Neurology Outcome
Quality Measurement Set

Approved by the Neurology Outcome Quality Measurement Work Group on April 29, 2019. Approved by the AANI Quality Measure Subcommittee on May 22, 2019. Approved by AANI Quality Committee on July 21, 2019. Approved by AANI Board of Directors on September 5, 2019.

Disclaimer

Quality Measures published by the American Academy of Neurology and its affiliates are assessments of current scientific and clinical information provided as an educational service. The information: 1) should not be considered inclusive of all proper treatments, methods of care, or as a statement of the standard of care; 2) is not continually updated and may not reflect the most recent evidence (new evidence may emerge between the time information is developed and when it is published or read); 3) addresses only the question(s) or topic(s) specifically identified; 4) does not mandate any particular course of medical care; and 5) is not intended to substitute for the independent professional judgment of the treating provider, as the information does not account for individual variation among patients. In all cases, the selected course of action should be considered by the treating provider in the context of treating the individual patient. Use of the information is voluntary. AAN provides this information on an "as is" basis, and makes no warranty, expressed or implied, regarding the information. AAN specifically disclaims any warranties of merchantability or fitness for a particular use or purpose. AAN assumes no responsibility for any injury or damage to persons or property arising out of or related to any use of this information or for any errors or omissions.

Limited proprietary coding is contained in the measure specifications for convenience. Users of the proprietary coding sets should obtain all necessary licenses from the owners of these code sets. The AAN and its members disclaim all liability for use or accuracy of any Current Procedural Terminology (CPT®) or other coding contained in the specifications. ICD-10 copyright 2012 International Health Terminology Standards Development Organization

Contents

Work Group Members

American Academy of Neurology
Sarah Benish, MD, FAAN
Neil Busis, MD, FAAN
Bruce H. Cohen, MD, FAAN
Rohit Das, MD, FAAN
John Halperin, MD, FAAN, FACP, FIDSA
Adam Kelly, MD
Michael Phipps, MD, MHS, FAAN
Parthasarathy D. Thirumala, MD, MS
Jason Sico, MD, MHS, FAHA, FAAN, FACP
Raissa Villanueva, MD, MPH, FAAN

American Association of Neuroscience Nurses
Jane von Gaudecker, PhD, RN, CNS

Epilepsy Foundation
Lisa Meunier

International Essential Tremor Foundation
Shari Finsilver, MS

American Academy of Neurology *Facilitators - non-voting work group members*
Aarti Sarwal, MD, FAAN
Anant Shenoy, MD, FAAN

American Academy of Neurology *Staff*
Amy Bennett, JD
Gina Gjorvad
Katie Hentges
Melissa Johnston-Gross, MS
Erin Lee
Karen Lundgren, MBA
Brandon Magliocco, MS
Becky Schierman, MPH

Importance and Prevalence

Defining Neurology Outcomes

In 2018, the American Academy of Neurology Institute (AANI), formed a Neurology Outcome Quality Measurement Set Work Group (work group) to develop quality measures directly assessing outcomes for patients with neurologic conditions in the outpatient setting. The AAN has developed quality measures since 2008 based on the belief that specialists should play a major role in selecting and creating measures that will drive performance improvement and possibly be used in accountability programs in the future. Historically, AAN measures have been process measures which focus on the actions of health care professionals and evaluate whether these activities follow established evidence-based clinical guidelines, protocols, or practices. Outcome measures address critical endpoints that represent the culmination of an episode of care. Measurement of neurologic outcomes is difficult. This measurement set will be updated iteratively to improve measures as lessons are learned over time through use and/or testing. It is hoped risk adjustment strategies will be added over time as data collection and analysis evolves over time.

Prevalence and Impact of Neurology Conditions

It is impossible to fully articulate the impact of neurology conditions. Below are some brief highlights indicating the importance of measuring and driving improvement in care for patients with neurologic conditions.

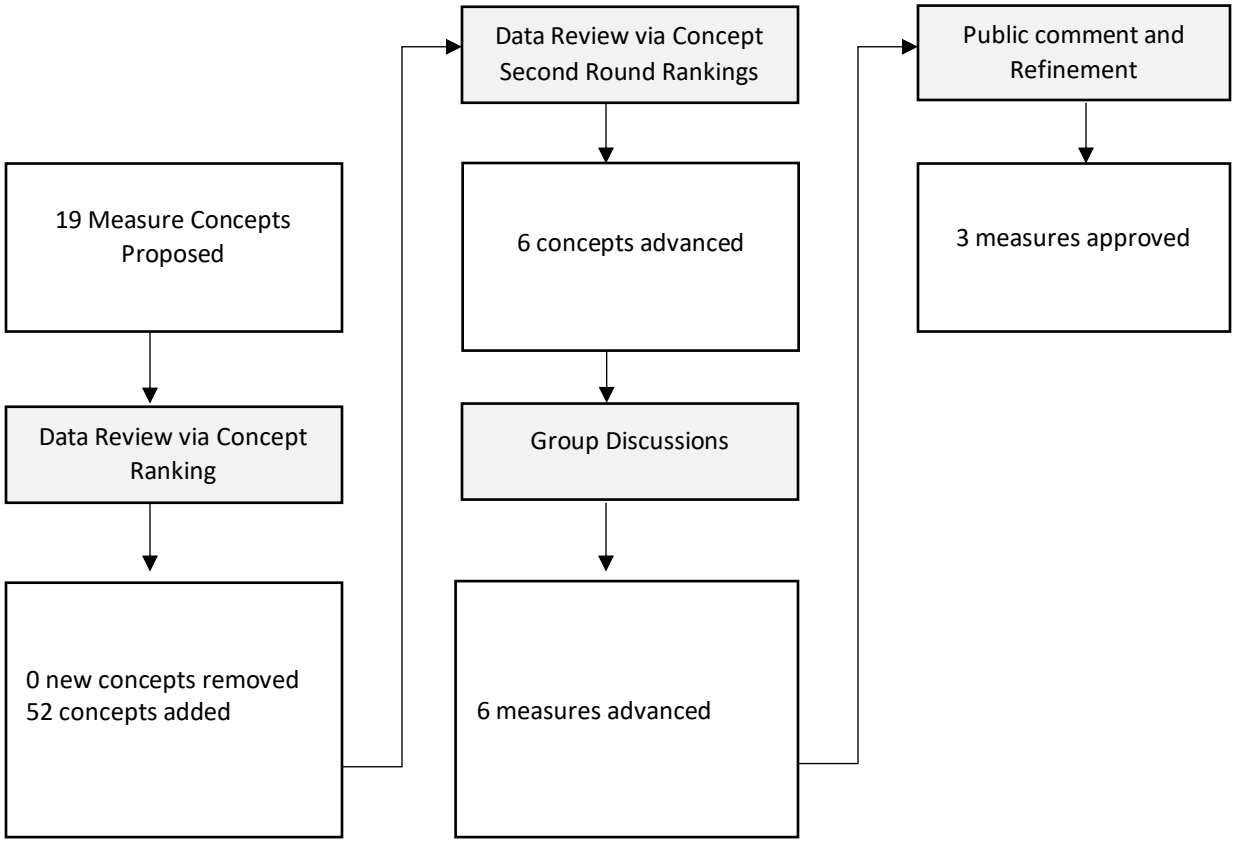
Measure Development Process

The American Academy of Neurology Institute (AANI) charged this work group with developing new outcome measures for patients diagnosed with neurologic conditions. The AANI identified non-voting facilitators from the Quality and Safety Subcommittee to serve as methodological support and guide the work group to consensus decisions. A call for work group volunteers was made for treatment team members. Work group members were selected based on review of disclosure statements, subject matter expertise, and measure development experience. All work group members are required to disclose relationships with industry and other entities to avoid actual, potential, or perceived conflicts of interest. Seated work group members were instructed to abstain from voting on individual measure concepts if a conflict was present. See Appendix B.

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.[i]

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, 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.

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



2018 Neurology Outcome Measurement Set
The work group approved 6 measures listed in the table below. There is no requirement that all the measures in the measurement set be used. Providers and treatment teams are encouraged to identify the one or two measures that would be most meaningful to your patient population 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 improve performance and overall care.

Patient Communication Experiences for Patients with Neurologic Conditions
Electromyography (EMG) Utilization for Lower Back Pain
Quality of Life Outcome for Patients with Neurologic Conditions

The work group declined to create a neurology specific depression outcome measure given the existence of cross-cutting depression measures. The work group encourages providers to utilize one of the below measures to monitor and track depression outcomes in practice:

- MIPS Quality ID #371 Depression Utilization of the PHQ-9 Tool. Process measure applicable to patients aged 18 years and older with diagnosis of major depression or dysthymia who had a PHQ-9 administered.
- MIPS Quality ID #411 Depression Remission at Six Months. Outcome measures at six months for patients age 18 years and older diagnosed with major depression or dysthymia utilizing PHQ-9 scores.
- MIPS Quality ID#370 Depression Remission at Twelve Months. Outcome measures at twelve months for patients age 18 years and older diagnosed with major depression or dysthymia utilizing PHQ-9 scores
- Add in progress towards depression remission

Public comment changes
The work group received comments from 48 individuals. Following review of comments, the work group dropped two measures from further development: "patient reported unacceptable or concerning side effects from medication for a neurologic condition" and "progress towards depression remission for patients with a neurologic condition." Several comments were received regarding testing and prior use of the measure proposals. The AANI made the draft measures available for public comment. The measures have been refined in response to public comment, are now made available to the public prior to testing and use. Any testing or implementation/use experiences will guide future updates of the measurement set. Measurement sets are reviewed at a minimum triennially for updates. These measures may be utilized in CMS' Qualified Clinical Data Registry (QCDRs) such as Axon Registry® prior to testing, but will not be submitted for consideration as CMS' Quality Payment Program (QPP) measures in their Merit-based Incentive Payment System (MIPS) without testing data.

The patient reported unacceptable or concerning side effects from medication for a neurologic condition was dropped from further development due to concerns the measure would not be feasible to collect. The work group discussed feasibility concerns throughout the measure development process and hopes that future advances will be made in collection of side effect information. Specifically, there is no unified method of collection or assessment of side effects for neurology, side effects are difficult to attribute to a specific medication when patients are utilizing multiple medications, and patients may opt to continue medications after side effects are identified for a variety of reasons. There is not one scale or tool currently widely implemented in neurologic care collecting side effect information. Also, many of the available tools have licensing or use fees and copyright concerns. A gap exists for meaningful side effects questionnaires for patients with chronic conditions.[1,2] The work group hopes a neurology specific patient reported outcome scale or tool

[1] Katusiime B, Corlett S, Reeve J, et al. Measuring medicine-related experiences from the patient perspective: a systematic review. Patient related outcome measures 2016;7:157-171.

addressing side effects is developed, and that during future updates of this measure, one tool or scale will be identified allowing for comparable data collection over time. This concept will be revisited over time in future updates of this measurement set.

The progress towards depression remission for patients with a neurologic condition was dropped from further development due to measure harmonization concerns. The work group agreed with commenters that a separate depression outcome measure for patients with neurologic conditions was not needed when an existing depression outcome measure could be endorsed for use. The work group encourages use of established Minnesota Community Measurement measures assessing depression and monitoring progress towards depression remission as noted above. Some comments reflected concern that treatment of depression was outside the realm of neurologic care. The AAN notes that assessment of co-morbid depression is a common concern identified in the measure development process and the AAN maintains separate depression assessment measures for ALS, child neurology, epilepsy, essential tremor, dementia management, multiple sclerosis, and Parkinson's disease. The work group believes there is a gap in identification and management of depression for patients with a neurologic condition that needs to be addressed and a team-based approached to identification and treatment should be adopted given the impact of this profound frequency of this co-morbid condition for neurology patients.

Comments were received suggesting two measures monitoring provider communication for adult and pediatric populations be combined into one measure incorporating both age ranges. The work group agreed and unified the measures into one as a result.

Following public comment, the work group discussed use of "Always" to meet the measure numerator. Some commenters suggested use of alternate answers such as "Usually" to meet the numerator, while other commenters suggested changing the response of the question to allow for a different standard to meet the measure. The work group declined to adopt a different standard given the existing use of the question and standard in CMS' Merit-based Incentive Payment System (MIPS). The work group chose the survey question to reduce data burden collection. The question and answers are maintained by the Agency for Healthcare Research and Quality (AHRQ), and changes to either are beyond the scope of this project. There was a suggestion that benchmark data be provided. The AAN does not establish benchmark data at this time. It is up to the individual provider to establish an initial performance benchmark and strive to improve upon that benchmark. The work group notes that 100% is not a realistic goal and no provider should be aiming for perfection in communication delivery.

The work group discussed the challenges of data collection for this measure and believe these hurdles can be addressed now. Collection of data via a registry is a challenge, but potential solutions are ripe for development. The work group approved the measure given the potential for data collected to impact and improve the delivery of care, although this will require a modification of how data is collected. The work group hopes that through registry collection and implementation solutions can be identified that will address aggregation of data without linking to a patient response and alleviate concerns of response bias that may occur when patients are aware physicians and providers are able to see their input without blinding. The ultimate goal is to identify a balance that is not unduly burdensome to providers while given freedom to patients to respond with candor. Individuals will need to establish a performance benchmark that can be used to drive improvement over time.

The work group discussed changes to the exclusions and exceptions of the EMG Utilization measure. The work group decided to leave the exclusions and exceptions unchanged with the plan to revisit during future updates to evaluate any

---

[2] Foster Phd, J. M., van der Molen MD, PhD, T., Caeser PhD, M., & Hannaford MD, PhD, P. (2008). The use of questionnaires for measuring patient-reported side effects of drugs: its importance and methodological challenges. Pharmacoepidemiology and drug safety, 17(3), 278-296.

unintended consequences from the exclusions and exceptions. The current exclusions and exceptions do address concerns raised by commenters that EMG providers would be unfairly penalized for inappropriate referrals.

Comments on the quality of life measure suggested use of other patient reported outcome measures to meet the numerator. The work group did not expand the numerator for several reasons. The AANI encourages work groups to use only one tool allowing for greater comparability of results. Use of one tool aids in feasibility of implementation into a registry, such as the Axon Registry. The measurement set will be revisited over time to consider adding additional tools. A few commenters suggested excluding patients with ALS from the measure. The work group discussed this concern extensively prior to posting the measure for public comment and again after. The work group disagrees. Patients with ALS and other terminal neurologic illnesses will benefit from quality of life assessment and monitoring. Providers can use values collected to aid in conversations on meaningful treatment and social considerations. Also, this data may prove useful for those providers caring for a specific condition as they can benchmark performance for their population and drive change over time. Over time improved data collection methods may result in the ability to risk adjust for specific disease states. These advances will be monitored and considered during updates of the measurement set.

Other Potential Measures

The work group proposed 71 measure concepts. The AANI encourages work groups to focus development of measure concepts that are feasible to collect, do not pose an excessive burden on providers to collect data, meaningful to quality improvement efforts, and address a known treatment gap.

Through two rounds of rankings, work group members prioritized five concepts for discussion: quality of life, healthcare utilization, medication use, patient experience and satisfaction, and depression.

The 71 concepts were grouped together during the second round of rankings to reduce competition of similar concepts (e.g., 14 separate patient experience and satisfaction concepts were proposed that were consolidated into one patient experience/satisfaction grouping, three separate concepts (improved adherence, reduction of side effects, and reduction of overmedication) grouped into one medication use grouping, etc.).

