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Neurotology 2017
Quality Measurement Set
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Improving Outcomes for Patients with Neurotology Conditions

Rationale for Measures
The American Academy of Neurology Institute (AANI) charged this work group with developing new measures focused on improving outcomes for patients diagnosed with neurotology conditions that is disorders that lead to dizziness and balance problems of a peripheral or central vestibular origin.

Measure Development Process

Below is an illustration of the measure development process from proposals, discussion, research, evaluation, to approval.
Importance and Prevalence
Neurotology conditions are broadly disorders that lead to dizziness and balance problems of a peripheral or central vestibular origin. These measures address numerous conditions with a focus on vertigo, benign paroxysmal positional vertigo (BPPV), Ménière's disease, vestibular migraine, and unilateral vestibular hypofunctions. Each measure specification includes additional information on the opportunity for improvement in the area, with specific citations to known treatment gap research when possible. Vestibular disorders impact quality of life, are closely linked with anxiety and mood disorders, and place individuals at a greater risk for falls.¹

Vertigo, which is a feeling your environment is moving or spinning, can be caused by both peripheral and central vestibular deficits. BPPV is the most common vestibular disorder², and is a brief, intense episode of vertigo triggered by a change in head position. BPPV has two main variants: BPPV of the posterior semicircular canal or posterior canal BPPV and BPPV of the lateral semicircular canal or horizontal canal BPPV.³ Vestibular migraine is characterized by dizziness, motion intolerance, vertigo attacks, sound sensitivity, and balance loss. Ménière's disease is a chronic illness with episodes of vertigo, hearing loss, tinnitus, and a feeling of fullness in the ear. Unilateral vestibular hypofunction impacts balance due to dysfunction in the inner ear, and common symptoms include vertigo, poor balance during head turns, and blurred vision when turning the head. Vestibular neuronitis is an inflammation of the vestibular nerve causing vertigo.

An estimated 90 million Americans aged 17 years and older (42% of the current population) experience dizziness at least once in their lifetime.⁴ BPPV accounts for approximately 8% of individuals with moderate or severe dizziness or vertigo.⁵ It is estimated 2.4% of the population will experience BPPV during their lifetime.⁶ BPPV is a recurrent disorder with approximately 2/3 of diagnosed patients having an episode within the past 12 months.⁷ von Brevern noted, “In 86% of affected individuals, BPPV led to medical consultation, interruption of daily activities or sick leave. In total, only 8% of affected participants received effective treatment.”⁸ Per Agrawal, “vestibular migraine appears to be the second most common cause of dizziness.”⁹ The impact of migraine and burden of migraine is well established.¹⁰ Ménière's disease affects approximately 10-15 out of every 1,000 people, and in the US the prevalence is estimated to be 190 per 100,000.¹¹ Ménière's disease may affect 2% of the US population, although only 0.2% of the population is formally diagnosed. There is no known cure, but the majority of patients with Ménière's disease see improvement through changes in lifestyle and oral medications.¹² Treatment practices vary among neurotologists and otolaryngologists.¹³

Clinical Evidence Base
A comprehensive search to identify published guidelines, measures, and consensus recommendations in the National Guidelines Clearinghouse, the National Quality Measures Clearinghouse, PubMed, MEDLINE, EMBASE, and the Cochrane Library occurred. The work group consulted the following clinical practice guidelines and systematic reviews with the following serving as the base of the measure drafts:


Common Abbreviations and Definitions for the Measurement Set
Below is a list of acronyms utilized in this document. The AAN has a Quality Improvement Glossary, which provides more in-depth explanations and is available at aan.com/practice/quality-measures/quality-resources.

- AAN: American Academy of Neurology
- AAO-HNS: American Academy of Otolaryngology – Head and Neck Surgery
- ADL: Activities of Daily Living
- BPPV: Benign Paroxysmal Positional Vertigo
- CMS: Centers for Medicare & Medicaid Services
- EHR: Electronic Health Record
- NQF: National Quality Forum
- MIPS: Merit-based Incentive Payment System
- PQRS: Physician Quality Reporting System
- QOL: Quality of Life

2017 Neurotology Quality Measurement Set
The following measures were approved by the work group. There is no requirement that all measures in the measurement set be used. Providers are encouraged to identify the one or two measures that would be most meaningful for their patient populations and implement these measures to drive performance improvement in practice.

<table>
<thead>
<tr>
<th>2017 Neurotology Quality Measurement Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Life for Patients with Neurotology Disorders</td>
</tr>
<tr>
<td>Vestibular Rehabilitation for Unilateral Vestibular Hypofunction</td>
</tr>
<tr>
<td>Dix-Hallpike Maneuver Performed for Patients with Benign Paroxysmal Positional Vertigo (BPPV)</td>
</tr>
<tr>
<td>Canalith Repositioning Procedure Performed for Patients with Posterior Canal BPPV</td>
</tr>
<tr>
<td>Optimal BPPV Care Provided</td>
</tr>
</tbody>
</table>

*The Work Group strongly suggests all providers screen for falls using the AAN’s Universal Neurology Falls Outcome and Plan of Care Measure.

Other Potential Measures
The work group did not create individual measures addressing vestibular migraine, instead encouraging expansion of existing migraine measure denominators to include vestibular migraine when supported by clinical evidence.

The work group strongly suggests all providers assess patients with neurotology disorders for falls. The work group did not develop a measure specific to falls, given the draft measure in development for a cross-cutting population of neurologic conditions. This draft measure will apply to patients with neurotology conditions, and as a result a disease specific falls measure was not developed. Addressing falls is vital for this population. Dizziness is a significant risk factor for falls in elderly individuals. Falls have been estimated to be the leading cause of hospital admissions and death in persons in the elderly. The work group declined to develop a new measure to address this concern given the simultaneous development of a falls measures for all patients with neurological disorders. This measure will be available for public comment in Winter 2017. The measure evaluates the percentage of patients that reported a fall during the measurement period and who had a plan of care documented. Given the existence of a cross-cutting measure, a measure exclusive to patients with neurotology disorders would be redundant.

