

Nonpharmacologic treatments for chronic vertigo

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Policy contains: Dynamic posturography; particle (canalith) repositioning maneuvers; transtympanic micropressure; vestibular rehabilitation.

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Coverage policy

Particle repositioning maneuvers (either the Epley maneuver or the Semont maneuver) for treatment of benign paroxysmal positioning vertigo is clinically proven and, therefore, and may be medically necessary when all of the following criteria are met (Bhattacharyya, 2017):

- **Confirmed by a positive Dix-Hallpike maneuver, characterized by:**
 - **Vertigo is associated with a mixed torsional and vertical nystagmus.**
 - **Latency period between the completion of the maneuver and the onset of vertigo and nystagmus.**
 - **Limited duration of vertigo and nystagmus, typically less than 60 seconds.**

For lateral (horizontal) canal BPPV: Confirmed by a positive supine roll test, characterized by:

- **Horizontal nystagmus changing direction based on head position.**
- **Geotropic or apogeotropic nystagmus.**

Patient History:

• Reports recurrent, brief episodes of vertigo triggered by changes in head position.

- ~~• Diagnosis of benign paroxysmal positioning vertigo has been confirmed by a positive Hallpike test.~~
- ~~• Member has had symptoms of benign paroxysmal positioning vertigo for at least one month.~~
- ~~• Maneuver is performed by a physical therapist or occupational therapist as part of a therapy plan of care.~~

Vestibular rehabilitation may be clinically proven and, therefore, medically necessary when all of the following criteria are met (McDonnell, 2015; Porciuncula, 2012; Wegner 2014):

- Diagnosis of vestibular hypofunction has been confirmed by vestibular function tests.
- Symptoms of vestibular hypofunction have existed for at least one month.
- Rehabilitation is performed by a physical therapist or occupational therapist as part of a therapy plan of care.

Dynamic posturography and tympanic micropressure for treatment of vestibular disorders are investigational/not clinically proven and, therefore, not medically necessary (Ahsan, 2015; Syed 2014, 2015).

Limitations

All other uses of particle repositioning maneuvers (the Epley maneuver or the Semont maneuver) or vestibular rehabilitation are not medically necessary, including:

- For particle repositioning maneuvers, benign paroxysmal positioning vertigo is usually in remission within two visits. Beyond two visits, there should be justification in the medical record for continued treatment. Beyond four visits with no remission, there should be consideration of referral back to the attending physician.
- For vestibular rehabilitation:
 - Members with certain comorbidities may not be appropriate candidates or may need specialized, individually tailored vestibular rehabilitation protocols. Examples of such comorbidities include cervical stenosis, Down syndrome, severe rheumatoid arthritis, cervical radiculopathies, Paget's disease, morbid obesity, ankylosing spondylitis, low back dysfunction, and spinal cord injuries (Bhattacharyya, 2017).
 - One visit per week for six weeks is considered medically necessary. Six additional visits are considered medically necessary if, upon medical review, there is evidence of clinically significant improvement. If there is no evidence of improvement after 12 visits, additional visits are not considered medically necessary.

Alternative covered services

- Surgical treatment.
- Medical treatment such as antiepilepsy pharmacologics, antivertigo drugs, beta-receptor blockers, betahistine, ototoxic antibiotics, corticosteroids, calcium-channel blockers, carboanhydrase inhibitors and serotonin reuptake inhibitors.

Background

The vestibular system uses sensory input from the eyes, muscles and joints, and inner ear to maintain balance and stable vision (Vestibular Disorders Association, 2023). Vestibular disorders can result from disease or injury that damages the processing areas in the inner ear and brain. The most common causes of vestibular disorders in adults are head trauma and age-related degeneration of the otolithic membrane, but in many cases the cause

is unknown (Vestibular Disorders Association, 2023). In children, the most common disorders known to cause dizziness and vertigo are benign paroxysmal vertigo of childhood, migraine, trauma, vestibular neuritis and otitis media (Gioacchini, 2014, McCaslin, 2011).

