BlueCross BlueShield of Alabama

Name of Blue Advantage Policy:

Transtympanic Micropressure Applications as a Treatment of Ménière's Disease

Policy #: 092
Category: DME

Latest Review Date: February 2019
Policy Grade: A

Background:

Blue Advantage *medical policy does not conflict with Local Coverage Determinations (LCDs), Local Medical Review Policies (LMRPs) or National Coverage Determinations (NCDs) or with coverage provisions in Medicare manuals, instructions or operational policy letters. In order to be covered by Blue Advantage the service shall be reasonable and necessary under Title XVIII of the Social Security Act, Section 1862(a)(1)(A). The service is considered reasonable and necessary if it is determined that the service is:*

1. *Safe and effective;*
2. *Not experimental or investigational*;*
3. *Appropriate, including duration and frequency that is considered appropriate for the service, in terms of whether it is:*
   - *Furnished in accordance with accepted standards of medical practice for the diagnosis or treatment of the patient's condition or to improve the function of a malformed body member;*
   - *Furnished in a setting appropriate to the patient's medical needs and condition;*
   - *Ordered and furnished by qualified personnel;*
   - *One that meets, but does not exceed, the patient's medical need; and*
   - *At least as beneficial as an existing and available medically appropriate alternative.*

Routine costs of qualifying clinical trial services with dates of service on or after September 19, 2000 which meet the requirements of the Clinical Trials NCD are considered reasonable and necessary by Medicare. Providers should bill* ***Original Medicare* *for covered services that are related to* ***clinical trials*** *that meet Medicare requirements (Refer to Medicare National Coverage Determinations Manual, Chapter 1, Section 310 and Medicare Claims Processing Manual Chapter 32, Sections 69.0-69.11).*

Description of Procedure or Service:

Meniere's disease is an idiopathic disorder of the inner ear characterized by episodes of vertigo, fluctuating hearing loss, tinnitus, and ear pressure. Conservative therapy includes a low sodium diet and diuretics to reduce fluid accumulation (i.e., hydrops) and pharmacologic therapy to reduce vestibular symptoms. Transtympanic pressure treatment has been proposed as an alternative treatment for Meniere disease. This treatment involves use of a handheld device (e.g., Meniett) that delivers air pressure pulses to the ear.

Meniere Disease

Meniere disease is an idiopathic disorder of the inner ear characterized by episodes of vertigo, fluctuating hearing loss, tinnitus, and ear pressure. The vertigo attacks are often unpredictable, incapacitating, and may impede activities of daily living. Therapy addresses symptoms, not the underlying pathophysiology. Although the pathophysiology of Meniere disease is not precisely known, it is thought to be related to a disturbance in the pressure-volume relationship of the endolymph within the inner ear.

Treatment

Conservative therapy includes a low sodium diet and diuretics to reduce fluid accumulation (i.e., hydrops) and pharmacologic therapy to reduce vestibular symptoms. Persons who do not respond to these conservative measures may receive gentamicin drops in the ear, as a technique of chemical labyrinthectomy to ablate vestibular function on the affected side. No therapy is available to restore hearing loss.

There has been interest in developing a more physiologic approach to treatment by applying local pressure treatment to restore the underlying fluid homeostasis. Researchers have noted that symptoms of Meniere's disease improve with fluctuations in ambient pressure, and patients with acute vertigo have been successfully treated in hypobaric chambers. It is hypothesized that the application of low-frequency, low-amplitude pressure pulse to the middle ear functions to evacuate endolymphatic fluids from the inner ear, thus relieving vertigo.

Transtympanic micropressure treatment for Meniere's disease involves use of a handheld air pressure generator (Meniett) that delivers intermittent complex pressure pulses. For this device to be used, a conventional ventilation tube is surgically placed in the eardrum. Patients then place an ear-cuff in the external ear canal and treat themselves for 3 minutes, 3 times daily. Treatment is continued for as long as patients find themselves in a period of attacks of vertigo.