During the healthcare utilization discussion it became apparent initial suggestions to measure reduced emergency department visits, reduced unplanned inpatient admissions and cost of care were not feasible to collect, outside the scope of a neurology provider's control, or data collected would not occur in a timely fashion limiting ability to drive quality improvement. The work group focused in on EMG use for lower back pain as a result.

During patient experience/satisfaction conversations the work group harmonized measurement with existing patient survey data being collected by many neurology practices to reduce burden to collect new or additional patient survey data.

Ultimately the work group cannot develop all appropriate concepts due to resource limitations and efforts to reduce provider reporting burden. A complete list of other concepts proposed is maintained by the AAN and can be provided by emailing quality@aan.com. The additional concepts will be revisited during the iterative update process.

Measure Harmonization

The AANI encourages work groups to avoid duplication of measures that already exist in the field. Further details on measure harmonization is included in individual measure specifications below.

The AANI has developed additional measures that may be of interest to clinicians and teams treating patients with neurologic conditions, such as the process measures for co-morbid psychiatric concerns noted above. All AANI measures are available for free at: https://www.aan.com/policy-and-guidelines/quality/quality-measures2/quality-measures/

Patient Communication Experience for Patients with Neurologic Conditions

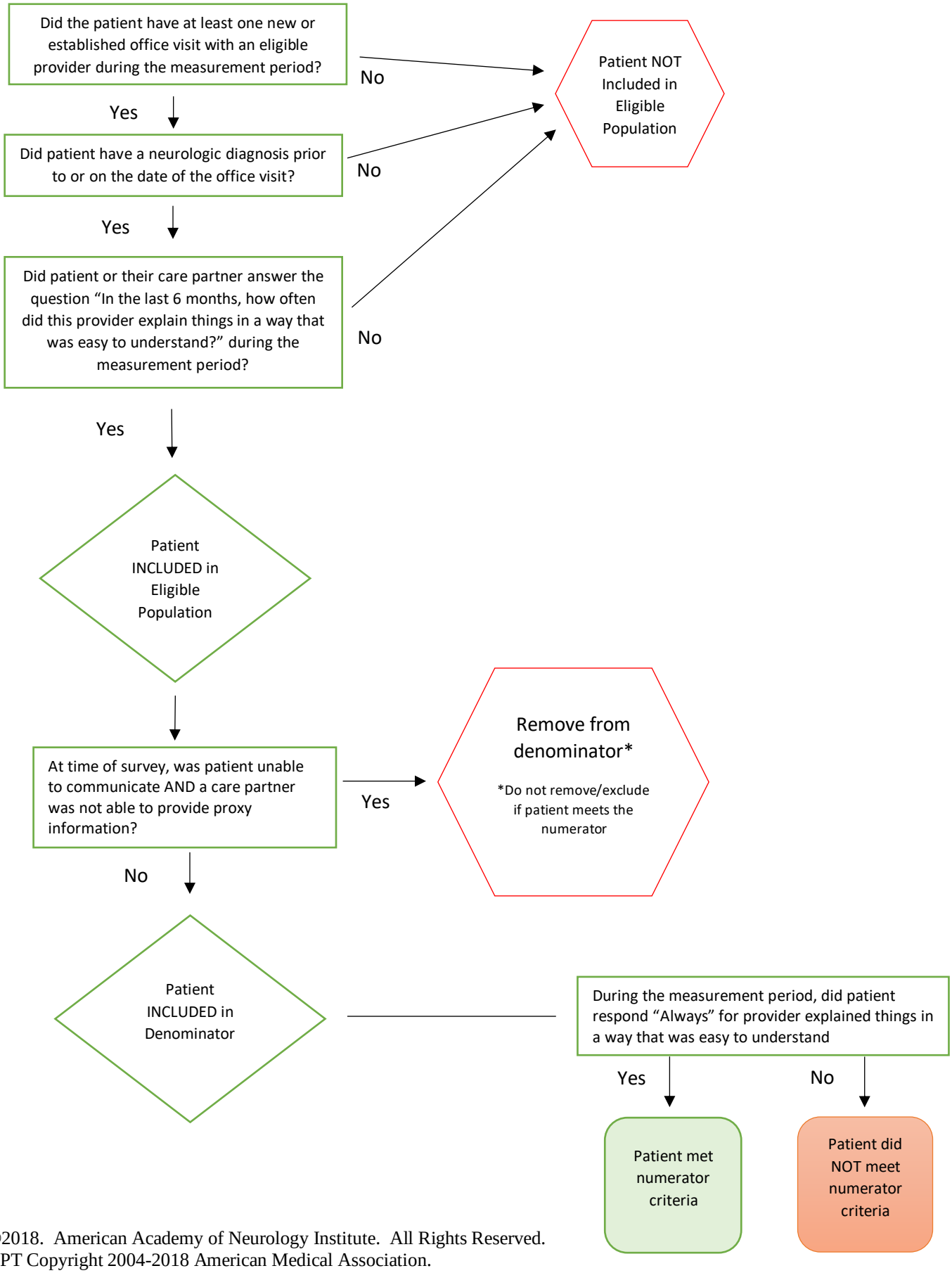
Measure Title	Patient Communication Experience for Patients with Neurologic Conditions	
Description	Percentage of patients with neurologic conditions or their care partners who reported provider always explained things in a way that was easy to understand.	
Measurement Period	January 1, 20xx to December 31, 20xx	
Eligible Population	**Eligible Providers**	Medical Doctor (MD), Doctor of Osteopathy (DO), Pharmacist (PharmD), Nurse Practitioners (NP), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN)
	Care Setting(s)	Outpatient Care
	Ages	Any
	Event	Office visit
	Diagnosis	See Appendix A for adult patients 18 years and older See Appendix B for child and adolescent patients 17 years and younger Diagnostic codes include amyotrophic lateral sclerosis, attention deficit disorders, autism, cerebral palsy, cognitive impairment and related dementias, developmental delays, headache and migraine, movement disorders, multiple sclerosis, muscular dystrophy, neoplasms of brain and spine, polyneuropathy, seizure and epilepsy, stroke, tic disorders, vertigo and related neuro-otology disorders, and other neurologic conditions.
Denominator	Patients or care partners* of those diagnosed with a neurologic condition who answered the question^ "In the last 6 months, how often did this provider explain things in a way that was easy to understand?". *Care partner is defined as any individual who assistance to an individual with a health condition to meet their self-care deficits, the commitment to a care partner relationship, and the recognition that people with self-care deficits are care partners contributing to their own care. Examples of care partners include spouses, guardians, and family members.(1) ^Question is part of the CAHPS® Clinician and Group Survey version 3.0.(2)	
Numerator	Patients or care partners who responded "Always" for the question "provider explained things in a way that was easy to understand."	
Required Exclusions	• None	
Allowable Exclusions	• At time of survey, patients who are unable to communicate AND do not have a care partner available to provide information. Suggested key phrases to locate exclusions are: • "Unable to collect survey response as patient unable to communicate and care partner not available." • "patient unable to communicate and proxy not available."	
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	The work group recommends that clinics and providers reach out to all patients and their care partners to provide this information. The work group is aware that patients with advanced disease activity may not be able to provide accurate responses to this question, but efforts should be made to engage care partners to provide information. For example, some patients may be unable to hold a pen or type on a keyboard to answer question while others may experience delusional beliefs preventing an accurate assessment of provider performance. These scenarios	

	include patients with reduced cognitive ability. Providers are encouraged to gain proxy information on performance when possible, and the work group recognizes this is not always possible. The AAN will monitor the measure over time for unintended consequences of having such an allowable exclusion.
Measure Scoring	Percentage
Interpretation of Score	Higher Score Indicates Better Quality
Measure Type	Patient Reported Outcome Performance Measure
Level of Measurement	Provider
Risk Adjustment	*See Appendix C AAN Statement on Comparing Outcomes of Patients* *This measure is being made available in advance of development of a risk adjustment strategy. The work group identified the following potential data elements that may be used in a risk adjustment methodology for this measure. If this measure is implemented into the Axon Registry the following potential data elements should be tested for possible risk adjustment:* • Co-morbidity (other neurologic or neurobehavioral/neuropsychological disorders) • Co-morbidities (medical conditions) • Cognitive impairment and abilities • Trauma exposure • High healthcare utilizer • Duration of the neurology diagnosis • Polypharmacy • Activity level – physical function • Use of an interpreter and primary spoken language
Opportunity to Improve Gap in Care	The work group noted an opportunity for neurologists and primary neurology providers to improve patient experience. The AAN does not establish thresholds or baselines. Providers are encouraged to monitor performance during a baseline period, establish their own internal benchmarks, and work to improve from their original baseline performance rate over subsequent years. The work group prioritized development of a patient experience measure and reviewed current patient experience survey data that is commonly collected in practice for concepts or areas under the control of neurologists and neurology providers focusing in on the above concept, which many providers and practices may already be collecting via the CAHPS – Clinician and Group Survey. The work group discussed the potential burden of data collection for this measure. The work group discussed potential solutions for small, solo practices and identified a potential solution: Collection of this information via a one question survey gathered via a patient portal to bypass any administrative costs to mail a hardcopy survey to a patient. The work group also discussed collection of this data in the clinic setting. However, providers and measure developer need to be mindful that filling a survey out in front of provider will yield different results then a survey mailed after the visit. The method of data collection will be monitored over time to address unintended consequences.
Harmonization with Existing Measures	There are multiple measures that have been previously developed to address patient experience for other populations. This measure was created to track outcomes specific to neurologic populations. Similar measures were reviewed and data elements harmonized when possible, including use of "Always" to meet the numerator which is required for the existing MIPS #321 measure. MIPS #321 applies solely to clinician groups, and a neurology specific measure was created for solo and small practices to utilize in driving quality improvement.

References	1. Bennett PN, Wang W, Moore M, et al. Care partner: A concept analysis. Nursing Outlook 2017; 65(2): 184-194. 2. Agency for Healthcare Research and Quality (AHRQ). Consumer Assessment of Healthcare Providers and Systems (CAHPS). Available at: https://www.ahrq.gov/cahps/index.html Accessed on October 16, 2018.

Code System	Code	Code Description
CPT	99201-99205	Office or Other Outpatient Visit - New Patient (E/M Codes)
CPT	99211-99215	Office or Other Outpatient Visit - Established Patient (E/M Codes)
CPT	99241-99245	Office or Other Outpatient Consultation – New or Established Patient
		AND
		Age 18 years and older
ICD-10		See Appendix A
		OR
		Age 17 years and older
ICD-10		See Appendix B

Flow Chart Diagram: Patient Communication Experience for Patients with Neurologic Conditions



Step-by-step Calculation: Patient Communication Experience for Adult Patients with Neurologic Conditions

Start with Denominator

1. Check Encounter Performed
    a. If Encounter as Listed in the Denominator equals No, do not include in Eligible Patient Population. Stop processing.
    b. If Encounter is Listed in the Denominator equals Yes, include in Eligible Patient Population.
2. Check Diagnosis, Neurology
    a. If there is no diagnosis from diagnosis list on the Date of Service, and equals No during the measurement period, do not include in Eligible Patient Population. Stop processing.
    b. If there is a diagnosis from diagnosis list on the Date of Service, and equals Yes during the measurement period, proceed to check Encounter Performed.
3. Check Question Answered
    a. If Question Answered (i.e., "In the last 6 months, how often did this provider explain things in a way that was easy to understand?") in the Denominator equals No, do not include in Eligible Patient Population. Stop processing.
    b. If Question Answered in the Denominator equals Yes, include in Eligible Patient Population.
4. Denominator Population
    a. Denominator population is all Eligible Patients in the denominator minus any Required Exclusions. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter c equals 90 patients in the Sample Calculation.

Start Numerator

5. Check Patients Respond Always
    a. If Patients Respond Always (i.e., did patient respond "Always" for provider explained things in a way that was easy to understand) equals Yes, include in Data Completeness Met and Performance Met.
    b. Data completeness met and performance met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a equals 40 patients in the Sample Calculation.
    c. If Patients Respond Always equals No, proceed to Check Patients Respond Not Always.
6. Check Patients Respond Not Always.
    a. If Patients Respond Not Always equals Yes, include in Data Completeness Met and Performance NOT Met.
    b. Data completeness met and performance NOT met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter b equals 40 patients in the Sample Calculation.
    c. If Patients Respond Not Always equals No, proceed to Data Completeness NOT Met.
7. Check Data Completeness Not Met
    a. If Data Completeness reveals at time of survey patient was unable to communicate and a care partner was not available to provide proxy data, remove patient from denominator population.
    b. If Data Completeness Not Met equals No, Quality Data Code or equivalent not submitted. 10 patients have been subtracted from the Data Completeness Numerator in the Sample Calculation.

Sample Calculations

Data Completeness*=

Performance Met (a=40) + Performance Not Met (b=40)	=80 Patients	=88.9%
Eligible Population/ Denominator (c=90)	90 Patients	

Performance Rate =

Performance Met (a=40)	=40 Patients	=44.4%
Eligible Population/ Denominator (c=90)	90 Patients	

CMS maintains a data completeness threshold for reporting in its Merit-based Incentive Payment System (MIPS). The data completeness threshold changes each year and varies based on which reporting mechanism a provider is using.

- For 2018 and 2019 quality measures reported via Medicare Part B claims, providers must report on 60% of the individual MIPS eligible clinician's Medicare Part B patients for the performance period.
- For 2019 quality measures reported via administrative claims, providers must report on 100% of the individual MIPS eligible clinician's Medicare Part B patients for the performance period.
- For 2018 and 2019 quality measures reported via a QCDR, MIPS CQMs and eCQMs, eligible clinicians must report on 60% of the individual MIPS eligible clinician's patients across all payers for the performance period.

