

Corporate Medical Policy

Vestibular Function Testing

File Name: vestibular_function_testing
Origination: 5/2017
Last Review: 2/2024

Description of Procedure or Service

Dizziness, vertigo, and balance impairments can arise from a loss of vestibular function. A number of established laboratory-based tests are used to evaluate whether the symptoms are due to dysfunction of the semicircular canals. These tests are based on the vestibulo-ocular reflex, which is an involuntary movement of the eyes (nystagmus) in response to vestibular stimulation. Established laboratory tests include electronystagmography (ENG) and videonystagmography (VNG) test batteries, caloric stimulation, and rotational chair testing. Vestibular evoked myogenic potentials (VEMPs), triggered by sound and vibration, are also being evaluated for the diagnosis of otolith dysfunction.

Vertigo

The vestibular system is an important component in balance control. It includes 5 end organs, 3 semicircular canals sensitive to head rotations, and 2 otolith organs (sacculae, utricle) that sense gravity and straight-line (forward, backward, left, right, downward or upward) accelerations. Vertigo is the primary symptom of vestibular dysfunction. It can be experienced as illusory movements such as spinning, swaying, or tilting. Vertigo may be associated with a feeling of being pushed or pulled to the ground, blurred vision, nausea and vomiting, or postural and gait instability. Vertigo may arise from damage or dysfunction of the vestibular labyrinth, vestibular nerve, or central vestibular structures in the brainstem.

Vertigo may be caused by loose particles (otoconia) from the otolith organs that pass into one of the semicircular canals, most frequently the posterior canal. Specific head movements cause the particle to stimulate the canal, causing brief benign paroxysmal positional vertigo (BPPV).

Diagnosis

Brief BPPV can usually be diagnosed clinically based on history of positional vertigo, response to the Dix-Hallpike maneuver or lateral roll tests, and resolution of symptoms with canal repositioning maneuvers.

If vertigo cannot be attributed to BPPV based on history, symptoms, or response to the standard maneuvers, a number of laboratory-based tests can be used to determine whether the vertigo is due to loss of vestibular function. These tests are based on the vestibulo-ocular reflex, which is an involuntary beating movement of the eyes (nystagmus) in response to vestibular stimulation. Nystagmus induced by these tests can help to distinguish between central and peripheral etiologies, in addition to determining whether the deficit is unilateral or bilateral. The typical tests include the electronystagmography (ENG) or videonystagmography (VNG) test batteries, caloric testing, and rotational chair testing.

ENG/VNG Test Batteries

The ENG/VNG test batteries include oculomotor evaluation and positional testing. ENG uses electrodes at the canthus of the eyes to detect nystagmus while VNG uses infrared video monitoring with goggles to measure nystagmus.

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Caloric Testing

Caloric testing evaluates unilateral vestibular function. In the caloric test, warm or cold water or warm or cold air, is introduced into each of the external ear canals. In some descriptions, caloric testing is conducted as part of ENG/VNG test batteries.

Rotational Chair Testing

The rotational chair test evaluates bilateral vestibular function. Rotational chair devices include a lightproof booth, computer-driven chair with a head restraint that rotates around a vertical axis, ENG recording, an infrared camera, and a 2-way communication system. Typically, the chair is rotated in 4 different patterns, constant acceleration followed by deceleration, rotating followed by a rapid stop, rotating at progressively increasing velocities, and alternating directions.

Passive rotational testing without a rotational chair may be performed when the rotational chair is not available. For the head impulse test, the individual is instructed to keep his or her eyes on a target. The examiner then turns the head rapidly by about 15°. With passive whole body testing the examiner rotates the whole body to the rhythm of a metronome.

Vestibular Evoked Myogenic Potential Testing

Vestibular evoked myogenic potential (VEMP) tests are newer techniques that use loud sound (e.g., click, tone burst) or bone vibration (e.g., tendon hammer tap to the forehead or mastoid) to assess otolith function. Both the saccule and utricle are sensitive to sound as well as vibration and movement.

