

THE DIZZY PATIENT'S GUIDE

Department of Otolaryngology Head
& Neck Surgery, Division of Otology,
Neurotology, and Skull Base Surgery



MUSCHealth.org/medical-services/ent/otology

MUSC Health Ear, Nose & Throat (ENT) provides comprehensive care for all diseases and disorders involving the ear and adjacent skull base in children and adults. We evaluate and treat approximately 5,000 patients annually and would be pleased to assist you or your loved ones. Please call us at 843-792-3531 to schedule an appointment with our team.

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Introduction

What is the MUSC Health Vestibular Program?

The MUSC Vestibular Program takes a comprehensive, multidisciplinary approach to the assessment and management of vestibular and balance system disorders. MUSC Health offers expertise for the care of those suffering from dizziness and imbalance, as well as advanced testing.

Available services:

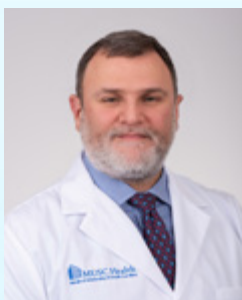
- Neurotology and otology evaluations
- A full battery of vestibular testing which may include: rotational chair, electronystagmography, computerized dynamic posturography, video head impulse and vestibular evoked myogenic potential
- Vestibular rehabilitation

After a thorough examination, evaluation and testing, we will work closely with you and our multidisciplinary team to develop an individualized treatment plan.

How to use this guide:

This informative booklet is intended to be used as a reference to learn about vestibular conditions, treatments, nutrition and additional resources.





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Habib G. Rizk, M.D. grew up in Beirut-Lebanon. He attended the Faculty of Medicine-Saint Joseph University in Beirut Lebanon and pursued an Otolaryngology – Head & Neck Surgery residency at Hôtel-Dieu de France Hospital in Beirut followed by a Otologic Medicine and Surgery Fellowship under the mentorship of Dr. Michael Teixido at Chrstiana Care in Wilmington, Delaware, and a two-year Neurotology fellowship at the Medical University of South Carolina. Dr. Rizk's interests pertain to all areas of otology and neurotology with a specific focus on medical and surgical management of vestibular disorders. He is an associate professor in the MUSC department of Otolaryngology Head & Neck Surgery, and is the Director of the Multidisciplinary Vestibular Program.

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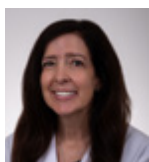
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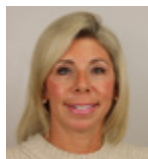
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Feeling Dizzy?

Charleston Dizzy Group

The Charleston Dizzy Group is a local chapter of the Vestibular Disorder Association (vestibular.org) and is a support system for people affected by vestibular and balance disorders.



For more information and to register, contact Stephanie Sams:

843-813-6735 or stepsams@comcast.net or visit www.facebook.com/groups/542582642742649 for meeting times.

Meetings are held on a monthly basis and in various locations; usually in an outdoor setting to allow for social distancing (if weather permits).

Vestibular Evaluation

Following a clinical evaluation, a full battery of tests may be needed

1. Videonystagmography (VNG)

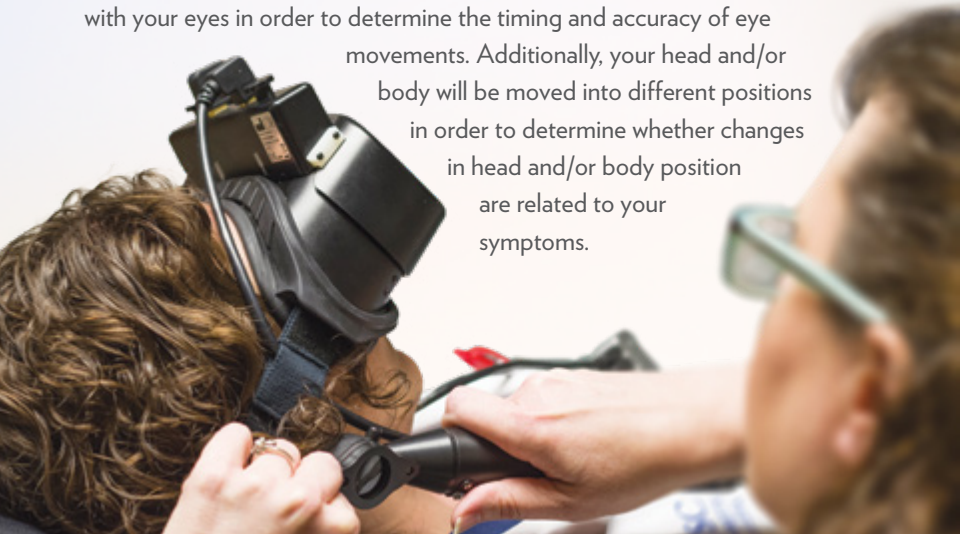
Videonystagmography (VNG) is a test battery that consists of multiple subtests; including the (a) Caloric Test, (b) Various positions head/eye positions and the (c) Rotational Chair. The purpose of this evaluation is to determine whether or not your vestibular system, housed within the inner ear, is responsible for the symptoms you have been experiencing. The VNG evaluation lasts approximately 60 minutes.

A. Caloric Test: Caloric testing involves the irrigation of both ears, one at a time, with either air or water. A minimum of four irrigations will be performed. The purpose of caloric testing is to compare the functionality between the right and left vestibular systems.