Electromyography (EMG) Utilization for Patients with Isolated Lower Back Pain

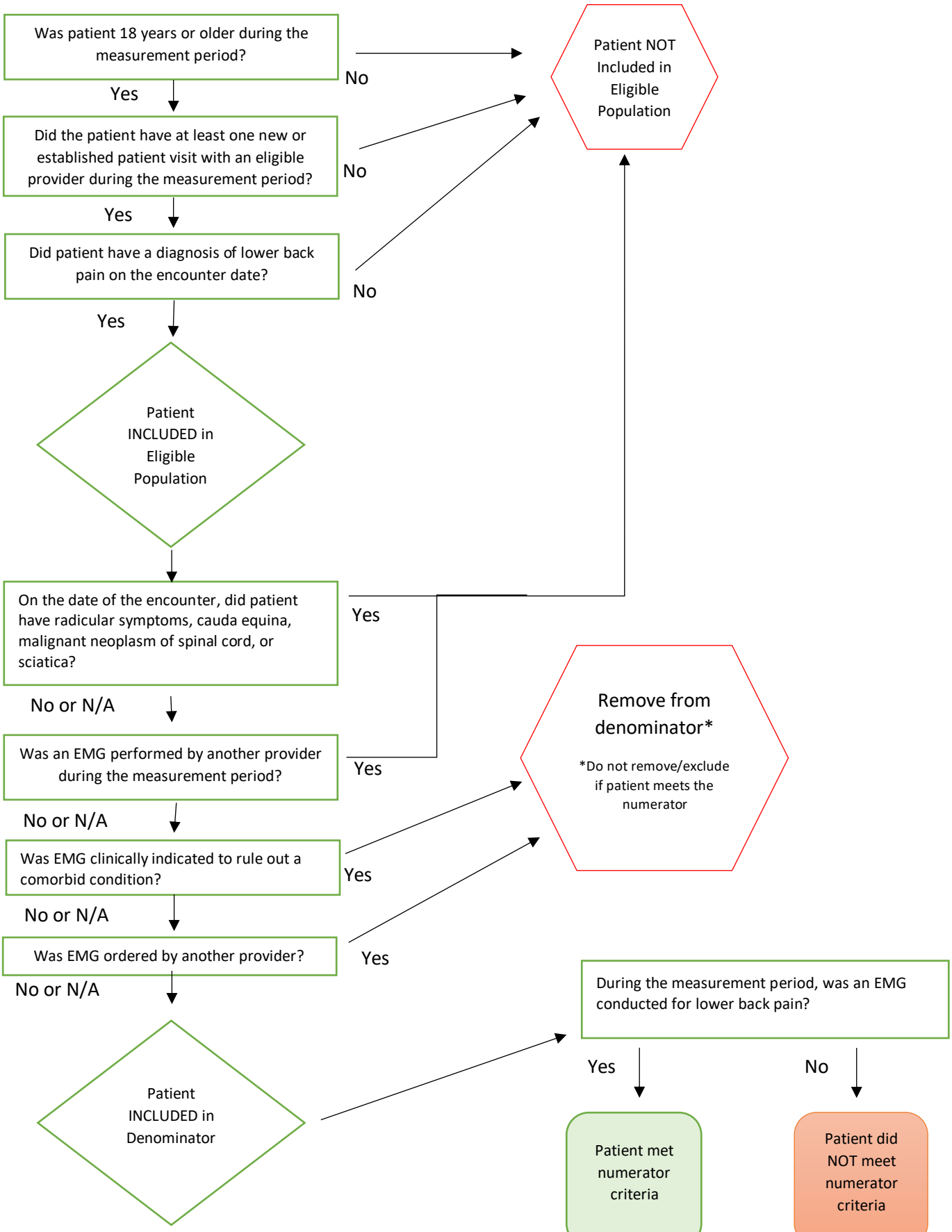
Measure Title	EMG Utilization for Patients with Isolated Lower Back Pain	
Description	Percentage of patients with lower back pain who had an EMG. ***Lower score is indicative of better care.**	
Measurement Period	January 1, 20xx to December 31, 20xx	
Eligible Population	**Eligible Providers**	Medical Doctor (MD), Doctor of Osteopathy (DO), Pharmacist (PharmD), Nurse Practitioners (NP), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN)
	Care Setting(s)	Outpatient Care
	Ages	Age 18 and older
	Event	Office visit
	Diagnosis	Lower back pain
Denominator	Patients aged 18 and older diagnosed with isolated lower back pain	
Numerator	Patients who had an EMG for diagnosis of isolated lower back pain	
Required Exclusions	• Patients who have radicular symptoms documented • Diagnosed with malignant neoplasm of spinal cord • Diagnosed with cauda equina syndrome • Diagnosed with sciatica • EMG performed by another provider Suggested key phrases to locate exclusions are: • "experiencing radicular symptoms" • "reported radicular symptoms" • "noted radicular symptoms" • "EMG performed by another …" • "reported pain going down the leg" • "noted pain going down the leg" • "Radiculopathy reported" • "Radiculopathy noted" • "Radiculopathy present" • "Radiculitis reported" • "Radiculitis noted" • "pain that radiates down the leg reported" • "pain that radiates down the leg noted"	
Allowable Exclusions	• EMG clinically indicated to rule out another comorbid neurologic condition • EMG ordered by another provider Suggested key phrases to locate exclusions are: • "EMG clinically indicated" • "EMG needed to rule out…" • "EMG indicated to rule out…"	

	• "EMG ordered by another …"
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	EMG is clinically indicated for patients with lower back pain who have radicular symptoms. The AAPMR has issued a Choosing Wisely statement, "Don't order an EMG for low back pain unless there is leg pain or sciatica."(1) Measure intent is to identify patients at current practice who received EMG for lower back pain, and EMG performed by another and EMG's ordered by another provider are excluded as outside scope of measure intent. EMG may be clinically appropriate for another diagnosis and excluded as a result.
Measure Scoring	Percentage
Interpretation of Score	Lower Score Indicates Better Quality
Measure Type	Health care utilization outcome
Level of Measurement	Provider
Risk Adjustment	None
Opportunity to Improve Gap in Care	Lower back pain is common and a frequent cause of why patients visit a doctor.(2,3) Multiple specialty societies have recommended reduction of EMG for lower back pain.(4) The AAPMR has issued a Choosing Wisely statement, "Don't order an EMG for low back pain unless there is leg pain or sciatica."(1) A similar statement was released by the North American Spine Society, "Don't use electromyography (EMG) and nerve conduction studies (NCS) to determine the cause of axial lumbar, thoracic or cervical spine pain."(5) The intent of this measure is to identify a baseline or benchmark performance rate for providers and over subsequent years reduce the number of patients receiving EMG for lower back pain without further clinical indication. 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 EMG for lower back pain. The work group discussed the possibility of creating additional exclusions for all clinical scenarios where EMGs are warranted, but declined to do so given the need for provider discretion to meet the needs of individual patients. The work group created an exclusion for orders from another provider with the intent this version of the measure focus on reduction of inappropriate EMG for individual patients seen at the provider's practice. The work group acknowledges that patients may be referred for EMG without clinical indication, and a provider would be placed in an awkward position declining the referral or EMG, especially when the patient is already in a neurology office. It is hoped providers receiving such referrals are educating and discussing treatment planning with the referring colleagues. The AAN will revisit this exception during iterative updates, to determine if the exclusion should be removed.
Harmonization with Existing Measures	There is a similar HEDIS measure which assesses adults 18-50 with a primary diagnosis of low back pain who did not have an imaging study (plain X-ray, MRI or CT scan) within 28 days of the diagnosis (a higher score indicates better performance). A measure focused on EMG is proposed as being within the scope of neurologist control.
References	1. American Academy of Physical Medicine and Rehabilitation. 2014. Don't order an EMG for low back pain unless there is leg pain or sciatica. Choosing Wisely recommendation. Available at: http://www.choosingwisely.org/clinician-lists/aapmr-emg-for-low-back-pain/ Accessed on October 25, 2018. 2. Deyo RA, Mirza SK, Martin BI. Back pain prevalence and visit rates: estimates from U.S.

national surveys, 2002. Spine. 2006;31:2724-2727.
3. St. Sauver JL, Warner DO, Yawn BP, et al. Why Patients Visit Their Doctors: Assessing the Most Prevalent Conditions in a Defined American Population. Mayo Clinic Proceedings. 2013; 88(1): 56-67.
4. Callaghan BC, De Lott LB, Kerber KA, et al. Neurology Choosing Wisely recommendations. Neurol Clin Pract. 2015;5(5)439-446
5. North American Spine Society. 2013. Don't use electromyography (EMG) and nerve conduction studies (NCS) to determine the cause of axial lumbar, thoracic or cervical spine pain. Choosing Wisely recommendation. Available at: http://www.choosingwisely.org/clinician-lists/nass-emg-nerve-conduction-studies-to-determine-cause-of-spine-pain/ Accessed on October 25, 2018.

Code System	Code	Code Description
CPT	99201-99205	Office or Other Outpatient Visit - New Patient (E/M Codes)
CPT	99211-99215	Office or Other Outpatient Visit - Established Patient (E/M Codes)
CPT	99241-99245	Office or Other Outpatient Consultation – New or Established Patient
AND		
ICD-10 CM	M54.5	Low back pain
ICD-10 CM	M54.50	Low back pain, multiple sites in spine
ICD-10 CM	M54.55	Low back pain, thoracolumbar region
ICD-10 CM	M54.56	Low back pain, lumbar region
ICD-10 CM	M54.57	Low back pain, lumbosacral region
ICD-10 CM	M54.58	Low back pain, sacral and sacrococcygeal region
ICD-10 CM	M54.59	Low back pain, site unspecified
EXCLUDE radiculopathy		
ICD-10 CM	M54.10	Radiculopathy, site unspecified
ICD-10 CM	M54.11	Radiculopathy, occipito-atlanto-axial region
ICD-10 CM	M54.12	Radiculopathy, cervical region
ICD-10 CM	M54.13	Radiculopathy, cervicothoracic region
ICD-10 CM	M54.14	Radiculopathy, thoracic region
ICD-10 CM	M54.15	Radiculopathy, thoracolumbar region
ICD-10 CM	M54.16	Radiculopathy, lumbar region
ICD-10 CM	M54.17	Radiculopathy, lumbosacral region
ICD-10 CM	M54.18	Radiculopathy, sacral and sacrococcygeal region
ICD-10 CM	M54.3	Sciatica
ICD-10 CM	C72.0	Malignant neoplasm of spinal cord
ICD-10 CM	G83.4	Cauda equina syndrome

Flow Chart Diagram: EMG Utilization for Lower Back Pain



Step-by-step Calculation: EMG Utilization for Lower Back Pain

Start with Denominator

1. Check Patient Age
    a. If the Age is less than 18 years on Date of Service and equals No during the measurement period, do not include in Eligible Patient Population. Stop processing.
    b. If the Age is greater than or equal to 18 years on Date of Service and equals Yes during the measurement period, proceed to check Diagnosis, Neurologic Condition.
2. Check Diagnosis, Lower Back Pain
    a. If there is no Diagnosis, Lower Back Pain on the Date of Service, and equals No during the measurement period, do not include in Eligible Patient Population. Stop processing.
    b. If there is a Diagnosis, Lower Back Pain on the Date of Service, and equals Yes during the measurement period, proceed to check Encounter Performed.
3. Check Encounter Performed
    a. If Encounter as Listed in the Denominator equals No, do not include in Eligible Patient Population. Stop processing.
    b. If Encounter is Listed in the Denominator equals Yes, include in Eligible Patient Population.
4. Check for Required Exclusions
    a. If Patient met Required Exclusions equals Yes, do not include in Eligible Patient Population. Stop processing.
    b. If Patient met Required Exclusions equals No, proceed to Denominator Population.
5. Denominator Population
    a. Denominator population is all Eligible Patients in the denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d equals 90 patients in the Sample Calculation.

Start Numerator

6. Check EMG Conducted
    a. If Patient EMG Conducted equals Yes, include in Data Completeness Met and Performance Met.
    b. Data completeness met and performance met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a equals 35 patients in the Sample Calculation.
    c. If Patient EMG Conducted equals No, proceed to Allowable Exclusions.
7. Check for Allowable Exclusions
    a. If Patient met Allowable Exclusions equals Yes, remove from Denominator population.
    b. If Patient met Allowable Exclusions equals No, proceed to check EMG Not Conducted.
8. Check EMG Not Conducted.
    a. If Patient, EMG Not Conducted equals Yes, include in Data Completeness Met and Performance NOT Met.
    b. Data completeness met and performance NOT met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter c equals 40 patients in the Sample Calculation.
    c. If Patient, EMG Not Conducted equals No, proceed to Data Completeness NOT Met.
9. Check Data Completeness Not Met
    a. If Data Completeness Not Met equals No, Quality Data Code or equivalent not submitted. 15 patients have been subtracted from the Data Completeness Numerator in the Sample Calculation.

Sample Calculations

Data Completeness*=

Performance Met (a=30 + b=5) + Performance Not Met (c=40)	=75 Patients	=83.3%
Eligible Population/ Denominator (d=90)	90 Patients	

Performance Rate =

Performance Met (a=30 + b=5)	=35 Patients	=38.8%
Eligible Population/ Denominator (d=90)	90 Patients	

CMS maintains a data completeness threshold for reporting in its Merit-based Incentive Payment System (MIPS). The data completeness threshold changes each year and varies based on which reporting mechanism a provider is using.

- For 2018 and 2019 quality measures reported via Medicare Part B claims, providers must report on 60% of the individual MIPS eligible clinician's Medicare Part B patients for the performance period.
- For 2019 quality measures reported via administrative claims, providers must report on 100% of the individual MIPS eligible clinician's Medicare Part B patients for the performance period.
- For 2018 and 2019 quality measures reported via a QCDR, MIPS CQMs and eCQMs, eligible clinicians must report on 60% of the individual MIPS eligible clinician's patients across all payers for the performance period.

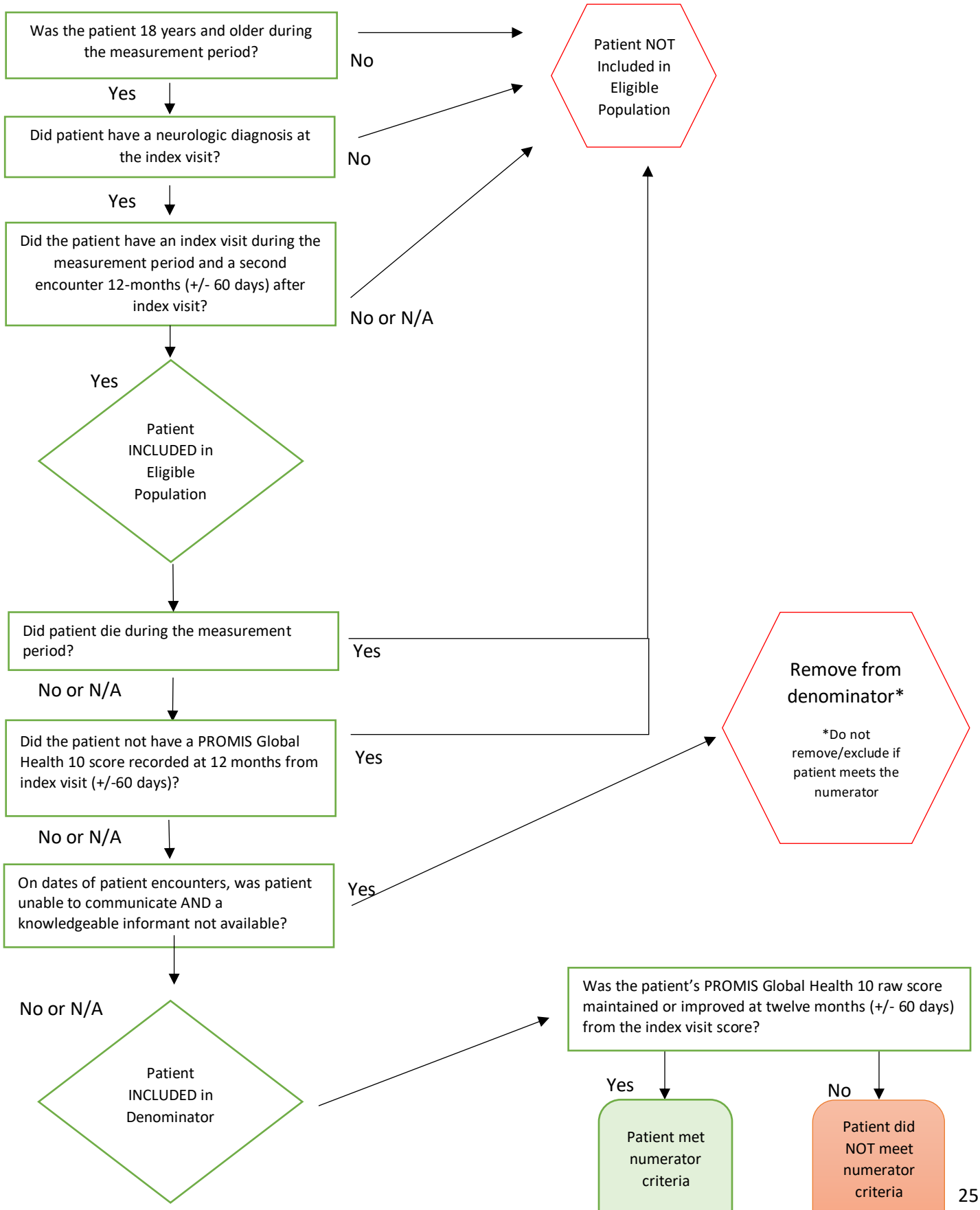
Quality of Life Outcome for Patients with Neurologic Conditions