The work group proposed multiple alternate measures. Ultimately these measures were not included in this measurement set, but the concepts will be retained for future measurement set updates as more evidence may support development or a treatment gap in care at that time. During the initial proposal of concepts seven concepts were identified that did not advance further that includes: driving safety for neurotology patients, complimentary alternative medicine for neurotology patients, vestibular migraine acute treatment, plan of care for vestibular migraine headache developed or reviewed, prescription steroid use for patients with vestibular neuritis, frequency of attacks for patients with BPPV, and interval of time passed for patients with dizziness to be seen in vestibular clinic.

The work group held a discussion about a potential measure assessing outcomes for patients with BPPV. This measure concept was not approved for further development due to feasibility concerns. Many patients with BPPV who are successfully treated are lost to further follow-up and there were also concerns on how to quantify resolution of symptoms. It is the work group’s hope that the process measures approved will lead to creation of future outcome measures for patients with BPPV.

Technical Specifications Overview
The Work Group developed technical specifications for measures that includes data from:
- Electronic Health Record (EHR) Data
- Administrative Data
- Registry

Administrative claims specifications are not provided for measures given the AMA’s decision to discontinue the maintenance of CPT II codes. The AAN is in the process of creating code value sets and the logic required for electronic capture of the quality measures with EHRs, when possible. A listing of the quality data model elements, code value sets, and measure logic (through the CMS Measure Authoring Tool) for each of the measures will be made available at a later date. These technical specifications will be updated as warranted.

The measurement set may include measures that require the use of validated screening or other assessment tools. The Work Group discussed more and less prescriptive ways to select these tools, eventually determining that multiple tools should be offered to allow providers to determine which tool best meets their individual practice needs. In some cases, tools may be subject to copyright and require licensing fees.

Testing and Implementation of the Measurement Set
The measures in this set are being made available without any prior testing. The AANI and AAO-HNSF encourage 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 the National Quality Forum for possible endorsement.
# 2017 Neurotology Quality Measure Specifications

## Neurotology Quality of Life

<table>
<thead>
<tr>
<th>Measure Title</th>
<th>Quality of Life for Patients with Neurotology Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Percentage of neurotology patients whose most recent Quality of Life scores were maintained or improved during the measurement period.</td>
</tr>
<tr>
<td><strong>Measurement Period</strong></td>
<td>January 1, 20xx to December 31, 20xx</td>
</tr>
<tr>
<td><strong>Eligible Population</strong></td>
<td><strong>Eligible Providers</strong></td>
</tr>
<tr>
<td></td>
<td>Medical Doctor (MD), Doctor of Osteopathy (DO), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN), Physical Therapists, Occupational Therapist, audiologists</td>
</tr>
<tr>
<td><strong>Care Setting(s)</strong></td>
<td>Outpatient</td>
</tr>
<tr>
<td><strong>Ages</strong></td>
<td>All</td>
</tr>
<tr>
<td><strong>Event</strong></td>
<td>Office Visit</td>
</tr>
<tr>
<td><strong>Diagnosis</strong></td>
<td>Age 18 years and older</td>
</tr>
<tr>
<td><strong>Denominator</strong></td>
<td>Patients aged 18 years and older with neurotology specific diagnosis (see code descriptions below) seen at least two times during the measurement period.</td>
</tr>
<tr>
<td><strong>Numerator</strong></td>
<td>Patients with age appropriate quality of life assessment* whose most recent scores were maintained or improved during the measurement period.</td>
</tr>
</tbody>
</table>

Approved quality of life assessments for this measure are:

- Dizziness Handicap Inventory (1),
- PROMIS-29 Profile (2),
- PROMIS Global Health Scale (3),
- Neuro-QOL (4),
- Short Form (SF-36) (5),
- Vertigo Symptom Scale (VSS) (6),
- Vertigo Symptom Scale – Short Form (VSS-SF) (7),
- Vestibular Activities of Daily Living Scale (VADL) (8),
- Activities-specific Balance Confidence (ABC) Scale (9),
- Vertigo Handicap Questionnaire (VHQ) (10),
- Vestibular Activity and Participation (VAP) Measure (11),
- Vestibular Rehabilitation Benefit Questionnaire (VRBQ) (12,13), or
- University of California Los Angeles Dizziness Questionnaire (UCLA-DQ) (14).

The work group recognizes other assessment tools may exist and can be used for quality improvement purposes.

| **Required Exclusions** | None |
| **Allowable Exclusions** | Patients who are unable or decline to complete screening tool |
| **Exclusion Rationale** | Patients need to be willing to complete the screening tool for performance scores to be valid. |
| **Measure Scoring** | Percentage |
| **Interpretation of Score** | Higher Score Indicates Better Quality |
| **Measure Type** | Patient Reported Outcome Performance Measure (PRO-PM) |
| **Level of Measurement** | Provider |
| **Risk Adjustment** | See Appendix A 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 (mood and anxiety disorders)
- Co-morbidities (medical conditions)
- Cognitive Impairment
- Trauma exposure
- High healthcare utilizer
- Duration of the neurotology diagnosis
- Polypharmacy
- Activity level – physical function

<table>
<thead>
<tr>
<th>Desired Outcome</th>
<th>This measure directly measures a patient reported outcome.</th>
</tr>
</thead>
</table>
| Opportunity to Improve Gap in Care | Dizziness is a common complaint, especially in older people, affecting up to 30% of the population, with vestibular vertigo accounting for a quarter of these cases(15, 16). Patients with dizziness are more likely to report poor health, depression, confidence in performing ADLs, and lower health related quality of life (17). Data on quality of life is not routinely collected in practice currently.