What to expect: Each ear will receive both warm and cool irrigations. Irrigations last anywhere from 20-60 seconds. It is not uncommon for people to experience a sensation of movement during this test. It is important to remember that the sensation will subside within a few minutes after the test is complete.

B. Ocular Motor Test: You will wear goggles that allow the audiologist to record your eye movements throughout the duration of the evaluation.

What to expect: You will be asked to follow a target on the video monitor with your eyes in order to determine the timing and accuracy of eye movements. Additionally, your head and/or body will be moved into different positions in order to determine whether changes in head and/or body position are related to your symptoms.



C. Rotational Chair Test: These are typically included in the VNG test battery in order to determine whether dizziness may be due to a disorder of the inner ear or brain.

Rotary chair tests provide specific information regarding whether or not both vestibular systems are impaired at the same time, and/or the level of compensation (the process of recovering from an insult).



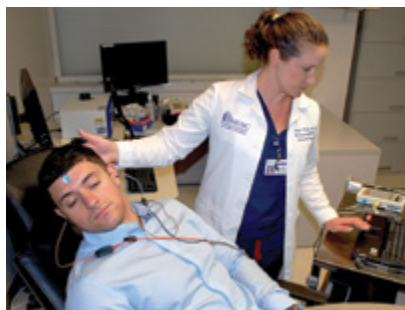
What to expect: While wearing goggles, you will be secured in a chair. The chair will rotate at various speeds. It is common to experience a sensation of movement as your whole body is rotated in the chair.

2. Video Head Impulse Testing (vHIT)

The Video Head Impulse Test is an objective measure of the vestibular ocular reflex (VOR), which is an important component of a healthy vestibular system. The VOR allows for gaze stabilization during head movements and when impaired, can result in altered visual acuity when in motion. The vHIT measures the VOR in response to head movements representative of every-day head motion and can allow for ear-specific information to be obtained regarding vestibular function.



What to expect: The duration of the vHIT is about 15 minutes. You will wear lightweight video goggles and focus on a light in front of you. The examiner will hold your head and or chin with both hands and make a quick movement up, down, right, or left. The video goggles will track any eye movement away from the target. A computer system will analyze this movement and provide information about VOR function.



3. Vestibular Myogenic Evoked Potential (VEMP) Test

The vestibular myogenic evoked potential VEMP test is used to evaluate the utricle and saccule; the organs of the inner ear that are responsible for our perception of tilt and linear acceleration relative to gravity. These organs respond

when you move forward, backward, up or down and when you tilt your head side-to-side, up or down. The VEMP test is valuable in the evaluation of inner ear function and can support a diagnosis of Ménière's disease, superior canal dehiscence, or vestibular migraine.

What to expect: This noninvasive test utilizes electrodes, which are placed on the surface of the skin around the eyes and on the neck to measure responses from the muscles. Responses are evoked by a clicking sound presented through insert-style earphones; These clicks translate vibrations to the inner ear organs. You will be asked to flex the muscles around your eyes by looking up or your neck by turning your head during these tests. This test is not affected by medications or hearing loss due to inner ear damage.

4. Computerized Dynamic Posturography (CDP)

Our bodies use our inner ears in conjunction with our vision and somatosenses (sense of touch or vibration) in order to help us maintain our balance and orientation. We will evaluate each of these three systems as they work together and in isolation in order to identify any weaknesses.

What to expect: A harness will ensure your safety as you maintain your balance on a platform. This test typically lasts 15 minutes. Please be sure to notify the audiologist of any knee, hip or back pain as well as any recent surgeries prior to testing.



Pre-Test Instructions For Vestibular Evaluation



Must read instructions for Videonystagmography (VNG), caloric, rotary chair, and posturography

Your physician has ordered a vestibular assessment to help evaluate the cause of your symptoms. There are several separate components to the test, all of which may or may not be performed. Please allow up to 2-3 hours for completion of evaluation.



Please adhere to the following instructions. Failure to do so may result in an inability to complete the evaluation.

2 days prior to your appointment: *Discontinue all medications for dizziness.*
Anti-vertigo medications- (ex: Antivert, meclizine, Dramamine Scopolamine, valium, Bonine)

24 hours prior to your appointment: *Sleep aids, alcohol and/or caffeine must be discontinued* (wine, beer, liquor and cough medications containing alcohol)

It is necessary that you DISCONTINUE the following medications:

1. Sleep aids (ex: melatonin, Ambien, Lunesta)
2. Anti-nausea medicine (ex: Zofran, Compazine, Marezine, Phenergan, Thorazine)
3. Pain medications (ex: Codeine, Demerol, Percodan, Hydrocodone, Vicodin)
4. Antihistamines or any over-the-counter (OTC) cold/allergy/sinus remedies (ex: Allegra, Advil Cold & Sinus, Benadryl, Claritin, Dimetapp and Zyrtec)

4 hours prior to your appointment:

NO smoking, eating or drinking

*If you are diabetic, do not skip meals necessary to maintain your blood glucose levels

Call Your Doctor Before You Abruptly Stop Taking Any Medication.

All of the Following Medications Should be Continued:

- Heart
- Blood Pressure
- Blood Thinning
- Diabetes
- Epilepsy or Other Seizure Control Medications
- And All Other Medications For Life Threatening Issues and Mental Health Treatment



Additional Considerations:

- Do NOT wear contact lenses. Please wear your glasses.
- Please wear comfortable clothing, shoes and simple hairstyles
- Do NOT wear eye or facial make-up (this includes: foundation, mascara, eye liner and false eye lashes)
- Please arrange to have someone who is able to drive accompany you to the appointment should the testing make you feel unsteady or nauseous
- You will not be available to care for children while you are being tested. If you are bringing a child to the appointment that is not being evaluated, please arrange to have another caregiver with you to attend to the child(ren) in the waiting room while you are in the exam room.

