# Vestibular evoked myogenic potential testing

Clinical Policy ID: CCP.1461

Recent review date: 5/2026

Next review date: 9/2027

Policy contains: Cervical and ocular vestibular evoked myogenic potential; labyrinth disorders; VEMP; vestibular disorders; vestibular function testing.



## Coverage policy

Vestibular evoked myogenic potential testing is clinically proven and, therefore, may be medically necessary to confirm the presence of superior canal dehiscence syndrome, when the results will impact treatment decisions (American Academy of Otolaryngology—Head and Neck Surgery [Bhattacharyya, 2017]; American Academy of Neurology [Fife, 2017]).

Limitations

All other indications for vestibular evoked myogenic potential testing are investigational/not clinically proven and, therefore, not medically necessary.

Alternative covered services

- Brainstem auditory evoked response.
- Caloric tests.
- Clinical examination.
- Diagnostic imaging (e.g., magnetic resonance imaging and computerized tomography).
- Electrocochleography.
- Electronystagmography.
- Otoacoustic emissions.
- Rotation tests.

- Videonystagmography.
- Other tests as indicated to help rule out causes of imbalance unrelated to the vestibular system.

## Background

Vestibular disorders result from damage to the parts of the inner ear and brain that process the sensory information involved with controlling balance and eye movements (Vestibular Disorders Association, undated). Symptoms of vestibular disorders include vertigo and dizziness, imbalance and spatial disorientation, vision disturbance, hearing changes, cognitive and/or psychological changes, and other symptoms such as nausea and vomiting, motion sickness, and headaches.

Vestibular disorders are more common among the elderly, persons with diabetes, and persons with existing sensory disorders. They can adversely impact quality of life, activities of daily living and are associated with an increased risk of clinically significant outcomes (e.g., falls). In children, vestibular deficits can impair motor development and balance, and affect gaze stability that interferes with learning to read (Vestibular Disorders Association, undated).

Etiologies include disease or injury to these sensory processing areas, genetic or environmental conditions, or unknown reasons (Vestibular Disorders Association, undated). Causes of vestibular dysfunction can be classified as peripheral (affecting the vestibular system) or central (central nervous system proper). In adults, stroke and demyelinating diseases are the most common etiologies of central origin. Benign paroxysmal positional vertigo is the most common peripheral vestibular disorder and may account for up to 20% of vertigo presentations to dizziness clinics (Dougherty, 2022). In children, vestibular migraine, benign paroxysmal positional vertigo, and vestibular neuritis are the three most common forms (Gioacchini, 2014). Other vestibular disorders include labyrinthitis and vestibular neuritis, Ménière's disease, secondary endolymphatic hydrops, and perilymph fistula, superior canal dehiscence, acoustic neuroma, ototoxicity, enlarged vestibular aqueduct syndrome, and mal de débarquement (Vestibular Disorders Association, undated).

Assessment of vestibular disorders involves testing of auditory, visual, and somatosensory systems that absorb information, as well as the associated nerves and brain centers that process the information and direct the appropriate response. The otolithic organs of the vestibular system (the saccule and utricle) sense motion according to their orientation. Vestibular evoked myogenic potential, also known as click evoked potential, is a noninvasive test that provides specific information about saccule and otolith function. It uses skin surface electrodes to measure muscle activity evoked in response to acoustic stimuli. Computer technology amplifies the myogenic response, which is averaged and presented as a vestibular evoked myogenic potential (Dougherty, 2022).

There are two main types of vestibular evoked myogenic potential for evaluating vestibular disorders that measure saccular or utricular function. Cervical vestibular evoked myogenic potential uses electrodes placed on the sternocleidomastoid muscle and is presumed to reflect the vestibulo-collic (or sacculo-collic) reflex, while ocular vestibular evoked myogenic potential employs electrodes on the ocular muscles below the eye believed to reflect the vestibule-ocular (or utriculo-ocular) reflex (Dougherty, 2022).

