Neurotology 2017
Quality Measurement Set

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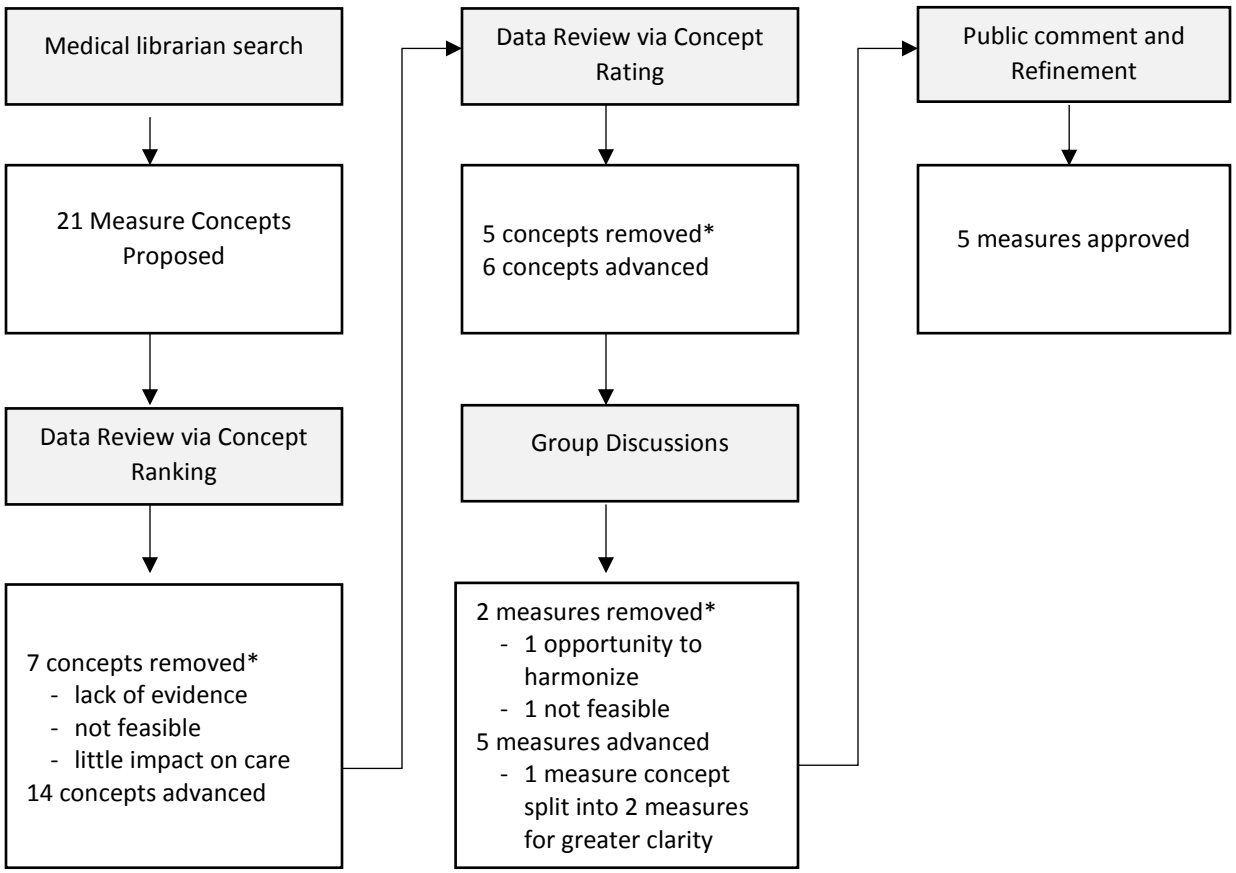
Improving Outcomes for Patients with Neurotology Conditions

Rationale for Measures

The American Academy of Neurology Institute (AANI) and American Academy of Otolaryngology – Head and Neck Surgery (AAO-HNS) charged this work group with developing new quality measures focused on improving outcomes for patients diagnosed with neurotology conditions, causing dizziness and balance problems. These are disorders that lead to dizziness and balance problems of a peripheral or central vestibular origin. Quality measures are not guidelines. Quality measures are math equations to help understand how often health care services are provided consistent with current medical knowledge. Measures are updated periodically to reflect evidence and practice changes. The AANI and AAO-HNS will review this measurement set for updates a minimum of every three years.

Measure Development Process

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



*See "Other Potential Measures" below for further details.

Importance and Prevalence

Peripheral and central vestibular disorders that lead to dizziness or balance problems, fall within the field of neurotology. These measures address numerous conditions with a focus on benign paroxysmal positional vertigo (BPPV), Ménière's disease, vestibular migraine, and unilateral vestibular hypofunction. 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.[i]

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Vertigo, which is a feeling your environment is moving or spinning, or having the sensation of movement, can be caused by both peripheral and central vestibular deficits. BPPV is the most common vestibular disorder[ii], 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.[iii] Vestibular migraine diagnosis is made using the Bárány Society criteria, which requires at least five episodes with vestibular symptoms of moderate or severe intensity, history of migraine, one or more migraine features occurring in at least half of the vestibular episodes, and lack of a better vestibular or headache diagnosis.[iv] 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, and is the hallmark cause of acute unilateral vestibular hypofunction.

An estimated 90 million Americans aged 17 years and older (42% of the current population) experience dizziness at least once in their lifetime.[v] BPPV accounts for approximately 8% of individuals with moderate or severe dizziness or vertigo.[vi] It is estimated 2.4% of the population will experience BPPV during their lifetime.[vii] BPPV is a recurrent disorder with approximately 2/3 of diagnosed patients having an episode within the past 12 months.[viii] 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."[ix],[x]

Per Agrawal, "vestibular migraine appears to be the second most common cause of dizziness."[xi] The impact of migraine and burden of migraine is well established.[xii] 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.[xiii] 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.[xiv] Treatment practices vary among neurotologists and otolaryngologists.[xv]

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:

- Hall CD, Herdman SJ and Whitney, SL et al, Vestibular Rehabilitation for Peripheral vestibular Hypofunction: An Evidence-Based Clinical Practice Guideline, J Neurol Phys Ther. 2016; 40: 124-155.
- McDonnell MN, Hillier SL. Vestibular rehabilitation for unilateral peripheral vestibular dysfunction. Cochrane Database of Systematic Reviews 2015, Issue 1. Art. No.: CD005397. DOI: 10.1002/14651858.CD005397.pub4.
- Bhattacharyya N, Gubbels SP, Schwartz SR, et al. Clinical Practice Guideline: Benign Paroxysmal Positional Vertigo (Update). Otolaryngol Head Neck Surg. 2017;156(3_suppl):S1-S47.
- Helminski JO, Zee DS, Janssen I , Hain TC. Effectiveness of particle repositioning maneuvers in the treatment of benign paroxysmal positional vertigo: a systematic review. Phys Ther2010; 90 (5):663-678.
- Hilton MP, Pinder DK. The Epley (canalith repositioning manoeuvre for benign paroxysmal positional vertigo. Cochrane Database Syst Rev. 2014;(12):CD003162.

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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.

2017 Neurotology Quality Measurement Set
Quality of Life for Patients with Neurotology Disorders
Vestibular Rehabilitation for Unilateral or Bilateral Vestibular Hypofunction
Dix-Hallpike Maneuver Performed for Patients with Benign Paroxysmal Positional Vertigo (BPPV)
Canalith Repositioning Procedure Performed for Patients with Posterior Canal BPPV
Standard BPPV Management

*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.[xvi] Falls have been estimated to be the leading cause of hospital admissions and death in persons in the elderly population.[xvii] 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 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.

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The work group held a discussion on 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 include 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.

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2017 Neurotology Quality Measure Specifications

Quality of Life for Patients with Neurotology Disorders

Measure Title	Quality of Life for Patients with Neurotology Disorders	
Description	Percentage of neurotology patients whose most recent Quality of Life scores were maintained or improved during the measurement period.	
Measurement Period	January 1, 20xx to December 31, 20xx	
Eligible Population	**Eligible Providers**	Medical Doctor (MD), Doctor of Osteopathy (DO), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN), Physical Therapist, Occupational Therapist, Audiologist
	Care Setting(s)	Outpatient
	Ages	Age 18 years and older
	Event	Office Visit
	Diagnosis	Neurotology specific diagnosis; See complete list in code descriptions
Denominator	Patients aged 18 years and older with neurotology specific diagnosis (see code descriptions below) seen at least two times during the measurement period.	
Numerator	Patients with age appropriate quality of life assessment* whose most recent scores^ were maintained or improved** on the same age appropriate quality of life assessment administered twice during the measurement period. Quality of life assessments tools to meet the numerator 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 Activities 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. ^For patients with more than 2 quality of life assessment scores in the calendar year, the last quality of life assessment score will be compared to the first quality of life assessment score received in the calendar year. ** See specific tools for scoring methods related to improvement or stayed the same: Each tool defines improvement differently based on their scoring methodology.	
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.	