Common symptoms of vestibular disorders include imbalance or unsteadiness, dizziness, blurred or bouncing vision, nausea, hearing changes, problems with coordination, and vertigo (Vestibular Disorders Association, 2023). Symptoms of vestibular dysfunction may be mild, lasting perhaps only seconds or minutes, or they may be severe, resulting in total disability.

There is no consensus on the precise definition of vertigo, but it is generally recognized as a distinct type of dizziness with the sense of rotation, rocking, or of the world spinning, even when the person is perfectly still, also known as illusion of motion (Strupp, 2013). In the United States, 1.7% of ambulatory medical care visits recorded vertigo or dizziness among the chief complaints (Nguyen-Huynh, 2012).

The most common vestibular disorder is benign paroxysmal positioning vertigo (Vestibular Disorders Association, 2023). Subtypes of benign paroxysmal positioning vertigo are distinguished by the particular semicircular canal involved (anterior, posterior, or horizontal) and whether the detached otoconia are free-floating within the affected canal (canalithiasis) or attached to the cupula (cupulolithiasis). Benign paroxysmal positioning vertigo is typically unilateral, and the most common form is canalithiasis in the posterior semicircular canal.

In most cases, the symptoms diminish or disappear without treatment as the vestibular system heals or the nervous system learns to compensate for the disorder (Strupp, 2013). Watchful waiting may be preferred, but the time to resolution of symptoms varies considerably across diagnoses. Some patients or providers may wish to expedite recovery and avoid further risk of injury. When symptoms persist, treatment can provide a complete cure or only control the symptoms. Treatment for vestibular disorders varies according to the diagnosis and may consist of positional head maneuvers, dietary changes, vestibular rehabilitation therapy, prescribed drugs or equipment, or, in some cases, surgery.

Findings

Guidelines:

The Clinical Practice Guideline on Benign Paroxysmal Positional Vertigo from the American Academy of Otolaryngology—Head and Neck Surgery strongly recommends the use of particle repositioning maneuvers, such as the Epley maneuver or the Semont maneuver, for the treatment of benign paroxysmal positional vertigo. The guidelines strongly recommend the Epley maneuver as the first-line treatment for posterior semicircular canal benign paroxysmal positional vertigo based on high-quality evidence from randomized controlled trials and systematic reviews cited in the guideline. The Epley maneuver has been shown to be significantly more effective than placebo or alternative treatments like Brandt-Daroff exercises for resolving symptoms and converting the Dix-Hallpike test to negative. Multiple studies cited in the guideline demonstrate high success rates with additional Epley maneuvers for patients not fully cleared after initial treatment. Serious adverse effects are rarely reported. While alternative maneuvers like the Semont maneuver may be effective, the Epley maneuver is more commonly referenced in the guidelines as the primary particle repositioning procedure (Bhattacharyya, 2017).

Systematic Reviews:

Vestibular Rehabilitation

There is sufficient evidence to support the use of vestibular rehabilitation for the treatment of chronic vertigo. Moderate- to strong-quality evidence indicates that vestibular rehabilitation is a safe and

effective treatment for individuals with unilateral peripheral vestibular dysfunction, as shown by multiple high-quality randomized controlled trials (McDonnell, 2015). Vestibular rehabilitation has been shown to resolve symptoms and improve functioning in the medium term (standardized mean difference -0.83, 95% confidence interval -1.02 to -0.64). The minimum symptom duration prior to treatment ranged from at least one week to at least 12 months (McDonnell, 2015).

For persons with benign paroxysmal positioning vertigo, the evidence for improved outcomes with vestibular rehabilitation is less conclusive (McDonnell, 2015; Porciuncula, 2012; Wegner, 2014). Vestibular rehabilitation may be more appropriate as adjunctive therapy rather than as a primary treatment modality for benign paroxysmal positioning vertigo. Subsets of patients with preexisting balance deficits, central nervous system disorders, or risk for falls may derive more benefit from vestibular rehabilitation than the patient with isolated benign paroxysmal positioning vertigo (Bhattacharyya, 2017).