On the Day of Your Appointment:

Please report to the 2nd floor registration desk in Rutledge Tower. We kindly ask that you check in prior to your scheduled appointment time as patients who are late may be asked to reschedule.

Should you need to reschedule, we ask that you give us 72 hours notice. Please contact 843-876-0112 if you have any questions regarding the test or difficulty following these pre-test instructions.

Vestibular Rehabilitation

Vestibular Rehabilitation Therapy (VRT) is an exercise-based program for reducing symptoms related to vestibular (inner ear/balance) disorders.

Patients suffering from vestibular disorders often experience problems with vertigo, dizziness, visual disturbance and/or imbalance. Secondary problems can also arise, such as nausea and/or vomiting, reduced ability to focus or concentrate, fatigue, anxiety and depression. The aim of VRT is to address these problems.

Vestibular disorders can directly impact a patient's quality of life. Patients often develop a more sedentary lifestyle to avoid provoking one's symptoms. This sedentary lifestyle can contribute to a decrease in physical health, becoming weaker, developing joint stiffness and having an overall decrease in endurance to perform daily activities.

A common approach for managing such symptoms is to prescribe medication that suppresses vestibular function. However, in the long term, such suppressants can interfere with a person's ability to make the necessary adaptations for reducing symptoms. Additionally, these medications can cause drowsiness that may further contribute to a person's inability to be active. VRT is an alternative treatment involving specific exercises to eliminate or significantly reduce both the primary and secondary symptoms caused by vestibular disorders by promoting central nervous system compensation for inner-ear deficits. This is accomplished through one or a combination of vestibular rehabilitation concepts:

Vestibular adaptation - The ability to make longer term changes in the neuronal response of head motion

Substitution - Learning strategies to replace loss of compromised function

Habituation - The repetitive exposure to a noxious stimulus (usually motion) to gradually inhibit the patient's response to the stimulus.

BPPV repositioning maneuvers - The goals of VRT are specific to each individual patient. They include: improve the patient's ability to see clearly during head motions, decrease feeling of dizziness and unsteadiness, improve functional balance especially during ambulation, decrease disequilibrium and oscillopsia, improve overall physical conditioning, decrease risk for falls, reduce social isolation and improve ability to perform activities of daily living.

Vestibular Rehabilitation

Why a Physical Therapist?

Physical therapists often specialize in VRT. Much of a physical therapist's job is to help get a person moving again while managing their dizziness at the same time. Exercise and performing daily activities are the primary ways of accomplishing this goal. Physical therapists can provide essential coping strategies that make recovery more tolerable. If specific activities cause dizziness, such as chores around the house or involvement in the community, then learning ways to perform them differently may help to keep the dizziness to a minimum while promoting an active lifestyle. Activities that were simple before the vestibular disorder may become difficult causing fatigue and dizziness. A physical therapist can help you work through some of these issues right away and get you moving, and back to a productive life more quickly.

Therapy for vestibular disorders takes many forms. The type of exercise utilized depends upon the unique problems that the individual demonstrates during the evaluation. Some exercises are geared toward helping with balance, some with helping the brain resolve differences in the inner ear signals, and some with improving the ability to visually focus. In addition, general exercise is often prescribed to improve overall physical health and well-being.

Regardless of the cause of your vestibular disorder, the sooner you start therapy the better. Research has shown that the brain and inner ears work best for compensation, or recovery, in the first few months after a vestibular deficit occurs. This time period is optimal for vestibular rehabilitation to promote the best chance for recovery.

Access information on vertigo and vestibular rehabilitation online:

<https://muschealth.org/medical-services/ent/otology/vertigo>

<https://muschealth.org/medical-services/ent/otology/vertigo/conditions>

<https://muschealth.org/medical-services/ent/otology/vertigo/vestibular-rehabilitation>

<https://muschealth.org/medical-services/ent/otology/vertigo/videos>

What should I expect on my first visit?

VRT begins with a comprehensive clinical assessment that will include gathering a detailed history and how symptoms are affecting daily activities, medications, hearing or vision problems, other medical issues, fall history, previous and current activity level and living/work situation.

After the collection of a detailed history, your physical therapist will administer different tests to more objectively evaluate symptoms. The physical therapist will screen the visual and vestibular system, posture, balance, muscle strength, range of motion, sensation and coordination. At this point, a customized plan is developed from the referring physician's recommendations, findings of the clinical assessment, results from laboratory testing and input from the patient about their goals for rehabilitation.

Before leaving your first visit, you can expect to be provided with a home exercise program. This is an important part of the VRT process. Compliance with the home exercise program is essential to help achieve both patient and rehabilitation goals. Along with exercise, patient and caregiver education is an integral part of VRT. Many patients find it useful to understand the science behind their vestibular problems, and how it relates to the difficulties that you may be experiencing in daily life. Your physical therapist can provide information about how to deal with these difficulties and what is to be expected from VRT. Education is important because it can help take away much of the mystery of what you may be experiencing, which can help reduce anxiety that may occur as a result of your vestibular disorder.

Benign Paroxysmal Positional Vertigo (BPPV)

BPPV is the most frequent cause of dizziness. It is expressed in laymen vernacular as “displaced crystals in the ear”.

