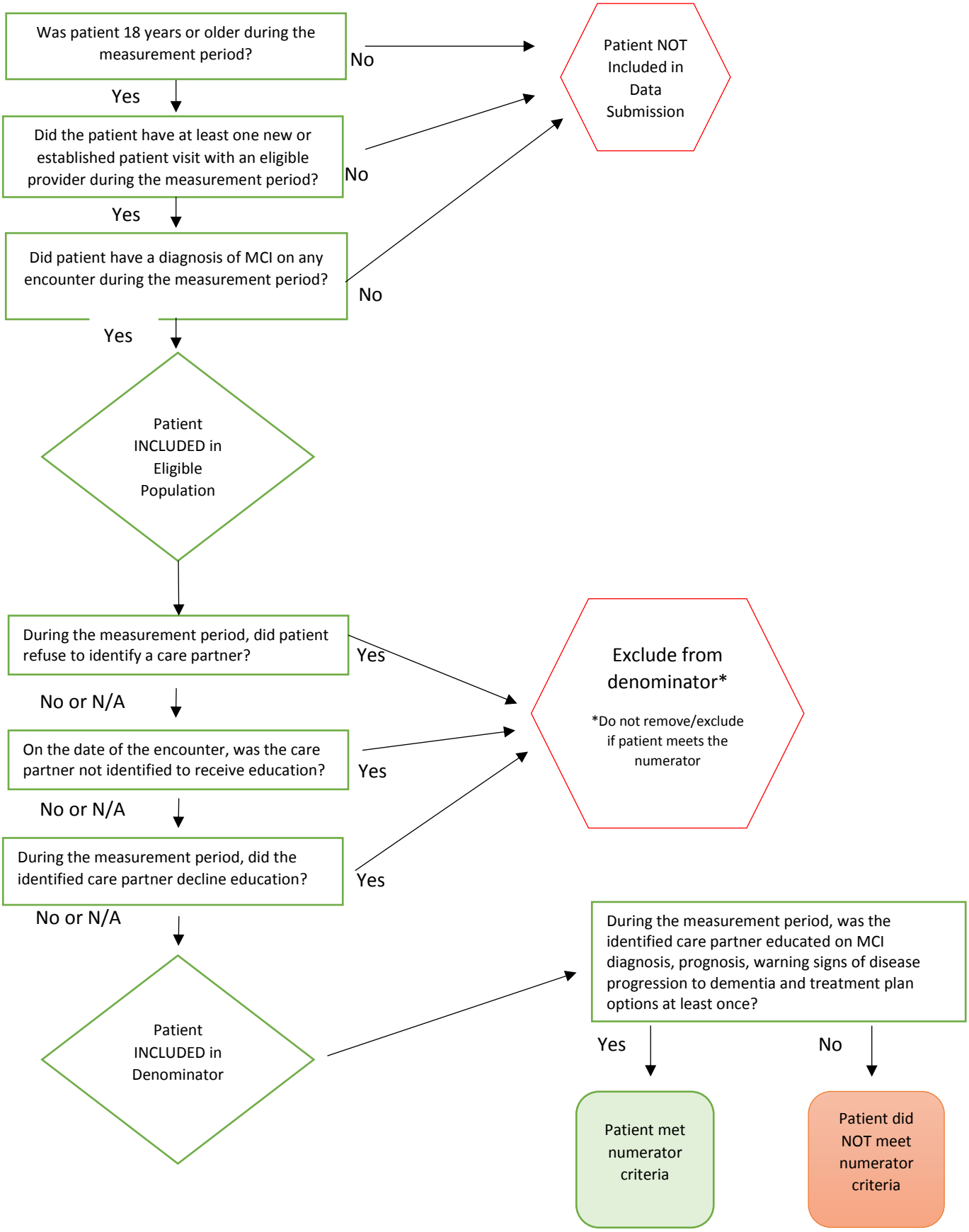
Education Provided to Care Partners of Patients with MCI