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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. 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 The work group will also evaluate the comparison strategy of using the last assessment score obtained to the first score obtained in the calendar year for unintended consequences (e.g., those providers treating episodic recurrent pathologies) should testing data be available.
Desired Outcome	This measure directly measures a patient reported outcome.
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, and less 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: 1. Jacobson GP and Newman CW. The development of the Dizziness Handicap Inventory. Arch Otolaryngol Head Neck Surg. 1990; 116(4):424-427. 2. Cella D, Yount S, Rothrock N, et al. The Patient-Reported Outcomes Measurement Information System (PROMIS). Med Care. 2007; 45(5 Suppl 1): S3-S11. 3. Cella D, Riley W, Stone A, et al. Initial Adult Health Item Banks and First Wave Testing of the Patient-Reported Outcomes Measurement Information System (PROMIS™) Network: 2005-2008. J Clin Epidemiol. 2010;63(11):1179-1194. 4. Gershon RC, Lai JS, Bode R, et al. Neuro-QOL: quality of life item banks for adults with neurological disorders: item development and calibrations based upon clinical and general population testing. Qual Life Res. 2012; 21(3):475-486.

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5. Brazier JE, Roberts J, Deverill M. The Estimation of a Preference-based Measure of Health from the SF-36. Journal of Health Economics. 2002; 21(2): 271-292.
6. Yardley L, Masson E, et al. Symptoms, anxiety and handicap in dizzy patients: development of the vertigo symptom scale. J Psychosom Res 1992; 36(8): 731-741.
7. Wilhelmsen K, Strand LI, et al. Psychometric properties of the vertigo symptom scale- short form. BMC Ear Nose Throat Disord 2008; 8(1):2.
8. Cohen HS and Kimball KT. Development of the vestibular disorders activities of daily living scale. Arch Otolaryngol Head Neck Surg. 2000; 126(7):881-887.
9. Powell LE and Myers AM. The Activities-specific Balance Confidence (ABC) Scale. Journals of Gerontology. Series A, Biological Sciences and Medical Sciences. 1995; 50A(1):M28-34.
10. Duracinsky M, Mosnier I, et al. Literature review of questionnaires assessing vertigo and dizziness and their impact on patients' quality of life. Value Health. 2007;10(4):273-284.
11. Alghwiri AA, Whitney SL, et al. The development and validation of the vestibular activities and participation measure. Arch Phys Med Rehabil. 2012;93(10):1822-1831.
12. Morris AE, Lutman ME, et al. Measuring outcome from vestibular rehabilitation, Part I: Qualitative development of a new self-report measure. Int J Audiol. 2008; 47(4):169-177.
13. Morris AE, Lutman ME, et al. Measuring outcome from vestibular rehabilitation, Part II: Refinement and validation of a new self-report measure. Int J Audiol. 2008; 48(1):24-37.
14. Perez N, Garmendia I, Garcia-Granero M, et al. Factor analysis and correlation between Dizziness Handicap Inventory and dizziness characteristics and impact on quality of life scales. Acta Otolaryngol Suppl. 2001;545:145-154.
15. Tinetti ME, Williams CS, Gill TM. Health, functional, and psychological outcomes among older persons with chronic dizziness J AM Geriatr Soc. 2000; 48(4);417-421.
16. Neuhauser HK, von Brevern M, Radtke A, et al. Epidemiology of vestibular vertigo: a neurotologic survey of the general population. Neurology. 2005;65(6):898-904.
17. Neuhauser HK, Radtke A, von Brevern M, et al. Burden of dizziness and vertigo in the community. Arch Intern Med. 2008;168(19):2118-2124.
18. 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.

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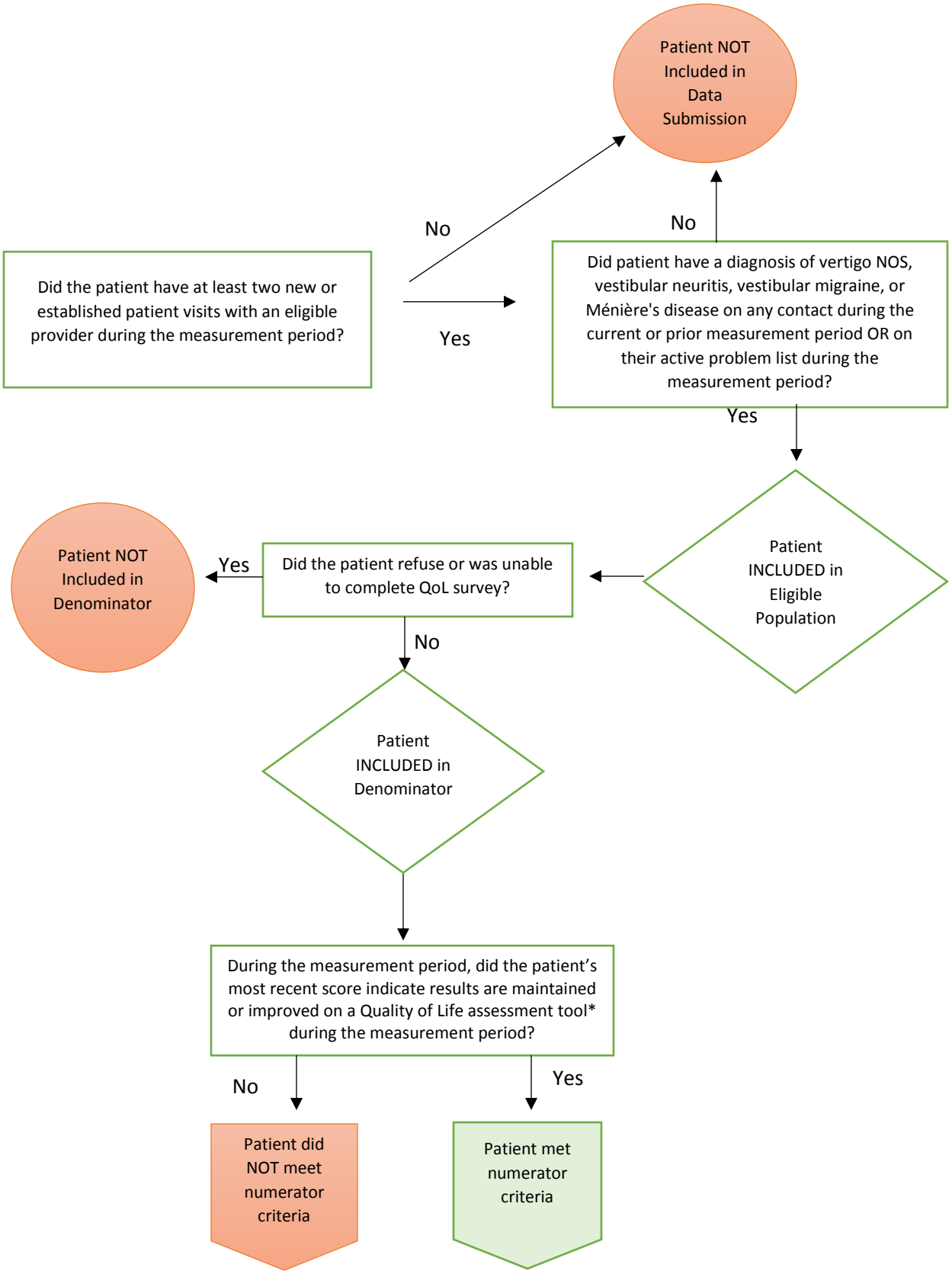
Flow Chart Diagram: Neurotology Quality of Life