Policy:

Effective for dates of service on or after July 1, 2005:

Blue Advantage will treat **Transtympanic micro-pressure applications as a treatment of Ménière's disease as a non-covered** benefit and as **investigational**.

Blue Advantage does not approve or deny procedures, services, testing, or equipment for our members. Our decisions concern coverage only. The decision of whether or not to have a certain test, treatment or procedure is one made between the physician and his/her patient. Blue

Advantage administers benefits based on the members' contract and medical policies. Physicians should always exercise their best medical judgment in providing the care they feel is most appropriate for their patients. Needed care should not be delayed or refused because of a coverage determination.

Key Points:

The most recent literature review was updated through December 06, 2018.

Evidence reviews assess the clinical evidence to determine whether the use of a technology improves the net health outcome. Broadly defined, health outcomes are length of life, quality of life, and ability to function-including benefits and harms. Every clinical condition has specific outcomes that are important to patients and to managing the course of that condition. Validated outcome measures are necessary to ascertain whether a condition improves or worsens; and whether the magnitude of that change is clinically significant. The net health outcome is a balance of benefits and harms.

To assess whether the evidence is sufficient to draw conclusions about the net health outcome of a technology, 2 domains are examined: the relevance and the quality and credibility. To be relevant, studies must represent one or more intended clinical use of the technology in the intended population and compare an effective and appropriate alternative at a comparable intensity. For some conditions, the alternative will be supportive care or surveillance. The quality and credibility of the evidence depend on study design and conduct, minimizing bias and confounding that can generate incorrect findings. The randomized controlled trial (RCT) is preferred to assess efficacy; however, in some circumstances, nonrandomized studies may be adequate. RCTs are rarely large enough or long enough to capture less common adverse events and long-term effects. Other types of studies can be used for these purposes and to assess generalizability to broader clinical populations and settings of clinical practice.

Meniere disease has a variable natural history, with waxing and waning symptomatology and spontaneous recovery. In addition, some outcome measures are subjective and, thus, may be particularly susceptible to placebo effects. Because of these factors, controlled trials are essential to demonstrate the clinical effectiveness of treatment of transtympanic micropressure therapy compared with alternatives such as continued medical management.

Transtympanic Micropressure Therapy For Meniere Disease

Clinical Context and Therapy Purpose

The purpose of transtympanic micropressure therapy is to provide a treatment option that is an alternative to or an improvement on existing therapies, such as medical management, in patients with Meniere disease.

The question addressed in this evidence review is: does transtympanic micropressure therapy improve the net health outcome for individuals with Meniere disease?

The following PICOTS were used to select literature to inform this review.

Patients
The relevant population of interest are individuals with Meniere disease.

Interventions
The therapy being considered is transtympanic micropressure therapy.

Comparators
The main comparator of interest is medical management.

Outcomes
The outcomes of interest are symptoms, functional outcomes, quality of life, and treatment-related morbidity.

Timing
Time for follow up ranges from months to years for outcomes of interest.

Setting
Patients are actively managed by otolaryngologists in an outpatient clinical setting.

Study Selection Criteria
Methodologically credible studies were selected using the following principles:

a. To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;
b. In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies.
c. To assess longer term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought.
d. Studies with duplicative or overlapping populations were excluded.

The data submitted to the U.S. Food and Drug Administration (FDA) as part of the FDA-approval process consisted of a case series of 20 patients. Other case series have also been published in the peer-reviewed literature, some reporting 2- to 4-year outcomes in patients who had failed medical therapy. These case series are inadequate to form conclusions due to the lack of a control group, and they will not be discussed further in this review. The remaining literature review will focus on RCTs and systematic reviews of RCTs that have been published.