Measure Title	Education Provided to Care Partners of Patients with Mild Cognitive Impairment (MCI)	
Description	Percentage of patients with MCI whose care partner was educated on MCI diagnosis, cognitive prognosis, warning signs of disease progression to dementia, and treatment plan options at least once in the measurement period.	
Measurement Period	January 1, 20xx to December 31, 20xx	
Eligible Population	**Eligible Providers**	Medical Doctor (MD), Doctor of Osteopathy (DO), Neuropsychologist (PhD, PsyD), Psychologist (PhD, PsyD), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN)
	Care Setting(s)	Outpatient Care
	Ages	Age 18 and older
	Event	Office visit
	Diagnosis	MCI
Denominator	Patients diagnosed with MCI	
Numerator	Care partner(s) of patients with MCI who were provided* with education on 1.MCI diagnosis, 2. cognitive prognosis, 3. warning signs of disease progression to dementia, and 4. treatment plan options at least once in the measurement period *Clinicians can meet numerator by referral to case manager, social work, nurse educator, health education counselor, care consultation by local, state, regional, or national organizations, or documentation of four key components. To perform well on this measure, the following key phrases are suggested for collection in a registry. These key phrases should be recorded within the measurement period, as education may not occur during the initial encounter and can occur throughout the measurement period: • "Care partner [OR spouse, informant, caregiver] education provided" • "Care partner [OR spouse, informant, caregiver] educated on diagnosis, prognosis, warning signs, and treatment plan options" • "Referral to nurse educator [case manager, social work, health education counselor, or care consultation]" • "Partner [OR spouse, informant, caregiver] education and referral provided."	
Required Exclusions	• Patients without a diagnosis of MCI	
Allowable Exclusions	• Patient declines to identify a care partner • Care partner cannot be identified • Care partner declines any education To perform well on this measure, the following key phrases are suggested for collection in a registry. These key phrases should be recorded on the encounter date: • "Patient declines to identify…" • "Patient refuses to identify…" • "Unable to identify care partner [OR spouse, informant, caregiver]" • "…declines MCI education" • "….refuses MCI education" • "…declines education on MCI" • "….refuses education on MCI"	
Allowable Exclusion Inclusion Logic	Allowable exclusions can only help measure performance. If a patient has an allowable exclusion but is found to meet the numerator that patient is included in the count to meet the measure.	

Exclusion Rationale	Some patients refuse to identify a care partner, be unable to identify a care partner, or some care partners may refuse education. These patients should be excluded from the measure as clinicians are unable to meet measure intent and to force education may be detrimental in these situations.
Measure Scoring	Percentage
Interpretation of Score	Higher Score Indicates Better Quality
Measure Type	Process
Level of Measurement	Provider
Risk Adjustment	Not applicable for process measure.
For Process Measures Relationship to Desired Outcome	For patients with MCI a knowledgeable informant is needed to determine whether there has been a change in cognitive status or function; patients may not adequately report deficits and function used to recognize MCI and change to dementia.(1-2) Grill, et al note the following: "Recommendation 2 – patients should have an informant present to  assist in the diagnostic process. The preference of MCI patients who decline bringing an informant should be respected, but they should understand that this preference limits the information needed for the diagnostic process and patient care."(3) Olazarán, et al., noted, " Multicomponent interventions based on CG education and support delayed the institutionalization of ADRD persons with only modest amounts of resources used. "(4)
Opportunity to Improve Gap in Care	Ryan, et al. found care partner of individuals with MCI have a need for increased support services, particularly social areas at similar levels as those reported by care partners of patients with Alzheimer's disease.(5) Savla J, et al. state: "The results also highlight the importance of mild cognitive impairment-related education and support programs for care dyads to strengthen concordance, which is likely an important underpinning for effective coping as the illness progresses."(6)

	Education should be provided to care partners as soon as possible once diagnosis is confirmed. Clinicians will need to individualize this education to meet the patient and care partner needs and balance the timing of education upon individual patient and care partner characteristics. The work group encourages education be provided as soon as possible. The work group discussed excluding individuals without an identified care partner, and declined to develop this exclusion. Clinicians are encouraged to work with patients to review their social support network and develop care partners to address this concern. The work group discussed adding additional components to this measure addressing assessment of care partner capacity and willingness to serve as well as education on hearing and vision co-morbidities. The work group declined to add these components at this time, however, clinicians are encouraged to address and document these concerns separate from the measure as needed to meet patient needs. Clinicians interested in additional guidance on counseling elements and best practices are encouraged to review Grill, et al and Nuffield Counsel on Bioethics references. (7,8)
Harmonization with Existing Measures	CMS and Mathematica have a draft measure, pending testing, assessing the identification of a care partner for patients diagnosed with dementia or MCI. As a result, the work group declined to create a duplicative measure assessing identification of a care partner and focused this measure on education of identified care partners. The CMS and Mathematica measure is currently pending testing. Once available to the public this measure will be posted on AAN.com.
References	1. Mak E, Chin R, Ng LT, et al. Clinical associations of anosognosia in mild cognitive impairment and Alzheimer's disease. Int J Geriatr Psychiatry. 2015;30(12):1207-14. 2. Galeone F, Pappalardo S, Chieffi S, et al. Anosognosia for memory deficit in amnestic mild cognitive impairment and Alzheimer's disease. Int J Geriatr Psychiatry. 2011;26(7):695-701. 3. Grill JD, Apostolova LG, Bullain S, et al. Communicating mild cognitive impairment diagnoses with and without amyloid imaging. Alzheimer' 4. Olazarán J, Reisberg B, Clare L, et al. Nonpharmacological therapies in Alzheimer's disease: a systematic review of efficacy. Dement Geriatr Cogn Disord. 2010;30(2):161-78. 5. Ryan KA, Weldon A, Huby NM, et al. Caregiver support service needs for patients with mild cognitive impairment and Alzheimer's disease. Alzheimer disease and associated disorders. 2010;24(2):171-176. 6. Savla J, Wang Z, Roberto KA, Blieszner R. Deficits awareness in persons with mild cognitive impairment and family care partners. Fam Syst Health. 2016;34(4):429-434. 7. Grill JD, Apostolova LG, Bullain S, et al. Communicating mild cognitive impairment diagnoses with and without amyloid imaging. Alzheimer's Research & Therapy 2017;9:35. 8. Nuffield Council on Bioethics. Dementia: ethical issues. London, UK: Nuffield Council on Bioethics; 2009.