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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
CPT	92537-92538	Caloric vestibular testing
CPT	92540, 92541, 92542, 92544, 92545	Basic vestibular evaluation, including (and listed individually) spontaneous nystagmus, positional nystagmus, optokinetic nystagmus, oscillating tracking
CPT	92546	Sinusoidal vertical axis rotational testing
CPT	92548	Computerized dynamic posturography
CPT	92557	Comprehensive audiometry threshold evaluation
CPT	97165,97166,97167	Occupational therapy low, moderate, and high evaluation
CPT	97168	Occupational therapy reevaluation
CPT	97161,97162,97163	Physical therapy low, moderate, and high evaluation
CPT	97164	Physical therapy reevaluation
ICD-10	A88.1	Epidemic vertigo
ICD-10	D33.3	Benign neoplasm of cranial nerves
ICD-10	G43.109	Migraine with aura, not intractable, without status migrainosus
ICD-10	G43.819	Other migraine, intractable, without status migrainosus
ICD-10	H81.0	Ménière's disease
ICD-10	H81.1	Benign paroxysmal vertigo
ICD-10	H81.2	Vestibular neuronitis
ICD-10	H81.3	Other peripheral vertigo
ICD-10	H81.4	Vertigo of central origin
ICD-10	H81.8	Other disorders of vestibular function
ICD-10	H81.9	Unspecified disorder of vestibular function
ICD-10	H82	Vertiginous syndromes in diseases classified elsewhere
ICD-10	H83.2X1	Vestibular hypofunction (Labyrinthine dysfunction, right ear)
ICD-10	H83.2X2	Vestibular hypofunction (Labyrinthine dysfunction, left ear)
ICD-10	H83.2X9	Vestibular hypofunction (Labyrinthine dysfunction, unspecified ear)
ICD-10	H81.20	Vestibular neuronitis unspecified ear
ICD-10	H81.21	Vestibular neuronitis right ear
ICD-10	H81.22	Vestibular neuronitis left ear
ICD-10	H81.8X1	Other disorders of vestibular function right ear
ICD-10	H81.8X2	Other disorders of vestibular function left ear
ICD-10	H81.8X9	Other disorders of vestibular function unspecified ear
ICD-10	H81.90	Unspecified disorder of vestibular function unspecified ear
ICD-10	H81.91	Unspecified disorder of vestibular function right ear
ICD-10	H81.92	Unspecified disorder of vestibular function left ear
ICD-10	H83.90	Unspecified disease of inner ear, unspecified ear
ICD-10	H83.91	Unspecified disease of right inner ear
ICD-10	H83.92	Unspecified disease of left inner ear
ICD-10	I69.398	Vertigo, post stroke
ICD-10	I69.998	Vertigo as a late effect of stroke
ICD-10	R42	Vertigo NOS

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Vestibular Rehabilitation for Unilateral or Bilateral Vestibular Hypofunction

Measure Title	Vestibular Rehabilitation for Unilateral or Bilateral Vestibular Hypofunction	
Description	Percentage of patients diagnosed with unilateral or bilateral vestibular hypofunction who were referred, prescribed, recommended for, or received vestibular rehabilitation.	
Measurement Period	January 1, 20xx to December 31, 20xx	
Eligible Population	**Eligible Providers**	Medical Doctor (MD), Doctor of Osteopathy (DO), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN), Physical Therapist, Occupational Therapist, Audiologist
	Care Setting(s)	Outpatient
	Ages	All
	Event	Office Visit
	Diagnosis	Unilateral or bilateral vestibular hypofunction
Denominator	Patients diagnosed with unilateral or bilateral vestibular hypofunction	
Numerator	Patients with an order for a referral to physical therapy or occupational therapy for vestibular rehabilitation, OR prescription for vestibular rehabilitation, OR documentation that vestibular rehabilitation was recommended, OR documentation that vestibular rehabilitation was provided.	
Required Exclusions	None	
Allowable Exclusions	• 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. • Clinically asymptomatic or compensated in unilateral or bilateral vestibular hypofunction. (To be captured via search terms, this exclusion should be written as "compensated" or "asymptomatic" or "clinically asymptomatic")	
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. Finally, if there is no evidence that patients are decompensated or symptomatic treatment via vestibular rehabilitation is not necessary.	
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 and bilateral vestibular hypofunction.(1) Vestibular rehabilitation would improve quality of life, reduce fall risk, accelerate resolution of symptoms and increase recovery of balance, return to activities of daily living, and decrease disability and morbidity.(1) 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."(2)	

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	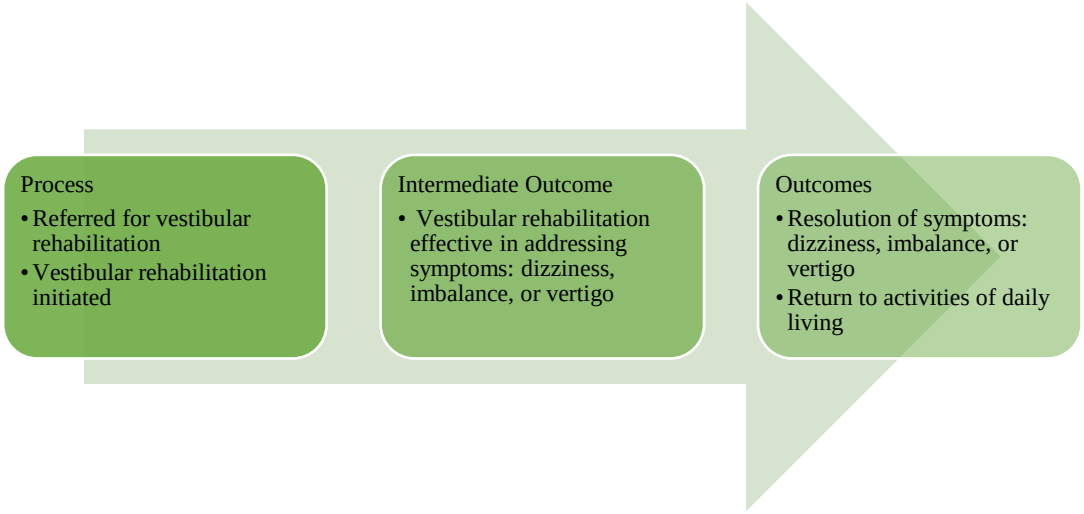
Opportunity to Improve Gap in Care	Practice variations exist in the referral of patients to vestibular rehabilitation.(3-5) It is hoped that by measuring referral rates practice variations will decrease.
Harmonization with Existing Measures	No similar measures known
References	1. Hall CD, Herdman SJ and Whitney, SL et al, Vestibular Rehabilitation for Peripheral Vestibular Hypofunction: An Evidence-Based Clinical Practice Guideline, J Neurol Phys Ther. 2016; 40: 124-155. 2. McDonnell MN, Hillier SL. Vestibular rehabilitation for unilateral peripheral vestibular dysfunction. Cochrane Database of Systematic Reviews 2015, Issue 1. Art. No.: CD005397. DOI: 10.1002/14651858.CD005397.pub4. 3. Bush ML and Dougherty W. Assessment of Vestibular Rehabilitation Therapy Training and Practice Patterns. J Community Health 2015;40(4):802-807. 4. Lee A, Jones G, Corcoran J, et al. A UK hospital based multidisciplinary balance clinic run by allied health professionals: first year results. The Journal of Laryngology & Otology 2011;125:661-667. 5. Cohen HS, Gottshall KR, Grazino M, et al. International survey of vestibular rehabilitation therapists by the Barany Society Ad Hoc Committee on Vestibular Rehabilitation Therapy. Journal of Vestibular Research. 2009;19:15-20.

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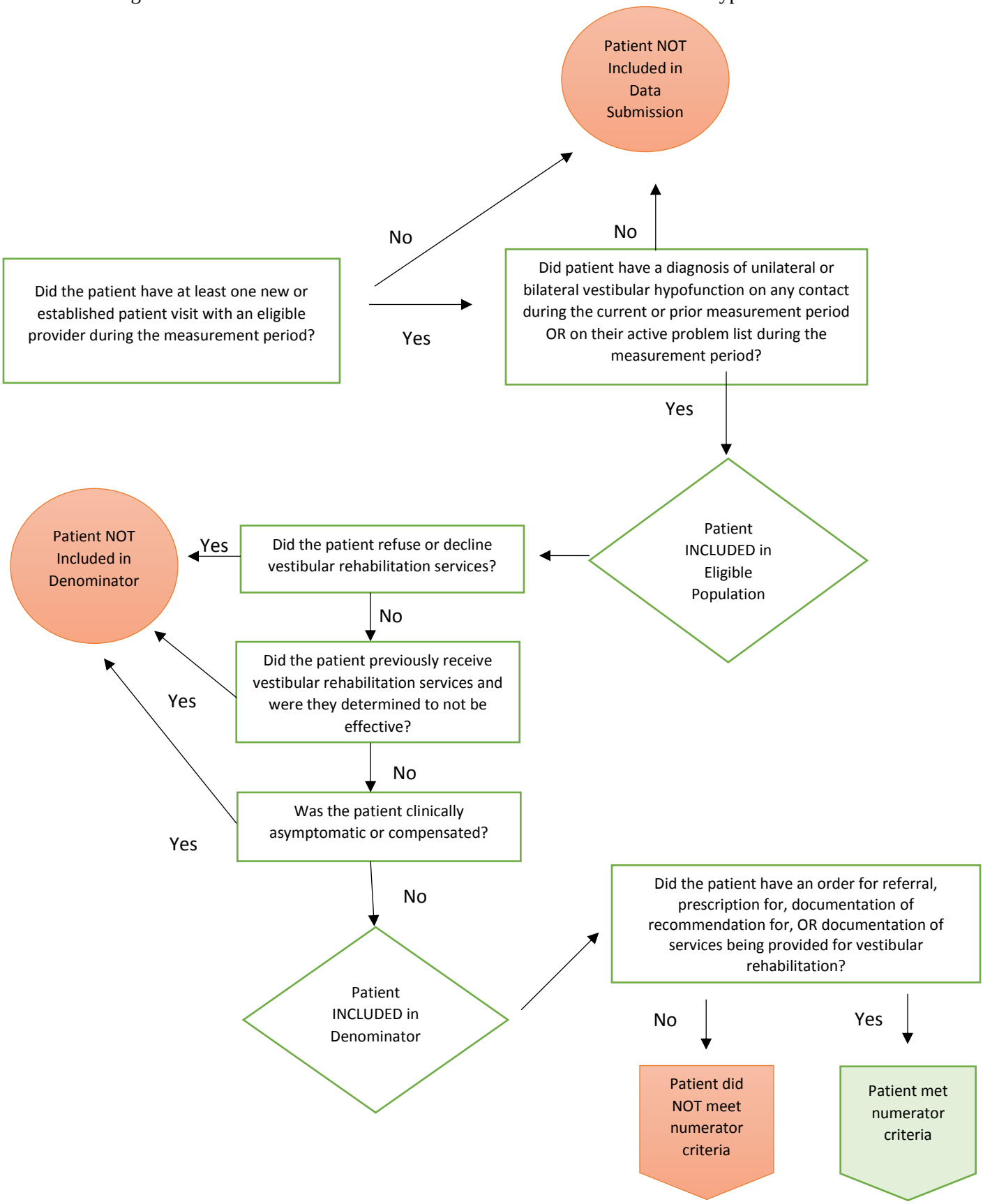
Flow Chart Diagram: Vestibular Rehabilitation for Unilateral or Bilateral Vestibular Hypofunction



