



Louisiana

Vestibular Function Testing

Policy # 00556

Original Effective Date: 04/19/2017

Current Effective Date: 05/10/2021

Applies to all products administered or underwritten by Blue Cross and Blue Shield of Louisiana and its subsidiary, HMO Louisiana, Inc. (collectively referred to as the "Company"), unless otherwise provided in the applicable contract. Medical technology is constantly evolving, and we reserve the right to review and update Medical Policy periodically.

When Services May Be Eligible for Coverage

Coverage for eligible medical treatments or procedures, drugs, devices or biological products may be provided only if:

- *Benefits are available in the member's contract/certificate, and*
- *Medical necessity criteria and guidelines are met.*

Based on review of available data, the Company may consider vestibular function testing using an electronystagmography (ENG) and videonystagmography (VNG) testing batteries, caloric testing, or rotational chair testing to be **eligible for coverage**** when the following conditions have been met:

Patient Selection Criteria

Coverage eligibility will be considered when all of the following criteria have been met:

- The patient has symptoms of a vestibular disorder (eg, 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.

When Services Are Considered Not Medically Necessary

Based on review of available data, the Company considers the use of vestibular function testing for the assessment of typical benign paroxysmal positional vertigo that can be diagnosed clinically to be **not medically necessary.****

Based on review of available data, the Company considers repeat vestibular function testing when treatment resolves symptoms to be **not medically necessary.****

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When Services Are Considered Investigational

Coverage is not available for investigational medical treatments or procedures, drugs, devices or biological products.

Based on review of available data, the Company considers vestibular function testing in all other situations to be **investigational**.*

Based on review of available data, the Company considers vestibular evoked myogenic potential (VEMP) tests to be **investigational**.*

Based on review of available data, the Company considers all other laboratory-based vestibular function tests not described above to be **investigational**.*

Background/Overview

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 (sacculle, 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 1 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.

Diagnosis

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

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If vertigo cannot be attributed to benign paroxysmal positional vertigo 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.

Electronystagmography/Videonystagmography 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.

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

Rotational chair testing 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 patient 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

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Vestibular evoked myogenic potential tests are newer techniques that use loud sound (eg, click, tone burst) or bone vibration (eg, 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 are measured by surface electrodes on the ipsilateral sternocleidomastoid muscle in the neck and are thought to originate primarily in the saccule. Abnormality in any part of the auditory cervical VEMP pathway (saccule, inferior vestibular nerve, vestibular nucleus, medial vestibulospinal tract, the accessory nucleus, the eleventh nerve, sternocleidomastoid) can affect the response.

Ocular VEMPs 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 ocular VEMP 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.

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 patients who have recurrent symptoms uncontrolled by other methods, a surgical or ablative approach may be used. The objective of ablation is to stabilize the deficit to allow central compensation.

FDA or Other Governmental Regulatory Approval

U.S. Food and Drug Administration (FDA)

Vestibular analysis devices are currently regulated by the U.S. FDA through the 510(k) pathway, under FDA product code LXV. The term “vestibular analysis devices” includes both diagnostic

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devices (eg, rotary chairs, multiaxial chairs) and therapeutic devices (eg, balance training and balance rehabilitation devices). Some devices indicated for diagnostic testing are included in Table 1.

Table 1. Vestibular Analysis Devices Approved by the U.S. Food and Drug Administration

Device	Manufacturer	Date Cleared	510(k) No.
Orion	Interacoustics A/S	Aug 2020	K200529
TRV	Interacoustics A/S	May 2020	K192652
ICS ^{®‡} Impulse	Otometrics	Feb 2013	K122550
Sway Balance ^{™‡}	Sway Medical (Capacity Sports)	Sep 2012	K121590
Nydiag 200 Rotary Chair	Interacoustics A/S	Dec 2010	K102364
Epley Omniax ^{®‡}	Vesticon	Jun 2008	K071973
VMT System	Target Health	Oct 1998	K971549
VORTEQ ^{™‡} (Vestibular Ocular Reflex Test Equipment)	Micromedical Technologies	May 1989	K891008
RVT-50 Rotary Chair for Vestibular Testing	ICS Medical	Sep 1987	K872093
EquiTest ^{®‡}	Natus Medical (NeuroCom International)	Aug 1985	K851744
Chair, Vestibular, Rotary, Computerized	Contraves	Aug 1978	K781268

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 the FDA through the 510(k) process (K994149) for use in the recording and displaying of 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.