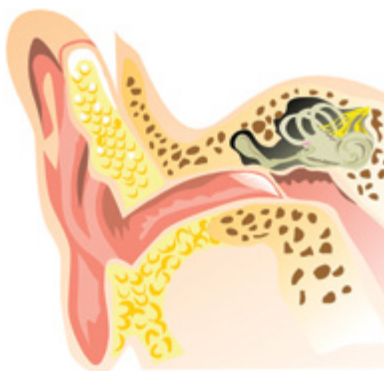
The inner ear has two functions: hearing and balance. The cochlea is responsible for hearing. Balance function is conveyed by three semicircular canals as well as the utricle and saccule. The canals sense rotational movements and the utricle and saccule are responsible for vertical and horizontal movements.

The utricle and saccule contain a membrane that holds calcium carbonate crystals that we call otoliths. The movement of these crystals over the membrane allows us to sense the movement of the body. When these crystals fall off the membrane, gravity pulls them into the semicircular canals. The cause of displacement of the crystals is often times unknown. Age, head trauma, previous infection, low vitamin D levels can be predisposing factors. Meniere’s disease and Migraine headaches also increase the risk of BPPV. The otoliths typically fall into the posterior semicircular canal: every time the patient lies down with the affected ear down, the crystals move the fluids of the inner ear activating the sensor of the semicircular canal inappropriately. This is perceived as vertigo or spinning by the patient and lasts less than a minute until the crystals settle down and stop moving. Treatment consists of specific maneuvers that can reposition or dissolve the crystals.

Please visit: muschealth.org/ent/services/otoneuro/vestibular-and-balance/conditions.html

There you will find valuable video resources, including:

- Benign Paroxysmal Positional Vertigo (BPPV)
- Right Epley Maneuver
- Left Epley Maneuver
- Left Gufoni Maneuver for Right Canalithiasis
- Left Gufoni Maneuver for Left Cupulithiasis
- Left Log Roll
- Right Log Roll
- Right Semont Maneuver
- Brandt-daroff Exercise



Vestibular Neuronitis and Labyrinthitis

These are disorders arising from an inflammation of the inner ear or the nerves of hearing and balance.

Vestibular neuritis is generally believed to be from a reactivation of varicella zoster virus (VZV). VZV is a virus of the herpes family and is implicated in chicken pox, a common childhood viral illness. The virus lies dormant after the infection. When it becomes reactivated, it can cause shingles or possibly vestibular neuronitis if it reactivates in the balance nerve. The patient presents with severe spinning dizziness, often associated with nausea and vomiting. The spinning is exacerbated with every motion of the head. It is self-remitting within a few days. Treatment is symptomatic. Treatment includes anti-nausea medications as well as vertigo suppressants. This is probably the only indication to use meclizine for a limited period of time.

Labyrinthitis is an inflammation within the inner ear that usually manifests with dizziness and hearing loss. We can see it in the context of a chronic middle ear effusion, in which case it is not usually an infection but only a mere inflammation. Occasionally, an acute otitis media can cause translocation of bacteria from the middle ear to the inner ear, which may cause the much more debilitating suppurative labyrinthitis.

Vestibular Schwannoma

Vestibular schwannoma, also called acoustic neuroma, is a benign slow-growing tumor that develops from the balance nerve supplying the inner ear.

The name schwannoma comes from the fact that the tumor arises from the proliferation of Schwann cells which form the sheath of the balance nerve.

As the tumor grows, the balance function progressively gets worse. Patients usually notice a unilateral hearing loss and tinnitus. There is rarely an acute dizziness because the growth is slow. Imbalance is also more slowly developing because the patient compensates using the contralateral vestibular function. In certain cases, the growth of the tumor can impinge on the trigeminal nerve causing facial numbness. More rarely it can cause facial

weakness. Since the facial nerve is located in the same bony canal as the balance nerve, a tumor in this location with facial weakness should raise the suspicion of a facial schwannoma. When the tumor grows to the point it starts compressing the cerebellum and the brainstem, symptoms become more severe and it can become potentially life-threatening.

The incidence of vestibular schwannoma is 1/100,000 individuals per year. It is usually a unilateral, non-familial pathology. In the setting of a genetic disease called neurofibromatosis, patients can develop bilateral acoustic neuromas.

Most frequently, acoustic neuromas are diagnosed with an MRI ordered in the setting of an asymmetric hearing loss. Less than 10 percent of cases of sudden sensorineural hearing loss turn out to have a vestibular schwannoma. This is generally due to a rapid increase in size of the tumor because of a hemorrhage within the tumor.

Once a vestibular schwannoma is diagnosed, there are three options to discuss with the patient. If there are no life threatening symptoms, we usually observe and repeat the MRI in 8 to 12 months to determine if the tumor is growing or not. Once the growth of the tumor is objectively put in evidence, we can treat it either with the radiation (gamma knife, cyberknife), which will stop the growth of the tumor, or with surgery.

Radiation stabilizes the tumor. There is a lower risk of facial nerve weakness, and generally the patient can hold on to their hearing much longer. There is however a progressive decrease in hearing on longer term results, especially depending on the amount of radiation the cochlea receives during the treatment. This option is generally suggested when the tumor is less than 2.5 cm in size and in elderly patients or those with contraindication to surgery. Surgical approaches depend on the degree of hearing loss and the size and location of the tumor.

Superior Semicircular Canal Dehiscence

Superior Canal Dehiscence (SCD) is a recently recognized pathology described in 1998.

The superior semicircular canal is a part of the inner ear balance system. Typically, there is bone covering the superior canal that separates it from the overlying brain. In certain patients, that bone layer is very thin or absent and the superior canal is directly in contact with the meninges or lining of the brain. These patients manifest symptoms of vertigo induced by sound or by coughing, sneezing, squatting. They also present with imbalance and autophony, which is a sensation of echoing of one's own voice in the affected ear. They can at the same time complain of pulsatile tinnitus or a pulsing sound in their ear.