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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
CPT	92537-92538	Caloric vestibular testing
CPT	92540, 92541, 92542, 92544, 92545	Basic vestibular evaluation, including (and listed individually) spontaneous nystagmus, positional nystagmus, optokinetic nystagmus, oscillating tracking
CPT	92546	Sinusoidal vertical axis rotational testing
CPT	92548	Computerized dynamic posturography
ICD-10	H83.2X1	Vestibular hypofunction (Labyrinthine dysfunction, right ear)
ICD-10	H83.2X2	Vestibular hypofunction (Labyrinthine dysfunction, left ear)
ICD-10	H83.2X3	Vestibular hypofunction (Labyrinthine dysfunction, bilateral)
ICD-10	H83.2X9	Vestibular hypofunction (Labyrinthine dysfunction, unspecified ear)
ICD-10	H81.20	Vestibular neuronitis unspecified ear
ICD-10	H81.21	Vestibular neuronitis right ear
ICD-10	H81.22	Vestibular neuronitis left ear
ICD-10	H81.23	Vestibular neuronitis bilateral
ICD-10	H81.8X1	Other disorders of vestibular function right ear
ICD-10	H81.8X2	Other disorders of vestibular function left ear
ICD-10	H81.8X3	Other disorders of vestibular function bilateral
ICD-10	H81.8X9	Other disorders of vestibular function unspecified ear
ICD-10	H81.90	Unspecified disorder of vestibular function unspecified ear
ICD-10	H81.91	Unspecified disorder of vestibular function right ear
ICD-10	H81.92	Unspecified disorder of vestibular function left ear
ICD-10	H81.93	Unspecified disorder of vestibular function bilateral

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Dix-Hallpike Maneuver Performed for Patients with BPPV

Measure Title	Dix-Hallpike Maneuver Performed for Patients with benign paroxysmal positional vertigo (BPPV)	
Description	Percentage of patients with BPPV who had a Dix-Hallpike maneuver performed.	
Measurement Period	January 1, 20xx to December 31, 20xx	
Eligible Population	**Eligible Providers**	Medical Doctor (MD), Doctor of Osteopathy (DO), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN), Physical Therapist, Occupational Therapist, Audiologist
	Care Setting(s)	Outpatient
	Ages	All
	Event	Office Visit
	Diagnosis	BPPV
Denominator	Patients diagnosed with BPPV.	
Numerator	Patients who had a Dix-Hallpike maneuver performed.	
Required Exclusions	None	
Allowable Exclusions	• Patient previously diagnosed with BPPV and who on date of encounter in calendar year does not have positional dizziness or 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) Dix-Hallpike maneuver." • 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 may be 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	

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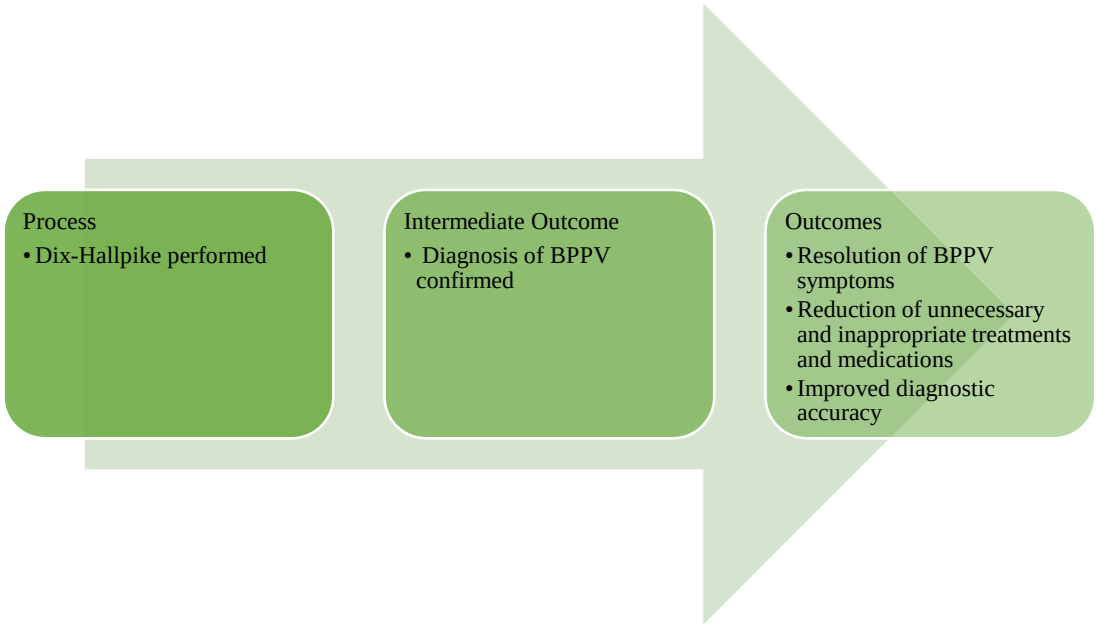
Risk Adjustment	Not Applicable
For Process Measures Relationship to Desired Outcome	The vast majority of patients with BPPV can be quickly and easily diagnosed in the office using the Dix-Hallpike maneuver.(1) By rapidly and accurately diagnosing and treating BPPV, unnecessary neuroimaging and other 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). In interviews with ED physicians, barriers to use of the maneuver included prior negative experiences or forgetting how to perform and reliance on patient history to diagnose BPPV or using the maneuver but misattributing the patterns of nystagmus.(3) 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 (4). 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 (4).
Harmonization with Existing Measures	No similar measures known
References	References: 1. Bhattacharyya N, Gubbels SP, Schwartz SR, et al. Clinical Practice Guideline: Benign Paroxysmal Positional Vertigo (Update). Otolaryngol Head Neck Surg. 2017;156(3_suppl):S1-S47 2. Kerber KA, Burke JF, Skolarus LE, et al. Use of BPPV processes in emergency department dizziness presentations: a population-based study. Otolaryngol Head Neck Surg. 2013; 148(3):425-430.

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	3. Kerber KA, Forman J, Damschroder L, et al. Barriers and facilitators to ED physician use of the test and treatment for BPPV. Neurology: Clinical Practice. 2017;7(3):214-224. 4. von Brevern M, Radtke A, Lezius F. Epidemiology of benign paroxysmal positional vertigo: a population based study. J Neurol Neurosurg Psychiatry. 2007;78(7):710-715. 5. Roberts RA, Abrams H, Sembach MK, et al. Utility measures of health-related quality of life in patients treated for benign paroxysmal positional vertigo. Ear Hear. 2009;30:369-376.

