

Meniere's Disease: Assessment Toolbox

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Meniere's disease (MD) is episodic, and typically classified as an "unstable vestibular disorder" with fluctuating severity and symptoms. Because patients with unstable vestibular disorders are unlikely to benefit from vestibular rehabilitation therapy,^{1,2} physical therapists are most likely to see individuals with MD after symptoms are brought under control through a surgical (i.e. vestibular neurectomy, labyrinthectomy) or less-invasive treatment (i.e. intracanal medications).^{2,3}

My clinical toolbox includes a basic set of outcome measures which can be used in an outpatient setting to evaluate the effects of Meniere's disease on an individual with stable unilateral vestibular hypofunction. It is not uncommon for these patients to experience continuing "disequilibrium" or other balance deficits following medical treatment.³ Therefore, the goals of my test battery (measures listed below in no particular order) are to:

- Assess balance impairment
- To evaluate how/if the individual's activity, participation, and/or quality of life (mental and physical) is affected by living with Meniere's disease.

1. Activities-Specific Balance Confidence Scale (ABC):

Number of Items: 16 (completed by patient self-report)

ICF Domain: Activity

Link: <http://music9.net/t/the-activities-specific-balance-confidence-abc-scale-w1533-book.html>

Patients with Meniere's disease commonly experienced a great deal of fear and anxiety as a result of living with the condition. Poor balance can inspire fear of falling, which in turn may limit activity, participation, and desire to move about.³ The ABC Scale presents 16 common activities such as walking from house to car, bend over to pick up something from the ground, sweeping the floor, and the individual describes confidence in ability to maintain balance on a scale of 0% (no confidence) to 100% (complete confidence). Item scores are then added together and divided by 16 for an approximate confidence rating. A low confidence rating is thought to coincide with greater fear, leading to increased fall risk, and perhaps greater activity limitation due to avoidance. As a result, the ABC Scale provides valuable insight into the potentially severe interaction between anxiety (psychological) and activity limitation (physical) for those with Meniere's.⁴ Since feeling such as anxiety and low confidence may impede the rehabilitation process, it is essential to identify and deal with them effectively.⁵ The measure is valid and reliable among a variety of populations (including vestibular disorders), but does not have a vestibular-specific MDC (Parkinson's = 11.12-13) or established MCID.⁴ The ABC Scale is advocated by Gottshall et al for PT evaluation of patients with stable Meniere's symptoms,³ and fills a unique niche in my assessment battery.

2. Modified Clinical Test of Sensory Interaction and Balance (mCTSIB or CTSIB-M):

Number of Items: 4 Positions (completed by PT observation)

ICF Domain: Activity, Impairment

Link: http://chhdgrant01.fullerton.edu/Bal_Mobil/downloads/Assessment_Forms/mctsib.pdf

The modified CTSIB is a measure of the individual's dependence on vestibular, somatosensory, and visual senses for balance. For those with Meniere's disease, vestibular control of balance is abnormal, so the body may develop an over-dependence on somatosensory and/or visual input to compensate.⁶ The mCTSIB helps to detect and identify the dominant sensory input by eliminating each in turn. The patient stands with feet together and arms at sides in four different conditions (30 seconds each): eyes open on firm ground, eyes closed on firm ground,

eyes open on a foam surface, eyes closed on a foam surface. Reduced balance with eyes closed suggests over-dependence on vision, while reduced balance on the foam surface suggests over-dependence on somatosensory.⁷ The measure detects conditions under which balance may become impaired, and can be used to predict activity limitations such as reduced balance while walking in the dark. Such information can also be used to identify fall risk. Completing the mCTSIB is simple and quick in a clinical setting, and can be used to determine how balance should be trained (i.e. modified visibility or surfaces) during intervention. MCID has not yet been established, and MDC is not vestibular-specific (Alzheimer's = 0.34). The measure is considered reliable and valid among a diversity of populations, including vestibular disorders,⁷ and fits into this test battery as a strong indicator of static balance.

3. **Dynamic Gait Index (DGI):**

Number of Items: 8 (completed by PT observation)

ICF Domain: Activity, Impairment

Link: <http://www.docstoc.com/docs/100759519/Dynamic-Gait-Index-Score-Sheet>

The DGI is a measure of dynamic balance, making it a good compliment to the mCTSIB. The assessment requires the patient to complete 8 different movement tasks including steady-state walking, walking while turning the head, and stair climbing. Scores for each item range from 0 (severe impairment) to 3 (no gait dysfunction) with a possible high score of 24 points.⁸ The measure is particularly useful for assessing patients with Meniere's disease, not only because its items are true to everyday ADL demands, but also because a number of items such as "gait with horizontal head turns" and "gait with vertical head turns" are especially challenging to the vestibular system, and may provoke symptoms. As seen above with the mCTSIB, items on the DGI which expose balance impairment can be used to focus intervention (i.e. VOR exercises), and to highlight circumstances under which the individual has greater fall risk or activity limitation. The reliability and validity of the measure is supported for many different populations, including vestibular disorders,⁸ and the DGI is advocated by Gottshall et al for PT evaluation of patients with stable Meniere's symptoms.³ The MDC for peripheral vestibular disorders is 3.2 points.⁹