Flow Chart Diagram: Education Provided to Care Partners of Patients with MCI



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CPT	99241-99245	Office or Other Outpatient Consultation – New or Established Patient
CPT	99483	Cognitive Impairment and Care Plan Assessment
ICD-9	331.83	Mild cognitive impairment, so stated
ICD-10	G31.84	Mild cognitive impairment, so stated

Contact Information

American Academy of Neurology
201 Chicago Avenue
Minneapolis, MN 55415
quality@aan.com

Appendix A Disclosures

Work Group Member	Disclosures
Norman L. Foster, MD (Chair)	Dr. Foster reports receiving grant support from National Institute of Health, June Morris Trust, Rodney and Carolyn Brady Fund and research funding from GE Health, Abbvie, Biogen, and Lilly Pharmaceuticals. Dr. Foster serves as a consultant for Abbvie, and is CEO and co-owner of Proactive Memory Services, Inc.
Mark W. Bondi, PhD, ABPP/CN	Dr. Bondi reports serving as a consultant from Eisai, Novartis, and Roche and received royalties from Oxford University Press.
Mary Foss	No disclosures
Linda A. Hershey, MD, PhD	Dr. Hershey reports she is author of the annual memory loss review for MedLink Neurology; has received royalties from MedLink Corporation and American College of Physicians; and has served on the Network of Experts for the FDA".
Steve Koh, MD, MPH, MBA	No disclosures
Rebecca Logan, PA-C, MPAS	Ms. Logan reports volunteering for the Alzheimer's Association and serving on their Speakers Bureau and current participation in National Institute of Aging and Eli Lilly and Company research projects.
Monica Moreno	No disclosures
Carol Poole	No disclosures
Joseph Shega, MD	No disclosures
Ajay Sood, MD, PhD	Dr. Sood has received research support from Takeda Inc, Roche, Merck, Eli lily, Neurotrope, Novartis, Eisai, Avanir; received compensation for talks for Piramal; and served as Site PI for IDEAS study.
Niranjan Thothala, MD, MRCP (UK), MBA	No disclosures
Meredith Wicklund, MD	Dr. Wicklund receives research support from the Florida Department of Health Ed and Ethel Moore Alzheimer's Disease Research Program, IDEAS and Novartis.
Melissa Yu, MD	No disclosures relevant to this project.
Rohit Das, MD, FAAN *(non-voting facilitator)*	No disclosures relevant to this project.
David Wang, DO, FAHA, FAAN *(non-voting facilitator)*	No disclosures relevant to this project.

Appendix B: 2018 Dementia Diagnostic Codes

The term 'dementia' is used as an all-inclusive descriptor for the myriad diseases that can produce the syndrome. Please review individual measure specifications to identify whether the measure applies generally or has aspects that restrict its applicability to a particular disease or subset of diseases that produce dementia. In 2018, the AAN and American Psychiatric Association seated a small group of technical experts to refine ICD-10 codes used for the dementia management measurement set. The MCI measure development work adopted the below codes for dementia related measure exclusions.