Particle Repositioning Maneuvers

There is sufficient evidence to support particle repositioning maneuvers as a first-line treatment for the specific diagnosis of benign paroxysmal positioning vertigo (Hilton, 2014; Hunt, 2012; Reinink, 2014; Wegner, 2014). Moderate to strong evidence from multiple randomized controlled trials indicates that the Epley maneuver is a safe and effective therapy for posterior canal benign paroxysmal positioning vertigo. There is less convincing evidence supporting the use of the Semont maneuver in persons with posterior canal benign paroxysmal positioning vertigo (Hilton, 2014), and guidelines provide weaker recommendations as a “possibly effective” treatment (Bhattacharyya, 2017; Fife, 2008).

A systematic review/network meta-analysis of 41 randomized controlled trials found benign paroxysmal positioning vertigo was effectively treated (eliminated nystagmus) after one month using only the Semont (76.1%) and Epley maneuvers (65.3%) were effective, of 12 treatments studied (Li, 2022).

A systematic review of nine studies (n=325) found a 95.2% success rate for canalith repositioning maneuvers to treat benign paroxysmal positional vertigo. The mean number of treatments was 2.9 and the recurrence rate was 19.8% (Karamy, 2022).

A systematic review and meta-analysis on particle repositioning maneuvers for benign paroxysmal positional vertigo analyzed 20 studies (n=2,597) participants (Pauwels, 2023). The findings showed that compared to those in the control population (n=1,581), the benign paroxysmal positional vertigo patients (n=1,016) exhibited impaired gait and increased fall risk prior to treatment. However, after benign paroxysmal positional vertigo patients (n=517) underwent particle repositioning maneuvers, there were significant improvements in level gait velocity and reduced number of fallers and fear of falling, demonstrating the efficacy of this treatment. In a separate meta-analysis of 22 studies, benign paroxysmal positional vertigo patients (n=5,196), 58.9% saw symptom resolution after one session of canalith repositioning procedures, while 18.3% and 4.4% required two or three sessions (Alfarghal, 2023).

Additionally, a systematic review and meta-analysis of 27 randomized controlled trials (n=1,629) of benign paroxysmal positional vertigo patients found that the Epley maneuver was effective in reducing vertigo symptoms and producing negative Dix-Hallpike test findings across primary care and subspecialty settings (Saishoji, 2023). This further supports the implementation of repositioning treatments for benign paroxysmal positional vertigo beyond referral centers.

Transtympanic Micropressure Therapy

There is insufficient evidence to support the use of transtympanic micropressure therapy for the treatment of vertigo associated with Ménière’s disease (Syed, 2014). Low-quality evidence suggests that

transtympanic micropressure therapy using the Meniett® Low-Pressure Pulse Generator (Medtronic Inc.; Minneapolis, Minnesota) is safe when used for persons with Ménière's disease who are refractory to medical therapy, but the evidence of any health benefit is inconclusive.

A systematic review of 25 randomized controlled trials (n=1,248) concluded no effective and well-tolerated treatment – positive pressure therapy, medicinal, or surgical - exists for Ménière's disease (van Esch, 2022).

Microvascular Decompression

A systematic review (van den Berge, 2017) of 572 patients with longstanding tinnitus and/or vertigo found microvascular decompression of the cochleovestibular nerve was modestly effective in patients who underwent treatment. A low rate of complication (11%) was noted. The quality of the evidence presented, however, was low, and the authors urged further study of this modality.

Transtympanic Micropressure Therapy

In 2016, an updated systematic review (Syed, 2015) of four randomized controlled trials (n=123) compared the efficacy of the Meniett device versus a placebo device in patients with Ménière's disease as defined by American Academy of Otolaryngologists-Head and Neck Surgeons criteria. There was a significant overall 61% reduction in the frequency of vertigo in both groups (mean no vertigo days per month of eight versus three). The reduction was not significantly different between the two groups in any study or on meta-analysis (mean difference in vertigo-free days between Meniett and placebo device of 0.77 days over a one-month period, 95% confidence interval 0.82 to 1.83, P=.45). There was no substantive data to support a greater reduction in the severity of the vertigo or any other outcome with the Meniett device compared with the placebo device.