One of the primary goals in health care is to improve the lives of our patients. This includes addressing issues that directly impact of their quality of life. Patient Reported Outcome Measures (PROMs) capture how a patient feels they are doing using a validated tool (18). There is a need for quality measures that allow a clinician to determine how they are addressing what is important to the patient using PROM. |
| Harmonization with Existing Measures | This measure is specific to those with neurotology conditions. No other quality of life measures for this population are known. |
| References | References:


Flow Chart Diagram: Neurotology Quality of Life

1. Did the patient have at least two new or established patient visits with an eligible provider during the measurement period?
   - Yes
     - Patient included in denominator
     - During the measurement period, did the patient’s most recent score indicate results are maintained or improved on a Quality of Life assessment tool* during the measurement period?
       - Yes
         - Patient not included in data submission
       - No
         - Patient included in eligible population
         - Did the patient refuse or was unable to complete QoL survey?
           - Yes
             - Patient not included in denominator
           - No
             - Yes
               - Patient included in denominator
               - Patient met numerator criteria
             - No
               - Patient did not meet numerator criteria

2. Did the patient have a diagnosis of vertigo, vestibular neuritis, vestibular migraine, or Ménière’s disease on any contact during the current or prior measurement period OR on their active problem list during the measurement period?
   - Yes
     - Patient included in eligible population
   - No
     - Yes
       - Did the patient refuse or was unable to complete QoL survey?
         - Yes
           - Patient not included in denominator
         - No
           - Yes
             - Patient included in denominator
             - Patient met numerator criteria
           - No
             - Patient did not meet numerator criteria

*Quality of Life assessment tool
<table>
<thead>
<tr>
<th>Code System</th>
<th>Code</th>
<th>Code Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPT</td>
<td>99201-99205</td>
<td>Office or Other Outpatient Visit - New Patient (E/M Codes)</td>
</tr>
<tr>
<td>CPT</td>
<td>99211-99215</td>
<td>Office or Other Outpatient Visit - Established Patient (E/M Codes)</td>
</tr>
<tr>
<td>CPT</td>
<td>99241-99245</td>
<td>Office or Other Outpatient Consultation – New or Established Patient</td>
</tr>
<tr>
<td>CPT</td>
<td>97165,97166,97167</td>
<td>Occupational therapy low, moderate, and high evaluation</td>
</tr>
<tr>
<td>CPT</td>
<td>97168</td>
<td>Occupational therapy reevaluation</td>
</tr>
<tr>
<td>CPT</td>
<td>97161,97162,97163</td>
<td>Physical therapy low, moderate, and high evaluation</td>
</tr>
<tr>
<td>CPT</td>
<td>97164</td>
<td>Physical therapy reevaluation</td>
</tr>
<tr>
<td>ICD-10</td>
<td>A88.1</td>
<td>Epidemic vertigo</td>
</tr>
<tr>
<td>ICD-10</td>
<td>D33.3</td>
<td>Benign neoplasm of cranial nerves</td>
</tr>
<tr>
<td>ICD-10</td>
<td>G43.109</td>
<td>Migraine with aura, not intractable, without status migrainosus</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.0</td>
<td>Ménière's disease</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.1</td>
<td>Benign paroxysmal vertigo</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.2</td>
<td>Vestibular neuronitis</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.3</td>
<td>Other peripheral vertigo</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.4</td>
<td>Vertigo of central origin</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.8</td>
<td>Other disorders of vestibular function</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.9</td>
<td>Unspecified disorder of vestibular function</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H82</td>
<td>Vertiginous syndromes in diseases classified elsewhere</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H83.2X1</td>
<td>Vestibular hypofunction (Labyrinthine dysfunction, right ear)</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H83.2X2</td>
<td>Vestibular hypofunction (Labyrinthine dysfunction, left ear)</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H83.2X9</td>
<td>Vestibular hypofunction (Labyrinthine dysfunction, unspecified ear)</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.20</td>
<td>Vestibular neuronitis unspecified ear</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.21</td>
<td>Vestibular neuronitis right ear</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.22</td>
<td>Vestibular neuronitis left ear</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.8X1</td>
<td>Other disorders of vestibular function right ear</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.8X2</td>
<td>Other disorders of vestibular function left ear</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.8X9</td>
<td>Other disorders of vestibular function unspecified ear</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.90</td>
<td>Unspecified disorder of vestibular function unspecified ear</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.91</td>
<td>Unspecified disorder of vestibular function right ear</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H81.92</td>
<td>Unspecified disorder of vestibular function left ear</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H83.90</td>
<td>Unspecified disease of inner ear, unspecified ear</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H83.91</td>
<td>Unspecified disease of right inner ear</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H83.92</td>
<td>Unspecified disease of left inner ear</td>
</tr>
<tr>
<td>ICD-10</td>
<td>I69.398</td>
<td>Vertigo, post stroke</td>
</tr>
<tr>
<td>ICD-10</td>
<td>I69.998</td>
<td>Vertigo as a late effect of stroke</td>
</tr>
<tr>
<td>ICD-10</td>
<td>R42</td>
<td>Vertigo NOS</td>
</tr>
</tbody>
</table>
### Vestibular Rehabilitation for Unilateral Vestibular Hypofunction