Cervical VEMPs (cVEMPs) are measured by surface electrodes on the ipsilateral sternocleidomastoid (SCM) muscle in the neck and are thought to originate primarily in the saccule. Abnormality in any part of the auditory cVEMP pathway (saccule, inferior vestibular nerve, vestibular nucleus, medial vestibulospinal tract, the accessory nucleus, the eleventh nerve, SCM) can affect the response.

Ocular VEMPs (oVEMPs) detect subtle activity of an extraocular muscle using surface electrodes under the contralateral eye during an upward gaze, and are thought to be due primarily to stimulation of the utricle. The vestibulo-ocular reflex stimulated by sound or vibration is very small, but synchronous bursts of activity of the extraocular muscles can be detected by electromyography. Lesions that affect the oVEMP may occur in the utricle, superior vestibular nerve, vestibular nucleus, and the crossed vestibulo-ocular reflex pathways.

Dynamic Posturography

Dynamic posturography may also be used to evaluate balance. Dynamic posturography is discussed in a separate policy.

Treatment

The central vestibular system is able to compensate for loss of peripheral vestibular function. Thus, the primary therapy for peripheral vestibular dysfunction is exercise-based and includes exercises to promote gaze stability, habituate symptoms, and improve balance and gait. Medications such as vestibular suppressants or antiemetics may be used in the acute stage but are not recommended for chronic use. For individuals who have recurrent symptoms uncontrolled by other methods, a surgical or ablative approach may be used. The objective of the ablative approach is to stabilize the deficit to allow central compensation.

Regulatory Status

Vestibular analysis devices are currently regulated by the Food and Drug Administration (FDA) through the 510(k) pathway. The term “vestibular analysis devices” includes both diagnostic devices (e.g., rotary chairs, multiaxial chairs) and therapeutic devices (e.g., balance training and balance rehabilitation devices). Some devices indicated for diagnostic testing include:

- Gyrostim (UltraTera Technologies, 2022)
- Orion (Interacoustis A/S, 2020)

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- TRV (Interacoustics A/S, 2020)
- ICS Impulse® (Otometrics, 2013)
- Sway Balance™ (Sway Medical [Capacity Sports], 2012)
- Nydiag 200 Rotary Chair (Interacoustics A/S, 2010)
- Epley Omniax® (Vesticon, 2008)
- VMT System (Target Health, 1998)
- VORTEQ™ (Vestibular Ocular Reflex Test Equipment, Micromedical Technologies, 1989)
- RVT-50 Rotary Chair for Vestibular Testing (ICS Medical, 1987)
- EquiTest® (Natus Medical [NeuroCom International], 1985)
- Chair, Vestibular, Rotary, Computerized (Contraves, 1978)

An example of equipment used for vestibular evoked myogenic potentials is the Bio-Logic Nav-Pro (Bio-logic Systems Corp), which in 2003 was cleared for marketing by FDA through the 510(k) process for use in recording and displaying human physiologic data, and for auditory screening and assisting in evaluation of auditory and hearing-related disorders using auditory brainstem responses recorded from electroencephalography electrodes placed on the scalp.

Related Policies

Dynamic Posturography

*****Note: This Medical Policy is complex and technical. For questions concerning the technical language and/or specific clinical indications for its use, please consult your physician.**

Policy

BCBSNC will provide coverage for vestibular function testing when it is determined to be medically necessary because the medical criteria and guidelines noted below are met.

Benefits Application

This medical policy relates only to the services or supplies described herein. Please refer to the Member's Benefit Booklet for availability of benefits. Member's benefits may vary according to benefit design; therefore member benefit language should be reviewed before applying the terms of this medical policy.

When Vestibular Function Testing is covered

Vestibular function testing using electronystagmography and videonystagmography testing batteries, caloric testing, or rotational chair testing may be considered **medically necessary** when the following conditions have been met:

- The individual has symptoms of a vestibular disorder (e.g., dizziness, vertigo, imbalance); AND
- A clinical evaluation, including maneuvers such as the Dix-Hallpike test if indicated, has failed to identify the cause of the symptoms.

Vestibular evoked myogenic potential (VEMP) tests may be considered **medically necessary** in the diagnostic evaluation of suspected superior semicircular canal dehiscence.