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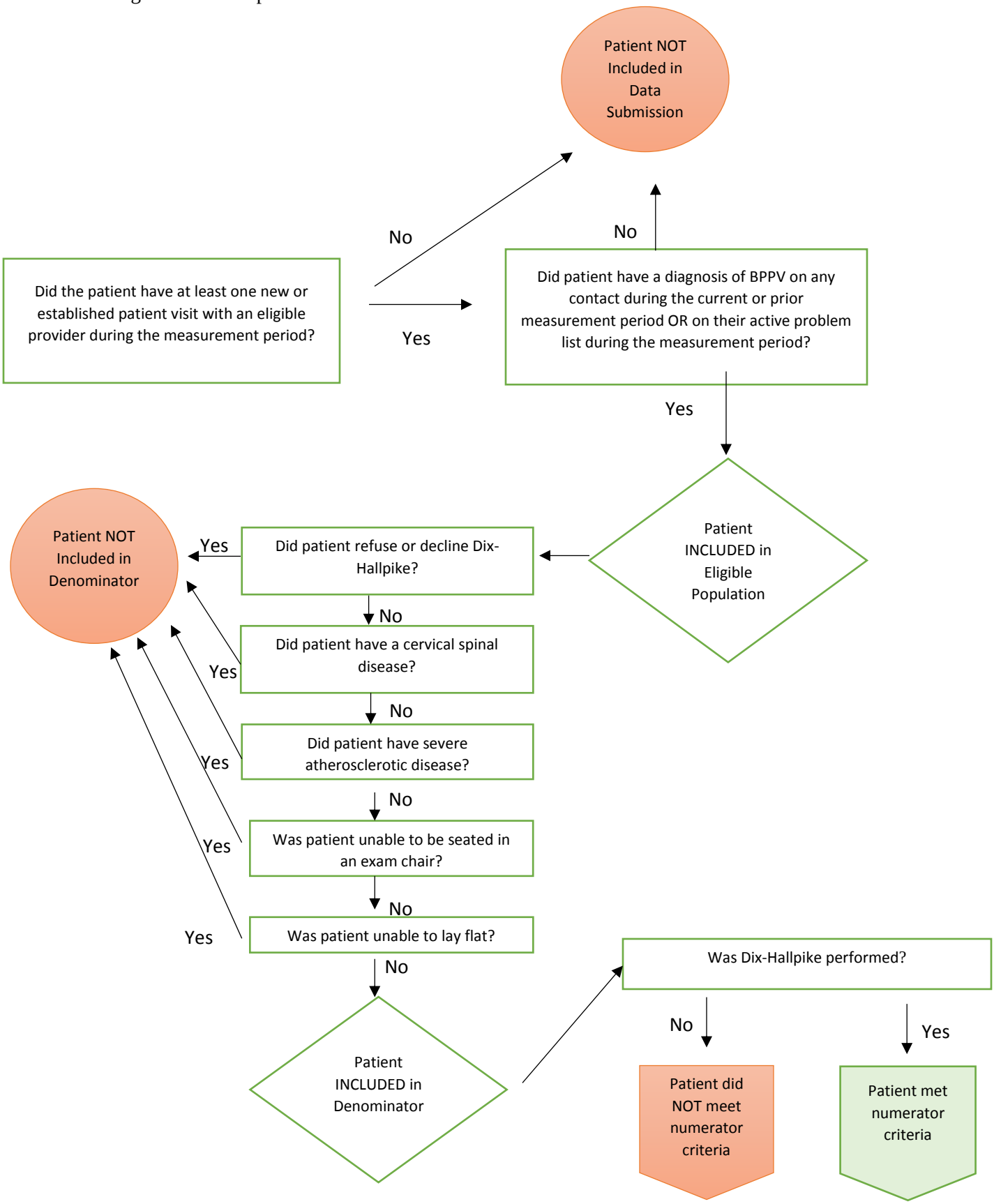
Flow Chart Diagram: Dix-Hallpike Maneuver Performed for Patients with BPPV



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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
CPT	92542	Positional nystagmus test
CPT	97165,97166,97167	Occupational therapy low, moderate, and high evaluation
CPT	97168	Occupational therapy reevaluation
CPT	97161,97162,97163	Physical therapy low, moderate, and high evaluation
CPT	97164	Physical therapy reevaluation
ICD-10	H81.1	Benign paroxysmal positional vertigo
ICD-10	H81.10	Benign paroxysmal positional vertigo unspecified ear
ICD-10	H81.11	Benign paroxysmal positional vertigo right ear
ICD-10	H81.12	Benign paroxysmal positional vertigo left ear
ICD-10	H81.13	Benign paroxysmal positional vertigo bilateral

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Canalith Repositioning Procedure Performed for Patients with Posterior Canal BPPV

Measure Title	Canalith Repositioning Procedure Performed for Patients with Posterior Canal BPPV	
Description	Percentage of patients diagnosed with posterior canal BPPV who had therapeutic canalith repositioning procedure (CRP) performed or who were referred for physical therapy or to a provider who can perform CRP.	
Measurement Period	January 1, 20xx to December 31, 20xx	
Eligible Population	**Eligible Providers**	Medical Doctor (MD), Doctor of Osteopathy (DO), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN), Physical Therapist, Occupational Therapist, Audiologist
	Care Setting(s)	Outpatient
	Ages	All
	Event	Office Visit
	Diagnosis	Posterior Canal BPPV
Denominator	Patients diagnosed with posterior canal BPPV	
Numerator	Therapeutic CRP performed or referred for physical therapy or to a provider who can perform CRP.	
Required Exclusions	None	
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, spinal fractures) • 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.	
Measure Scoring	Percentage	
Interpretation of Score	Higher Score Indicates Better Quality	
Measure Type	Process	
Level of Measurement	Provider	
Risk Adjustment	Not Applicable	

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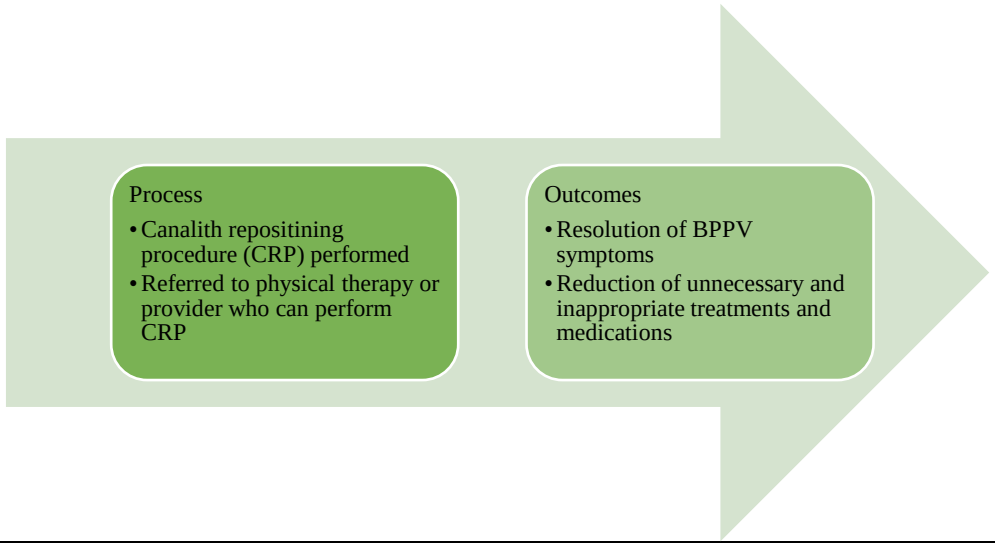
For Process Measures Relationship to Desired Outcome	
Opportunity to Improve Gap in Care	Despite the known efficacy of CRP, current implementation rates for CRP in practice are not known. Consistent and timely application of the appropriate maneuver to treat symptoms in this patient population will improve 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: 1. Bhattacharyya N, Gubbels SP, Schwartz SR, et al. Clinical Practice Guideline: Benign Paroxysmal Positional Vertigo (Update). Otolaryngol Head Neck Surg. 2017;156(3_suppl):S1-S47. 2. Helminski JO, Zee DS, Janssen I , Hain TC. Effectiveness of particle repositioning maneuvers in the treatment of benign paroxysmal positional vertigo: a systematic review. Phys Ther2010; 90 (5):663-678. 3. Hilton MP, Pinder DK. The Epley (canalith repositioning manoeuvre for benign paroxysmal positional vertigo. Cochrane Database Syst Rev. 2014;(12):CD003162.