Measure Title	Quality of Life Outcome for Patients with Neurologic Conditions	
Description	Percentage of patients whose quality of life assessment results are maintained or improved during the measurement period.	
Measurement Period	January 1, 20xx to December 31, 20xx (See below denominator identification period.)	
Eligible Population	**Eligible Providers**	Medical Doctor (MD), Doctor of Osteopathy (DO), Pharmacist (PharmD), Nurse Practitioners (NP), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN)
	Care Setting(s)	Outpatient
	Ages	Age 18 years and older
	Event	An index event date occurs when ALL of the following criteria are met during a face-to-face visit: • An active diagnosis of a neurologic condition • The first instance a PROMIS Global Health-10 score was recorded • The patient is NOT in a prior index period.(The first instance in the denominator identification period). *An index period begins with an index visit and is 10-14 months in duration.*
	Diagnosis	See Appendix A Diagnostic codes include amyotrophic lateral sclerosis, attention deficit disorders, autism, cerebral palsy, cognitive impairment and related dementias, developmental delays, headache and migraine, movement disorders, multiple sclerosis, muscular dystrophy, neoplasms of brain and spine, polyneuropathy, seizure and epilepsy, stroke, tic disorders, vertigo and related neuro-otology disorders, and other neurologic conditions.
Denominator	Patients aged 18 years and older diagnosed with neurologic condition	
Denominator Identification Period	The period in which eligible patients can have an index event. The denominator identification period occurs prior to the measurement period and is defined as 14 months to two months prior to the start of the measurement period. For example, the denominator identification period for the 2019 calendar year is from 11/1/2017 to 10/31/2018. For patients with an index event, there needs to be enough time following index for the patients to have the opportunity to reach comparison twelve months +/- 60 days after the index event date.	
Numerator	Patients whose PROMIS Global Health-10 score(1)* at twelve months (+/-60 days) was maintained or improved from the index score^. *For patients with more than 2 scores present at twelve months (+/- 60 days) the last score recorded shall be compared to the index visit score.	
Required Exclusions	• Patients who died • Second PROMIS Global Health-10 score not collected at twelve months (+/-60 days)	
Allowable Exclusions	• At time of survey, patients who are unable to communicate AND do not have a care partner available to provide information. Suggested key phrases to locate exclusions are: • "Unable to collect survey response as patient unable to communicate and care partner not available." • "patient unable to communicate and proxy not available."	
Allowable Exclusion	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.	

Inclusion Logic	
Exclusion Rationale	Patients who have died are appropriate to exclude from a quality of life measure requiring patient report of outcomes. Similarly, if a follow-up score was not collected performance cannot be calculated and are appropriate for exclusion. The work group recommends that clinics and providers reach out to all patients and their care partners to provide this information. The work group is aware that patients with advanced disease activity may not be able to provide accurate responses to this question, but efforts should be made to engage care partners to provide information. For example, some patients may be unable to hold a pen or type on a keyboard to answer question while others may experience delusional beliefs preventing an accurate assessment of provider performance. These scenarios include patients with reduced cognitive ability. Providers are encouraged to gain proxy information on performance when possible, and the work group recognizes this is not always possible. The AAN will monitor the measure over time for unintended consequences of having such an allowable exclusion.
Measure Scoring	Percentage
Interpretation of Score	Higher Score Indicates Better Quality
Measure Type	Patient Reported Outcome Performance Measure
Level of Measurement	Provider
Risk Adjustment	*See Appendix B AAN Statement on Comparing Outcomes of Patients* *This measure is being made available in advance of development of a risk adjustment strategy. Individuals commenting on the measures are encouraged to provide input on potential risk adjustment or stratification methodologies. The work group identified the following potential data elements that may be used in a risk adjustment methodology for this measure:* • Co-morbidity (other neurologic or neurobehavioral/neuropsychological disorders) • Co-morbidities (medical conditions) • Cognitive impairment and abilities • Trauma exposure • High healthcare utilizer • Duration of the neurology diagnosis • Polypharmacy • Activity level – physical function • Use of an interpreter and primary spoken language
Desired Outcome	Measuring quality of life allows patients and providers to identify areas of concern and develop appropriate treatment plan adjustments as needed.
Opportunity to Improve Gap in Care	Collecting quality of life data in a neurology ambulatory setting is feasible and found to be meaningful.(2,3)
Harmonization with Existing Measures	There are no known similar measures applicable to patients with neurologic conditions.
References	1. Hays RD, Bjorner JB, Revicki DA, et al. Development of physical and mental health summary scores from the patient-reported outcomes measurement information system (PROMIS) global items. Qual Life Res. 2009;18:873–880. 2. Moura LMVR, Schwamm E, Moura Jr V., et al. Feasibility of the collection of patient-reported outcomes in an ambulatory neurology clinic. Neurology. 2016;87:1-8. 3. Katzan IL, Lapin B. PROMIS GH (Patient-Reported Outcomes Measurement

	Information System Global Health) Scale in Stroke: A Validation Study. Stroke 2018; 49(1): 147-154.	
Code System	**Code**	**Code Description**
CPT	99201-99205	Office or Other Outpatient Visit - New Patient (E/M Codes)
CPT	99211-99215	Office or Other Outpatient Visit - Established Patient (E/M Codes)
CPT	99241-99245	Office or Other Outpatient Consultation – New or Established Patient
		AND
ICD-10		See Appendix A

Flow Chart Diagram: Quality of Life Outcome for Patients with Neurologic Conditions



Step-by-Step Calculation: Quality of Life Outcome for Patients with Neurologic Conditions

Start with Denominator

10. Check Patient Age
    a. If the Age is less than 18 years on Date of Service and equals No during the measurement period, do not include in Eligible Patient Population. Stop processing.
    b. If the Age is greater than or equal to 18 years on Date of Service and equals Yes during the measurement period, proceed to check Diagnosis, Neurologic Condition.
11. Check Diagnosis, Neurologic Condition
    a. If there is no diagnosis of neurologic condition on the Date of Service, and equals No during the measurement period, do not include in Eligible Patient Population. Stop processing.
    b. If there is a diagnosis of neurologic condition on the Date of Service, and equals Yes during the measurement period, proceed to check Encounter Performed.
12. Check Index Visit Performed
    a. If Index Visit Performed in the Denominator equals No, do not include in Eligible Patient Population. Stop processing.
    b. If Index Visit Performed in the Denominator equals Yes, include in Eligible Patient Population.
13. Check for Required Exclusions
    a. If Patient met Required Exclusions equals Yes, do not include in Eligible Patient Population. Stop processing.
    b. If Patient met Required Exclusions equals No, proceed to Denominator Population.
14. Denominator Population
    a. Denominator population is all Eligible Patients in the denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d equals 90 patients in the Sample Calculation.

Start Numerator

15. Check Patient Quality of Life Maintained or Improved
    a. If Patient Quality of Life Maintained or Improved (i.e., patient raw score at twelve months (+/- 60 days) was equal to or greater than an index visit raw score) equals Yes, include in Data Completeness Met and Performance Met.
    b. Data completeness met and performance met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a equals 35 patients in the Sample Calculation.
    c. If Patient Quality of Life Maintained or Improved equals No, proceed to Allowable Exclusions
16. Check for Allowable Exclusions
    a. If Patient met Allowable Exclusions equals Yes, remove from Denominator population.
    b. If Patient met Allowable Exclusions equals No, proceed to check Patient Quality of Life Worsened.
17. Check Patient Quality of Life Worsened.
    a. If Patient Quality of Life Worsened (i.e., patient raw score at twelve months (+/- 60 days) was less than an index visit raw score) equals Yes, include in Data Completeness Met and Performance NOT Met.
    b. Data completeness met and performance NOT met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter c equals 40 patients in the Sample Calculation.
    c. If Patient Quality of Life Worsened equals No, proceed to Data Completeness NOT Met.
18. Check Data Completeness Not Met
    a. If Data Completeness Not Met equals No, Quality Data Code or equivalent not submitted. 15 patients have been subtracted from the Data Completeness Numerator in the Sample Calculation.

Sample Calculations

Data Completeness*=

Performance Met (a=30 + b=5) + Performance Not Met (c=40)	=75 Patients	=83.3%
Eligible Population/ Denominator (d=90)	90 Patients	

Performance Rate =

Performance Met (a=30 + b=5)	=35 Patients	=38.8%
Eligible Population/ Denominator (d=90)	90 Patients	

CMS maintains a data completeness threshold for reporting in its Merit-based Incentive Payment System (MIPS). The data completeness threshold changes each year and varies based on which reporting mechanism a provider is using.

- For 2018 and 2019 quality measures reported via Medicare Part B claims, providers must report on 60% of the individual MIPS eligible clinician's Medicare Part B patients for the performance period.
- For 2019 quality measures reported via administrative claims, providers must report on 100% of the individual MIPS eligible clinician's Medicare Part B patients for the performance period.
- For 2018 and 2019 quality measures reported via a QCDR, MIPS CQMs and eCQMs, eligible clinicians must report on 60% of the individual MIPS eligible clinician's patients across all payers for the performance period.

Contact Information

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

Appendix A Diagnostic Codes

Code System	Code	Code Description
ICD-10 CM	A52.17	General paresis Dementia paralytica
ICD-10 CM	A81.00	Creutzfeldt-Jacob disease, unspecified
ICD-10 CM	A81.01	Variant Creutzfeldt-Jacob disease
ICD-10 CM	A81.89	Other Creutzfeldt-Jacob disease: Familial Creutzfeldt-Jacob disease Iatrogenic Creutzfeldt-Jacob disease Sporadic Creutzfeldt-Jacob disease Subacute spongioform encephalopathy (with dementia)
ICD-10 CM	A88.1	Epidemic vertigo
ICD-10 CM	C70	Malignant neoplasm of meninges
ICD-10 CM	C70.0	Malignant neoplasm of cerebral meninges
ICD-10 CM	C70.1	Malignant neoplasm of spinal meninges
ICD-10 CM	C70.9	Malignant neoplasm of meninges, unspecified
ICD-10 CM	C71.0	Malignant neoplasm of cerebrum, except lobes and ventricles
ICD-10 CM	C71.1	Malignant neoplasm of frontal lobe
ICD-10 CM	C71.2	Malignant neoplasm of temporal lobe
ICD-10 CM	C71.3	Malignant neoplasm of parietal lobe
ICD-10 CM	C71.4	Malignant neoplasm of occipital lobe
ICD-10 CM	C71.5	Malignant neoplasm of cerebral ventricle
ICD-10 CM	C71.6	Malignant neoplasm of cerebellum
ICD-10 CM	C71.7	Malignant neoplasm of brain stem
ICD-10 CM	C71.8	Malignant neoplasm of overlapping sites of brain
ICD-10 CM	C71.9	Malignant neoplasm of brain, unspecified
ICD-10 CM	C72	Malignancies
ICD-10 CM	D33.3	Benign neoplasm of cranial nerves
ICD-10 CM	E08.42	Diabetes mellitus due to underlying condition with diabetic polyneuropathy
ICD-10 CM	E09.42	Drug or chemical induced diabetes mellitus with neurological complications with diabetic polyneuropathy
ICD-10 CM	E10.40	Type 1 diabetes mellitus with diabetic neuropathy, unspecified
ICD-10 CM	E10.42	Type 1 diabetes mellitus with diabetic polyneuropathy
ICD-10 CM	E11.40	Type 2 diabetes mellitus with diabetic neuropathy, unspecified
ICD-10 CM	E11.42	Type 2 diabetes mellitus with diabetic polyneuropathy
ICD-10 CM	E13.42	Other specified diabetes mellitus with diabetic polyneuropathy
ICD-10 CM	F01.50	Vascular dementia without behavioral disturbance Includes: arteriosclerotic dementia Code first the underlying physiological condition or sequelae of cerebrovascular disease
ICD-10 CM	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
ICD-10 CM	F02	Dementia in other diseases classified elsewhere
ICD-10 CM	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)
ICD-10 CM	F03.91	Unspecified dementia with behavioral disturbance Unspecified dementia with aggressive behavior Unspecified dementia with combative behavior Unspecified dementia with violent behavior
ICD-10 CM	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
ICD-10 CM	F06.8	Mild memory disturbance
ICD-10 CM	F10.27	Alcohol dependence with alcohol-induced persisting dementia
ICD-10 CM	F20.89	Dementia in other diseases classified elsewhere, without behavioral disturbance Dementia in other diseases classified elsewhere not otherwise specified Code first the underlying physiologic condition
ICD-10 CM	F20.81	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
ICD-10 CM	F84.0	Autistic disorder
ICD-10 CM	F84.2	Rett's syndrome
ICD-10 CM	F84.3	Other childhood disintegrative disorder
ICD-10 CM	F84.5	Asperger's syndrome
ICD-10 CM	F84.8	Other pervasive developmental disorders
ICD-10 CM	F84.9	Pervasive developmental disorder, unspecified
ICD-10 CM	F88.X	Global developmental delay
ICD-10 CM	F90.0	Attention-deficit hyperactivity disorder, predominantly inattentive type
ICD-10 CM	F90.0	Attention-deficit hyperactivity disorder, predominantly inattentive type
ICD-10 CM	F90.1	Attention-deficit hyperactivity disorder, predominantly hyperactive type
ICD-10 CM	F90.2	Attention-deficit hyperactivity disorder, combined type
ICD-10 CM	F90.8	Attention-deficit hyperactivity disorder, other type
ICD-10 CM	F90.9	Attention-deficit hyperactivity disorder, unspecified type
ICD-10 CM	F95.1	Tic chronic
ICD-10 CM	F95.2	Tourette syndrome
ICD-10 CM	G10	Huntington's disease
ICD-10 CM	G12.21	Amyotrophic lateral sclerosis