Most of the time, SCD is not treated if the symptoms are not tremendously affecting the patient's quality of life. If the symptoms are extremely debilitating, there are several surgical options that can be more or less aggressive.

The most conservative option would be to place a tube in the ear drum, which diverts the sound energy and diminishes the sound-induced symptoms. Another option would be opening the middle ear and identifying the round window, which is one of two "windows" to the inner ear, and blocking it with a piece of cartilage.

Classically, however, the dehiscence should be repaired directly, through a craniotomy. The dehiscence is identified and a piece of bone is used to plug it. In certain patients, we can avoid a craniotomy and open the mastoid cavity behind the ear and slip a piece of cartilage or perichondrium (cartilage cover) over the dehiscence and under the meninges. These surgical approaches work both on the auditory and vestibular symptoms. There is a risk of transient postoperative vertigo as well as a hearing loss of variable severity in these cases.

Bilateral Vestibular Hypofunction

Patients with bilateral decrease in function of their balance system are usually very debilitated.

They present with chronic imbalance, especially in the dark or on an uneven surface. It can, in extreme cases, decrease the patient's ability to see clearly during head movements. This latter symptom is known as oscillopsia.

Please see link for a simulation of what oscillopsia feel/looks like from the patient's perspective, <https://collections.lib.utah.edu/details?id=1213442>.

The most frequent causes of bilateral vestibular hypofunction are ototoxicity from chemotherapy drugs or antibiotics, meningitis, autoimmune disorders, polyneuropathy, and neurofibromatosis with bilateral vestibular schwannoma. In most cases it is idiopathic.

Unfortunately, there is no treatment that reverses the vestibular loss. The best course of treatment is vestibular rehabilitation. Such treatment consists of gaze stabilization exercises as well as exercises that increase postural stability and allow the patient to use the alternate systems of vision and proprioception to adjust for the missing vestibular information. However, future treatment will consist of developing a prosthesis that replaces the missing vestibular function; much like cochlear implants replace the hearing function.

Several labs are currently working on developing vestibular implants. The majority of the work with these prostheses is still in human clinical trials specifically at Johns Hopkins University and University of Washington as well as at the University of Maastricht in the Netherlands, but clinical application in humans is not anticipated for the near future. The basic design is that sensors will detect and measure the directions of rotation and then electrically stimulate the appropriate ampullary nerves, but clinical application in humans is not anticipated for the near future.

Mal de Debarquement

It literally means sickness of disembarkment. It refers to an illusion of movement primarily noted following travel on water.

Most individuals will recover within a few days. It becomes pathological if it persists more than a month. Most patients note a resolution of their symptoms within 12 months.

Middle-aged women are most at risk, following exposure to an unfamiliar movement and removal of the stimulus. The pathophysiological process seems to arise from the brain rather than the inner ear. Functional MRI studies suggest that the brain is able to adapt to an unfamiliar movement but is unable to re-adapt once the movement has stopped.

Most commonly, the patients describe their symptoms as rocking, swaying and disequilibrium but rarely a spinning vertigo. The symptoms are worsened when individuals are in an enclosed space or when motionless. They feel better when they are moving or driving. Diagnosis is made after taking an appropriate history and after ruling out other disorders that can cause dizziness.

There is no single effective treatment for Mal de Debarquement Syndrome. Short-term use of benzodiazepines may alleviate the symptoms. However, prolonged use may cause delay in the necessary compensation to recover.

Vestibular rehabilitation is controversial. Early exposure to motion may exacerbate symptoms. After a variable wait time for spontaneous resolution, however, it can be suggested. The rehabilitation will focus on readjusting the maladapted vestibulo-ocular reflex.



Persistent Postural Perceptual Dizziness (PPPD)

A chronic dysfunction of the vestibular system and brain that produces persistent non-vertiginous dizziness, unsteadiness, and non-spinning vertigo that are exacerbated by postural challenges and perceptual sensitivity to space-motion stimuli.

PPPD is usually triggered by a previous or current episode of vertigo or dizziness. After that first episode, the person continues to have feelings of movement, dizziness, unsteadiness or light-headedness that can last for hours or days at a time. These symptoms are present nearly all the time, but they can be better or worse at times. Things like sitting or standing upright and seeing busy patterns or movement often make the symptoms worse. As a result, people with PPPD often become anxious about losing their balance or falling. They may avoid situations that make their symptoms worse, to the point where it can start to interfere with their lives.

The brain's balance system combines information from many sources. The inner ear which senses when you head tilts, turn or changes speed; your visual system and the proprioceptive system which sends signals to your legs, feet and trunk about position, pressure movement and vibration. Normally, you don't consciously notice all these different sources of information because the balance system combines them for you in the background. Therefore, you can stand, walk or turn your head without needing to think about keeping your balance. But with PPPD, the experience is no longer seamless. You start to notice the different signals, especially if they do not all agree with each other. This can make you feel like you are moving when you are standing still, or like you are about to fall.