## Findings

Across the evidence base, vestibular evoked myogenic potential testing is described more as a complementary test than as a standalone diagnostic tool. The literature repeatedly identifies variability in normative values, abnormal definitions, and testing protocols as major barriers to consistent clinical interpretation across vestibular disorders. The evidence is more favorable in third window syndromes, especially superior semicircular canal dehiscence, where vestibular evoked myogenic potential abnormalities are more consistently linked to imaging

findings, symptom patterns, and postoperative change. Overall, the findings support a selective rather than broad clinical role for vestibular evoked myogenic potential testing.

Clinical guidelines

Guideline evidence supports a limited and condition-specific role for vestibular evoked myogenic potential testing rather than routine use across vestibular disorders. The policy identified three evidence-based guidelines (Bhattacharyya, 2017; Fife, 2017; Lopez-Escamez, 2015). The American Academy of Neurology guideline includes cervical and ocular vestibular evoked myogenic potential testing in the battery of available tests for diagnosing superior canal dehiscence syndrome, based on limited, low quality evidence suggesting cervical vestibular evoked myogenic potential thresholds are lower than normal and amplitudes are higher than normal, while also noting substantial uncertainty in the research (Fife, 2017). The American Academy of Otolaryngology-Head and Neck Surgery guideline also mentions vestibular evoked myogenic potential testing among the battery of diagnostic tests that can be considered, particularly to differentiate superior canal dehiscence syndrome from benign paroxysmal positional vertigo, but these recommendations are likewise based on very limited evidence and unresolved questions about clinical value (Bhattacharyya, 2017; Noij, 2018).

For Ménière's disease, the guideline evidence is more cautionary. Ménière's disease is described as a clinical diagnosis based on patient-reported symptomatology and audiometric data, and the American Academy of Otolaryngology-Head and Neck Surgery recommends against routine vestibular function testing to establish the diagnosis because lower quality evidence suggests the harms of testing generally exceed the benefits (Basura, 2020). Select individuals with atypical symptoms or difficulty determining the affected ear may still benefit from vestibular testing when the results will affect patient management, such as when considering ablative interventions (Basura, 2020). Taken together, the guideline literature suggests that vestibular evoked myogenic potential testing may have a complementary role in selected scenarios, but its clinical utility for other vestibular disorders remains unclear (Fife, 2017).

Systematic reviews

Systematic reviews consistently identify interpretation and standardization as central barriers to broader clinical use, although the evidence is more coherent in third window disorders than in other vestibular conditions. A systematic review of 66 articles sought to describe normative data for 0.1-ms click-evoked and 500-Hz tone burst cervical vestibular evoked myogenic potential responses and highlighted the effects of different testing factors on response parameters, as well as the lack of standardized normative data used in vestibular evoked myogenic potential studies. Both issues were identified as confounding interpretation of study results (Meyer, 2015). A later systematic review similarly highlighted the potential of vestibular evoked myogenic potential testing for vestibular neuritis, Ménière's disease, and benign paroxysmal positional vertigo, but found that the lack of normative thresholds for these conditions continued to hamper a defined clinical role for the test (Scarpa, 2019).

Newer systematic reviews suggest that this uncertainty is not uniform across indications. A systematic review of third window syndrome analyzed 70 studies and found that diagnosis involves clinical evaluation, high-resolution imaging, and functional tests such as vestibular evoked myogenic potentials, which were described as having high sensitivity and specificity, particularly in superior semicircular canal dehiscence, the most common cause of third window syndrome (Lazarou, 2025). That review also reported that cervical vestibular evoked myogenic potential thresholds are reduced and ocular vestibular evoked myogenic potential responses are greater in superior semicircular canal dehiscence, that high frequencies such as 4,000 Hz improve diagnostic accuracy, and that vestibular evoked myogenic potential findings can support clinical and radiologic assessment as well as postoperative follow-up because values may return to normal after surgical repair (Lazarou, 2025).