When Vestibular Function Testing is not covered

Vestibular evoked myogenic potential (VEMP) tests are considered **investigational** for all other indications except as outlined in the when covered section.

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Vestibular function testing for the assessment of typical benign paroxysmal positional vertigo that can be diagnosed clinically is **not medically necessary**.

Repeat vestibular function testing when treatment resolves symptoms is **not medically necessary**.

Vestibular function testing in all other situations is **investigational**.

All other laboratory-based vestibular function tests not described above are considered **investigational**.

Policy Guidelines

For individuals who have a suspected vestibular disorder not clinically diagnosed as benign paroxysmal positional vertigo who receive ENG/VNG test batteries, caloric testing, or rotational chair testing, the evidence includes technology assessments of a large body of literature. Relevant outcomes are test accuracy, symptoms, functional outcomes, and quality of life. Based on review of controlled studies, caloric testing was given a level A recommendation that this test was predictive of loss of vestibular function. Based on a prospective study assessing a narrow spectrum of patients with the suspected vestibular dysfunction and a well-designed retrospective study, which included a criterion standard test, rotational chair testing was also given a level A recommendation. These tests are both considered criterion standard tests of vestibular function. ENG/VNG test batteries, which may include caloric testing, are also established methods of assessing loss of vestibular function. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have a suspected vestibular disorder not clinically diagnosed as benign paroxysmal positional vertigo who receive VEMP testing, the evidence includes mainly association studies. Relevant outcomes are test accuracy, symptoms, functional outcomes, and quality of life. There is a large and rapidly growing literature on VEMP tests for the assessment of otolith function, although most studies have assessed how the cervical VEMP and ocular VEMP change with various disease states. Studies on diagnostic accuracy and clinical utility of this technique for evaluating otolith organs and central pathways are needed in the appropriate populations. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have clinically diagnosed benign paroxysmal positional vertigo (BPPV) with typical presentation who receive laboratory-based vestibular function testing, the evidence includes technology assessments and practice guidelines. Relevant outcomes are test accuracy, symptoms, functional outcomes, and quality of life. BPPV with a typical presentation can be diagnosed clinically based on history, the Dix-Hallpike maneuver, lateral roll test, and canalith repositioning procedures; thus, laboratory-based vestibular function testing does not add diagnostic information in such routine cases. The evidence is sufficient to determine that the technology is unlikely to improve the net health outcome.

The American Academy of Neurology published a practice guideline on cervical and ocular vestibular evoked myogenic potential testing in 2017 and later reaffirmed in 2021 (Fife, 2017). The guideline was based on a review of nine controlled non-randomized studies. The guideline panel stated that cervical or ocular VEMP is possibly useful for distinguishing individuals with superior canal dehiscence syndrome (SCDS) from controls. The guideline stated that evidence is insufficient to determine whether VEMP is useful for diagnosing vestibular neuritis or Ménière disease. Additionally the guideline stated that it has not been demonstrated that VEMP is useful for diagnosing or managing vestibular migraine.

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Billing/Coding/Physician Documentation Information

This policy may apply to the following codes. Inclusion of a code in this section does not guarantee that it will be reimbursed. For further information on reimbursement guidelines, please see Administrative Policies on the Blue Cross Blue Shield of North Carolina web site at www.bcbsnc.com. They are listed in the Category Search on the Medical Policy search page.

CODING

The following codes may be used for evaluation of vestibular function under electronystagmography (ENG) and videonystagmography (VNG) testing batteries, caloric testing, rotational chair, and vestibular evoked myogenic potential (VEMP) testing.

ENG/VNG Testing Batteries

The ENG/VNG testing batteries may include caloric testing, positional tests, and oculomotor evaluation (i.e., spontaneous nystagmus including gaze-evoked nystagmus, positional nystagmus, optokinetic nystagmus, smooth pursuit tracking, saccade test).

The following codes may be used: 92537, 92538, 92540, 92541, 92542, 92544, 92545, 92546, and 92547.

Vestibular Evoked Myogenic Potential Testing: 92517, 92518, 92519.

ICD-10: A88.1, H81.01 – H82.9, and R42.

BCBSNC may request medical records for determination of medical necessity. When medical records are requested, letters of support and/or explanation are often useful, but are not sufficient documentation unless all specific information needed to make a medical necessity determination is included.