If the brain thinks you might be in danger of falling, it reacts automatically to protect you. Your body gets stiff, you take shorter strides and you focus on staying upright. At the same time, the balance system uses less information from the vestibular system and more from the visual system. Normally, when the risk of falling is over, the balance system goes back to normal. But in PPPD, the brain stays in "high-alert" mode. This causes a vicious circle: you are fearful of falling and pay more attention to keeping your balance; at the same time the brain stays on alert and relies on visual input; and this visual input – like busy patterns or motion – suggests that you may be in danger of



falling. This description may make it sound as if PPPD is “all in your head,” but the symptoms are real. PPPD has some things in common with anxiety disorders, but it is not a psychiatric disorder. Some studies have found differences in brain activity in people with PPPD, compared with people who do not have PPPD. These differences may make it harder for the brain to integrate different sources of information and assess threats properly.

Treatment and Management - Once the diagnosis is made, the first step in treatment is helping you understand what causes PPPD and how the brain is responding to normal signals as if you were in danger. Knowing what is going on will help you feel more in control and able to take part in treatment. Treatment for PPPD usually involves “retraining” your brain through a combination of vestibular rehabilitation and strategies to address anxiety, such as medication and cognitive-behavioral therapy (CBT). Remember that both vestibular rehabilitation and CBT take practice and effort. Your therapists will teach you the skills you need, but you are the one who puts them to use.

Medications - We often add medications from the SSRI or SNRI family to help with the management of the symptoms. In our clinic, we preferably use venlafaxine at a dose of 37.5 mg per day. It reduces the excitability of the brain. It also helps with the anxiety, which is a very common comorbidity. Other medications from the same family as well as clonazepam have been tried with variable results.

For more information on PPPD please visit www.neurosymptoms.org.

Vestibular Paroxysmia

Vestibular paroxysmia is a rare condition characterized by repeated short-lived episodes of vertigo and unsteadiness (with or without hearing loss and tinnitus) that can occur multiple times a day and can be debilitating. Typically the episodes last less than one minute at a time and are not clearly provoked by specific triggers or head positions.

It is thought to be due to a focal area of demyelination of the nerve due to a compression of the nerve by a vascular loop (even though, at times, there is no clear-cut evidence of compression). The treatment consists of anticonvulsants such as carbamazepine or oxcarbazepine, with the latter particularly safer and better tolerated. The response to treatment is considered one of the diagnostic criteria. Surgical decompression of the nerve is no longer considered an appropriate treatment for those patients





Ménière's Disease

French physician Prosper Ménière described the disease bearing his name in the 19th century after seeing several patients who presented with episodic vertigo attacks that would come out of nowhere. He also noticed that a lot of these patients developed ringing and hearing loss in one ear.

The typical symptoms of Ménière's disease are episodic attacks of vertigo (spinning), lasting between 20 minutes and 12 hours, that are associated with tinnitus/ringing and fullness in the affected ear. When the vertigo resolves, the tinnitus and the fullness also disappear. A hearing test obtained close to the spell will show a hearing loss in the low pitch sounds. Hearing will usually return to normal following the episode. The pathophysiology of Ménière's disease consists of a decline in hearing. In some people, Ménière's disease may become bilateral. This usually happens within the first five years of presentation in the first ear. The longer the patient suffers from the disease, the less likely he will develop it in the contralateral ear. Additionally, it is now more readily acknowledged that Ménière's disease patients have a higher lifetime prevalence of migraines (up to 50 percent in all patients and around 75 percent in women).

We do not know what causes Ménière's disease. We do know that the symptoms are due to increased pressure in the fluids of the inner ear (the endolymph). Initial treatment starts with a low salt diet (less than 1500 mg a day) and a diuretic called Dyazide® (triamterene hydrochlorothiazide). If the episodes are very frequent, a steroid can be injected through the ear drum. If there is not substantial hearing loss, a surgical intervention, consisting of an endolymphatic sac decompression, may be recommended to relieve the pressure within the inner ear.

Should hearing decrease, one of the more aggressive treatment options is to inject an antibiotic through the ear drum, which works by decreasing the balance function thus reducing the perception of vertigo and spinning. The final option is surgical and entails performing a labyrinthectomy, which consists of drilling out the inner ear.

In severe cases, patients may start experiencing drop attacks, also called Tumarkin crisis. See link for example of a drop attack <https://edhub.ama-assn.org/jn-learning/video-player/18471263>.

Treatment options for those with hearing loss include conventional hearing aids. In those who have bilateral Ménière's disease and have lost hearing, bilaterally, cochlear implants may be an option.

Please inquire about available clinical trials that you may be eligible for.

Eating Well with Ménière's Disease

Ménière's disease is thought to be caused by problems with fluids in the inner ear. By controlling the fluid in the inner ear with diet, we can reduce symptoms.



Here's where to get started:

Eat consistently throughout the day.

Do not go longer than four hours without eating!



Limit or avoid alcohol. At most, one drink maximum per day. This can help prevent migraines.



Limit caffeine. Avoid things like coffee, tea, soda, energy drinks, chocolate, and diet pills. Caffeine will stimulate the nervous system and make migraines and tinnitus worse.



Eat a low sodium diet. Sodium causes fluid retention and can make your symptoms worse in your inner ear.



Avoid MSG (monoSODIUM glutamate) — which is a form of sodium that is a common migraine trigger. Common foods that contain MSG include Asian foods, ramen noodles, and Accent® seasoning.