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Rationale/Source

Description

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 and videonystagmography test batteries, caloric stimulation, and rotational chair testing. VEMPs, triggered by sound and vibration, are also being evaluated for the diagnosis of otolith dysfunction.

Summary of Evidence

Undiagnosed Benign Paroxysmal Positional Vertigo

For individuals who have a suspected vestibular disorder not clinically diagnosed as benign paroxysmal positional vertigo (BPPV) who receive electronystagmography/videonystagmography 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 is 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. Electronystagmography/videonystagmography 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 BPPV 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.

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Diagnosed Benign Paroxysmal Positional Vertigo

For individuals who have clinically diagnosed 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.

Supplemental Information

Practice Guidelines and Position Statements

The purpose of the remaining sections in Supplemental Information is to provide reference material regarding existing practice guidelines and position statements, U.S. Preventive Services Task Force Recommendations and Medicare National Coverage Decisions and registered, ongoing clinical trials. Inclusion in the Supplemental Information does not imply endorsement and information may not necessarily be used in formulating the evidence review conclusions.

Guidelines or position statements will be considered for inclusion in ‘Supplemental Information if they were issued by, or jointly by, a US professional society, an international society with US representation, or National Institute for Health and Care Excellence (NICE). Priority will be given to guidelines that are informed by a systematic review, include strength of evidence ratings, and include a description of management of conflict of interest.

American Academy of Neurology

In 2000, the American Academy of Neurology (AAN) published a technology assessment on vestibular testing techniques in adults and children. The assessment compared various vestibular testing techniques (see Table 2).

Table 2. Comparison of Vestibular Test Techniques and Level of Evidence

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Technique	Advantages	Disadvantages	SOR and QOE^a
Clinical head-shaking test	Inexpensive, easily performed during examination	Nonquantitative; may not detect bilateral vestibular loss or mild unilateral vestibular loss	Class III
Vibration-induced nystagmus	Inexpensive, easily performed during examination	Nonquantitative; may not detect bilateral vestibular loss or mild unilateral vestibular loss	Class III
Clinical head thrust sign	Inexpensive, easily performed during examination	Nonquantitative; may not detect bilateral vestibular loss or mild unilateral vestibular loss	Class III
Caloric testing (ENG or infrared VNG)	“Gold standard” study for detecting unilateral vestibular loss	Intensity of caloric stimulation depends on anatomy and irrigation technique; less	Strength: A; Quality: classes II, III, IV, and expert

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Technique	Advantages	Disadvantages	SOR and QOE ^a
		sensitive and specific than rotational chair testing for bilateral vestibular loss	consensus
Rotational chair testing (computer-driven chair rotations)	“Gold standard” study for detecting bilateral vestibular loss	Not widely available; generally not effective for testing frequencies >1.0 Hz; less sensitive than caloric testing for unilateral vestibular hypofunction	Strength: A; Quality: classes II, III, IV, and expert consensus
Passive examiner-generated head rotation testing	Portable alternative to rotational chair testing	Probably not practical at frequencies >2 Hz and may be difficult for patients with neck pain; not sensitive to unilateral vestibular loss	Strength: B; Quality: class II, not yet fully accepted by expert consensus

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Technique	Advantages	Disadvantages	SOR and QOE ^a
Active head rotation (self-generated head turns)	Allows testing of vestibulo-ocular reflex from 1-5 Hz; portable; inexpensive	Normative data limited; some patients cannot rotate head sufficiently well to test at higher frequencies; may not detect partial unilateral vestibular loss	Strength: B; Quality: class II, not yet fully accepted by experts

ENG: electronystagmography; QOE: quality of evidence; SOR: strength of recommendation; VNG: videonystagmography.