<table>
<thead>
<tr>
<th>Measure Title</th>
<th>Vestibular Rehabilitation for Unilateral Vestibular Hypofunction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Percentage of patients diagnosed with unilateral vestibular hypofunction who referred, prescribed, recommended for, or received vestibular rehabilitation.</td>
</tr>
<tr>
<td><strong>Measurement Period</strong></td>
<td>January 1, 20xx to December 31, 20xx</td>
</tr>
<tr>
<td><strong>Eligible Population</strong></td>
<td>Eligible Providers: Medical Doctor (MD), Doctor of Osteopathy (DO), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN)</td>
</tr>
<tr>
<td><strong>Care Setting(s)</strong></td>
<td>Outpatient</td>
</tr>
<tr>
<td><strong>Ages</strong></td>
<td>All</td>
</tr>
<tr>
<td><strong>Event</strong></td>
<td>Office Visit</td>
</tr>
<tr>
<td><strong>Diagnosis</strong></td>
<td>Unilateral vestibular hypofunction</td>
</tr>
<tr>
<td><strong>Denominator</strong></td>
<td>Patients diagnosed with unilateral vestibular hypofunction</td>
</tr>
<tr>
<td><strong>Numerator</strong></td>
<td>Patients with an order for a referral for vestibular rehabilitation, OR prescription for vestibular rehabilitation, OR documentation that vestibular rehabilitation was recommended, OR documentation that vestibular rehabilitation was provided.</td>
</tr>
<tr>
<td><strong>Required Exclusions</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Allowable Exclusions</strong></td>
<td></td>
</tr>
</tbody>
</table>
- Notation that patient has refused or declined vestibular rehabilitation services. (To be captured via search terms, this exclusion should be written as “patient refuses (or declines) vestibular rehabilitation services.”)  
- Documentation of prior vestibular rehabilitation services provided and determined to not be effective. |
| **Exclusion Rationale** | It is appropriate to exclude patients who decline or refuse vestibular rehabilitation, as such treatment must be engaged in voluntarily to be effective. Additionally, if vestibular rehabilitation services were provided previously without success there is a low likelihood further vestibular rehabilitation would be an effective treatment. |
| **Measure Scoring** | Percentage |
| **Interpretation of Score** | Higher Score Indicates Better Quality |
| **Measure Type** | Process |
| **Level of Measurement** | Provider or System |
| **Risk Adjustment** | Not Applicable |
| **For Process Measures Relationship to Desired Outcome** | Strong guideline statements support referral to vestibular rehabilitation for patients with chronic unilateral vestibular hypofunction. Vestibular rehabilitation would improve quality of life, reduce fall risk, accelerate resolution of symptoms and increase recovery of balance and return to activities of daily living and decrease disability and morbidity. A 2015 Cochrane review found that, “There is moderate to strong evidence that vestibular rehabilitation is a safe, effective management for unilateral peripheral vestibular dysfunction, based on a number of high-quality randomised controlled trials. There is moderate evidence that vestibular rehabilitation resolves symptoms and improves functioning in the medium term.” |

Opportunity to Improve Gap in Care

Practice variations exist in the referral of patients to vestibular rehabilitation.\(^{(3-5)}\) It is hoped that by measuring referral rates practice variations will decrease.

Harmonization with Existing Measures

No similar measures known

References

Flow Chart Diagram: Vestibular Rehabilitation for Unilateral Vestibular Hypofunction

Did the patient have at least one new or established patient visit with an eligible provider during the measurement period?

Did patient have a diagnosis of unilateral vestibular hypofunction on any contact during the current or prior measurement period OR on their active problem list during the measurement period?

Did the patient refuse or decline vestibular rehabilitation services?

Did the patient previously receive vestibular rehabilitation services and were they determined to not be effective?

Did the patient have an order for referral, prescription for, documentation of recommendation for, OR documentation of services being provided for vestibular rehabilitation?

<table>
<thead>
<tr>
<th>Code System</th>
<th>Code</th>
<th>Code Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPT</td>
<td>99201-99205</td>
<td>Office or Other Outpatient Visit - New Patient (E/M Codes)</td>
</tr>
<tr>
<td>CPT</td>
<td>99211-99215</td>
<td>Office or Other Outpatient Visit - Established Patient (E/M Codes)</td>
</tr>
<tr>
<td>CPT</td>
<td>99241-99245</td>
<td>Office or Other Outpatient Consultation – New or Established Patient</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H83.2X1</td>
<td>Vestibular hypofunction (Labyrinthine dysfunction, right ear)</td>
</tr>
<tr>
<td>ICD-10</td>
<td>H83.2X2</td>
<td>Vestibular hypofunction (Labyrinthine dysfunction, left ear)</td>
</tr>
<tr>
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<td>H83.2X9</td>
<td>Vestibular hypofunction (Labyrinthine dysfunction, unspecified ear)</td>
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<td>ICD-10</td>
<td>H81.22</td>
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<td>ICD-10</td>
<td>H81.8X1</td>
<td>Other disorders of vestibular function right ear</td>
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<tr>
<td>ICD-10</td>
<td>H81.8X2</td>
<td>Other disorders of vestibular function left ear</td>
</tr>
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<td>ICD-10</td>
<td>H81.8X9</td>
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<td>ICD-10</td>
<td>H81.92</td>
<td>Unspecified disorder of vestibular function left ear</td>
</tr>
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<td>ICD-10</td>
<td>H83.90</td>
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<td>H83.91</td>
<td>Unspecified disease of right inner ear</td>
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<td>ICD-10</td>
<td>H83.92</td>
<td>Unspecified disease of left inner ear</td>
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</tbody>
</table>

Dix-Hallpike Maneuver Performed for Patients with BPPV

<table>
<thead>
<tr>
<th>Measure Title</th>
<th>Dix-Hallpike Maneuver Performed for Patients with benign paroxysmal positional vertigo (BPPV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Percentage of patients with BPPV who had a Dix-Hallpike maneuver performed.</td>
</tr>
<tr>
<td>Measurement Period</td>
<td>January 1, 20xx to December 31, 20xx</td>
</tr>
<tr>
<td>Eligible Population</td>
<td>Medical Doctor (MD), Doctor of Osteopathy (DO), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN)</td>
</tr>
<tr>
<td>Care Setting(s)</td>
<td>Outpatient</td>
</tr>
<tr>
<td>Ages</td>
<td>All</td>
</tr>
<tr>
<td>Event</td>
<td>Office Visit</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>BPPV</td>
</tr>
<tr>
<td>Denominator</td>
<td>Patients diagnosed with BPPV.</td>
</tr>
<tr>
<td>Numerator</td>
<td>Patients who had a Dix-Hallpike maneuver performed.</td>
</tr>
<tr>
<td>Required Exclusions</td>
<td>None</td>
</tr>
</tbody>
</table>

Allowable Exclusions
- Patient has a history of BPPV, but is not currently experiencing positional dizziness/vertigo consistent with active BPPV.
- Patient has refused or declined Dix-Hallpike maneuver. (To be captured via search terms, this exclusion should be written as “patient refuses (or declines) vestibular rehabilitation services.”
- Patient has cervical spinal disease (i.e., cervical stenosis, severe kyphoscoliosis, limited cervical range of motion, Down’s syndrome, severe rheumatoid arthritis, cervical radiculopathies, Paget’s disease, ankylosing spondylitis, low back dysfunction, spinal cord injuries, spinal fractures)
- Patient unable to lay flat (i.e., severe heart disease)
- Patient has severe atherosclerotic disease or recent dissection involving the anterior or posterior cerebral circulation.
- Unable to be seated in exam chair (i.e., morbidly obese), or maneuver cannot be safely performed given morbid obesity