Low Sodium Diet

2,000 mg sodium limit can help alleviate symptoms, but some people need to limit their sodium intake to 1,500 mg. If this limit does not help, please consult your doctor. See below for tips to reduce sodium:

- Read nutrition labels. Know how much sodium is in your foods. Keep in mind that the sodium listing relates to the serving size and not the entire package, so remember to multiply the amount of sodium by the number of serving sizes you are eating!
- Read your ingredients list for words like sodium and salt. Sneaky ingredients contain salt like baking soda, baking powder, monosodium glutamate (MSG), and preservatives such as sodium benzoate, sodium citrate, and sodium nitrate.
- Rethink your seasonings; just a pinch of salt is equal to 600 mg of sodium! Sodium free seasonings are best or use liquid marinades which can help infuse flavors.
- It's hard to limit sodium while dining out, so whenever possible cooking at home is best. Many chain dining and fast food restaurants have much of their food pre-cooked and processed, so often there isn't much control over the sodium content of their foods, but below are a few tips for when you have to eat out:

- Check the nutrition facts before you go.
- Cut back on portions.
- Ask to leave off sauces and dressings completely or keep them on the side.
- Pair foods with fresh fruits and vegetables.



Tips to Reduce Sodium While Dining Out



When eating out or dining in at take out or fast food restaurants, it can be hard to find a menu item that meets reduced sodium limits. Just one meal at a fast food location can amount to the days reduced total recommended intake of sodium (1500 - 2000 mg). While fast food and take out restaurants are convenient for time and cost often, it is health that pays the price. If possible, it is better to prepare all foods at home, this allows you to control the amount of sodium that is in food you prepare. A Deluxe Hamburger (lettuce/tomato/onion/ketchup/ mustard) prepared with spices and no salt in a home is around 220 mg of sodium, when prepared by a fast food restaurant in the same way the amount easily doubles 430 mg (McDonald's hamburger without pickles and seasonings).

Preparing your own food at your home is the best way to take charge of your health.

Avoid adding salt to your food while cooking and after it is prepared. Remove the shaker from the table. Try salt alternatives like Mrs. Dash. Sometimes cooking at home is not a choice, or there is a day that you want to eat out with family or friends. The following chart lists some options to ease the overwhelming choices on the menu.

This list is a thorough review of 10 of the most popular chain restaurants which offer better options. If your favorite fast food restaurant is not listed here, there is a good chance that no good options exist. If you are at a restaurant that is not listed below, check out their website for their nutrition information or use CalorieKing.com. It is important to always review the nutrition information available at the restaurant, as recipes and restaurant options change often. The limited options highlight the importance of preparing your food yourself and within your control.

Breakfast Options

McDonald's			
Fruit and Maple Oatmeal			140 mg
Fruit N Yogurt Parfait			75 mg
Chick - Fil - A			
Plain English Muffin with Jelly			220 mg
Greek Yogurt Parfait			85 mg
Fruit Cup			0 mg
Starbucks			
Classic Oatmeal	125 mg	Blueberry Oatmeal	125 mg
Bantam's Bagels	270-280 mg	Classic Coffee Cake	270 mg
Iced Lemon Loaf	310 mg	Almond Croissant	290 mg
Butter Croissant	320 mg	Apples, Egg, Cheese & Pretzel Protein Box	180 mg
Lemon Crunch Yogurt	90 mg	Strawberry Overnight Grains	15 mg
Blueberry Honey Greek Yogurt	100 mg	Strawberries and Lemon Cream	20 mg
Petite Vanilla Scone	95 mg	Apples, Egg, Cheese & Nut Protein Boxes	250 mg
Burger King			
French Toast Sticks (3)			260 mg

Entrée Options

McDonald's		Chick - Fil - A	
4 Piece Chicken McNuggets	460 mg	8 Piece Grilled Nuggets	440 mg
Fruit N Yogurt Parfait	75 mg	Market Salad with Grilled Filet	530 mg
McChicken Sandwich	560 mg	Small Fries	190 mg
Filet O Fish Sandwich	560 mg	Fruit Cup	0 mg
Side Salad	380 mg	Side Salad	170 mg
Kid small fries	90 mg	Kale Crunch Side	140 mg
Small Fries	180 mg	Greek Yogurt Parfait	85 mg
		Apple Sauce	0 mg
Captain D's		Starbucks	
Blackened Tilapia (no sides)	270 mg	Tomato & Mozzarella Panini	580 mg
Lemon Pepper White Fish (no sides)	450 mg	Egg & Cheese Protein Box	540 mg
Wild Alaskan Salmon Salad	480 mg	Apples, Egg, Cheese & Nuts Protein Box	250 mg
Butterfly Shrimp (no sides)	105 mg	Apples, Egg, Cheese & Pretzels Protein Box	180 mg
Popeye's Chicken			
6 Piece Chicken Nuggets	345 mg	Corn on the Cob (1 or 3)	30 or 90 mg
Regular Cole Slaw	190 mg	Blackened Ranch Sauce	250 mg
Buttermilk Ranch Sauce	230 mg	Mardi Gras Mustard Sauce	240 mg

Entrée Options

Subway			
6" Veggie Delight on 9 Grain Wheat	280 mg	Rotisserie Chicken Fit and Fresh Salad	360 mg
6" Egg Salad on 9 Grain Wheat	530 mg	Veggie Delight Fit and Fresh Salad	75 mg
Kid's Mini Sub Veggie Delight	180 mg	Salad Topped with Tuna Salad	380 mg
Kid's Mini Sub Black Forest Ham	430 mg	Oil and Vinegar Dressing	0 mg
Kid's Mini Sub Roast Beef	390 mg	Subway® Vinaigrette Dressing	220 mg
Kid's Mini Turkey Breast	370 mg	Sweet Onion Sauce Dressing	150 mg
Oven Roasted Chicken Fit and Fresh Salad	360 mg		
Church's Chicken		Cookout	
1 Boneless Wing without Sauce	270 mg	Small Hamburger (1/8 lb)	309 mg
1 Boneless Wing with Sauce	230 mg	Regular Hamburger (1/4 lb)	340 mg
Crispy Fish Fillet	380 mg	Big Double	126 mg
Side of Corn (R/L)	15 or 30 mg	Everything	301 mg
Honey Sauce	0 mg	Steak Style	141 mg
Ketchup	65 mg	Cajun Chicken Sandwich	250 mg
Pete's Hot Sauce	230 mg	Side of Chicken Nuggets	314 mg
Burger King			
4 Piece Chicken Nuggets	310 mg	Hamburger	380 mg