Systematic Reviews
A 2015 Cochrane review on positive pressure therapy for Meniere's disease included 5 double-blind, placebo-controlled RCTs (total N=265 patients). Three of the studies were considered to be at low risk of bias, one was at unclear risk, and one study was at high risk of bias. Results on the primary outcome measure, control of vertigo, could not be pooled due to heterogeneity in measurement, but most trials showed no significant difference in vertigo between Meniett therapy and placebo. This review supports the conclusion that evidence does not support the effectiveness of positive pressure therapy for the treatment of Meniere disease, and that there is some evidence that hearing is impaired with this treatment. Another systematic review, which

included 4 of the same RCTs that specifically used the Meniett device, also found no significant difference between low pressure therapy and placebo for the frequency of vertigo. The 3 trials with low risk of bias are described next.

Randomized Controlled Trials

The 3 trials, considered to be of low risk of bias in the Cochrane review, are described next.

In 2004, Gates et al reported the 4-month results of a randomized multi-institutional study that enrolled 67 patients with active unilateral Meniere's disease refractory to a three-month trial of medical management. All patients underwent tympanostomy, and patients were additionally randomly assigned to either a sham device or a Meniett device. Outcomes were assessed using symptom report cards that focused on the severity and frequency of vertigo. Vertigo was assessed on a scale of one to four, and vertigo scored as two or higher was considered definitive vertigo. The total number of days of definitive vertigo for all the participants was reported at each month. While an analysis of variance (ANOVA) showed that over the entire 4-month trial, there was a significant difference in the total number of episodes of vertigo in the treatment group compared to the control group, the difference between the groups was most apparent at one month, while at four months the treatment effect had disappeared almost entirely. Similarly, overall, there was a significant decrease in the frequency of vertigo in the treatment group, but again this difference was most apparent at the 1-month interval and almost disappeared at 4 months. This study is limited by a number of methodologic issues related to the statistical analysis of the data and results from this trial do not allow drawing conclusions about the impact of this device on patient outcomes.

A multicenter, double-blind, placebo-controlled trial of 63 patients by Thomsen et al (2005) compared micropressure devices with ventilation tubes and sham pressure devices. This trial reported an improvement in functionality (American Academy of Otolaryngology–Head and Neck Surgery [AAO-HNS] criteria) and a trend ($p=0.09$) toward a reduction in episodes of vertigo for the active treatment group compared with controls. The frequency of attacks decreased from 10.5 to 4.0 in the placebo group and from 9.6 to 1.9 in the active group. There were no changes in secondary outcome measures (patient's perception of tinnitus, aural pressure, and hearing). In addition to a marginal improvement in efficacy over ventilation tubes with sham pressure, this study is limited by the high dropout rate (37%), lack of intent-to-treat analysis, and short (2-month) monitoring period.

In 2006, Gates and colleagues reported 2-year open-label follow-up from this randomized trial. At the end of the randomized phase of the study, 61 of 67 patients from both the control and active treatment arms were treated with the Meniett device; 3 were subsequently lost to follow-up or excluded due to concurrent health problems. Vertigo episodes were reported on a daily symptom diary (44 patients) or by a structured telephone interview (17 patients). Of the 58 patients followed up for 2 years, 14 (24%) dropped out to seek alternative surgical treatment, 5 (9%) showed little or no improvement, and 39 (67%) reported being in remission or substantially improved. Patients who went into remission had an 80% probability of remaining in remission for the 2 years. This assessment is limited, however, by the lack of a control group followed up over the same period.

In 2012, Gurkov et al reported a randomized double-blind sham-controlled trial with the Meniett device. After a 4-week baseline period, 74 patients underwent ventilation tube placement and were monitored for another 4 weeks. Patients were then randomized to 16 weeks of active or sham treatment (5 minutes, 3 times daily). The primary outcomes were subjective vertigo score, number of definitive vertigo days, and number of sick days as recorded on a daily log over the last 4 weeks of treatment. Sixty-eight patients (92%) completed the study. The cumulative vertigo score decreased by 6.5 in the active group and by 1.19 in the sham group (p=0.048). The number of vertigo days decreased by 2.42 in the active treatment group and by 0.42 in the sham group (p=0.102), and the number of sick days decreased by 2.32 in the active treatment group and increased by 0.58 days in the sham group (p=0.041). There was no significant difference between groups in the vertigo-free days, activity score, hearing level, or slow phase velocity. The study shows a modest improvement in 2 of 5 subjective measures, but not in objective outcome measures, with the Meniett device.