A second systematic review focused specifically on electrophysiologic assessment in third mobile window syndrome and included 19 studies comprising 603 affected ears. All included studies investigated vestibular evoked myogenic potentials and electrocochleography in superior semicircular canal dehiscence in pre-operative, intra-operative, and post-operative settings (Legois, 2025). Across these studies, vestibular evoked myogenic potential responses showed increased amplitudes and lowered thresholds versus unaffected ears. Atypical stimulation frequencies also appeared especially informative: 2,000 Hz for cervical vestibular evoked myogenic potentials and 4,000 Hz for ocular vestibular evoked myogenic potentials were reported as specific for third mobile window syndrome, with sensitivity ranging from 92.00% to 100% and specificity of 100% (Legois, 2025).

The third window review literature also highlights ongoing limitations. The broader third window syndrome review noted false-positive imaging, the need for better long-term outcome data, and the need for predictive models to improve patient selection and treatment planning (Lazarou, 2025). The electrophysiology review concluded that vestibular evoked myogenic potentials and electrocochleography appear essential for diagnosis and follow-up in superior semicircular canal dehiscence when interpreted alongside symptomatology and high-resolution computed tomography, but it also reported that methodological quality was generally moderate, with total quality scores ranging from 5 to 7 out of 9, five of 19 studies (26.0%) rated high quality, and 14 of 19 studies (74.0%) rated intermediate quality (Legois, 2025).

The same pattern appears in non-otologic neurologic populations. A systematic review of 21 studies (n = 668) in multiple sclerosis found that vestibular evoked myogenic potential testing identified prolonged latencies, reduced amplitudes, and increased asymmetry, with 40% of participants exhibiting delayed or absent cervical vestibular evoked myogenic potential responses. These findings correlated with higher disability and were reported to surpass traditional imaging in detecting subclinical vestibular dysfunction (Subramanian, 2025). Even where abnormalities are detectable, the review evidence still points back to the same limiting issue: physiologic findings do not by themselves establish standardized thresholds or a clearly defined clinical role across conditions.

Meta-analysis

Meta-analytic evidence shows measurable diagnostic associations in selected conditions, but it does not establish vestibular evoked myogenic potential testing as sufficient on its own. A meta-analysis of 30 observational studies found that vestibular evoked myogenic potential testing alone was not sufficient for diagnosing Ménière's disease or delayed endolymphatic hydrops, with pooled sensitivity of 49% (95% confidence interval 46% to 51%) and specificity of 95% (94% to 96%) (Zhang, 2015). Another meta-analysis found that utricular dysfunction may be more predominant in benign paroxysmal positional vertigo than saccular dysfunction (Chen, 2020). These findings suggest physiologic differences may be detectable, but they do not resolve the broader issues of standardization or establish a standalone clinical role.

The meta-analytic evidence is somewhat stronger for superior canal dehiscence syndrome, although the underlying evidence quality remains limited. A meta-analysis of nine studies (n = 721) evaluating cervical vestibular evoked myogenic potential thresholds against radiological and surgical findings in participants with signs and symptoms of superior canal dehiscence syndrome reported an overall diagnostic odds ratio of 32.8483, area under the summary receiver operating characteristic curve of .879, sensitivity of .83, and specificity of .88 (Kim, 2022). Sensitivity and specificity differed by normal hearing level threshold used (≤ 65 dB, 70 dB, 75 dB, 80 dB, and 85 dB), but the subgroup differences were not significant. Higher thresholds were associated with higher sensitivity and lower specificity, and a threshold of 75 dB yielded the highest diagnostic accuracy, with moderate sensitivity (.75) and high specificity (.95) (Kim, 2022). However, the quality of the evidence was low for sensitivity and very low for specificity because risk of bias in the studies was high (Kim, 2022).

A separate meta-analysis of 28 studies found that adults with obstructive sleep apnea had significantly higher risks of abnormal vestibular test results, including absent cervical and ocular vestibular evoked myogenic potential responses and decreased amplitudes, indicating impairments in the semicircular canal, saccule, and utricle, although the effect of obstructive sleep apnea treatment remained unclear (Kang, 2024).

