

HOW IS MENIERE'S DIAGNOSED?

What do you do when you are feeling dizzy, spinning, feeling nausea, feeling of fluid in the ears, pressure in your head and hearing changes? You have no idea what is wrong and don't know what to do.

Firstly, make an appointment with your General Practitioner (GP)

Your GP will usually order an MRI before they refer you to a medical professional such as an ear nose and throat specialist (ENT), audiologist or neurologist.

How will they diagnose you?

Many people often notice dizziness before tinnitus and hearing loss. As episodes of dizziness can have many causes and it is necessary to exclude many other possible causes during the consultation and investigation. They need to know:

- Whether or not it is in fact Meniere's disease?
- Perhaps you have another condition needing different treatment?
- If it is Meniere's you would be monitored for different treatment at various stages of the disease
- Your treatment response would be monitored.

The treating professional will need a detailed history of your condition e.g.

- How your dizziness started?
- How often your symptoms occur?
- What affect it has on you?
- Hearing loss, distortion of sounds, tinnitus, general balance, your general health etc.?

During your consultations and testing you will have the opportunity to discuss with your medical professional regarding treatments available, any fears or concerns you have about your illness, medication etc.

Below is a description of some of the tests that may be undertaken in your Meniere's diagnosis or throughout your Meniere's journey:

Magnetic resonance imaging (MRI) scan

This is a routine part of the investigation and usually the first. **It is used to exclude other serious conditions, which can cause vertigo or unilateral hearing loss and tinnitus.** The MRI scan will not confirm a diagnosis of Ménière's disease, nor will it show which ear is affected or how severe the condition is.

The scan looks for the presence of some other illnesses. It can show the internal auditory canal and exclude the presence of tumours. It can also check that other areas of the brain are structurally normal and help to exclude brain tumours and

multiple sclerosis. It is useful during the early stages of the disease especially if symptoms are severe and the other diagnoses need to be considered.

Audiogram

An audiogram tests your hearing. This test is carried out in a soundproof room. Through a set of headphones you will hear tones that the equipment produces. The test measures how sounds are normally heard, coming through the air, down the ear canal and onto the eardrum. You will be tested for inner ear function. The hearing test does tests your response to the quietest sounds which may be heard in a totally artificial scenario. This test is well standardised and does give a reliable guide as to what level your hearing is at. The machines used are highly calibrated, and there are regulations stating what the sound environment needs to be like to get a reliable test.

Caloric test

The caloric test investigates the function of the horizontal semicircular canal in the inner ear. It gives useful information about balance function and may indicate which ear is affected. It involves stimulating the canal and recording the eye movements (nystagmus). It produces the sensation of vertigo, and the test needs to be repeated several times. The semicircular canal is stimulated by introducing warm or cold water or air into the outer ear canal. You lie on your back with head on an angled rest and asked to fix their eyes on a point or light on the ceiling. The nystagmus will be recorded either visually or by small electrodes adhered to the temples. The sensation of vertigo will stop within a minute or two of the water or air flow stopping. It can be unpleasant for many people as it may resemble the start of an attack. For this reason it is important you are calm and fully understands the procedure. The caloric test produces vertigo and nystagmus in a normally functioning ear.

In Ménière's disease the caloric test is used, together with other evidence, to make a diagnosis. The caloric test gives essential information when surgical procedures are considered, and can give useful information about progression of the disease. Many people have the test at some time, either prior to surgery or when being examined for bilateral disease.

Electrocochleography

This is an electrical test of the organ of hearing. Sound goes into the organ of hearing. The cells inside which register sound fire off little electrical impulses into the brain. You would have to lay down a long thin probe is pushed into the ear canal, either so it touches the ear drum, or alternatively, a needle is used to pass through the ear drum (under local anaesthetic). A speaker playing loud clicks is set up next to the patient while electrodes are places on their head to pick up the nerves firing. The computer is programmed to look at the first few

thousandths of a second after each click and then averages out the electrical activity, taking out the background brain activity.