ICD-10 CM	G12.23	Primary lateral sclerosis
ICD-10 CM	G12.24	Familial motor neuron disease
ICD-10 CM	G12.25	Progressive spinal muscle atrophy
ICD-10 CM	G20	Parkinson's Disease Hemiparkinsonism Idiopathic Parkinsonism or Parkinson's Disease Paralysis agitans Parkinsonims or Parkinson's disease NOS Primary Parkinsonism or Parkinson's disease
ICD-10 CM	G24.9	Dystonia
ICD-10 CM	G25.0	Essential Tremor
ICD-10 CM	G30.0	Alzheimer's disease with early onset Use additional code to identify: delirium, if applicable (F05) dementia with behavioral disturbance (F02.81) dementia without behavioral disturbance (F02.80)
ICD-10 CM	G31.01	Pick's disease Circumscribed brain atrophy Progressive isolated aphasia
ICD-10 CM	G30.1	Alzheimer's disease with late onset Use additional code to identify: delirium, if applicable (F05) dementia with behavioral disturbance (F02.81) dementia without behavioral disturbance (F02.80)
ICD-10 CM	G30.8	Other Alzheimer's disease Use additional code to identify: delirium, if applicable (F05) dementia with behavioral disturbance (F02.81) dementia without behavioral disturbance (F02.80)
ICD-10 CM	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)
ICD-10 CM	G31.09	Other frontotemporal dementia
ICD-10 CM	G31.83	Dementia with Lewy bodies Dementia with Parkinsonism Lewy body dementia Lewy body disease
ICD-10 CM	G31.84	Mild cognitive impairment, so stated
ICD-10 CM	G31.85	Corticobasal degeneration
ICD-10 CM	G31.89	Other specified degenerative diseases of nervous system
ICD-10 CM	G32.89	Other specified degenerative disorders of nervous system in diseases classified elsewhere
ICD-10 CM	G35	Multiple sclerosis
ICD-10 CM	G40.001	Localization-related (focal) (partial) idiopathic epilepsy and epileptic syndromes with seizures of localized onset, not intractable, with status epilepticus
ICD-10 CM	G40.011	Localization-related (focal) (partial) idiopathic epilepsy and epileptic syndromes with seizures of localized onset, intractable, with status epilepticus
ICD-10 CM	G40.109	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, without status epilepticus
ICD-10 CM	G40.119	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, without status epilepticus
ICD-10 CM	G40.201	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, with status epilepticus

ICD-10 CM	G40.209	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, without status epilepticus
ICD-10 CM	G40.211	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, with status epilepticus
ICD-10 CM	G40.219	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, without status epilepticus
ICD-10 CM	G40.301	Generalized idiopathic epilepsy and epileptic syndromes, not intractable, with status epilepticus
ICD-10 CM	G40.309	Generalized idiopathic epilepsy and epileptic syndromes, not intractable, without status epilepticus
ICD-10 CM	G40.311	Generalized idiopathic epilepsy and epileptic syndromes, intractable, with status epilepticus
ICD-10 CM	G40.319	Generalized idiopathic epilepsy and epileptic syndromes, intractable, with status epilepticus
ICD-10 CM	G40.401	Other generalized epilepsy and epileptic syndromes, intractable, with status epilepticus
ICD-10 CM	G40.409	Other generalized epilepsy and epileptic syndromes, not intractable, without status epilepticus
ICD-10 CM	G40.411	Other generalized epilepsy and epileptic syndromes, not intractable, with status epilepticus
ICD-10 CM	G40.419	Other generalized epilepsy
ICD-10 CM	G40.5	Special epileptic syndromes
ICD-10 CM	G40.501	Epileptic seizures related to external causes, not intractable, with status epilepticus
ICD-10 CM	G40.822	Epileptic spasms, not intractable, without status epilepticus
ICD-10 CM	G40.824	Epileptic spasms, intractable, without status epilepticus
ICD-10 CM	G40.901	Epilepsy, unspecified, not intractable, with status epilepticus
ICD-10 CM	G40.909	Epilepsy, unspecified, not intractable, without status epilepticus
ICD-10 CM	G40.911	Epilepsy, unspecified, intractable, with status epilepticus
ICD-10 CM	G40.919	Epilepsy, unspecified, intractable, without status epilepticus
ICD-10 CM	G40.A09	Absence epileptic syndrome, not intractable, without status epilepticus
ICD-10 CM	G40.A11	Absence epileptic syndrome, intractable with status epilepticus
ICD-10 CM	G40.A19	Absence epileptic syndrome, intractable, without status epilepticus
ICD-10 CM	G43.001	Migraine without aura, not intractable, with status migrainosus
ICD-10 CM	G43.009	Migraine without aura, not intractable, without status migrainosus
ICD-10 CM	G43.011	Migraine without aura, intractable, with status migrainosus
ICD-10 CM	G43.019	Migraine without aura, intractable, without status migrainosus
ICD-10 CM	G43.101	Migraine with aura, not intractable, with status migrainosus
ICD-10 CM	G43.109	Migraine with aura, not intractable, without status migrainosus
ICD-10 CM	G43.111	Migraine with aura, intractable, with status migrainosus
ICD-10 CM	G43.119	Migraine with aura, intractable, without status migrainosus
ICD-10 CM	G43.4	Hemiplegic migraine
ICD-10 CM	G43.409	Hemiplegic migraine, not intractable without status migrainosus
ICD-10 CM	G43.419	Hemiplegic migraine, intractable without status migrainosus
ICD-10 CM	G43.401	Hemiplegic migraine, not intractable with status migrainosus
ICD-10 CM	G43.411	Hemiplegic migraine, intractable with status migrainosus
ICD-10 CM	G43.501	Persistent migraine aura without cerebral infarction, not intractable, with status migrainosus
ICD-10 CM	G43.509	Persistent migraine aura without cerebral infarction, not intractable, without status migrainosus

ICD-10 CM	G43.511	Persistent migraine aura without cerebral infarction, intractable, with status migrainosus
ICD-10 CM	G43.519	Persistent migraine aura without cerebral infarction, intractable, without status migrainosus
ICD-10 CM	G43.601	Persistent migraine aura with cerebral infarction, not intractable, with status migrainosus
ICD-10 CM	G43.609	Persistent migraine aura with cerebral infarction, not intractable, without status migrainosus
ICD-10 CM	G43.611	Persistent migraine aura with cerebral infarction, intractable, with status migrainosus
ICD-10 CM	G43.619	Persistent migraine aura with cerebral infarction, intractable, without status migrainosus
ICD-10 CM	G43.701	Chronic migraine without aura, not intractable, with status migrainosus
ICD-10 CM	G43.709	Chronic migraine without aura, not intractable, without status migrainosus
ICD-10 CM	G43.711	Chronic migraine without aura, intractable, with status migrainosus
ICD-10 CM	G43.719	Chronic migraine without aura, intractable, without status migrainosus
ICD-10 CM	G43.801	Other migraine, not intractable with status migrainosus
ICD-10 CM	G43.809	Other migraine, not intractable, without status migrainosus
ICD-10 CM	G43.811	Other migraine, intractable, with status migrainosus
ICD-10 CM	G43.819	Other migraine, intractable without status migrainosus
ICD-10 CM	G43.821	Menstrual migraine not intractable, with status migrainosus
ICD-10 CM	G43.829	Menstrual migraine not intractable, without status migrainosus
ICD-10 CM	G43.839	Menstrual migraine intractable, without status migrainosus
ICD-10 CM	G43.831	Menstrual migraine intractable, with status migrainosus
ICD-10 CM	G43.901	Migraine unspecified not intractable with status migrainosus
ICD-10 CM	G43.909	Migraine unspecified not intractable without status migrainosus
ICD-10 CM	G43.911	Migraine unspecified intractable with status migrainosus
ICD-10 CM	G43.919	Migraine unspecified intractable without status migrainosus
ICD-10 CM	G43.B0	Ophthalmoplegic migraine, not intractable
ICD-10 CM	G43.B1	Ophthalmoplegic migraine, intractable
ICD-10 CM	G43.C0	Periodic headache syndromes in child or adult, not intractable
ICD-10 CM	G43.C1	Periodic headache syndromes in child or adult, intractable
ICD-10 CM	G44.001	Cluster headache syndrome, unspecified, intractable
ICD-10 CM	G44.009	Cluster headache syndrome, unspecified, not intractable
ICD-10 CM	G44.011	Episodic cluster headache, intractable
ICD-10 CM	G44.019	Episodic cluster headache, not intractable
ICD-10 CM	G44.021	Chronic cluster headache, intractable
ICD-10 CM	G44.029	Chronic cluster headache, not intractable
ICD-10 CM	G44.031	Episodic paroxysmal hemicrania, intractable
ICD-10 CM	G44.039	Episodic paroxysmal hemicrania, not intractable
ICD-10 CM	G44.041	Chronic paroxysmal hemicrania, intractable
ICD-10 CM	G44.049	Chronic paroxysmal hemicrania, not intractable
ICD-10 CM	G44.051	Short lasting unilateral neuralgiform headache with conjunctival injection and tearing (SUNCT), intractable
ICD-10 CM	G44.059	Short lasting unilateral neuralgiform headache with conjunctival injection and tearing (SUNCT), not intractable
ICD-10 CM	G44.091	Other trigeminal autonomic cephalgias (TAC), intractable
ICD-10 CM	G44.099	Other trigeminal autonomic cephalgias (TAC), not intractable
ICD-10 CM	G44.1	Vascular headache, not elsewhere classified
ICD-10 CM	G44.201	Tension-type headache, unspecified, intractable
ICD-10 CM	G44.209	Tension-type headache, unspecified, not intractable

ICD-10 CM	G44.211	Episodic tension-type headache, intractable
ICD-10 CM	G44.219	Episodic tension-type headache, not intractable
ICD-10 CM	G44.221	Chronic tension-type headache, intractable
ICD-10 CM	G44.229	Chronic tension-type headache, not intractable
ICD-10 CM	G44.301	Post-traumatic headache, unspecified, intractable
ICD-10 CM	G44.309	Post-traumatic headache, unspecified, not intractable
ICD-10 CM	G44.311	Acute post-traumatic headache, intractable
ICD-10 CM	G44.319	Acute post-traumatic headache, not intractable
ICD-10 CM	G44.321	Chronic post-traumatic headache, intractable
ICD-10 CM	G44.329	Chronic post-traumatic headache, not intractable
ICD-10 CM	G44.40	Drug-induced headache, not elsewhere classified, not intractable
ICD-10 CM	G44.41	Drug-induced headache, not elsewhere classified, intractable
ICD-10 CM	G44.51	Hemicrania continua
ICD-10 CM	G44.52	New daily persistent headache (NDPH)
ICD-10 CM	G44.53	Primary thunderclap headache
ICD-10 CM	G44.59	Other complicated headache syndrome
ICD-10 CM	G44.81	Hypnic headache
ICD-10 CM	G44.82	Headache associated with sexual activity
ICD-10 CM	G44.83	Primary cough headache
ICD-10 CM	G44.84	Primary exertional headache
ICD-10 CM	G44.85	Primary stabbing headache
ICD-10 CM	G44.89	Other headache syndrome
ICD-10 CM	G45.0	Vertebro-basilar artery syndrome
ICD-10 CM	G45.1	Carotid artery syndrome
ICD-10 CM	G45.8	Other transient cerebral ischemic attacks and related syndromes
ICD-10 CM	G45.9	Transient cerebral ischemic attack, unspecified
ICD-10 CM	G58.9	Mononeuropathy, unspecified
ICD-10 CM	G59	Mononeuropathy in diseases classified elsewhere
ICD-10 CM	G60.3	Idiopathic progressive neuropathy
ICD-10 CM	G60.9	Hereditary and idiopathic neuropathy, unspecified
ICD-10 CM	G61.89	Other inflammatory polyneuropathies
ICD-10 CM	G61.9	Inflammatory polyneuropathy, unspecified
ICD-10 CM	G62.0	Drug-induced polyneuropathy
ICD-10 CM	G62.1	Alcoholic polyneuropathy
ICD-10 CM	G62.2	Polyneuropathy due to other toxic agents
ICD-10 CM	G63	Polyneuropathy in diseases classified elsewhere
ICD-10 CM	G65.0	Sequelae of Guillain-Barre syndrome
ICD-10 CM	G70.00	Myasthenia gravis without (acute) exacerbation G70.01
ICD-10 CM	G70.01	Myasthenia gravis with (acute) exacerbation
ICD-10 CM	G71.0	Muscular dystrophy
ICD-10 CM	G71.0	Muscular dystrophy
ICD-10 CM	G71.11	Myotonic muscular dystrophy
ICD-10 CM	G71.12	Myotonia congenita
ICD-10 CM	G71.13	Myotonic chondrodystrophy
ICD-10 CM	G71.14	Drug induced myotonia
ICD-10 CM	G71.19	Other specified myotonic disorders
ICD-10 CM	G72.0	Drug-induced myopathy
ICD-10 CM	G72.1	Alcoholic myopathy
ICD-10 CM	G72.2	Myopathy due to other toxic agents
ICD-10 CM	G72.4	Inflammatory and immune myopathies, not elsewhere classified

ICD-10 CM	G72.8	Other specified myopathies
ICD-10 CM	G72.9	Myopathy, unspecified
ICD-10 CM	G80.0	Spastic quadriplegic cerebral palsy
ICD-10 CM	G80.1	Spastic diplegic cerebral palsy
ICD-10 CM	G80.2	Spastic hemiplegic cerebral palsy
ICD-10 CM	G80.3	Athetoid cerebral palsy
ICD-10 CM	G80.4	Ataxic cerebral palsy
ICD-10 CM	G80.8	Other cerebral palsy
ICD-10 CM	G80.9	Cerebral palsy, unspecified
ICD-10 CM	G94	Other disorders of brain in diseases classified elsewhere Code first underlying disease
ICD-10 CM	G96.8	Other specified disorders of central nervous system
ICD-10 CM	H81.0	*Ménière's* disease
ICD-10 CM	H81.1	Benign paroxysmal vertigo
ICD-10 CM	H81.2	Vestibular neuronitis
ICD-10 CM	H81.20	Vestibular neuronitis unspecified ear
ICD-10 CM	H81.21	Vestibular neuronitis right ear
ICD-10 CM	H81.22	Vestibular neuronitis left ear
ICD-10 CM	H81.3	Other peripheral vertigo
ICD-10 CM	H81.4	Vertigo of central origin
ICD-10 CM	H81.8	Other disorders of vestibular function
ICD-10 CM	H81.8X1	Other disorders of vestibular function right ear
ICD-10 CM	H81.8X2	Other disorders of vestibular function left ear
ICD-10 CM	H81.8X9	Other disorders of vestibular function unspecified ear
ICD-10 CM	H81.9	Unspecified disorder of vestibular function
ICD-10 CM	H81.90	Unspecified disorder of vestibular function unspecified ear
ICD-10 CM	H81.91	Unspecified disorder of vestibular function right ear
ICD-10 CM	H81.92	Unspecified disorder of vestibular function left ear
ICD-10 CM	H82	Vertiginous syndromes in diseases classified elsewhere
ICD-10 CM	H83.2X1	Vestibular hypofunction (Labyrinthine dysfunction, right ear)
ICD-10 CM	H83.2X2	Vestibular hypofunction (Labyrinthine dysfunction, left ear)
ICD-10 CM	H83.2X9	Vestibular hypofunction (Labyrinthine dysfunction, unspecified ear)
ICD-10 CM	H83.90	Unspecified disease of inner ear, unspecified ear
ICD-10 CM	H83.91	Unspecified disease of right inner ear
ICD-10 CM	H83.92	Unspecified disease of left inner ear
ICD-10 CM	I63.00	Cerebral infarction due to thrombosis of unspecified precerebral artery
ICD-10 CM	I63.011	Cerebral infarction due to thrombosis of right vertebral artery
ICD-10 CM	I63.012	Cerebral infarction due to thrombosis of left vertebral artery
ICD-10 CM	I63.013	Cerebral infarction due to thrombosis of bilateral vertebral arteries
ICD-10 CM	I63.019	Cerebral infarction due to thrombosis of unspecified vertebral artery
ICD-10 CM	I63.02	Cerebral infarction due to thrombosis of left carotid artery
ICD-10 CM	I63.031	Cerebral infarction due to thrombosis of right carotid artery
ICD-10 CM	I63.032	Cerebral infarction due to thrombosis of left carotid artery
ICD-10 CM	I63.033	Cerebral infarction due to thrombosis of bilateral carotid arteries
ICD-10 CM	I63.039	Cerebral infarction due to thrombosis of unspecified carotid artery
ICD-10 CM	I63.09	Cerebral infarction due to thrombosis of other precerebral artery
ICD-10 CM	I63.10	Cerebral infarction due to embolism of unspecified precerebral artery
ICD-10 CM	I63.111	Cerebral infarction due to embolism of right vertebral artery
ICD-10 CM	I63.112	Cerebral infarction due to embolism of left vertebral artery
ICD-10 CM	I63.113	Cerebral infarction due to embolism of bilateral vertebral arteries