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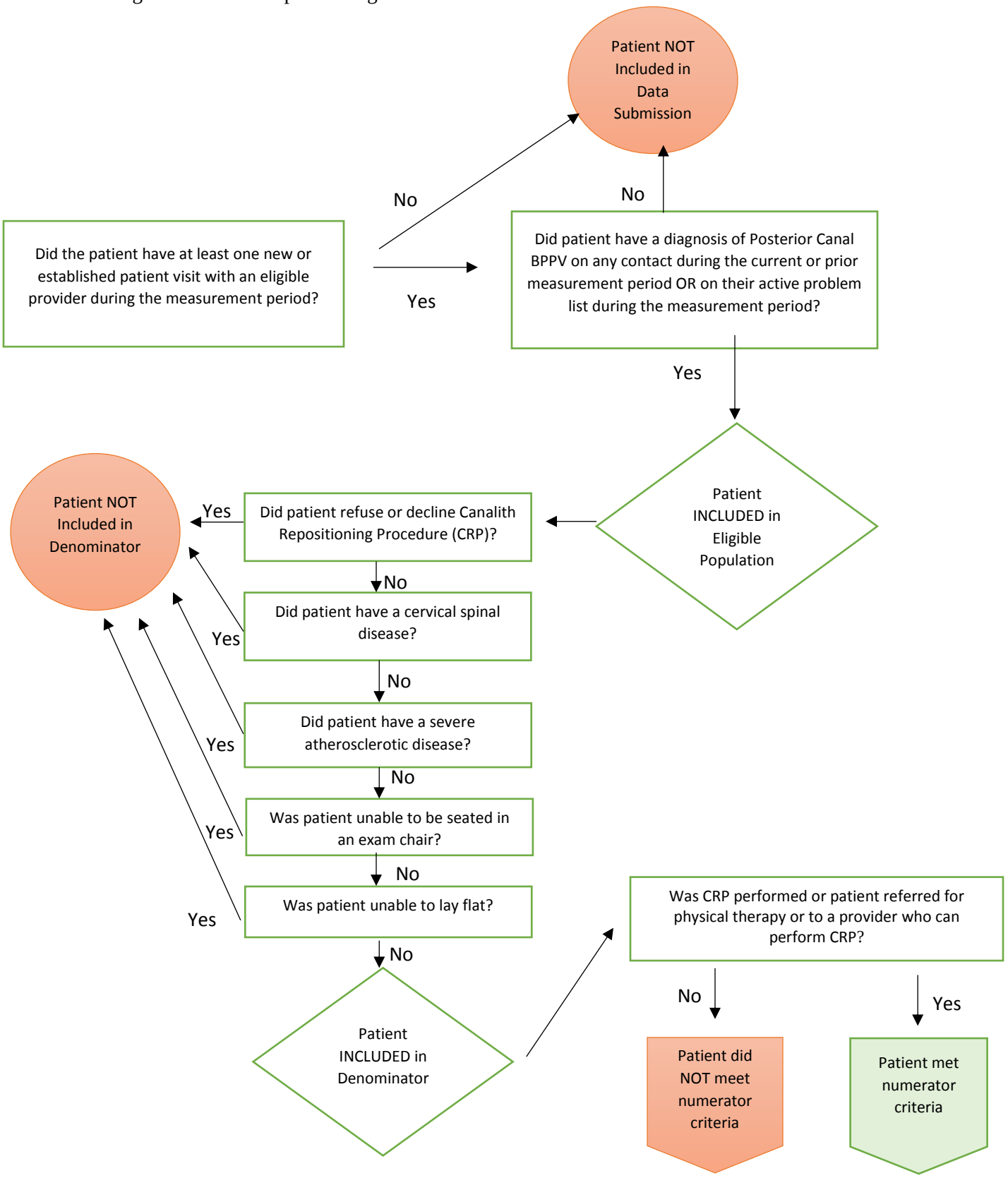
Flow Chart Diagram: Canalith Repositioning Procedure Performed for Patients with Posterior Canal BPPV



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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
CPT	97165,97166,97167	Occupational therapy low, moderate, and high evaluation
CPT	97168	Occupational therapy reevaluation
CPT	97161,97162,97163	Physical therapy low, moderate, and high evaluation
CPT	97164	Physical therapy reevaluation
CPT	95992	Canalith Repositioning Procedure(s) (e.g., Epley maneuver, Semont maneuver), per day
		Search term “Posterior Canal” AND
ICD-10	H81.1	Benign paroxysmal positional vertigo
ICD-10	H81.10	Benign paroxysmal positional vertigo unspecified ear
ICD-10	H81.11	Benign paroxysmal positional vertigo right ear
ICD-10	H81.12	Benign paroxysmal positional vertigo left ear
ICD-10	H81.13	Benign paroxysmal positional vertigo bilateral

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Standard BPPV Management

Measure Title	Standard BPPV Management	
Description	Percentage of BPPV patients who received vestibular testing, imaging, and antihistamine or benzodiazepine medications. ***A lower score is indicative of better quality.**	
Measurement Period	January 1, 20xx to December 31, 20xx	
Eligible Population	**Eligible Providers**	Medical Doctor (MD), Doctor of Osteopathy (DO), Physician Assistant (PA), Advanced Practice Registered Nurse (APRN), Physical Therapist, Occupational Therapist, Audiologist
	Care Setting(s)	Outpatient
	Ages	All
	Event	Office Visit
	Diagnosis	BPPV
Denominator (for all 4 numerator components)	Patients diagnosed with BPPV	
Numerator	A. Patients with BPPV referred for vestibular testing^ by the encounter provider. ^Vestibular testing is defined as a basic vestibular evaluation, and/or caloric testing, and/or VEMP testing, and/or rotary chair testing, and/or posturography, and/or 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." • Patients who have comorbid neurotology disorders. • 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	

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	• 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 multi-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. Patients with comorbid neurotology conditions have unique considerations that make standard BPPV management difficult, and an exclusion has been created to capture the clinical indications for this population. 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 multi-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)
Measure Scoring	Percentage
Interpretation of Score	Lower Score Indicates Better Quality

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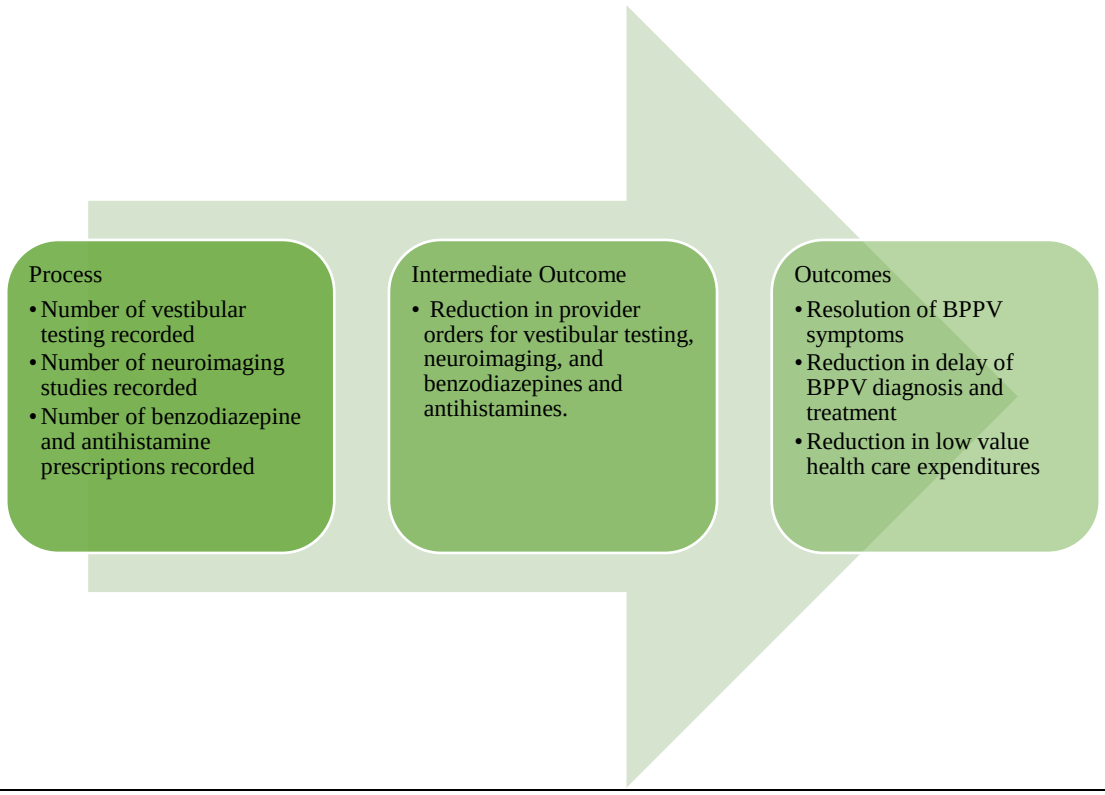
Measure Type	Process
Level of Measurement	Provider
Risk Adjustment	Not Applicable
For Process Measures Relationship to Desired Outcome	This measure is intended to reduce vestibular testing, inappropriate imaging, and medication use. The measure is intended to focus on typical patients with BPPV, but 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). 
Opportunity to Improve Gap in Care	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.
Harmonization with Existing Measures	No similar measures known
References	References:

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	1. Bhattacharyya N, Gubbels SP, Schwartz SR, et al. Clinical Practice Guideline: Benign Paroxysmal Positional Vertigo (Update). Otolaryngol Head Neck Surg. 2017;156(3_suppl):S1-S47. 2. Phillips JS, FitzGerald JE, Bath AP. The role of the vestibular assessment. J Laryngol Otol. 2009;123:1212-1215. 3. Grill E, Strupp M, Müller M, et al. Health services utilization of patients with vertigo in primary care: a retrospective cohort study. J Neurol. 2014;261:1492-1498.