Meta-Analysis

Particle Repositioning Maneuvers

A meta-analysis of 20 studies (n=2,597 participants) found that compared to those in the control population (n=1,581), benign paroxysmal positional vertigo patients (n=1,016) exhibited impaired gait and increased fall risk prior to treatment. However, after benign paroxysmal positional vertigo patients (n=517) underwent particle repositioning maneuvers, there were significant improvements in level gait velocity and reduced number of fallers and fear of falling, demonstrating the efficacy of this treatment (Pauwels, 2023).

A separate meta-analysis of 22 studies of benign paroxysmal positional vertigo patients (n=5,196) found that 58.9% saw symptom resolution after one session of canalith repositioning procedures, while 18.3% and 4.4% required two or three sessions (Alfarghal, 2023).

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Other Evidence

Randomized Control Trial

The randomized controlled trial with participants diagnosed with posterior canal benign paroxysmal positional vertigo (PC-BPPV) (n = 234) aimed to compare the effectiveness of the traditional Epley repositioning maneuver with the newer Gans repositioning maneuver. The participants were split into two groups, with 118 patients in the Epley group and 116 in the Gans group, ensuring balanced demographics across both groups, including age, gender, and vertigo onset characteristics. The study

found that both maneuvers led to significant improvement in vertigo symptoms, with 82.20% (n=97) of patients in the Epley group and 78.44% (n=91) in the Gans group showing a negative Dix-Hallpike (DH) test result 24 hours post-treatment, indicating the absence of vertigo and nystagmus. Furthermore, the one-month follow-up demonstrated that 95% of patients in both groups maintained improvement, with only a small percentage experiencing recurrence (4.12% in the Epley group and 2.19% in the Gans group). These findings suggest that the Gans maneuver is not only effective but also a viable alternative to the traditional Epley maneuver, particularly for patients with cervical spine disorders who may struggle with the positional requirements of the Epley technique (Dhiman et al., 2023).

In 2023, we removed the Centers for Medicare & Medicaid Services article and reference.

In 2024, we revised the coverage section to better align with a clinical guideline by American Academy of Otolaryngology—Head and Neck Surgery (Bhattacharyya, 2017). We also reorganized the findings section thematically and by study type. We also added a new randomized control trial (Dhiman et al., 2023).

~~Seven systematic reviews (Hilton, 2014; Hunt 2012; McDonnell, 2015; Porciuncula, 2012; Reinink 2014; Syed, 2014; Wegner, 2014) and two evidence-based guidelines (Bhattacharyya, 2017; Fife, 2008) examined the evidence for vestibular rehabilitation, particle repositioning maneuvers, and transtympanic micropressure therapy. No systematic reviews examined dynamic posturography as a treatment modality. There was marked heterogeneity across studies with respect to minimum symptom duration prior to treatment, diagnosis, treatment administration, and outcome measures. Most studies were carried out in specialty settings.~~

~~There is sufficient evidence to support the use of vestibular rehabilitation for treatment of chronic vertigo. There is moderate to strong-quality evidence that vestibular rehabilitation is a safe, effective treatment for persons with unilateral peripheral vestibular dysfunction based on a number of high-quality randomized controlled trials (McDonnell, 2015). There is moderate-quality evidence that vestibular rehabilitation resolves symptoms and improves functioning in the medium term (standardized mean difference -0.83, 95% confidence interval -1.02 to -0.64). Minimum symptom duration prior to treatment ranged from at least one week to at least 12 months. The optimal treatment protocol could not be determined from the evidence base.~~