Subsequent to the 2015 Cochrane review, Russo et al (2017) reported on an industry-sponsored, multicenter, double-blind RCT of the Meniett device. A total of 129 patients with Meniere disease not controlled by medical treatment were withdrawn from any vertigo treatment and received placement of a transtympanic tube. Patients (n=97 [75%]) who continued to have symptoms (≥2 vertigo episodes during a 6-week period) after placement of a transtympanic tube were randomized to an active or sham device for 6 weeks, and then were followed for an additional 6 weeks. The number of vertigo episodes during the baseline period did not differ significantly between groups (p=0.07). The trial was powered to detect a 30% difference in vertigo episodes compared to the sham group. Per protocol analysis showed a significant decrease in vertigo episodes in both groups (see Table 1), but no between-group difference (p=0.11), suggesting a possible effect of the transtympanic tube. Vertigo-related quality of life also did not differ between groups.

Table 1. Number of Vertigo Episodes

Treatment Arms	Before Treatment(SEM)	During Treatment(SEM)	After Treatment (SEM)
Active	3.2 (0.4)	2.5 (NR)[b]	1.5 (0.02)[a]
Sham	4.3(0.6)	2.6 (0.05)[b]	1.8 (0.8)[a]

NR: not reported.
a p<0.005 vs during treatment.
b p<0.05 vs baseline.

Summary of Evidence

For individuals who have Meniere disease who receive transtympanic micropressure therapy (Meniett), the evidence includes randomized controlled trials (RCTs) and systematic reviews. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. Six RCTs of positive pressure therapy have been reported, with 5 trials specifically investigating the Meniett device. A systematic reviews of 5 of these trials found that micropressure therapy does not result in a greater reduction in vertigo than placebo. The sixth trial also found no significant benefit of the transtympanic micropressure therapy for Meniere disease. The evidence is sufficient to determine that the technology is unlikely to improve the net health outcome.

Practice Guidelines and Position Statements

American Academy of Otolaryngology-Head and Neck surgery

In 2016, the American Academy of Otolaryngology-Head and Neck Surgery updated their position statement on the use of transtympanic micropressure: "We find that there is some medical evidence to support the use of micropressure therapy (such as the Meniett device) in certain cases of Meniere's disease. Micropressure therapy is best used as a second level therapy when medical treatment has failed. The device represents a largely non-surgical therapy that should be available as one of the many treatments for Meniere's disease." No supporting evidence was provided.

National Institute for Clinical Excellence (NICE)

In 2012, guidance from the United Kingdom's National Institute for Clinical Excellence (NICE) concluded that current evidence on the safety of micropressure therapy for refractory Meniere's disease is inadequate in quantity. Although there is some evidence of efficacy, it is based on limited numbers of patients. Therefore this procedure should only be used with special arrangements for clinical governance, consent and audit, or research.

U.S. Preventive Services Task Force Recommendations

Not applicable.

Key Words:

Meniere's disease, Meniett, low-pressure pulse generator, transtympanic micropressure

Approved by Governing Bodies:

In 1999, the Meniett device (Medtronic Xomed, Inc., Jacksonville, Florida) received 510(k) approval by the U.S. Food and Drug Administration (FDA) as a symptomatic treatment of Meniere's disease.

Benefit Application:

Coverage is subject to member's specific benefits. Group specific policy will supersede this policy when applicable.

Coding:

HCPCS codes:

A4638	Replacement battery for patient owned ear pulse generator, each
E2120	Pulse generator system for tympanic treatment of inner endolymphatic fluid

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Policy History:

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Medical Policy Group, September 2006
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