Exclusion Rationale
- If symptoms consistent with BPPV are not actively being experienced, additional diagnostic testing with the Dix-Hallpike maneuver is unnecessary.
- If there is a significant structural or vascular (cerebrovascular or cardiac) condition (e.g., severe cervical stenosis or heart failure are known to be present) or concern (e.g., a vertebral artery dissection is suspected), then the benefits of performing the Dix-Hallpike maneuver are unlikely to outweigh the risk(s).
- A clinician may not possess the resources (e.g., wide enough or sturdy enough examination table) needed to safely perform the Dix-Hallpike maneuver on morbidly obese patient.

Measure Scoring
Percentage

Interpretation of Score
Higher Score Indicates Better Quality

Measure Type
Process

Level of Measurement
Provider

Risk Adjustment
Not Applicable

The vast majority of patients with BPPV can be quickly and easily diagnosed in the office using the Dix-Hallpike maneuver (1). By rapidly and accurately diagnosing BPPV, unnecessary neuroimaging and other testing (cardiac, hematologic, etc) can be prevented, and misdiagnosis and the use of ineffective (for the purposes of treating BPPV) anti-emetics and vestibular suppressant medications can be minimized (1). Once BPPV is diagnosed, the highly effective canalith repositioning maneuvers can be performed before the patient leaves the office, providing immediate (and oftentimes long-lasting) symptomatic relief.

| Opportunity to Improve Gap in Care | BPPV is one of the most common vestibular conditions, and these patients commonly present to otolaryngologists, neurologists, primary care physicians, and emergency room settings. Despite the frequency of BPPV, particularly in the aging population, the Dix-Hallpike maneuver which can diagnose BPPV with a high degree of accuracy is largely underutilized (2). Even when the Dix-Hallpike maneuver is properly performed, commonly patients who receive the diagnosis of BPPV do not then receive treatment with appropriate repositioning maneuvers (3).

When BPPV is quickly and accurately diagnosed and treated, an improvement in quality of life has been demonstrated (4). When BPPV persists undiagnosed or untreated, it has been shown to lead to interruption of daily activities and/or sick leave in 86% of those affected (3).

| Harmonization with Existing Measures | No similar measures known

| References | References:


Flow Chart Diagram: Dix-Hallpike Maneuver Performed for Patients with BPPV

1. Did the patient have at least one new or established patient visit with an eligible provider during the measurement period? 
   - Yes → 2. Did patient have a diagnosis of BPPV on any contact during the current or prior measurement period OR on their active problem list during the measurement period? 
     - Yes → Patient INCLUDED in Eligible Population 
     - No → Patient NOT Included in Data Submission 
   - No → Patient NOT Included in Denominator 
   - Patient NOT Included in Denominator → Did patient refuse or decline Dix-Hallpike? 
     - Yes → Patient NOT Included in Denominator 
     - No → Did patient have a cervical spinal disease? 
       - Yes → Was patient unable to be seated in an exam chair? 
         - Yes → Was patient unable to lay flat? 
           - Yes → Patient NOT Included in Denominator 
           - No → Patient Included in Denominator 
         - No → Was Dix-Hallpike performed? 
           - Yes → Patient met numerator criteria 
           - No → Patient did NOT meet numerator criteria


<table>
<thead>
<tr>
<th>Code System</th>
<th>Code Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPT</td>
<td>Office or Other Outpatient Visit - New Patient (E/M Codes)</td>
</tr>
<tr>
<td>CPT</td>
<td>Office or Other Outpatient Visit - Established Patient (E/M Codes)</td>
</tr>
<tr>
<td>CPT</td>
<td>Office or Other Outpatient Consultation – New or Established Patient</td>
</tr>
<tr>
<td>ICD-10</td>
<td>Benign paroxysmal positional vertigo</td>
</tr>
<tr>
<td>ICD-10</td>
<td>Benign paroxysmal positional vertigo unspecified ear</td>
</tr>
<tr>
<td>ICD-10</td>
<td>Benign paroxysmal positional vertigo right ear</td>
</tr>
<tr>
<td>ICD-10</td>
<td>Benign paroxysmal positional vertigo left ear</td>
</tr>
<tr>
<td>ICD-10</td>
<td>Benign paroxysmal positional vertigo bilateral</td>
</tr>
</tbody>
</table>
## Canith Repositioning Procedure Performed for Patients with Posterior Canal BPPV