~~For persons with benign paroxysmal positioning vertigo, the evidence for improved outcomes with vestibular rehabilitation is less conclusive (McDonnell, 2015; Porciuncula, 2012; Wegner, 2014). Vestibular rehabilitation may be more appropriate as adjunctive therapy rather than as a primary treatment modality for benign paroxysmal positioning vertigo. However, subsets of patients with preexisting balance deficit, central nervous system disorders, or risk for falls may derive more benefit from vestibular rehabilitation than the patient with isolated benign paroxysmal positioning vertigo (Bhattacharyya, 2017). Persons with certain comorbidities may not be appropriate candidates for vestibular rehabilitation or may need specialized, individually tailored vestibular rehabilitation protocols. Examples of such comorbidities include cervical stenosis, Down syndrome, severe rheumatoid arthritis, cervical radiculopathies, Paget's disease, morbid obesity, ankylosing spondylitis, low back dysfunction and spinal cord injuries.~~

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~~Although benign paroxysmal positioning vertigo is likely to remit spontaneously in a few months, evidence-based guidelines recommend particle repositioning maneuvers as initial therapy to expedite recovery (Bhattacharyya,~~

2017; Fife, 2008). Guidelines made no recommendations for or against other particle repositioning maneuvers for treatment of either horizontal or anterior canal benign paroxysmal positioning vertigo due to very limited evidence from uncontrolled studies (Bhattacharyya, 2017; Fife, 2008).

Evidence of improved health benefit with the addition of mastoid vibration or oscillation or post-treatment postural restrictions (e.g., cervical collar, sleeping upright) is inconclusive. There is no consensus for recommending or refuting post-maneuver postural restrictions (Bhattacharyya, 2017; Fife, 2008).

In most cases, one treatment sufficiently resolves symptoms and improves functioning, but, in approximately one-third of cases, symptoms do not fully clear. However, there is no conclusive evidence that supports improved outcomes with the use of multiple sessions of particle repositioning maneuvers for persistent symptoms. The repeated application of particle repositioning is likely to be determined by the severity of the symptoms, clinician availability and the clinician's historical success with the maneuvers (Bhattacharyya, 2017).

There is insufficient evidence to support the use of transtympanic micropressure therapy for treatment of vertigo associated with Ménière's disease (Syed, 2014). There is low-quality evidence that suggests transtympanic micropressure therapy using the Meniett® Low-Pressure Pulse Generator (Medtronic Inc.; Minneapolis, Minnesota) is safe when used for persons with Ménière's disease who are refractory to medical therapy, but the evidence of any health benefit is inconclusive.

There is insufficient evidence to support the use of computerized dynamic posturography for treatment of vestibular disorders. One small, low-quality study randomized 24 patients with chronic unilateral peripheral vestibular disease to either computerized dynamic posturography or optokinetic stimulation (Rossi-Izquierdo, 2011). The computerized dynamic posturography group showed greater benefits in visual and vestibular input and limits of stability, but these results need to be confirmed in larger prospective studies.

In 2016, we updated a systematic review (Syed, 2015) of four randomized controlled trials ($n = 123$) that compared the efficacy of the Meniett device versus a placebo device in patients with Ménière's disease as defined by American Academy of Otolaryngologists-Head and Neck Surgeons criteria. There was a significant overall 61% reduction in the frequency of vertigo in both groups (mean no vertigo days per month of eight versus three). The reduction was not significantly different between the two groups in any study or on meta-analysis (mean difference in vertigo-free days between Meniett and placebo device of 0.77 days over a one-month period, 95% confidence interval 0.82 to 1.83, $P = .45$). There was no substantive data to support a greater reduction in the severity of the vertigo or any other outcome with the Meniett device compared with the placebo device.

In 2017, we added a systematic review (van den Berge, 2017) of 572 patients with longstanding tinnitus and/or vertigo found microvascular decompression of the cochleovestibular nerve was modestly effective in patients who underwent treatment. A low rate of complication (11%) was noted. The quality of the evidence presented, however, was low and the authors urged further study of this modality.

In 2018, we found no new information published regarding non-pharmacologic treatments for chronic vertigo to add to the policy.

In 2019, we identified no newly published, relevant literature to add to the policy. The policy ID was changed from CP# 10.02.03 to CCP.1159.

In 2020, we added one Centers for Medicare & Medicaid Services local coverage article (A56566) (Centers for Medicare & Medicaid Services, 2020) and two systematic reviews (Melo, 2019; Sim 2019), which do not change previous conclusions in this policy. No policy changes are warranted.