^a The American Academy of Neurology strength of evidence rating system is as follows. For strength of recommendation: A: established as useful or predictive; B: probably useful or predictive. For quality of evidence: class II: Evidence provided by a prospective study of a narrow spectrum of persons with the suspected condition, or a well-designed retrospective study of a broad spectrum of persons with an established condition (by "gold standard") compared with a broad spectrum of control subjects, in which the test is applied in a blinded evaluation, and enabling the assessment of appropriate measures of diagnostic accuracy; class III: Evidence provided by a retrospective study, in which either persons with the established condition or control subjects are of a narrow spectrum, and in which the test is applied in a blinded evaluation; class IV: Any design in which the test is not applied in a blinded evaluation, OR evidence is provided by the expert opinion alone or in descriptive case series (without control subjects).

The 2017 practice guidelines from AAN assessed the diagnostic value of vestibular evoked myogenic potential testing in individuals with vestibular symptoms. The conditions of interest included superior canal dehiscence syndrome, vestibular neuritis or migraine, Meniere disease, and

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BPPV. The evidence for testing in BPPV was drawn from 2 class III studies, neither of which presented sufficient diagnostic value of vestibular evoked myogenic potential testing for the treatment to be recommended (level C evidence).

American Academy of Otolaryngology – Head and Neck Surgery

In 2008, the American Academy of Otolaryngology - Head and Neck Surgery (AAO-HNS) published practice guidelines on BPPV. The guidelines were endorsed by AAN and the American Academy of Family Physicians. The panel made strong recommendations for the diagnosis of BPPV when vertigo associated with nystagmus is provoked by the Dix-Hallpike maneuver. The panel recommended against vestibular testing, unless the diagnosis is uncertain or there are additional symptoms or signs unrelated to BPPV that warrant testing.

In 2017, the AAO-HNS updated its guidelines on BPPV, retaining the recommendation for the diagnosis of BPPV if a Dix-Hallpike maneuver elicits vertigo associated with nystagmus. The panel recommended a canalith repositioning procedure as treatment for posterior canal BPPV, although subsequent postprocedural postural restrictions were strongly warned against. Patients with symptoms similar to BPPV but for whom the Dix-Hallpike does not evoke nystagmus should be subjected to a supine roll test. Potential diagnoses of BPPV should be distinguished from confounding factors, and patients should have regular reassessment and follow-up. The panel did not recommend radiographic imaging, vestibular testing, or vestibular suppressant medications as treatment for BPPV, although disease management options for caregivers include vestibular rehabilitation and/or observation.

American Academy of Audiology

The 2009 American Academy of Audiology has a position statement on the audiologist's role in the diagnosis and treatment of vestibular disorders. Citing a 2009 scope of practice report, the Academy stated that "An audiologist is a person who, by virtue of academic degree, clinical training, and license to practice and/or professional credential, is uniquely qualified to provide a comprehensive array of professional services related to the prevention of hearing loss and the audiologic identification, assessment, diagnosis, and treatment of persons with impairment of auditory and vestibular function, and to the prevention of impairments associated with them." Evaluations of vestibular and extr vestibular systems may include:

- Video-oculography, videonystagmography, and electronystagmography
- Tests of dynamic visual acuity,

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- Tests of active and passive rotation,
- Tests of postural stability, and
- Tests of vestibular evoked myogenic potentials.

Vestibular treatment and therapy protocols that fall within the scope of practice are also described. The Academy considers vestibular function testing following treatment to be an essential part of the clinical practice.

International Federation of Clinical Neurophysiology

A 2014 expert consensus document on cervical vestibular evoked myogenic potential methods from the International Federation of Clinical Neurophysiology has stated that the clinical use of vestibular evoked myogenic potential “is evolving and questions still exist about its physiology and measurement.”

U.S. Preventive Services Task Force Recommendations

Not applicable.

Medicare National Coverage

There is no national coverage determination. In the absence of a national coverage determination, coverage decisions are left to the discretion of local Medicare carriers.

Ongoing and Unpublished Clinical Trials

Some currently ongoing trials that might influence this review are listed in Table 3.

Table 3. Summary of Key Trials

NCT No.	Trial Name	Planned Enrollment	Completion Date
<i>Ongoing</i>			
NCT02483429 ^a	Acute-Video-oculography for Vertigo in Emergency Rooms for Rapid Triage (AVERT)	226	Mar 2021

NCT: national clinical trial.

^a Denotes industry-sponsored or cosponsored trial.