<table>
<thead>
<tr>
<th>Measure Title</th>
<th>Canith Repositioning Procedure Performed for Patients with Posterior Canal BPPV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Percentage of patients diagnosed with posterior canal BPPV who had therapeutic canith repositioning procedure (CRP) performed or who were referred for physical therapy or to a provider who can perform CRP.</td>
</tr>
<tr>
<td><strong>Measurement Period</strong></td>
<td>January 1, 20xx to December 31, 20xx</td>
</tr>
<tr>
<td><strong>Eligible Population</strong></td>
<td><strong>Eligible Providers</strong> Medical Doctor (MD), Doctor of Osteopathy (DO), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN),</td>
</tr>
<tr>
<td><strong>Care Setting(s)</strong></td>
<td>Outpatient</td>
</tr>
<tr>
<td><strong>Ages</strong></td>
<td>All</td>
</tr>
<tr>
<td><strong>Event</strong></td>
<td>Office Visit</td>
</tr>
<tr>
<td><strong>Diagnosis</strong></td>
<td>Posterior Canal BPPV</td>
</tr>
<tr>
<td><strong>Denominator</strong></td>
<td>Patients diagnosed with posterior canal BPPV</td>
</tr>
<tr>
<td><strong>Numerator</strong></td>
<td>Therapeutic CRP performed or referred for physical therapy or to a provider who can perform CRP.</td>
</tr>
<tr>
<td><strong>Required Exclusions</strong></td>
<td>None</td>
</tr>
</tbody>
</table>
| **Allowable Exclusions** | • Patient has refused or declined CRP. (To be captured via search term processing this exclusion should be written as “patient refuses (or declines) CRP.”)  
• Patient has cervical spinal disease (i.e., cervical stenosis, severe kyphoscoliosis, limited cervical range of motion, Down’s syndrome, severe rheumatoid arthritis, cervical radiculopathies, Paget’s disease, ankylosing spondylitis, low back dysfunction, spinal cord injuries, demyelinating disease of cervical spine)  
• Patient unable to lay flat (i.e., congestive heart disease with supine dyspnea)  
• Patient unable to be seated in exam chair (i.e., morbidly obese) |
| **Exclusion Rationale** | • For CRP to be completed and effective, a patient must consent.  
• If there is a significant structural or vascular (cerebrovascular or cardiac) condition (e.g., severe cervical stenosis or heart failure are known to be present) or concern (e.g., a vertebral artery dissection is suspected), then the benefits of performing the Dix-Hallpike maneuver are unlikely to outweigh the risk(s).  
• A clinician may not possess the resources (e.g., wide enough or sturdy enough examination table) needed to safely perform the Dix-Hallpike maneuver on morbidly obese patient. |
<p>| <strong>Measure Scoring</strong> | Percentage |
| <strong>Interpretation of Score</strong> | Higher Score Indicates Better Quality |
| <strong>Measure Type</strong> | Process |
| <strong>Level of Measurement</strong> | Provider |
| <strong>Risk Adjustment</strong> | Not Applicable |</p>
<table>
<thead>
<tr>
<th>For Process Measures</th>
<th>Relationship to Desired Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process</td>
<td>Intermediate Outcome</td>
</tr>
<tr>
<td>• Canalith repositioning procedure (CRP) performed</td>
<td></td>
</tr>
<tr>
<td>• Referred to physical therapy or provider who can perform CRP</td>
<td></td>
</tr>
<tr>
<td>Outcomes</td>
<td></td>
</tr>
<tr>
<td>• Resolution of BPPV symptoms</td>
<td></td>
</tr>
<tr>
<td>• Reduction of unnecessary and inappropriate treatments and medications</td>
<td></td>
</tr>
</tbody>
</table>

**Opportunity to Improve Gap in Care**

Current performance rates for CRP in practice are not known. Consistent and timely application of the appropriate maneuver to treat symptoms in this patient population will improve time-to-resolution of the BPPV and therefore will both improve and expedite positive patient outcomes. Untreated vestibular disorders restrict physical activities necessary to maintain cardiovascular fitness, and serve as a falling risk. There are no corroborating research outcome studies to prove this point. All research is toward resolution of the positional vertigo/confirmed by the cessation of the positioning nystagmus.

**Harmonization with Existing Measures**

No similar measures known

**References**

References:

Flow Chart Diagram: Canalith Repositioning Procedure Performed for Patients with Posterior Canal BPPV

Did the patient have at least one new or established patient visit with an eligible provider during the measurement period?

Yes → Did patient have a diagnosis of Posterior Canal BPPV on any contact during the current or prior measurement period OR on their active problem list during the measurement period?

Yes → Patient INCLUDED in Eligible Population

No → Patient NOT Included in Data Submission

No → Did the patient refuse or decline Canalith Repositioning Procedure (CRP)?

Yes → Patient NOT Included in Denominator

No → Did patient have a cervical spinal disease?

Yes → Was patient unable to be seated in an exam chair?

Yes → Was patient unable to lay flat?

Yes → Was CRP performed or patient referred for physical therapy or to a provider who can perform CRP?

Yes → Patient met numerator criteria

No → Patient did NOT meet numerator criteria

No → Patient NOT Included in Denominator
<table>
<thead>
<tr>
<th>Code System</th>
<th>Code</th>
<th>Code Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPT</td>
<td>99201-99205</td>
<td>Office or Other Outpatient Visit - New Patient (E/M Codes)</td>
</tr>
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<td>CPT</td>
<td>99211-99215</td>
<td>Office or Other Outpatient Visit - Established Patient (E/M Codes)</td>
</tr>
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<td>CPT</td>
<td>99241-99245</td>
<td>Office or Other Outpatient Consultation – New or Established Patient</td>
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<td>Canalith Repositioning Procedure</td>
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<td>H81.10</td>
<td>Benign paroxysmal positional vertigo unspecified ear</td>
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<td>H81.11</td>
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<td>ICD-10</td>
<td>H81.13</td>
<td>Benign paroxysmal positional vertigo bilateral</td>
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</table>
## Optimal BPPV Care Provided