ICD-9	ICD-10
290.0 Senile dementia, uncomplicated	F03.90 Unspecified dementia without behavioral disturbance Includes: presenile dementia NOS presenile psychosis NOS primary degenerative dementia NOS senile dementia NOS senile dementia depressed or paranoid type senile psychosis NOS Excludes1: senility NOS (R41.81) Excludes2: mild memory disturbance due to known physiological condition senile dementia with delirium or acute confusional state (F05)
290.10 Presenile dementia, uncomplicated	F03.90 Unspecified dementia without behavioral disturbance Includes: presenile dementia NOS presenile psychosis NOS primary degenerative dementia NOS senile dementia NOS senile dementia depressed or paranoid type senile psychosis NOS Excludes1: senility NOS (R41.81) Excludes2: mild memory disturbance due to known physiological condition senile dementia with delirium or acute confusional state (F05)
290.12 Presenile dementia with delusional features	F03.90 Unspecified dementia without behavioral disturbance Includes: presenile dementia NOS presenile psychosis NOS primary degenerative dementia NOS senile dementia NOS senile dementia depressed or paranoid type senile psychosis NOS Excludes1: senility NOS (R41.81) Excludes2: mild memory disturbance due to known physiological condition senile dementia with delirium or acute confusional state (F05) F05 Delirium due to known physiological condition Acute or subacute brain syndrome Acute or subacute confusional state (nonalcoholic) Acute or subacute infective psychosis Acute or subacute psycho-organic syndrome Delirium of mixed etiology

	Delirium superimposed on dementia Sundowning *Code first the underlying physiological condition* Excludes1: delirium NOS Excludes2: delirium tremens alcohol-induced or unspecified (F10.231, F10.921)
290.13 Presenile dementia with depressive features	F03.90 Unspecified dementia without behavioral disturbance Includes: presenile dementia NOS presenile psychosis NOS primary degenerative dementia NOS senile dementia NOS senile dementia depressed or paranoid type senile psychosis NOS Excludes1: senility NOS (R41.81) Excludes2: mild memory disturbance due to known physiological condition senile dementia with delirium or acute confusional state (Comm)
290.20 Senile dementia with delusional or depressive features	F03.90 Unspecified dementia without behavioral disturbance Includes: presenile dementia NOS presenile psychosis NOS primary degenerative dementia NOS senile dementia NOS senile dementia depressed or paranoid type senile psychosis NOS Excludes1: senility NOS (R41.81) Excludes2: mild memory disturbance due to known physiological condition senile dementia with delirium or acute confusional state (F05) F05 Delirium due to known physiological condition Acute or subacute brain syndrome Acute or subacute confusional state (nonalcoholic) Acute or subacute infective psychosis Acute or subacute psycho-organic syndrome Delirium of mixed etiology Delirium superimposed on dementia Sundowning *Code first the underlying physiological condition* Excludes1: delirium NOS Excludes2: delirium tremens alcohol-induced or unspecified (F10.231, F10.921)
290.21 Senile dementia with delusional features	F03.90 Unspecified dementia without behavioral disturbance Includes: presenile dementia NOS presenile psychosis NOS primary degenerative dementia NOS senile dementia NOS senile dementia depressed or paranoid type

	senile psychosis NOS Excludes1: senility NOS (R41.81) Excludes2: mild memory disturbance due to known physiological condition senile dementia with delirium or acute confusional state (F05)
290.40 Vascular dementia, uncomplicated *Use additional code to identify cerebral atherosclerosis (437.0) or other condition resulting in this diagnosis*	F01.50 Vascular dementia without behavioral disturbance Includes: arteriosclerotic dementia *Code first the underlying physiological condition or sequelae of cerebrovascular disease*
290.42 Vascular dementia with delusions *Use additional code to identify cerebral atherosclerosis (437.0) or other condition resulting in this diagnosis*	F01.51 Vascular Dementia with behavioral disturbance Vascular dementia with aggressive behavior Vascular dementia with combative behavior Vascular dementia with violent behavior Includes: arteriosclerotic dementia *Code first the underlying physiological condition or sequelae of cerebrovascular disease*
290.43 Vascular dementia with depressed mood *Use additional code to identify cerebral atherosclerosis (437.0) or other condition resulting in this diagnosis*	F01.51 Vascular Dementia with behavioral disturbance Vascular dementia with aggressive behavior Vascular dementia with combative behavior Vascular dementia with violent behavior Includes: arteriosclerotic dementia *Code first the underlying physiological condition or sequelae of cerebrovascular disease*
291.2 Alcohol-induced persisting dementia	F10.27 Alcohol dependence with alcohol-induced persisting dementia
294.10 Dementia in conditions classified elsewhere without behavioral disturbance *Code first the underlying condition*	F02.2 Dementia in Huntington Disease F02.3 Dementia in Parkinson's Disease F02.80 Dementia in other diseases classified elsewhere, without behavioral disturbance Dementia in other diseases classified elsewhere not otherwise specified *Code first the underlying physiologic condition*
294.11 Dementia in conditions classified elsewhere with behavioral disturbance *Code first the underlying condition*	F02.2 Dementia in Huntington Disease F02.3 Dementia in Parkinson's Disease F02.81 Dementia in other diseases classified elsewhere, with behavioral disturbance Dementia in other diseases classified elsewhere with aggressive behavior Dementia in other diseases classified elsewhere with combative behavior Dementia in other diseases classified elsewhere with violent behavior *Code first the underlying physiologic condition*
294.20 Dementia, unspecified, without behavioral disturbance	F03.90 Unspecified dementia without behavioral disturbance Includes: presenile dementia NOS