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|------------|--|
| 04/06/2017 | Medical Policy Committee review |
| 04/19/2017 | Medical Policy Implementation Committee approval. New policy. |
| 04/05/2018 | Medical Policy Committee review |
| 04/18/2018 | Medical Policy Implementation Committee approval. No change to coverage. |
| 04/04/2019 | Medical Policy Committee review |
| 04/24/2019 | Medical Policy Implementation Committee approval. No change to coverage. |

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04/02/2020 Medical Policy Committee review

04/08/2020 Medical Policy Implementation Committee approval. No change to coverage.

12/11/2020 Coding update

04/01/2021 Medical Policy Committee review

04/14/2021 Medical Policy Implementation Committee approval. No change to coverage.

Next Scheduled Review Date: 04/2022

Coding

The five character codes included in the Blue Cross Blue Shield of Louisiana Medical Policy Coverage Guidelines are obtained from Current Procedural Terminology (CPT®)‡, copyright 2020 by the American Medical Association (AMA). CPT is developed by the AMA as a listing of descriptive terms and five character identifying codes and modifiers for reporting medical services and procedures performed by physician.

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CPT is a registered trademark of the American Medical Association.

Codes used to identify services associated with this policy may include (but may not be limited to) the following:

Code Type	Code
CPT	92700

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Louisiana

Vestibular Function Testing

Policy # 00556

Original Effective Date: 04/19/2017

Current Effective Date: 05/10/2021

	Add codes eff 1/1/2021: 92517, 92518, 92519
HCPCS	No codes
ICD-10 Diagnosis	A88.1, H81.01-H82.9, H81.41-H81.49, R42

*Investigational – A medical treatment, procedure, drug, device, or biological product is Investigational if the effectiveness has not been clearly tested and it has not been incorporated into standard medical practice. Any determination we make that a medical treatment, procedure, drug, device, or biological product is Investigational will be based on a consideration of the following:

- A. Whether the medical treatment, procedure, drug, device, or biological product can be lawfully marketed without approval of the U.S. Food and Drug Administration (FDA) and whether such approval has been granted at the time the medical treatment, procedure, drug, device, or biological product is sought to be furnished; or
- B. Whether the medical treatment, procedure, drug, device, or biological product requires further studies or clinical trials to determine its maximum tolerated dose, toxicity, safety, effectiveness, or effectiveness as compared with the standard means of treatment or diagnosis, must improve health outcomes, according to the consensus of opinion among experts as shown by reliable evidence, including:
 1. Consultation with the Blue Cross and Blue Shield Association technology assessment program (TEC) or other nonaffiliated technology evaluation center(s);
 2. Credible scientific evidence published in peer-reviewed medical literature generally recognized by the relevant medical community; or
 3. Reference to federal regulations.

**Medically Necessary (or “Medical Necessity”) - Health care services, treatment, procedures, equipment, drugs, devices, items or supplies that a Provider, exercising prudent clinical judgment, would provide to a patient for the purpose of preventing, evaluating, diagnosing or treating an illness, injury, disease or its symptoms, and that are:

- A. In accordance with nationally accepted standards of medical practice;
- B. Clinically appropriate, in terms of type, frequency, extent, level of care, site and duration, and considered effective for the patient's illness, injury or disease; and
- C. Not primarily for the personal comfort or convenience of the patient, physician or other health care provider, and not more costly than an alternative service or sequence of services

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at least as likely to produce equivalent therapeutic or diagnostic results as to the diagnosis or treatment of that patient's illness, injury or disease.

For these purposes, "nationally accepted standards of medical practice" means standards that are based on credible scientific evidence published in peer-reviewed medical literature generally recognized by the relevant medical community, Physician Specialty Society recommendations and the views of Physicians practicing in relevant clinical areas and any other relevant factors.

‡ Indicated trademarks are the registered trademarks of their respective owners.

NOTICE: If the Patient's health insurance contract contains language that differs from the BCBSLA Medical Policy definition noted above, the definition in the health insurance contract will be relied upon for specific coverage determinations.

NOTICE: Medical Policies are scientific based opinions, provided solely for coverage and informational purposes. Medical Policies should not be construed to suggest that the Company recommends, advocates, requires, encourages, or discourages any particular treatment, procedure, or service, or any particular course of treatment, procedure, or service.

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