All other evidence types

Outside the systematic reviews, meta-analyses, and guidelines, the evidence base is described as consisting primarily of small observational studies assessing the diagnostic performance of vestibular evoked myogenic potential testing in persons with benign paroxysmal positional vertigo and, to a lesser extent, persons with Ménière's disease. Across this broader body of evidence, the central themes are lack of consensus regarding normal values, lack of agreement on the definition of an abnormal vestibular evoked myogenic potential, lack of standardized testing protocols, and uncertainty regarding clinical application. The text also notes that participant characteristics and aspects of the technique can influence test results, further complicating interpretation. For these reasons, the evidence is described as insufficient to support vestibular evoked myogenic potential testing for evaluating vestibular disorders.

At the same time, the non-meta-analytic and non-guideline evidence is more supportive in superior canal dehiscence syndrome and related third window conditions than in other vestibular disorders. The broader third window literature describes vestibular evoked myogenic potentials as part of a diagnostic framework that includes symptoms and high-resolution imaging, rather than as an isolated test, and it reports that cervical vestibular evoked myogenic potential thresholds are lower and ocular vestibular evoked myogenic potential amplitudes are higher in superior semicircular canal dehiscence, with normalization after surgical repair in some series (Lazarou, 2025; Legois, 2025). This is consistent with the policy record, which states that vestibular evoked myogenic potential testing may have value as part of a battery of other accepted vestibular function tests, but that patient selection has not been established and its impact on patient management has not been studied broadly.

Additional comparative evidence is also consistent with ongoing technical variation. A review of five studies (n = 222) comparing narrowband chirp and 500 Hz tone burst stimuli in cervical vestibular evoked myogenic potential testing found shorter latencies with the chirp stimulus but comparable response rates and amplitudes (Zakaria, 2024). Within the policy record, some updates identified no new relevant literature, one update added a guideline and a new meta-analysis, and the coverage determination was changed to medically necessary for superior canal dehiscence syndrome based on recommendations that vestibular evoked myogenic potential testing may serve a complementary role alongside temporal bone computed tomography and clinical history (Bhattacharyya, 2017; Fife, 2017). The newer systematic review evidence is consistent with that narrower use case: it strengthens the case for vestibular evoked myogenic potential testing as an adjunctive diagnostic and follow-up tool in superior semicircular canal dehiscence and third window syndromes, while leaving unresolved the broader problems of standardization, evidence quality, and generalizability across other vestibular disorders.

In 2026, we found these two systematic reviews, which further supported vestibular evoked myogenic potential testing as an adjunctive diagnostic and follow-up tool in third window syndromes, especially superior semicircular canal dehiscence, while continuing to identify limits in standardization, evidence quality, and long-term outcome data (Lazarou, 2025; Legois, 2025).

## References

On April 11, 2026, we searched PubMed and the databases of the Cochrane Library, the U.K. National Health Services Centre for Reviews and Dissemination, the Agency for Healthcare Research and Quality, and the Centers for Medicare & Medicaid Services. Search terms were “Vestibule, Labyrinth/diagnosis” (MeSH), “Vestibular Evoked Myogenic Potentials” (MeSH), “Labyrinth Diseases/diagnosis” (MeSH), and “vestibular evoked myogenic potential.” We included the best available evidence according to established evidence hierarchies (typically systematic reviews, meta-analyses, and full economic analyses, where available) and professional guidelines based on such evidence and clinical expertise.


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## Policy updates

10/2016: initial review date and clinical policy effective date: 4/2017

11/2018: Policy references updated. Policy ID changed.

11/2019: Policy retired.

4/2020: Policy reactivated. Policy references updated.

5/2021: Policy references updated.

5/2022: Policy references updated.

5/2023: Policy references updated.

5/2024: Policy references updated. Coverage modified.

5/2025: Policy references updated.

5/2026: Policy references updated.

## Related codes

Below are the most commonly submitted codes for the service(s)/item(s) subject to this policy CCP.1461 This is not an exhaustive list of codes. Providers are expected to consult the appropriate coding manuals and bill accordingly.

| Code | Code description |
|---|---|
| 92517 | VEMP testing, with interpretation and report; cervical (cVEMP) |
| 92518 | VEMP testing, with interpretation and report; ocular (oVEMP) |
| 92519 | VEMP testing, with interpretation and report; cervical (cVEMP) and ocular (oVEMP) |