ICD-10 CM	I63.119	Cerebral infarction due to embolism of unspecified vertebral artery
ICD-10 CM	I63.12	Cerebral infarction due to embolism of basilar artery
ICD-10 CM	I63.131	Cerebral infarction due to embolism of right carotid artery
ICD-10 CM	I63.132	Cerebral infarction due to embolism of left carotid artery
ICD-10 CM	I63.133	Cerebral infarction due to embolism of bilateral carotid arteries
ICD-10 CM	I63.139	Cerebral infarction due to embolism of unspecified carotid artery
ICD-10 CM	I63.19	Cerebral infarction due to embolism of other precerebral artery
ICD-10 CM	I63.20	Cerebral infarction due to unspecified occlusion or stenosis of unspecified precerebral arteries
ICD-10 CM	I63.211	Cerebral infarction due to unspecified occlusion or stenosis of right vertebral artery
ICD-10 CM	I63.212	Cerebral infarction due to unspecified occlusion or stenosis of left vertebral artery
ICD-10 CM	I63.213	Cerebral infarction due to unspecified occlusion or stenosis of bilateral vertebral arteries
ICD-10 CM	I63.219	Cerebral infarction due to unspecified occlusion or stenosis of unspecified vertebral arteries
ICD-10 CM	I63.22	Cerebral infarction due to unspecified occlusion or stenosis of basilar artery
ICD-10 CM	I63.231	Cerebral infarction due to unspecified occlusion or stenosis of right carotid arteries
ICD-10 CM	I63.232	Cerebral infarction due to unspecified occlusion or stenosis of left carotid arteries
ICD-10 CM	I63.233	Cerebral infarction due to unspecified occlusion or stenosis of bilateral carotid arteries
ICD-10 CM	I63.239	Cerebral infarction due to unspecified occlusion or stenosis of unspecified carotid arteries
ICD-10 CM	I63.29	Cerebral infarction due to unspecified occlusion or stenosis of other precerebral arteries
ICD-10 CM	I63.30	Cerebral infarction due to thrombosis of unspecified cerebral artery
ICD-10 CM	I63.311	Cerebral infarction due to thrombosis of right middle cerebral artery
ICD-10 CM	I63.312	Cerebral infarction due to thrombosis of left middle cerebral artery
ICD-10 CM	I63.313	Cerebral infarction due to thrombosis of bilateral middle cerebral artery
ICD-10 CM	I63.319	Cerebral infarction due to thrombosis of unspecified middle cerebral artery
ICD-10 CM	I63.321	Cerebral infarction due to thrombosis of right anterior cerebral artery
ICD-10 CM	I63.322	Cerebral infarction due to thrombosis of left anterior cerebral artery
ICD-10 CM	I63.323	Cerebral infarction due to thrombosis of bilateral anterior cerebral artery
ICD-10 CM	I63.329	Cerebral infarction due to thrombosis of unspecified anterior cerebral artery
ICD-10 CM	I63.331	Cerebral infarction due to thrombosis of right posterior cerebral artery
ICD-10 CM	I63.332	Cerebral infarction due to thrombosis of left posterior cerebral artery
ICD-10 CM	I63.333	Cerebral infarction due to thrombosis of bilateral posterior cerebral artery
ICD-10 CM	I63.339	Cerebral infarction due to thrombosis of unspecified posterior cerebral artery
ICD-10 CM	I63.341	Cerebral infarction due to thrombosis of right cerebellar artery
ICD-10 CM	I63.342	Cerebral infarction due to thrombosis of left cerebellar artery
ICD-10 CM	I63.343	Cerebral infarction due to thrombosis of bilateral cerebellar artery
ICD-10 CM	I63.349	Cerebral infarction due to thrombosis of unspecified cerebellar artery
ICD-10 CM	I63.39	Cerebral infarction due to thrombosis of other cerebral artery
ICD-10 CM	I63.40	Cerebral infarction due to embolism of unspecified cerebral artery
ICD-10 CM	I63.411	Cerebral infarction due to embolism of right middle cerebral artery
ICD-10 CM	I63.412	Cerebral infarction due to embolism of left middle cerebral artery
ICD-10 CM	I63.413	Cerebral infarction due to embolism of bilateral middle cerebral artery
ICD-10 CM	I63.419	Cerebral infarction due to embolism of unspecified middle cerebral artery
ICD-10 CM	I63.421	Cerebral infarction due to embolism of right anterior cerebral artery

ICD-10 CM	I63.422	Cerebral infarction due to embolism of left anterior cerebral artery
ICD-10 CM	I63.423	Cerebral infarction due to embolism of bilateral anterior cerebral artery
ICD-10 CM	I63.429	Cerebral infarction due to embolism of unspecified anterior cerebral artery
ICD-10 CM	I63.431	Cerebral infarction due to embolism of right posterior cerebral artery
ICD-10 CM	I63.432	Cerebral infarction due to embolism of left posterior cerebral artery
ICD-10 CM	I63.433	Cerebral infarction due to embolism of bilateral posterior cerebral artery
ICD-10 CM	I63.439	Cerebral infarction due to embolism of unspecified posterior cerebral artery
ICD-10 CM	I63.441	Cerebral infarction due to embolism of right cerebellar artery
ICD-10 CM	I63.442	Cerebral infarction due to embolism of left cerebellar artery
ICD-10 CM	I63.443	Cerebral infarction due to embolism of bilateral cerebellar artery
ICD-10 CM	I63.449	Cerebral infarction due to embolism of unspecified cerebellar artery
ICD-10 CM	I63.49	Cerebral infarction due to embolism of other cerebral artery
ICD-10 CM	I63.50	Cerebral infarction due to unspecified occlusion or stenosis of unspecified cerebral artery
ICD-10 CM	I63.511	Cerebral infarction due to unspecified occlusion or stenosis of right middle cerebral artery
ICD-10 CM	I63.512	Cerebral infarction due to unspecified occlusion or stenosis of left middle cerebral artery
ICD-10 CM	I63.513	Cerebral infarction due to unspecified occlusion or stenosis of bilateral middle cerebral artery
ICD-10 CM	I63.519	Cerebral infarction due to unspecified occlusion or stenosis of unspecified middle cerebral artery
ICD-10 CM	I63.521	Cerebral infarction due to unspecified occlusion or stenosis of right anterior cerebral artery
ICD-10 CM	I63.522	Cerebral infarction due to unspecified occlusion or stenosis of left anterior cerebral artery
ICD-10 CM	I63.523	Cerebral infarction due to unspecified occlusion or stenosis of bilateral anterior cerebral artery
ICD-10 CM	I63.529	Cerebral infarction due to unspecified occlusion or stenosis of unspecified anterior cerebral artery
ICD-10 CM	I63.531	Cerebral infarction due to unspecified occlusion or stenosis of right posterior cerebral artery
ICD-10 CM	I63.532	Cerebral infarction due to unspecified occlusion or stenosis of left posterior cerebral artery
ICD-10 CM	I63.533	Cerebral infarction due to unspecified occlusion or stenosis of bilateral posterior cerebral artery
ICD-10 CM	I63.539	Cerebral infarction due to unspecified occlusion or stenosis of unspecified posterior cerebral artery
ICD-10 CM	I63.541	Cerebral infarction due to unspecified occlusion or stenosis of right cerebellar artery
ICD-10 CM	I63.542	Cerebral infarction due to unspecified occlusion or stenosis of left cerebellar artery
ICD-10 CM	I63.543	Cerebral infarction due to unspecified occlusion or stenosis of bilateral cerebellar artery
ICD-10 CM	I63.549	Cerebral infarction due to unspecified occlusion or stenosis of unspecified cerebellar artery
ICD-10 CM	I63.59	Cerebral infarction due to unspecified occlusion or stenosis of other cerebral artery
ICD-10 CM	I63.6	Cerebral infarction due to cerebral venous thrombosis, nonpyogenic
ICD-10 CM	I63.8	Other cerebral infarction
ICD-10 CM	I63.9	Cerebral infarction, unspecified

ICD-10 CM	I69.01	Cognitive deficits following nontraumatic subarachnoid hemorrhage
ICD-10 CM	I69.11	Cognitive deficits following nontraumatic intracerebral hemorrhage
ICD-10 CM	I69.21	Cognitive deficits following other nontraumatic intracranial hemorrhage
ICD-10 CM	I69.31	Cognitive deficits following cerebral infarction
ICD-10 CM	I69.398	Vertigo, post stroke
ICD-10 CM	I69.81	Cognitive deficits following other cerebrovascular disease
ICD-10 CM	I69.91	Cognitive deficits following unspecified cerebrovascular disease
ICD-10 CM	I69.998	Vertigo as a late effect of stroke
ICD-10 CM	M54.5	Low back pain
ICD-10 CM	M54.50	Low back pain, multiple sites in spine
ICD-10 CM	M54.55	Low back pain, thoracolumbar region
ICD-10 CM	M54.56	Low back pain, lumbar region
ICD-10 CM	M54.57	Low back pain, lumbosacral region
ICD-10 CM	M54.58	Low back pain, sacral and sacrococcygeal region
ICD-10 CM	M54.59	Low back pain, site unspecified
ICD-10 CM	R25.2	Spasticity
ICD-10 CM	R41.3	Other amnesia, (i.e., Amnesia NOS and Memory loss NOS)
ICD-10 CM	R42	Vertigo NOS
ICD-10 CM	R51.X	Headache
ICD-10 CM	R56.8	Seizures (otherwise unspecified)
ICD-10 CM	S06.0X0A	Concussion without loss of consciousness, initial encounter
ICD-10 CM	S06.0X0D	Concussion without loss of consciousness, subsequent encounter
ICD-10 CM	S06.0X0S	Concussion without loss of consciousness, sequela
ICD-10 CM	S06.0X9A	Concussion with loss of consciousness of unspecified duration, initial encounter
ICD-10 CM	S06.0X9D	Concussion with loss of consciousness of unspecified duration, subsequent encounter
ICD-10 CM	S06.0X9S	Concussion with loss of consciousness of unspecified duration, sequela
ICD-10 CM	S06.0X1A	Concussion with loss of consciousness of 30 minutes or less, initial encounter
ICD-10 CM	S06.0X1D	Concussion with loss of consciousness of 30 minutes or less, subsequent encounter
ICD-10 CM	S06.0X1S	Concussion with loss of consciousness of 30 minutes or less, sequela

Appendix B Diagnostic Codes for Child & Adolescent Measure

Code System	Code	Code Description
ICD-10 CM	C70	Malignant neoplasm of meninges
ICD-10 CM	C70.0	Malignant neoplasm of cerebral meninges
ICD-10 CM	C70.1	Malignant neoplasm of spinal meninges
ICD-10 CM	C70.9	Malignant neoplasm of meninges, unspecified
ICD-10 CM	C71.0	Malignant neoplasm of cerebrum, except lobes and ventricles
ICD-10 CM	C71.1	Malignant neoplasm of frontal lobe
ICD-10 CM	C71.2	Malignant neoplasm of temporal lobe
ICD-10 CM	C71.3	Malignant neoplasm of parietal lobe
ICD-10 CM	C71.4	Malignant neoplasm of occipital lobe
ICD-10 CM	C71.5	Malignant neoplasm of cerebral ventricle
ICD-10 CM	C71.6	Malignant neoplasm of cerebellum
ICD-10 CM	C71.7	Malignant neoplasm of brain stem
ICD-10 CM	C71.8	Malignant neoplasm of overlapping sites of brain
ICD-10 CM	C71.9	Malignant neoplasm of brain, unspecified
ICD-10 CM	C72	Malignancies
ICD-10 CM	D33.3	Benign neoplasm of cranial nerves
ICD-10 CM	E08.42	Diabetes mellitus due to underlying condition with diabetic polyneuropathy
ICD-10 CM	E09.42	Drug or chemical induced diabetes mellitus with neurological complications with diabetic polyneuropathy
ICD-10 CM	E10.40	Type 1 diabetes mellitus with diabetic neuropathy, unspecified
ICD-10 CM	E10.42	Type 1 diabetes mellitus with diabetic polyneuropathy
ICD-10 CM	E11.40	Type 2 diabetes mellitus with diabetic neuropathy, unspecified
ICD-10 CM	E11.42	Type 2 diabetes mellitus with diabetic polyneuropathy
ICD-10 CM	E13.42	Other specified diabetes mellitus with diabetic polyneuropathy
ICD-10 CM	F70	Mild intellectual disabilities
ICD-10 CM	F71	Moderate intellectual disabilities
ICD-10 CM	F72	Severe intellectual disabilities
ICD-10 CM	F73	Profound intellectual disabilities
ICD-10 CM	F84	Pervasive developmental disorders
ICD-10 CM	F84.0	Autistic disorder
ICD-10 CM	F84.2	Rett's syndrome
ICD-10 CM	F84.3	Other childhood disintegrative disorder
ICD-10 CM	F84.5	Asperger's syndrome
ICD-10 CM	F84.8	Other pervasive developmental disorders
ICD-10 CM	F84.9	Pervasive developmental disorder, unspecified
ICD-10 CM	F88.X	Global developmental delay
ICD-10 CM	F90.0	Attention-deficit hyperactivity disorder, predominantly inattentive type
ICD-10 CM	F90.0	Attention-deficit hyperactivity disorder, predominantly inattentive type
ICD-10 CM	F90.1	Attention-deficit hyperactivity disorder, predominantly hyperactive type
ICD-10 CM	F90.2	Attention-deficit hyperactivity disorder, combined type
ICD-10 CM	F90.8	Attention-deficit hyperactivity disorder, other type
ICD-10 CM	F90.9	Attention-deficit hyperactivity disorder, unspecified type
ICD-10 CM	F95.1	Tic chronic
ICD-10 CM	F95.2	Tourette syndrome
ICD-10 CM	G12.23	Primary lateral sclerosis
ICD-10 CM	G12.24	Familial motor neuron disease
ICD-10 CM	G12.25	Progressive spinal muscle atrophy
ICD-10 CM	G24.9	Dystonia
ICD-10 CM	G25.0	Essential Tremor