<table>
<thead>
<tr>
<th>Measure Title</th>
<th>Optimal BPPV Care Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Percentage of BPPV patients who did receive vestibular testing, imaging, and antihistamine or benzodiazepine medications.</td>
</tr>
<tr>
<td></td>
<td><em>A lower score is indicative of better quality.</em></td>
</tr>
<tr>
<td><strong>Measurement Period</strong></td>
<td>January 1, 20xx to December 31, 20xx</td>
</tr>
<tr>
<td><strong>Eligible Population</strong></td>
<td>Medical Doctor (MD), Doctor of Osteopathy (DO), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN)</td>
</tr>
<tr>
<td>Care Setting(s)</td>
<td>Outpatient</td>
</tr>
<tr>
<td>Ages</td>
<td>All</td>
</tr>
<tr>
<td>Event</td>
<td>Office Visit</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>BPPV</td>
</tr>
<tr>
<td><strong>Denominator (for all 4 numerator components)</strong></td>
<td>Patients diagnosed with BPPV</td>
</tr>
</tbody>
</table>
| **Numerator** | A. Patients with BPPV referred for vestibular testing^ by the encounter provider.  
^Vestibular testing is defined as caloric testing, VEMP testing, rotary chair testing, posturography, video head impulse test.  
* A lower score is indicative of better quality. |
|               | B. Patients with BPPV referred, recommended, or ordered a CTA, CT, MRA, or MRI by the encounter provider.  
* A lower score is indicative of better quality. |
|               | C. Patients with BPPV prescribed antihistamine or benzodiazepine medication by the encounter provider.  
* A lower score is indicative of better quality. |
|               | D. Total patient performance on the 3 above components |
| **Required Exclusions** | Patients whose diagnosis of BPPV was made after vestibular testing, imaging, or antihistamine or benzo prescribed are not included in the eligible population for the denominator. |
| **Allowable Exclusions** | For numerator components A-D exclude:  
• Patient treatment preference; patient declines repositioning as first line treatment option requiring alternate treatment option consideration. (To be captured via search term processing this exclusion should be written as “patient refuses (or declines) CRP.”)  
• Patient has cervical spinal disease (i.e., cervical stenosis, severe kyphoscoliosis, limited cervical range of motion, Down’s syndrome, severe rheumatoid arthritis, cervical radiculopathies, Paget’s disease, ankylosing spondylitis, low back dysfunction, spinal cord injuries, demyelinating disease of cervical spine)  
• Patient unable to lay flat (i.e., congestive heart disease with supine dyspnea)  
• Patient unable to be seated in exam chair (i.e., morbidly obese)  
For numerator component A patients may be excluded if they have:  
• Negative Dix-Hallpike maneuver  
• Dizziness that lasts longer than one minute  
• Postural or gait abnormalities  
• Transient dizziness that is unresponsive to repositioning  
• Positional testing with video-oculography may be appropriate for characterizing the nystagmus |
For numerator component B patients may be excluded if they have:

- Atypical BPPV (anterior canal, relapsing BPPV (To be captured via search term processing this exclusion should be written as “Patient has relapsing BPPV.”), BPPV associated with other neurological conditions, or severe canal BPPV)
- Focal deficit or unilateral hearing loss
- Vision changes
- Trauma history
- Recent surgery

For numerator component C patients may be excluded if they have:

- Patient refuses other treatment options
- Severe symptoms during positioning
- Nausea or Vomiting during positioning
- Patient requires prophylaxis
- Clinical indication for long-term use present (e.g., anxiety disorder)

**Exclusion Rationale**

If a patient has a preferred course of treatment other than repositioning, their desires should be honored within reason. Focal deficits implies a potential peripheral vestibular disorder requiring additional testing. Patients should be evaluated for other treatment options if repositioning is clinically inappropriate such as patients who are morbidly obese or have neck trauma.

Vestibular testing is appropriate for:

- Negative Dix-Hallpike
- Dizziness that last longer than a minute
- Postural or gait abnormalities
- Transient dizziness that is unresponsive to repositioning
- Positional testing with video-oculography. may be appropriate for nystagmus

Imaging (MRI or CT) may be appropriate for:

- Atypical BPPV (anterior canal, relapsing BPPV (more than 3 episodes in X) or BPPV associated w/ other neurological conditions, severe canal BPPV)
- Focal deficit
- Unilateral hearing loss
- Vision changes
- Trauma history
- Recent surgery

Short-course of antihistamines or benzodiazepines may be appropriate for:

- Severe symptoms during positioning
- Nausea or Vomiting during positioning
- Patient requires prophylaxis
- Patient refuses other treatment options
- Clinical indication for long-term use present (anxiety disorder)

<table>
<thead>
<tr>
<th>Measure Scoring</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpretation of Score</td>
<td>Lower Score Indicates Better Quality</td>
</tr>
<tr>
<td>Measure Type</td>
<td>Process</td>
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<tr>
<td>Level of Measurement</td>
<td>Provider</td>
</tr>
<tr>
<td>Risk Adjustment</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

This measure is intended to reduce vestibular testing, inappropriate imaging, and medication use. The measure is intended to focus on typical patients with BPPV, but work group realizes there may be extraordinary cases (atypical vertigo, vertical nystag. on Dix Hallpike) where these treatments are warranted. AAO-HNS guideline supports limited vestibular testing, benzodiazepine and antihistamine use, and imaging (1).

<table>
<thead>
<tr>
<th>For Process Measures</th>
<th>Relationship to Desired Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process</td>
<td>Intermediate Outcome</td>
</tr>
<tr>
<td>• Number of vestibular testing recorded</td>
<td></td>
</tr>
<tr>
<td>• Number of neuroimaging studies recorded</td>
<td></td>
</tr>
<tr>
<td>• Number of benzodiazepine and antihistamine prescriptions recorded</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Outcomes</td>
</tr>
<tr>
<td></td>
<td>• Resolution of BPPV symptoms</td>
</tr>
<tr>
<td></td>
<td>• Reduction in delay of BPPV diagnosis and treatment</td>
</tr>
<tr>
<td></td>
<td>• Reduction in low value health care expenditures</td>
</tr>
</tbody>
</table>

Current performance rates for measure components in practice are not known, as research on practice variation is limited. Phillips et al. estimate referrals for vestibular testing could be reduced by 9% by use of Dix-Hallpike and obtaining a complete medical history (2). A study by Grill et al. indicated that 70% of patients with BPPV receive magnetic resonance imaging scanning, and there remains opportunity to reduce the use of imaging (3). This measure will improve care by reducing the use of low-value diagnostic studies, which are unnecessary to diagnose typical cases of BPPV. There is evidence supporting potential increase of cognitive impairment and fall risk for patients prescribed benzodiazepines and antihistamines (1). By limiting prescriptions to those who require short-term management of autonomic symptoms patient quality of life may improve. Implementation of this measure provides an opportunity to reduce delays in BPPV diagnosis and treatment, reduce the use of low-value, high-cost studies, and reduce unwarranted variation in care.

Opportunity to Improve Gap in Care

Harmonization with Existing Measures

No similar measures known

References:
Flow Chart Diagram: Optimal BPPV Care Provided – Component A

Did the patient have at least one new or established patient visit with an eligible provider during the measurement period?

Yes

Did patient have a diagnosis of BPPV on any contact during the current or prior measurement period OR on their active problem list during the measurement period?

Yes

Patient INCLUDED in Eligible Population

Patient NOT Included in Data Submission

No

Did patient have at least one new or established patient visit with an eligible provider during the measurement period?