In 2021, we updated the American Academy of Otolaryngology—Head and Neck Surgery Foundation guideline (Bhattacharyya, 2017, update of 2008) and added a meta-analysis, both of which address the effectiveness of unique repositioning procedures for horizontal semicircular canal benign paroxysmal positional vertigo. These

procedures are called the “barbeque roll” and the Gufoni maneuver. Bhattacharyya (2017) stated that variations of these procedures appear moderately effective for the geotropic form of the condition, but there was insufficient evidence of support for their use with the apogeotropic form or for other methods.

Results of a meta-analysis (Fu, 2020) of four randomized controlled trials ($n = 714$ participants) found the immediate recovery rate of the Gufoni maneuver was higher than that of sham maneuver (risk ratio = 2.68, 95% confidence interval 1.54 to 4.65, $P < .01$) and was similar to that of other maneuvers (risk ratio = 1.18, 95% confidence interval 0.99 to 1.41, $P = .06$). The otolith switch rate was similar among all maneuvers ($P = .27$). Because 36% to 88% of cases resolve spontaneously within several days to months, its long-term efficacy requires additional study. The new information requires no policy changes.

In 2022, we added a systematic review/network meta-analysis of 41 randomized controlled trials that found benign paroxysmal positioning vertigo was effectively treated (eliminated nystagmus) after one month using only the Semont (76.1%) and Epley maneuvers (65.3%) were effective, of 12 treatment studied (Li, 2022).

A systematic review of 25 randomized controlled trials ($n = 1,248$) concluded no effective and well-tolerated treatment—positive pressure therapy, medicinal, or surgical—exists for Meniere’s disease (van Esch, 2022).

In 2023, we removed the Centers for Medicare & Medicaid Services article and reference. We added a systematic review of nine studies ($n = 325$) that found a 95.2% success rate for canalith repositioning maneuvers to treat benign paroxysmal positional vertigo. The mean number of treatments was 2.9 and the recurrence rate was 19.8% (Karamy, 2022).

In 2024, we found a systematic review and meta-analysis on particle repositioning maneuvers for benign paroxysmal positional vertigo analyzed 20 studies ($n = 2,597$) participants (Pauwels, 2023). The findings showed that compared to those in the control population ($n = 1,581$), the benign paroxysmal positional vertigo patients ($n = 1,016$) exhibited impaired gait and increased fall risk prior to treatment. However, after benign paroxysmal positional vertigo patients ($n = 517$) underwent particle repositioning maneuvers, there were significant improvements in level gait velocity and reduced number of fallers and fear of falling, demonstrating the efficacy of this treatment. In a separate meta-analysis of 22 studies, benign paroxysmal positional vertigo patients ($n = 5,196$), 58.9% saw symptom resolution after one session of canalith repositioning procedures, while 18.3% and 4.4% required two or three sessions (Alfarghal, 2023).

This underscores the variable yet largely successful outcomes of repositioning maneuvers for multi-canal benign paroxysmal positional vertigo. Additionally, a systematic review and meta-analysis of 27 randomized controlled trials ($n = 1,629$) benign paroxysmal positional vertigo patients found that the Epley maneuver was effective in reducing vertigo symptoms and producing negative Dix-Hallpike test findings across primary care and subspecialty settings (Saishoji, 2023). This further supports the implementation of repositioning treatments for benign paroxysmal positional vertigo beyond referral centers.

References

On January 16, 2024 August 15, 2024, 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 “transtympanic micropressure treatment” (MeSH), “physical therapy modalities” (MeSH), “vestibular diseases” (MeSH), “Dizziness” (MeSH). 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

2/2015: initial review date and clinical policy effective date: 6/2015

3/2016: Policy references updated.

3/2017: Policy references updated.

3/2018: Policy references updated.

3/2019: Policy references updated. Policy ID changed.

4/2020: Policy references updated.

4/2021: Policy references updated.

4/2022: Policy references updated.

4/2023: Policy references updated.

8/2024: Policy references updated.