ICD-10 CM	G35	Multiple sclerosis
ICD-10 CM	G40.001	Localization-related (focal) (partial) idiopathic epilepsy and epileptic syndromes with seizures of localized onset, not intractable, with status epilepticus
ICD-10 CM	G40.011	Localization-related (focal) (partial) idiopathic epilepsy and epileptic syndromes with seizures of localized onset, intractable, with status epilepticus
ICD-10 CM	G40.109	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, without status epilepticus
ICD-10 CM	G40.119	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, without status epilepticus
ICD-10 CM	G40.201	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, with status epilepticus
ICD-10 CM	G40.209	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, without status epilepticus
ICD-10 CM	G40.211	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, with status epilepticus
ICD-10 CM	G40.219	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, without status epilepticus
ICD-10 CM	G40.219	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, without status epilepticus
ICD-10 CM	G40.301	Generalized idiopathic epilepsy and epileptic syndromes, not intractable, with status epilepticus
ICD-10 CM	G40.309	Generalized idiopathic epilepsy and epileptic syndromes, not intractable, without status epilepticus
ICD-10 CM	G40.311	Generalized idiopathic epilepsy and epileptic syndromes, intractable, with status epilepticus
ICD-10 CM	G40.319	Generalized idiopathic epilepsy and epileptic syndromes, intractable, with status epilepticus
ICD-10 CM	G40.401	Other generalized epilepsy and epileptic syndromes, intractable, with status epilepticus
ICD-10 CM	G40.409	Other generalized epilepsy and epileptic syndromes, not intractable, without status epilepticus
ICD-10 CM	G40.411	Other generalized epilepsy and epileptic syndromes, not intractable, with status epilepticus
ICD-10 CM	G40.419	Other generalized epilepsy
ICD-10 CM	G40.5	Special epileptic syndromes
ICD-10 CM	G40.501	Epileptic seizures related to external causes, not intractable, with status epilepticus
ICD-10 CM	G40.82	Infantile spasms
ICD-10 CM	G40.822	Epileptic spasms, not intractable, without status epilepticus
ICD-10 CM	G40.824	Epileptic spasms, intractable, without status epilepticus
ICD-10 CM	G40.901	Epilepsy, unspecified, not intractable, with status epilepticus
ICD-10 CM	G40.909	Epilepsy, unspecified, not intractable, without status epilepticus
ICD-10 CM	G40.911	Epilepsy, unspecified, intractable, with status epilepticus
ICD-10 CM	G40.919	Epilepsy, unspecified, intractable, without status epilepticus
ICD-10 CM	G40.A09	Absence epileptic syndrome, not intractable, without status epilepticus
ICD-10 CM	G40.A11	Absence epileptic syndrome, intractable with status epilepticus
ICD-10 CM	G40.A19	Absence epileptic syndrome, intractable, without status epilepticus
ICD-10 CM	G43.001	Migraine without aura, not intractable, with status migrainosus
ICD-10 CM	G43.009	Migraine without aura, not intractable, without status migrainosus
ICD-10 CM	G43.011	Migraine without aura, intractable, with status migrainosus

ICD-10 CM	G43.019	Migraine without aura, intractable, without status migrainosus
ICD-10 CM	G43.101	Migraine with aura, not intractable, with status migrainosus
ICD-10 CM	G43.109	Migraine with aura, not intractable, without status migrainosus
ICD-10 CM	G43.111	Migraine with aura, intractable, with status migrainosus
ICD-10 CM	G43.119	Migraine with aura, intractable, without status migrainosus
ICD-10 CM	G43.4	Hemiplegic migraine
ICD-10 CM	G43.409	Hemiplegic migraine, not intractable without status migrainosus
ICD-10 CM	G43.419	Hemiplegic migraine, intractable without status migrainosus
ICD-10 CM	G43.401	Hemiplegic migraine, not intractable with status migrainosus
ICD-10 CM	G43.411	Hemiplegic migraine, intractable with status migrainosus
ICD-10 CM	G43.501	Persistent migraine aura without cerebral infarction, not intractable, with status migrainosus
ICD-10 CM	G43.509	Persistent migraine aura without cerebral infarction, not intractable, without status migrainosus
ICD-10 CM	G43.511	Persistent migraine aura without cerebral infarction, intractable, with status migrainosus
ICD-10 CM	G43.519	Persistent migraine aura without cerebral infarction, intractable, without status migrainosus
ICD-10 CM	G43.601	Persistent migraine aura with cerebral infarction, not intractable, with status migrainosus
ICD-10 CM	G43.609	Persistent migraine aura with cerebral infarction, not intractable, without status migrainosus
ICD-10 CM	G43.611	Persistent migraine aura with cerebral infarction, intractable, with status migrainosus
ICD-10 CM	G43.619	Persistent migraine aura with cerebral infarction, intractable, without status migrainosus
ICD-10 CM	G43.701	Chronic migraine without aura, not intractable, with status migrainosus
ICD-10 CM	G43.709	Chronic migraine without aura, not intractable, without status migrainosus
ICD-10 CM	G43.711	Chronic migraine without aura, intractable, with status migrainosus
ICD-10 CM	G43.719	Chronic migraine without aura, intractable, without status migrainosus
ICD-10 CM	G43.801	Other migraine, not intractable with status migrainosus
ICD-10 CM	G43.801	Other migraine, not intractable, with status migrainosus
ICD-10 CM	G43.809	Other migraine, not intractable without status migrainosus
ICD-10 CM	G43.811	Other migraine, intractable, with status migrainosus
ICD-10 CM	G43.819	Other migraine, intractable, without status migrainosus
ICD-10 CM	G43.821	Menstrual migraine not intractable, with status migrainosus
ICD-10 CM	G43.829	Menstrual migraine not intractable, without status migrainosus
ICD-10 CM	G43.830	Menstrual migraine intractable, without status migrainosus
ICD-10 CM	G43.831	Menstrual migraine intractable, with status migrainosus
ICD-10 CM	G43.901	Migraine unspecified not intractable with status migrainosus
ICD-10 CM	G43.909	Migraine unspecified not intractable without status migrainosus
ICD-10 CM	G43.911	Migraine unspecified intractable with status migrainosus
ICD-10 CM	G43.919	Migraine unspecified intractable without status migrainosus
ICD-10 CM	G43.B0	Ophthalmoplegic migraine, not intractable
ICD-10 CM	G43.B1	Ophthalmoplegic migraine, intractable
ICD-10 CM	G43.C0	Periodic headache syndromes in child or adult, not intractable
ICD-10 CM	G43.C1	Periodic headache syndromes in child or adult, intractable
ICD-10 CM	G44.001	Cluster headache syndrome, unspecified, intractable
ICD-10 CM	G44.009	Cluster headache syndrome, unspecified, not intractable
ICD-10 CM	G44.011	Episodic cluster headache, intractable
ICD-10 CM	G44.019	Episodic cluster headache, not intractable

ICD-10 CM	G44.021	Chronic cluster headache, intractable
ICD-10 CM	G44.029	Chronic cluster headache, not intractable
ICD-10 CM	G44.031	Episodic paroxysmal hemicrania, intractable
ICD-10 CM	G44.039	Episodic paroxysmal hemicrania, not intractable
ICD-10 CM	G44.041	Chronic paroxysmal hemicrania, intractable
ICD-10 CM	G44.049	Chronic paroxysmal hemicrania, not intractable
ICD-10 CM	G44.051	Short lasting unilateral neuralgiform headache with conjunctival injection and tearing (SUNCT), intractable
ICD-10 CM	G44.059	Short lasting unilateral neuralgiform headache with conjunctival injection and tearing (SUNCT), not intractable
ICD-10 CM	G44.091	Other trigeminal autonomic cephalgias (TAC), intractable
ICD-10 CM	G44.099	Other trigeminal autonomic cephalgias (TAC), not intractable
ICD-10 CM	G44.1	Vascular headache, not elsewhere classified
ICD-10 CM	G44.201	Tension-type headache, unspecified, intractable
ICD-10 CM	G44.209	Tension-type headache, unspecified, not intractable
ICD-10 CM	G44.211	Episodic tension-type headache, intractable
ICD-10 CM	G44.219	Episodic tension-type headache, not intractable
ICD-10 CM	G44.221	Chronic tension-type headache, intractable
ICD-10 CM	G44.229	Chronic tension-type headache, not intractable
ICD-10 CM	G44.301	Post-traumatic headache, unspecified, intractable
ICD-10 CM	G44.309	Post-traumatic headache, unspecified, not intractable
ICD-10 CM	G44.311	Acute post-traumatic headache, intractable
ICD-10 CM	G44.319	Acute post-traumatic headache, not intractable
ICD-10 CM	G44.321	Chronic post-traumatic headache, intractable
ICD-10 CM	G44.329	Chronic post-traumatic headache, not intractable
ICD-10 CM	G44.40	Drug-induced headache, not elsewhere classified, not intractable
ICD-10 CM	G44.41	Drug-induced headache, not elsewhere classified, intractable
ICD-10 CM	G44.51	Hemicrania continua
ICD-10 CM	G44.52	New daily persistent headache (NDPH)
ICD-10 CM	G44.53	Primary thunderclap headache
ICD-10 CM	G44.59	Other complicated headache syndrome
ICD-10 CM	G44.81	Hypnic headache
ICD-10 CM	G44.82	Headache associated with sexual activity
ICD-10 CM	G44.83	Primary cough headache
ICD-10 CM	G44.84	Primary exertional headache
ICD-10 CM	G44.85	Primary stabbing headache
ICD-10 CM	G44.89	Other headache syndrome
ICD-10 CM	G45.0	Vertebro-basilar artery syndrome
ICD-10 CM	G45.1	Carotid artery syndrome
ICD-10 CM	G45.8	Other transient cerebral ischemic attacks and related syndromes
ICD-10 CM	G45.9	Transient cerebral ischemic attack, unspecified
ICD-10 CM	G58.9	Mononeuropathy, unspecified
ICD-10 CM	G59	Mononeuropathy in diseases classified elsewhere
ICD-10 CM	G60.3	Idiopathic progressive neuropathy
ICD-10 CM	G60.9	Hereditary and idiopathic neuropathy, unspecified
ICD-10 CM	G61.89	Other inflammatory polyneuropathies
ICD-10 CM	G61.9	Inflammatory polyneuropathy, unspecified
ICD-10 CM	G62.0	Drug-induced polyneuropathy
ICD-10 CM	G62.1	Alcoholic polyneuropathy
ICD-10 CM	G62.2	Polyneuropathy due to other toxic agents
ICD-10 CM	G63	Polyneuropathy in diseases classified elsewhere

ICD-10 CM	G65.0	Sequelae of Guillain-Barre syndrome
ICD-10 CM	G70.00	Myasthenia gravis without (acute) exacerbation G70.01
ICD-10 CM	G70.01	Myasthenia gravis with (acute) exacerbation
ICD-10 CM	G71.0	Muscular dystrophy
ICD-10 CM	G71.11	Myotonic muscular dystrophy
ICD-10 CM	G71.12	Myotonia congenita
ICD-10 CM	G71.13	Myotonic chondrodystrophy
ICD-10 CM	G71.14	Drug induced myotonia
ICD-10 CM	G71.19	Other specified myotonic disorders
ICD-10 CM	G72.0	Drug-induced myopathy
ICD-10 CM	G72.1	Alcoholic myopathy
ICD-10 CM	G72.2	Myopathy due to other toxic agents
ICD-10 CM	G72.4	Inflammatory and immune myopathies, not elsewhere classified
ICD-10 CM	G72.8	Other specified myopathies
ICD-10 CM	G72.9	Myopathy, unspecified
ICD-10 CM	G80.0	Spastic quadriplegic cerebral palsy
ICD-10 CM	G80.1	Spastic diplegic cerebral palsy
ICD-10 CM	G80.2	Spastic hemiplegic cerebral palsy
ICD-10 CM	G80.3	Athetoid cerebral palsy
ICD-10 CM	G80.4	Ataxic cerebral palsy
ICD-10 CM	G80.8	Other cerebral palsy
ICD-10 CM	G80.9	Cerebral palsy, unspecified
ICD-10 CM	G94	Other disorders of brain in diseases classified elsewhere Code first underlying disease
ICD-10 CM	G96.8	Other specified disorders of central nervous system
ICD-10 CM	H81.0	*Ménière's* disease
ICD-10 CM	H81.1	Benign paroxysmal vertigo
ICD-10 CM	H81.2	Vestibular neuronitis
ICD-10 CM	H81.20	Vestibular neuronitis unspecified ear
ICD-10 CM	H81.21	Vestibular neuronitis right ear
ICD-10 CM	H81.22	Vestibular neuronitis left ear
ICD-10 CM	H81.3	Other peripheral vertigo
ICD-10 CM	H81.4	Vertigo of central origin
ICD-10 CM	H81.8	Other disorders of vestibular function
ICD-10 CM	H81.8X1	Other disorders of vestibular function right ear
ICD-10 CM	H81.8X2	Other disorders of vestibular function left ear
ICD-10 CM	H81.8X9	Other disorders of vestibular function unspecified ear
ICD-10 CM	H81.9	Unspecified disorder of vestibular function
ICD-10 CM	H81.90	Unspecified disorder of vestibular function unspecified ear
ICD-10 CM	H81.91	Unspecified disorder of vestibular function right ear
ICD-10 CM	H81.92	Unspecified disorder of vestibular function left ear
ICD-10 CM	H82	Vertiginous syndromes in diseases classified elsewhere
ICD-10 CM	H83.2X1	Vestibular hypofunction (Labyrinthine dysfunction, right ear)
ICD-10 CM	H83.2X2	Vestibular hypofunction (Labyrinthine dysfunction, left ear)
ICD-10 CM	H83.2X9	Vestibular hypofunction (Labyrinthine dysfunction, unspecified ear)
ICD-10 CM	H83.90	Unspecified disease of inner ear, unspecified ear
ICD-10 CM	H83.91	Unspecified disease of right inner ear
ICD-10 CM	H83.92	Unspecified disease of left inner ear
ICD-10 CM	I63.00	Cerebral infarction due to thrombosis of unspecified precerebral artery
ICD-10 CM	I63.011	Cerebral infarction due to thrombosis of right vertebral artery