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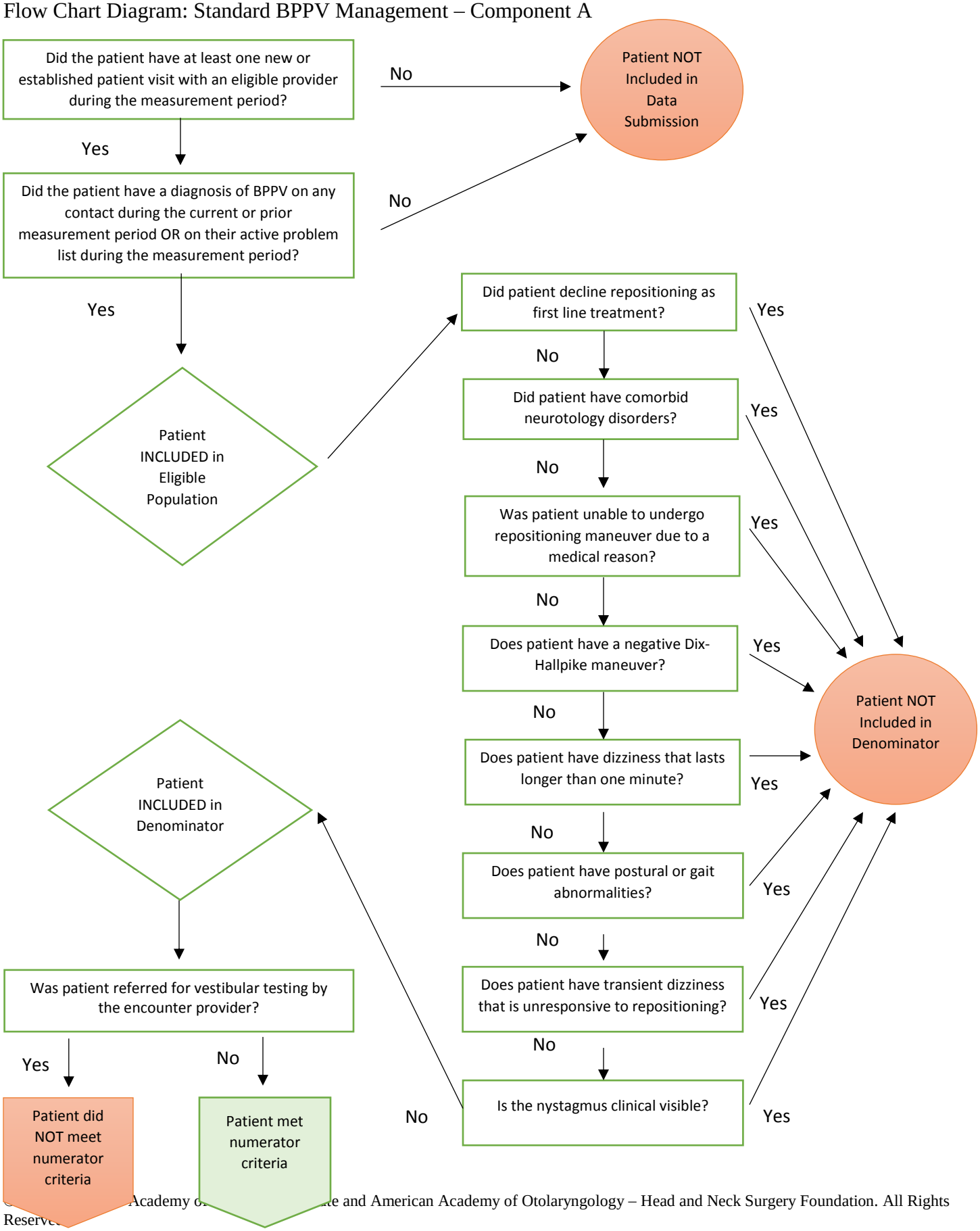
Flow Chart Diagram: Standard BPPV Management – Component A



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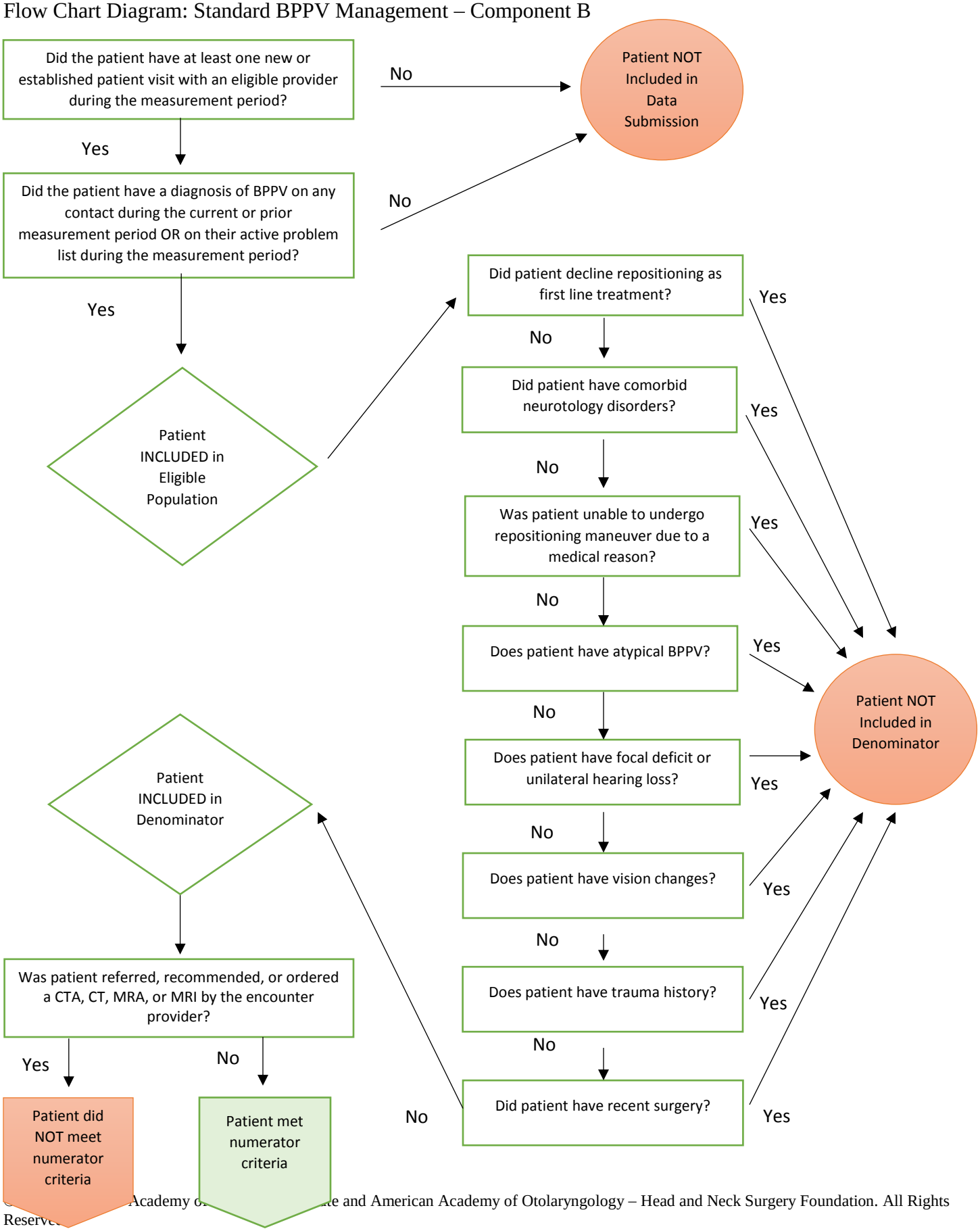
Flow Chart Diagram: Standard BPPV Management – Component B