Scientific Background and Reference Sources

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.104, 3/9/2017

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.104, 2/8/2018

Specialty Matched Consultant Advisory Panel 2/2018

Specialty Matched Consultant Advisory Panel 2/2019

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.104, 2/14/2019

Specialty Matched Consultant Advisory Panel 2/2020

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.104, 2/13/2020

Specialty Matched Consultant Advisory Panel 2/2021

Fife TD, Colebatch JG, Kerber KA, et al. Practice guideline: Cervical and ocular vestibular evoked myogenic potential testing: Report of the Guideline Development, Dissemination, and Implementation Subcommittee of the American Academy of Neurology. *Neurology*. 2017; 89(22):2288-2296.

Medical Director review 4/2021

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.104, 2/11/2021

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Specialty Matched Consultant Advisory Panel 2/2022

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Fife TD, Tusa RJ, Furman JM, et al. Assessment: vestibular testing techniques in adults and children: report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. *Neurology*. Nov 28 2000; 55(10): 1431-41. PMID 11094095

Schubert MC. Vestibular function tests. In: Herdman SJ, Clendaniel RA, eds. *Vestibular Rehabilitation. Vol Contemporary Perspectives in Rehabilitation*: F.A. Davis; 2014:178-194.

Halmagyi GM, Curthoys IS. Otolith function tests. In: Herdman SJ, Clendaniel RA, eds. *Vestibular Rehabilitation. Vol Contemporary Perspectives in Rehabilitation*: F.A. Davis; 2014:195-225.

Hall CD, Herdman SJ, Whitney SL, et al. Vestibular Rehabilitation for Peripheral Vestibular Hypofunction: An Evidence-Based Clinical Practice Guideline: From The American Physical Therapy Association Neurology Section. *J Neurol Phys Ther*. Apr 2016; 40(2): 124-55. PMID 26913496

US Food and Drug Administration. 510(k) Premarket Notification. US Department of Health and Human Services website. <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm>.

Specialty Matched Consultant Advisory Panel 2/2024

Medical Director Review 2/2024

Policy Implementation/Update Information

- 5/26/17 New policy developed. Vestibular function testing with electronystagography/ videonystagmography, caloric test, and rotational chair test for suspected vestibular dysfunction is considered medically necessary when criteria are met. Vestibular evoked myogenic potentials are considered investigational. Vestibular function testing for benign paroxysmal positional vertigo is not medically necessary. Notification given 5/26/2017 for effective date 7/28/2017. (sk)
- 7/13/18 Reference added. Specialty Matched Consultant Advisory Panel review 2/28/2018. (sk)
- 7/16/19 Specialty Matched Consultant Advisory Panel review 2/20/2019. Reference added. (sk)
- 6/30/20 Specialty Matched Consultant Advisory Panel review 2/19/2020. (sk)
- 12/31/20 Reference added. New codes 92517, 92518, and 92519 added to Billing/Coding section effective 1/1/2021. (sk)
- 5/18/21 Specialty Matched Consultant Advisory Panel review 2/17/2021. Medical Director review. When Covered section updated with medically necessary statement for Vestibular Evoked Myogenic Potentials (VEMP). (sk)
- 3/8/22 Reference added. Code 92700 deleted from Billing/Coding section. Specialty Matched Consultant Advisory Panel review 2/16/2022. (sk)
- 3/7/23 Specialty Matched Consultant Advisory Panel review 2/15/2023. (sk)

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3/20/24 Regulatory Status and References updated. Added Related Policy. Specialty Matched Consultant Advisory Panel review 2/2024. Medical Director review 2/2024. (ldh)

Medical policy is not an authorization, certification, explanation of benefits or a contract. Benefits and eligibility are determined before medical guidelines and payment guidelines are applied. Benefits are determined by the group contract and subscriber certificate that is in effect at the time services are rendered. This document is solely provided for informational purposes only and is based on research of current medical literature and review of common medical practices in the treatment and diagnosis of disease. Medical practices and knowledge are constantly changing and BCBSNC reserves the right to review and revise its medical policies periodically.