ICD-10 CM	I63.012	Cerebral infarction due to thrombosis of left vertebral artery
ICD-10 CM	I63.013	Cerebral infarction due to thrombosis of bilateral vertebral arteries
ICD-10 CM	I63.019	Cerebral infarction due to thrombosis of unspecified vertebral artery
ICD-10 CM	I63.02	Cerebral infarction due to thrombosis of left carotid artery
ICD-10 CM	I63.031	Cerebral infarction due to thrombosis of right carotid artery
ICD-10 CM	I63.032	Cerebral infarction due to thrombosis of left carotid artery
ICD-10 CM	I63.033	Cerebral infarction due to thrombosis of bilateral carotid arteries
ICD-10 CM	I63.039	Cerebral infarction due to thrombosis of unspecified carotid artery
ICD-10 CM	I63.09	Cerebral infarction due to thrombosis of other precerebral artery
ICD-10 CM	I63.10	Cerebral infarction due to embolism of unspecified precerebral artery
ICD-10 CM	I63.111	Cerebral infarction due to embolism of right vertebral artery
ICD-10 CM	I63.112	Cerebral infarction due to embolism of left vertebral artery
ICD-10 CM	I63.113	Cerebral infarction due to embolism of bilateral vertebral arteries
ICD-10 CM	I63.119	Cerebral infarction due to embolism of unspecified vertebral artery
ICD-10 CM	I63.12	Cerebral infarction due to embolism of basilar artery
ICD-10 CM	I63.131	Cerebral infarction due to embolism of right carotid artery
ICD-10 CM	I63.132	Cerebral infarction due to embolism of left carotid artery
ICD-10 CM	I63.133	Cerebral infarction due to embolism of bilateral carotid arteries
ICD-10 CM	I63.139	Cerebral infarction due to embolism of unspecified carotid artery
ICD-10 CM	I63.19	Cerebral infarction due to embolism of other precerebral artery
ICD-10 CM	I63.20	Cerebral infarction due to unspecified occlusion or stenosis of unspecified precerebral arteries
ICD-10 CM	I63.211	Cerebral infarction due to unspecified occlusion or stenosis of right vertebral artery
ICD-10 CM	I63.212	Cerebral infarction due to unspecified occlusion or stenosis of left vertebral artery
ICD-10 CM	I63.213	Cerebral infarction due to unspecified occlusion or stenosis of bilateral vertebral arteries
ICD-10 CM	I63.219	Cerebral infarction due to unspecified occlusion or stenosis of unspecified vertebral arteries
ICD-10 CM	I63.22	Cerebral infarction due to unspecified occlusion or stenosis of basilar artery
ICD-10 CM	I63.231	Cerebral infarction due to unspecified occlusion or stenosis of right carotid arteries
ICD-10 CM	I63.232	Cerebral infarction due to unspecified occlusion or stenosis of left carotid arteries
ICD-10 CM	I63.233	Cerebral infarction due to unspecified occlusion or stenosis of bilateral carotid arteries
ICD-10 CM	I63.239	Cerebral infarction due to unspecified occlusion or stenosis of unspecified carotid arteries
ICD-10 CM	I63.29	Cerebral infarction due to unspecified occlusion or stenosis of other precerebral arteries
ICD-10 CM	I63.30	Cerebral infarction due to thrombosis of unspecified cerebral artery
ICD-10 CM	I63.311	Cerebral infarction due to thrombosis of right middle cerebral artery
ICD-10 CM	I63.312	Cerebral infarction due to thrombosis of left middle cerebral artery
ICD-10 CM	I63.313	Cerebral infarction due to thrombosis of bilateral middle cerebral artery
ICD-10 CM	I63.319	Cerebral infarction due to thrombosis of unspecified middle cerebral artery
ICD-10 CM	I63.321	Cerebral infarction due to thrombosis of right anterior cerebral artery
ICD-10 CM	I63.322	Cerebral infarction due to thrombosis of left anterior cerebral artery
ICD-10 CM	I63.323	Cerebral infarction due to thrombosis of bilateral anterior cerebral artery
ICD-10 CM	I63.329	Cerebral infarction due to thrombosis of unspecified anterior cerebral artery
ICD-10 CM	I63.331	Cerebral infarction due to thrombosis of right posterior cerebral artery
ICD-10 CM	I63.332	Cerebral infarction due to thrombosis of left posterior cerebral artery

ICD-10 CM	I63.333	Cerebral infarction due to thrombosis of bilateral posterior cerebral artery
ICD-10 CM	I63.339	Cerebral infarction due to thrombosis of unspecified posterior cerebral artery
ICD-10 CM	I63.341	Cerebral infarction due to thrombosis of right cerebellar artery
ICD-10 CM	I63.342	Cerebral infarction due to thrombosis of left cerebellar artery
ICD-10 CM	I63.343	Cerebral infarction due to thrombosis of bilateral cerebellar artery
ICD-10 CM	I63.349	Cerebral infarction due to thrombosis of unspecified cerebellar artery
ICD-10 CM	I63.39	Cerebral infarction due to thrombosis of other cerebral artery
ICD-10 CM	I63.40	Cerebral infarction due to embolism of unspecified cerebral artery
ICD-10 CM	I63.411	Cerebral infarction due to embolism of right middle cerebral artery
ICD-10 CM	I63.412	Cerebral infarction due to embolism of left middle cerebral artery
ICD-10 CM	I63.413	Cerebral infarction due to embolism of bilateral middle cerebral artery
ICD-10 CM	I63.419	Cerebral infarction due to embolism of unspecified middle cerebral artery
ICD-10 CM	I63.421	Cerebral infarction due to embolism of right anterior cerebral artery
ICD-10 CM	I63.422	Cerebral infarction due to embolism of left anterior cerebral artery
ICD-10 CM	I63.423	Cerebral infarction due to embolism of bilateral anterior cerebral artery
ICD-10 CM	I63.429	Cerebral infarction due to embolism of unspecified anterior cerebral artery
ICD-10 CM	I63.431	Cerebral infarction due to embolism of right posterior cerebral artery
ICD-10 CM	I63.432	Cerebral infarction due to embolism of left posterior cerebral artery
ICD-10 CM	I63.433	Cerebral infarction due to embolism of bilateral posterior cerebral artery
ICD-10 CM	I63.439	Cerebral infarction due to embolism of unspecified posterior cerebral artery
ICD-10 CM	I63.441	Cerebral infarction due to embolism of right cerebellar artery
ICD-10 CM	I63.442	Cerebral infarction due to embolism of left cerebellar artery
ICD-10 CM	I63.443	Cerebral infarction due to embolism of bilateral cerebellar artery
ICD-10 CM	I63.449	Cerebral infarction due to embolism of unspecified cerebellar artery
ICD-10 CM	I63.49	Cerebral infarction due to embolism of other cerebral artery
ICD-10 CM	I63.50	Cerebral infarction due to unspecified occlusion or stenosis of unspecified cerebral artery
ICD-10 CM	I63.511	Cerebral infarction due to unspecified occlusion or stenosis of right middle cerebral artery
ICD-10 CM	I63.512	Cerebral infarction due to unspecified occlusion or stenosis of left middle cerebral artery
ICD-10 CM	I63.513	Cerebral infarction due to unspecified occlusion or stenosis of bilateral middle cerebral artery
ICD-10 CM	I63.519	Cerebral infarction due to unspecified occlusion or stenosis of unspecified middle cerebral artery
ICD-10 CM	I63.521	Cerebral infarction due to unspecified occlusion or stenosis of right anterior cerebral artery
ICD-10 CM	I63.522	Cerebral infarction due to unspecified occlusion or stenosis of left anterior cerebral artery
ICD-10 CM	I63.523	Cerebral infarction due to unspecified occlusion or stenosis of bilateral anterior cerebral artery
ICD-10 CM	I63.529	Cerebral infarction due to unspecified occlusion or stenosis of unspecified anterior cerebral artery
ICD-10 CM	I63.531	Cerebral infarction due to unspecified occlusion or stenosis of right posterior cerebral artery
ICD-10 CM	I63.532	Cerebral infarction due to unspecified occlusion or stenosis of left posterior cerebral artery
ICD-10 CM	I63.533	Cerebral infarction due to unspecified occlusion or stenosis of bilateral posterior cerebral artery
ICD-10 CM	I63.539	Cerebral infarction due to unspecified occlusion or stenosis of unspecified posterior cerebral artery

ICD-10 CM	I63.541	Cerebral infarction due to unspecified occlusion or stenosis of right cerebellar artery
ICD-10 CM	I63.542	Cerebral infarction due to unspecified occlusion or stenosis of left cerebellar artery
ICD-10 CM	I63.543	Cerebral infarction due to unspecified occlusion or stenosis of bilateral cerebellar artery
ICD-10 CM	I63.549	Cerebral infarction due to unspecified occlusion or stenosis of unspecified cerebellar artery
ICD-10 CM	I63.59	Cerebral infarction due to unspecified occlusion or stenosis of other cerebral artery
ICD-10 CM	I63.6	Cerebral infarction due to cerebral venous thrombosis, nonpyogenic
ICD-10 CM	I63.8	Other cerebral infarction
ICD-10 CM	I63.9	Cerebral infarction, unspecified
ICD-10 CM	I69.01	Cognitive deficits following nontraumatic subarachnoid hemorrhage
ICD-10 CM	I69.11	Cognitive deficits following nontraumatic intracerebral hemorrhage
ICD-10 CM	I69.21	Cognitive deficits following other nontraumatic intracranial hemorrhage
ICD-10 CM	I69.31	Cognitive deficits following cerebral infarction
ICD-10 CM	I69.398	Vertigo, post stroke
ICD-10 CM	I69.81	Cognitive deficits following other cerebrovascular disease
ICD-10 CM	I69.91	Cognitive deficits following unspecified cerebrovascular disease
ICD-10 CM	I69.998	Vertigo as a late effect of stroke
ICD-10 CM	M54.5	Low back pain
ICD-10 CM	M54.50	Low back pain, multiple sites in spine
ICD-10 CM	M54.55	Low back pain, thoracolumbar region
ICD-10 CM	M54.56	Low back pain, lumbar region
ICD-10 CM	M54.57	Low back pain, lumbosacral region
ICD-10 CM	M54.58	Low back pain, sacral and sacrococcygeal region
ICD-10 CM	M54.59	Low back pain, site unspecified
ICD-10 CM	R25.2	Spasticity
ICD-10 CM	R41.3	Other amnesia, (i.e., Amnesia NOS and Memory loss NOS)
ICD-10 CM	R42	Vertigo NOS
ICD-10 CM	R51.X	Headache
ICD-10 CM	R56.8	Seizures (otherwise unspecified)
ICD-10 CM	S06.	Cognitive impairment due to intracranial or head injury
ICD-10 CM	S06.0X0A	Concussion without loss of consciousness, initial encounter
ICD-10 CM	S06.0X0D	Concussion without loss of consciousness, subsequent encounter
ICD-10 CM	S06.0X0S	Concussion without loss of consciousness, sequela
ICD-10 CM	S06.0X9A	Concussion with loss of consciousness of unspecified duration, initial encounter
ICD-10 CM	S06.0X9D	Concussion with loss of consciousness of unspecified duration, subsequent encounter
ICD-10 CM	S06.0X9S	Concussion with loss of consciousness of unspecified duration, sequela
ICD-10 CM	S060X1A	Concussion with loss of consciousness of 30 minutes or less, initial encounter
ICD-10 CM	S060X1D	Concussion with loss of consciousness of 30 minutes or less, subsequent encounter
ICD-10 CM	S060X1S	Concussion with loss of consciousness of 30 minutes or less, sequela

Appendix C AAN Statement on Comparing Outcomes of Patients

Why this statement: Characteristics of patients can vary across practices and differences in those characteristics may impact the differences in health outcomes among those patients. Some examples of these characteristics are: demographics, co-morbidities, socioeconomic status, and disease severity. Because these variables are typically not under the control of a clinician, it would be inappropriate to compare outcomes of patients managed by different clinicians and practices without accounting for those differences in characteristics among patients. There are many approaches and models to improve comparability, but this statement will focus on risk adjustment. This area continues to evolve (1), and the AAN will revisit this statement regularly to ensure accuracy, as well as address other comparability methods (2) should they become more common.

AAN quality measures are used primarily to demonstrate compliance with evidence-based and consensus-based best practices within a given practice as a component of a robust quality improvement program. The AAN includes this statement to caution against using certain measures, particularly outcome measures, for comparison to other individuals/practices/hospitals without the necessary and appropriate risk adjustment.

What is Risk Adjustment: Risk adjustment is a statistical approach that can make populations more comparable by controlling for patient characteristics (most commonly adjusted variable is a patient's age) that are associated with outcomes but are beyond the control of the clinician. By doing so, the processes of care delivered and the outcomes of care can be more strongly linked.

Comparing measure results from practice to practice: For process measures, the characteristics of the population are generally not a large factor in comparing one practice to another. Outcome measures, however, may be influenced by characteristics of a patient that are beyond the control of a clinician.(3) For example, demographic characteristics, socioeconomic status, or presence of comorbid conditions, and disease severity may impact quality of life measurements. Unfortunately, for a particular outcome, there may not be sufficient scientific literature to specify the variables that should be included in a model of risk adjustment. When efforts to risk adjust are made, for example by adjusting socioeconomic status and disease severity, values may not be documented in the medical record, leading to incomplete risk adjustment.

When using outcome measures to compare one practice to another, a methodologist, such as a health researcher, statistician, actuary or health economist, ought to ensure that the populations are comparable, apply the appropriate methodology to account for differences or state that no methodology exists or is needed.

Use of measures by other agencies for the purpose of pay-for-performance and public reporting programs: AAN measures, as they are rigorously developed, may be endorsed by the National Quality Forum or incorporated into Centers for Medicare & Medicaid Services (CMS) and private payer programs. 14

It is important when implementing outcomes measures in quality measurement programs that a method be employed to account for differences in patients beyond a clinicians' control such as risk adjustment.

References and Additional Reading for AAN Statement on Comparing Outcomes of Patients

1. Shahian DM, Wolf RE, Iezzoni LI, Kirle L, Normand SL. Variability in the measurement of hospital-wide mortality rates. N Engl J Med 2010;363(26):2530-2539. Erratum in: N Engl J Med 2011;364(14):1382.
2. Psaty BM, Siscovick DS. Minimizing bias due to confounding by indication in comparative effectiveness research: the importance of restriction. JAMA 2010;304(8):897-898.
3. National Quality Forum. Risk Adjustment for Socioeconomic Status or Other Sociodemographic Factors. August 2014. Available at: http://www.qualityforum.org/Publications/2014/08/Risk_Adjustment_for_Socioeconomic_Status_or_Other_Sociodemographic_Factors.aspx Accessed on January 8, 2015.

- Sharabiani MT, Aylin P, Bottle A. Systematic review of comorbidity indices for administrative data. Med Care. 2012;50(12):1109-1118.
- Pope GC, Kauter J, Ingber MJ, et al. for The Centers for Medicare & Medicaid Services' Office of Research, Development, and Information. Evaluation of the CMS-HCC Risk Adjustment Model. March 2011. Available at: http://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/downloads/evaluation_risk_adj_model_2011.pdf Accessed on January 8, 2015.

Appendix D Disclosures

Work Group Member	Disclosures
Sarah Benish, MD, FAAN	Reports no relevant disclosures for this project.
Neil Busis, MD, FAAN	Reports consulting services for the National Academies of Sciences, Engineering, and Medicine.
Bruce H. Cohen, MD, FAAN	Reports has received personal compensation for consulting, serving on a scientific advisory board, speaking, or other activities with Stealth Biotheraputics; research support from Stealth Biotherapeutics, BioElectron Technologies, Reata Pharmaceuticals, Horizon Pharmaceuticals.
Rohit Das, MD, FAAN	Reports research funding from Eisai, consulting with law firms and Neurotech EEG and prior speakers' bureau with LivaNova.
Shari Finsilver, MS	Reports no disclosures.
John Halperin, MD, FAAN, FACP, FIDSA	Reports no relevant disclosures for this project.
Adam Kelly, MD	Reports no disclosures.
Lisa Meunier	Reports no disclosures.
Michael Phipps, MD, MHS, FAAN	Reports no disclosures.
Aarti Sarwal, MD, FAAN (non-voting member)	Reports no relevant disclosures for this project.
Anant Shenoy, MD, FAAN (non-voting member)	Reports no relevant disclosures for this project.
Jason Sico, MD, MHS, FAHA, FAAN, FACP	Reports he has received grant support from the Department of Veterans Affairs, Health Service Research and Development, the American Academy of Neurology, and American Heart Association/American Stroke Association.
Partha Thirumala, MD, MS	Reports no disclosures.
Raissa Villanueva, MD, MPH	Reports no disclosures.
Jane von Gaudecker, PhD, RN, CNS	Reports no relevant disclosures for this project.

[i] 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/