Dementia, not otherwise specified	presenile psychosis NOS primary degenerative dementia NOS senile dementia NOS senile dementia depressed or paranoid type senile psychosis NOS Excludes1: senility NOS (R41.81) Excludes2: mild memory disturbance due to known physiological condition senile dementia with delirium or acute confusional state (F05)
294.21 Dementia, unspecified, with behavioral disturbance	F03.91 Unspecified dementia with behavioral disturbance Unspecified dementia with aggressive behavior Unspecified dementia with combative behavior Unspecified dementia with violent behavior
331.0 Alzheimer's disease *Use additional code, where applicable, to identify dementia:* with behavioral disturbance (294.11) without behavioral disturbance (294.10)	G30.0 Alzheimer's disease with early onset G30.1 Alzheimer's disease with late onset G30.8 Other Alzheimer's disease G30.9 Alzheimer's disease, unspecified *Use additional code to identify*: delirium, if applicable (F05) dementia with behavioral disturbance (F02.81) dementia without behavioral disturbance (F02.80)
331.11 Pick's disease	G31.01 Pick's disease Circumscribed brain atrophy Progressive isolated aphasia *Use additional code to identify*: delirium, if applicable (F05) dementia with behavioral disturbance (F02.81) dementia without behavioral disturbance (F02.80)
331.19 Other frontotemporal dementia	G31.09 Other frontotemporal dementia
331.6 Corticobasal degeneration	G31.85 Corticobasal degeneration
331.7 Cerebral degeneration in diseases classified elsewhere. *Code first underlying disease*	G94 Other disorders of brain in diseases classified elsewhere *Code first underlying disease*
331.82 Dementia with Lewy bodies	G31.83 Dementia with Lewy bodies Dementia with Parkinsonism Lewy body dementia Lewy body disease
331.89 Other cerebral degeneration, Other (Corticobasal degeneration)	G31.89 Other specified degenerative diseases of nervous system
094.1 Neurosyphilis, General Paresis Dementia Paralytica *Use additional code to identify associated mental disorder*	A52.17 General paresis Dementia paralytica

046.11 Variant Creutzfeld-Jacob disease vCJD *Use additional code to identify dementia:* *with behavioral disturbance (294.11)* *without behavioral disturbance (294.12)* 046.19 Other and unspecified Creutzfeld-Jacob disease CJD Familial Creutzfeldt-Jacob disease Iatrogenic Creutzfeldt-Jacob disease Sporadic Creutzfeldt-Jacob disease Subacute spongioform encephalopathy *Use additional code to identify dementia:* *with behavioral disturbance (294.11)* *without behavioral disturbance (294.12)*	A81.00 Creutzfeldt-Jacob disease, unspecified A81.01 Variant Creutzfeldt-Jacob disease vCJD A81.89 Other Creutzfeldt-Jacob disease CJD Familial Creutzfeldt-Jacob disease Iatrogenic Creutzfeldt-Jacob disease Sporadic Creutzfeldt-Jacob disease Subacute spongioform encephalopathy (with dementia)

[i] Petersen RC, Lopez O, Armstrong MJ, et al. Practice guideline update: mild cognitive impairment. Neurology 2018;90(3):126-135.

[ii] Ton TGN, DeLeire T, May SG, et al. The financial burden and health care utilization patterns associated with amnestic mild cognitive impairment. Azheimer's & Dementia 2017;13:217-224.

[iii] Zhu CW, Sano M, Ferris SH, et al. Health-Related Resource Use and Costs in Elderly Adults with and without Mild Cognitive Impairment. J Am Geriatr Soc. 2013;61(3):396-402.

[iv] Quality and Safety Subcommittee. American Academy of Neurology Quality Measurement Manual 2017 Update. ??p. January 2018. Available at: https://www.aan.com/policy-and-guidelines/quality/quality-measures2/how-measures-are-developed/