In Ménière's disease there is a lot of pressure in the inner ear, ballooning out of endolymphatic space, pressing on the cells of the inner ear. When these little cells are pressed the electricity they produce changes, so the test is a measure of how much the cells are being pushed.

Electronystagmography

This is a diagnostic test to record involuntary movements of the eye caused by a condition known as nystagmus. It can also be used to diagnose the cause of vertigo, dizziness or balance dysfunction by testing the vestibular system.

Electrodes are placed on the head and their eye movement tracked by glasses, which are linked up to a computer. As the eyes move they create a little electric field and changes in this electric field are measured and traced onto a computer screen. You start off looking at a bar with a red dot. The system is calibrated so the computer knows how far their eyes move. You are then asked to follow the dot with your eyes as it rocks back and forth like a pendulum. You may be asked to look at dots jumping around the bar. These tests work out how well the eyes are wired into the brain and how well the nerve responds controlling the eyes.

Dix-Hallpike test

This test is used to diagnose Posterior canal benign paroxysmal vertigo (BPPV)

This test requires you to be in a sitting position on an examination couch. From the sitting position the medical professional lowers you onto your back so that your head is hanging off the edge of the bed and rotate initially to the right at 45 degrees. The position is maintained for a minimum of half a minute. If the test is positive, the patient will become briefly very dizzy and will develop a characteristic repetitive eye movement called nystagmus. From the exact pattern of the nystagmus, the doctor can determine which semi-circular canal and which ear is involved. The treatment depends critically on this information. At the same time the other (mainly neurological) causes of these symptoms can be positively ruled out. When you sit up again, further vertigo will usually be experienced, with the nystagmus reversing direction. The test is then repeated with the head turned the other way. In the commonest form of BPPV, involving the posterior semi-circular canal in most cases the Hallpike test is positive (i.e. induces vertigo and nystagmus) when the affected ear is downmost. Up to ten percent of cases may involve both ears.

Speech audiometry

Speech audiometry is a measure of the patient's ability to understand speech. You are required listen to a recording of words. Each word has three phonemes

(blocks of sounds which make up words) e.g. mat is made up of the sounds 'm', 'a' and 't'. You listen to each word and the audiologist asks you to repeat the words. The words are played at different volumes, starting quietly and getting louder. There are likely to be more mistakes on the quieter words, but you are asked to produce their best guess.

Tympanometry

Tympanometry is an examination used to **test the condition of the middle ear and mobility of the eardrum** (tympanic membrane) and the conduction bones by creating variations of air pressure in the ear canal. Tympanometry is an objective test of middle-ear function. This machine measures how well the Eustachian tube is working by bouncing sound off the eardrum.

Vestibular evoked myogenic potentials (VEMPs)

Vestibular evoked myogenic potential (VEMP) testing technique determines **vestibular** function by applying a repetitive sound stimulus to one ear and then averaging the reaction of the muscle activity in response to each sound click or pulse. It complements the information provided by caloric testing and other forms of inner ear (vestibular apparatus) testing.

VEMPs are generated by the vestibular system, they have to be evoked in some way, they are myogenic, which means it is a muscle response, and they are an electrical potential, i.e. an electrical pulse that can be picked up. VEMPS tap into the fact that the balance organ responds to sound to see if it is actually functioning or not. This is one of the positive aspects of VEMPs and why they are likely to become more prominent. VEMPs are non-invasive and don't really cause any discomfort. However the sound used to elicit a response can be loud and therefore care should be taken if the patient has tinnitus. Recording leads with sticky pads are put on the patient, along with the standard sort of headphones used in hearing tests.

If you have Meniere's disease:

Your medical professional will discuss lifestyle changes, medication and other tools and information you need to manage on a day-to-day basis. You can get a lot of support by learning how other sufferers manage.

Some helpful links to self manage:

<https://sydneymenieressupportgroup.com/information-links>

Support Groups:

<https://sydneymenieressupportgroup.com/meetings-1>

(Most of above information was sourced from Meniere's Research UK)