No

Did patient have a diagnosis of BPPV on any contact during the current or prior measurement period OR on their active problem list during the measurement period?

No

Patient NOT Included in Eligible Population

Patient Included in Denominator

Patient NOT Included in Denominator

Did patient have a negative Dix-Hallpike maneuver?

Yes

Patient NOT Included in Denominator

No

Was patient unable to undergo repositioning maneuver due to a medical reason?

Yes

Patient NOT Included in Denominator

No

Does patient have dizziness that lasts longer than one minute?

Yes

Patient NOT Included in Denominator

No

Does patient have postural or gait abnormalities?

Yes

Patient NOT Included in Denominator

No

Does patient have transient dizziness that is unresponsive to repositioning?

Yes

Patient NOT Included in Denominator

No

Does patient have nystagmus?

Yes

Patient NOT Included in Denominator

No

Was patient referred for vestibular testing by the encounter provider?

Yes

Patient did NOT meet numerator criteria

No

Patient did NOT meet numerator criteria

No

Patient met numerator criteria
Flow Chart Diagram: Optimal BPPV Care Provided – Component B

Did the patient have at least one new or established patient visit with an eligible provider during the measurement period?

Yes → Did patient have a diagnosis of BPPV on any contact during the current or prior measurement period OR on their active problem list during the measurement period?

Yes → Patient INCLUDED in Eligible Population

No → Patient NOT Included in Data Submission

Yes → Did patient decline?

Yes → Was patient unable to undergo repositioning maneuver due to a medical reason?

No → Patient NOT Included in Denominator

Yes → Did patient decline?

No → Does patient have atypical BPPV?

Yes → Does patient have focal deficit or unilateral hearing loss?

No → Does patient have vision changes?

Yes → Does patient have trauma history?

No → Did patient have recent surgery?

Yes → Patient NOT Included in Denominator

No → Patient INCLUDED in Denominator

Was patient referred, recommended, or ordered a CTA, CT, MRA, or MRI by the encounter provider?

Yes → Patient did NOT meet numerator criteria

No → No

Yes → Patient met numerator criteria
Flow Chart Diagram: Optimal BPPV Care Provided – Component C

Did the patient have at least one new or established patient visit with an eligible provider during the measurement period?

- Yes
  - Did patient have a diagnosis of BPPV on any contact during the current or prior measurement period OR on their active problem list during the measurement period?
    - Yes
      - Patient INCLUDED in Eligible Population
    - No
      - Patient NOT Included in Data Submission
  - No
    - Patient NOT Included in Eligible Population

Patient INCLUDED in Denominator

Was patient prescribed an antihistamine or benzodiazepine medication by the encounter provider?

- Yes
  - Patient did NOT meet numerator criteria
- No
  - Patient met numerator criteria

Did patient decline all other treatment options?

- Yes
  - Patient NOT Included in Denominator
- No
  - Was patient unable to undergo repositioning maneuver due to a medical reason?
    - Yes
      - Patient NOT Included in Denominator
    - No
      - Patient NOT Included in Denominator

Does patient experience severe symptoms during positioning?

- Yes
  - Does patient require prophylaxis?
    - Yes
      - Patient NOT Included in Denominator
    - No
      - Patient NOT Included in Denominator
  - No
    - Does patient have a clinical indication for long-term use?
      - Yes
        - Patient NOT Included in Denominator
      - No
        - Patient Not Included in Denominator
Flow Chart Diagram: Optimal BPPV Care Provided – Component D

Was patient included in component A denominator?
- Yes
  - Was patient included in component B denominator?
    - Yes
      - Was patient included in component C denominator?
        - Yes
          - Patient INCLUDED in Eligible Population
        - No
          - Patient NOT Included in Data Submission
    - No
      - Patient NOT Included in Data Submission

Did patient meet numerator for components A, B, and C?
- Yes
  - Patient did NOT meet numerator criteria
- No
  - Patient met numerator criteria
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<thead>
<tr>
<th>Code System</th>
<th>Code</th>
<th>Code Description</th>
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<tr>
<td>CPT</td>
<td>99201-99205</td>
<td>Office or Other Outpatient Visit - New Patient (E/M Codes)</td>
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<td>CPT</td>
<td>99211-99215</td>
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<td>99241-99245</td>
<td>Office or Other Outpatient Consultation – New or Established Patient</td>
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<td>Caloric Vestibular Test</td>
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<td>ICD-10</td>
<td>H81.13</td>
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Appendix A 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 a 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 the clinician. 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**


## Appendix B Disclosures

<table>
<thead>
<tr>
<th>Work Group Member</th>
<th>Disclosures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yuri Agrawal, MD</td>
<td>Recipient of NIH K23 and R03 grants, consultant to AARP.</td>
</tr>
<tr>
<td>Susan Barthel</td>
<td>No disclosures.</td>
</tr>
<tr>
<td>Marc Bennett, MD, FACS</td>
<td>No disclosures.</td>
</tr>
<tr>
<td>Joni Doherty, MD, PhD, FACS</td>
<td>No disclosures relevant for this project.</td>
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<tr>
<td>Patricia Gerend</td>
<td>No disclosures.</td>
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<td>Daniel Gold, DO</td>
<td>No disclosures relevant for this project.</td>
</tr>
<tr>
<td>David Morrill</td>
<td>No disclosures.</td>
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<td>John G. Oas, MD</td>
<td>No disclosures.</td>
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<tr>
<td>Habib Rizk, MD, MSc</td>
<td>No disclosures.</td>
</tr>
<tr>
<td>J. Kirk Roberts, MD, FAAN</td>
<td>No disclosures.</td>
</tr>
<tr>
<td>Anant Shenoy, MD (non-voting facilitator)</td>
<td>No disclosures.</td>
</tr>
<tr>
<td>Erika Woodson, MD, FACS</td>
<td>No disclosures relevant for this project.</td>
</tr>
<tr>
<td>David Zapala, PhD</td>
<td>No disclosures.</td>
</tr>
</tbody>
</table>

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