4. **Dizziness Handicap Inventory (DHI):**

Number of Items: 25 (completed by patient self-report)

ICF Domain: Impairment, Participation, Activity

Link:

<http://www.southamptonhospital.org/Resources/10355/FileRepository/Forms/Dizziness%20Hanicap%20Inventory%20-%20English.pdf>

The DHI score can range from 100 points (highest perceived handicap) to 0 (no perceived handicap). Individuals choose from three available answers for each item: "never" (0 points), "sometimes" (2 points), or "always" (4 points). The measure's items address a variety of physical, functional, and emotional consequences of living with dizziness (i.e. is it difficult to go for a walk by yourself?, is it difficult to concentrate? Are you depressed?) which makes it a good toolbox component for evaluating the individual's quality of life.¹⁰ As with the other outcome measures in this assessment battery, completing the DHI offers not only a window into the individual's everyday life, but also identifies areas and specific activity/participation limitations which can be targeted with intervention to improve quality of life. Like the ABC Scale, the DHI may help to identify psychological/emotional aspects of the individual which will need to be considered and addressed in order to maximize the success of rehabilitation.⁵ For that matter, the ABC and DHI demonstrate excellent criterion validity for vestibular populations (correlation of $r=-0.64$),¹¹ and the DHI is reliable for vestibular dysfunction as

well.¹² Vestibular-specific MDC is 17.18, and MCID for the population states that pre- and post- treatment scores must differ by 18 points.¹² The DHI is well-supported for use with patients who live with vestibular dysfunction, and Gottshall et al advocates that the measure be used for evaluation of patients with stable Meniere's symptoms.³

5. Meniere's Disease Patient-Oriented Symptom-Severity Index (MD POSI):

Number of Items: 20 (completed by patient self-report)

ICF Domain: Impairment, Participation, Activity

Link: <http://onlinelibrary.wiley.com/libproxy.lib.unc.edu/doi/10.1097/00005537-200003002-00003/full#fig2> (measure is presented in two parts as "Figure 2")

The MD POSI is a short disease-specific evaluation which examines the effects of Meniere's on various levels, beginning with personal items such as balance, hearing, memory, and various pertinent ADLs. The measure also inquires after the condition's influence on occupation, and social aspects of life, then expands to global questions about current and future predictions of overall health.¹³ The measure is responsive to changes in patient condition, and is considered reliable and valid for use with the Meniere's population.¹⁴ Not only does the MD POSI add to the data collected by the DHI, but using the two measures together (a disease-specific QOL instrument + a symptom-specific instrument) is thought to provide a more accurate reflection of disease impact (and changes) over time than can be assessed with generic QOL measures such as the SF-36.¹⁵ Another Meniere's-specific measure, the Meniere's Disease Outcomes Questionnaire, is similar to the MD POSI, but contains 40 items relating to status before and after surgery.¹⁶ Though neither measure has available MDC or MCID values, the MD POSI was chosen for this toolbox based on its length and ease of administration, and because the MDOQ primarily evaluates the impact of surgical intervention on patient quality of life, rather than the impact of the disease itself.^{13,16}

The five assessment measures included in this Meniere's disease toolbox have been chosen based on their ability to complement one another, to encompass many ICF domains, for pertinence to vestibular dysfunction, and for ease of use and administration. The toolbox contains both self-report and observation measures, all of which can be feasibly administered in the course of one outpatient treatment session. Currently, there are not many Meniere's-specific outcome measures available, and the majority of measures which can be applied to the population lack vestibular-specific psychometric data (i.e. MDC, MCID).

Despite exclusion from the primary toolbox, a number of other outcome measures exist which could prove useful as supplements in the assessment of patients with MD. Some have already been used successfully in other Meniere's studies: Generic health measures that encompass many facets of the ICF model include the EuroQual 5D Generic Health Measure, and the SF-12 or 36;^{17,18} the Tinnitus Inventory, the Hearing Disability and Handicap Scale, and the Vertigo Symptom Scale are symptom-specific measures which can help to zero in on other aspects of living with Meniere's disease.^{15,17} The Berg Balance Scale assesses balance response using motor tasks that are different from those of the DGI (i.e. forward reach, bending, timed unilateral stance, etc.) and could provide a good secondary screening tool to identify fall risk or other balance-related activity limitations in patients with MD.¹⁹ Though it has not yet been validated for use with vestibular populations, the Community Balance and Mobility Scale may be able to discern "high level balance and mobility deficits" which do not present under other, less challenging outcome assessments (i.e. Berg or DGI).²⁰ Finally, there is the Meniere's Disease Outcomes Questionnaire, which may be suitable for measuring the quality of life (and lingering deficits) experienced by some patients who undergo surgical intervention.¹⁶

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