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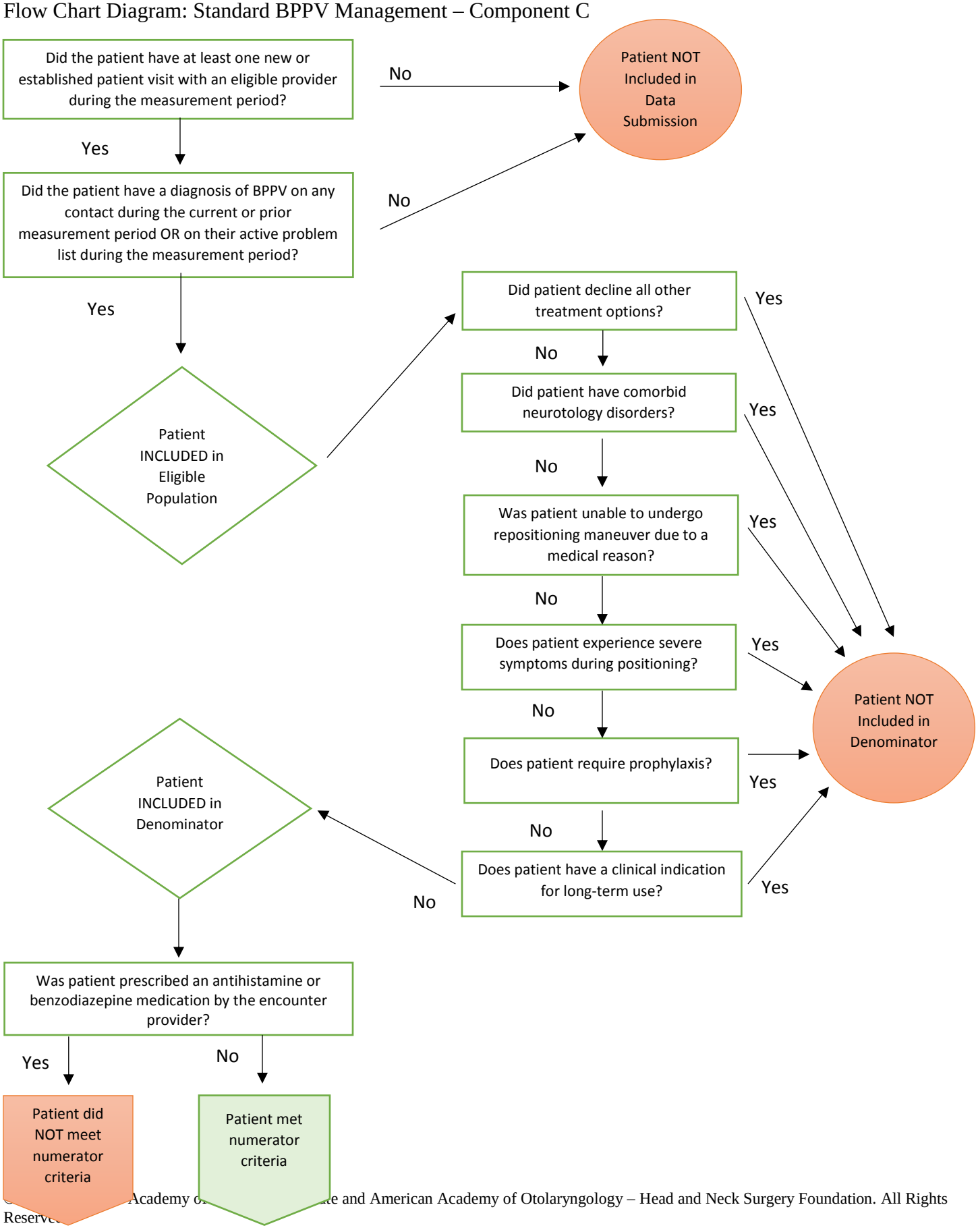
Flow Chart Diagram: Standard BPPV Management – Component C



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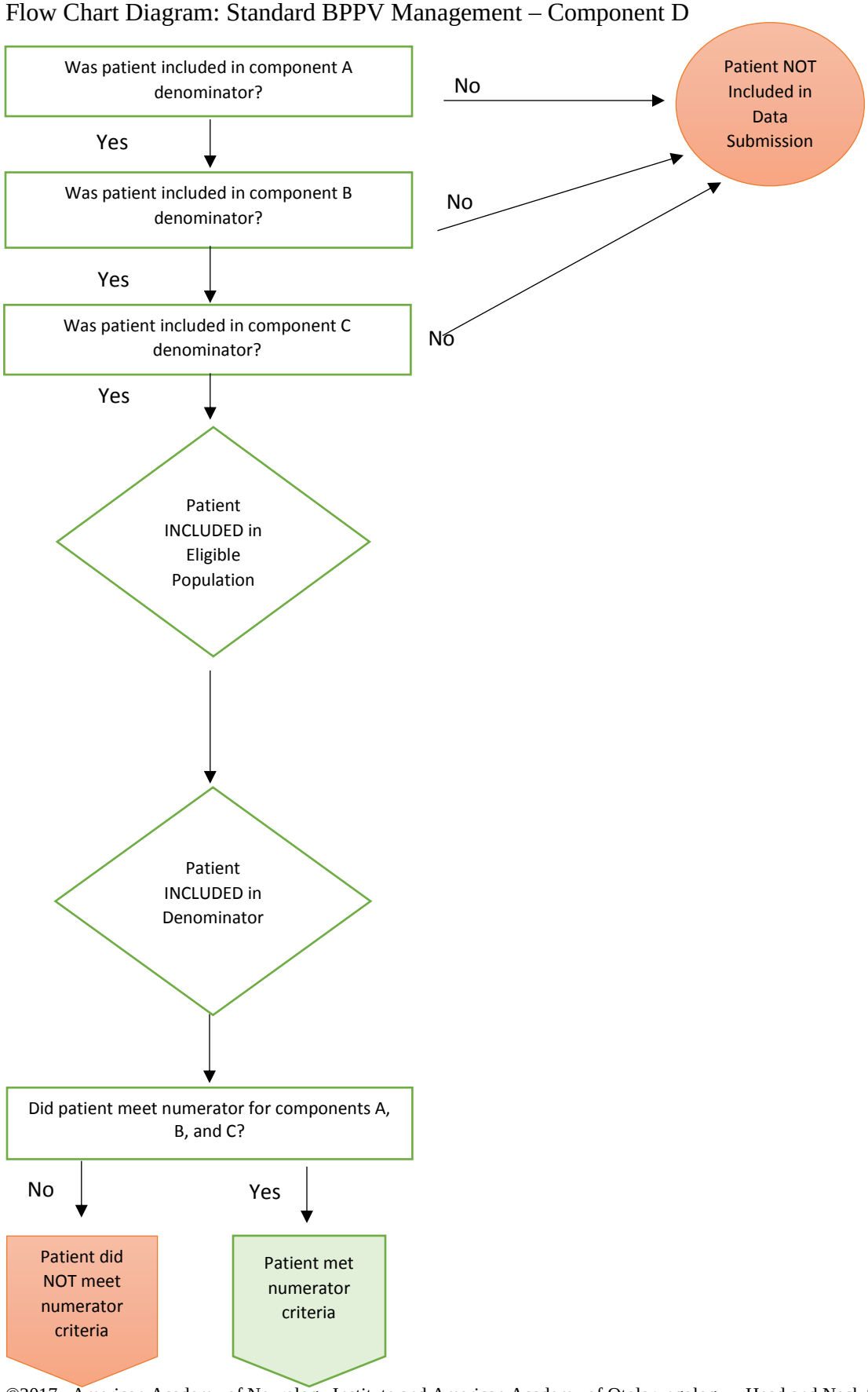
Flow Chart Diagram: Standard BPPV Management – Component D



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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
CPT	92543	Caloric Vestibular Test
CPT	92537	Caloric vestibular test with recording, bilateral; bithermal
CPT	92538	Caloric vestibular test with recording, bilateral; monthermal
CPT	92540, 92541, 92544, 92545	Basic vestibular evaluation, including (and listed individually) spontaneous nystagmus, optokinetic nystagmus, oscillating tracking
CPT	92546	Sinusoidal vertical axis rotational testing
CPT	92548	Computerized dynamic posturography
CPT	92700	Unlisted (used for VEMP)
CPT	97165,97166,97167	Occupational therapy low, moderate, and high evaluation
CPT	97168	Occupational therapy reevaluation
CPT	97161,97162,97163	Physical therapy low, moderate, and high evaluation
CPT	97164	Physical therapy reevaluation
ICD-10	H81.1	Benign paroxysmal positional vertigo
ICD-10	H81.10	Benign paroxysmal positional vertigo unspecified ear
ICD-10	H81.11	Benign paroxysmal positional vertigo right ear
ICD-10	H81.12	Benign paroxysmal positional vertigo left ear
ICD-10	H81.13	Benign paroxysmal positional vertigo bilateral

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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 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.

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Appendix B Disclosures

Work Group Member	Disclosures
Yuri Agrawal, MD	Recipient of NIH K23 and R03 grants, consultant to AARP.
Susan Barthel	No disclosures.
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Erika Woodson, MD, FACS	No disclosures relevant for this project.
David Zapala, PhD	No disclosures.

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