Getting Creative with Food



Lean Protein	Try Adding	Also Works With
skinless chicken breast	olive oil + garlic powder + rosemary	pork chops, turkey cutlets
Vegetable	Try Adding	Also Works With
asparagus	lemon juice + rosemary + black pepper	green beans, brussel sprouts, snap peas
zucchini	olive oil + basil + oregano	broccoli, cauliflower
carrots	honey + ground cinnamon + ground ginger	sweet potatoes, butternut squash
tomatoes	balsamic vinegar + garlic powder + oregano	spinach, eggplant
Whole Grain	Try Adding	
brown rice	unsalted chicken stock + garlic powder + black pepper	
whole grain pasta	olive oil + oregano + basil	
quinoa	lemon juice + red pepper + cumin	



SALT

THE SECRET BLEND

Read Nutrition Labels

Know how much sodium is in your foods. What if your food doesn't have a label? Look up nutrition facts for free at calorieking.com.


Nutrition Facts			
Serving Size 1 cup (228g)			
Servings Per Container 2			
Amount Per Serving			
Calories 250	Calories from Fat 110		
% Daily Value*			
Total Fat 12g	18%		
Saturated Fat 3g	15%		
Trans Fat 3g			
Cholesterol 30mg	10%		
Sodium 470mg	20%		
Total Carbohydrate 31g	10%		
Dietary Fiber 0g	0%		
Sugars 5g			
Protein 5g			
Vitamin A	4%		
Vitamin C	2%		
Calcium	20%		
Iron	4%		
* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.			
	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Look at the serving size first.

Then look at the sodium. This number relates to the SERVING SIZE – not the entire package

* Remember to multiply the amount of sodium by the number of serving sizes you are eating

Tips to Reduce Sodium

Food group	Choose more low sodium <100mg/serving  GREEN LIGHT
Spices, sauces, condiments, seasonings	Cinnamon, garlic, curry, mint, lemon juice, dill, onion, parsley, basil, dry mustard, paprika, oregano, tabasco sauce, vinegar, Mrs. Dash, etc...
Grains	Flour, rice, pasta noodles, whole grains, matzo, hot cereals (not instant), unsalted popcorn, shredded wheat
Fruits and vegetables	Fresh, frozen and canned fruits, fresh and plain frozen vegetables (not types with sauces or seasonings)
Beverages	Carbonated beverages, coffee, tea, most mineral water
Fish, poultry, meat and other dishes	Fresh meat without salt such as beef, veal, lamb, poultry, pork, eggs, unsalted nuts and peanut butter, tofu, green soybeans
Milk products	Cream cheese, ricotta or swiss cheese, unsalted butter or margarine

Choose less low sodium 100-300 mg/serving  YELLOW LIGHT	Avoid high sodium >300mg/serving  RED LIGHT
BBQ Sauce, ketchup, chili sauce, salsa, gravies, mustard, mayonaise, tomato sauce, bottle salad dressing	Salt, MSG, garlic salt, onion salt, marinades, teriyaki sauce, Worcestershire sauce
breads and rolls, most ready to eat cereals, biscuits, muffins, cakes, pies, cookies, pastries, pancakes, waffles, etc...	Commercially prepared spaghetti with sauce, instant hot cereals, pretzels, crackers, salted popcorn, chips and other snack foods
Canned vegetables, frozen lima beans, frozen peas	Pickled vegetables, olives, pickles, sauerkraut, vegetables with seasoned sauces
Milk, buttermilk	Tomato juice, vegetable juice
Fresh shellfish, salted peanut butter	Bacon, ham, corned beef, luncheon meats, sausages, salami, processed turkey, frozen, restaurant or prepackaged entrees, canned/packages soups, salted nuts
Milk, buttermilk, salted butter or margarine, ice cream, pudding	Most cheeses, such as: blue, cottage, parmesan, american



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right.**[®]

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Eating less sodium can help you if you have high blood pressure, heart failure, or kidney or liver disease. Your body needs a little sodium, but too much sodium can cause your body to hold onto extra water. This extra water will raise your blood pressure and can cause damage to your heart, kidneys, or liver as they are forced to work harder. Sometimes you can see how the extra fluid affects you because your hands, legs, or belly swell. You may also hold water around your heart and lungs, which makes it hard to breathe. Even if you take medication for blood pressure or a water pill (diuretic) to remove fluid, it is still important to have less salt in your diet. Check with your primary care provider before drinking alcohol since it may affect the amount of fluid in your body and how your heart, kidneys, or liver work.

Sodium in Food

A low-sodium meal plan limits the sodium that you get from food and beverages to 1,500-2,000 milligrams (mg) per day. Salt is the main source of sodium. Read the nutrition label on the package to find out how much sodium is in one serving of a food. Select foods with 140 milligrams (mg) of sodium or less per serving. You may be able to eat one or two servings of foods with a little more than 140 milligrams (mg) of sodium if you are closely watching how much sodium you eat in a day. Check the serving size on the label. The amount of sodium listed on the label shows the amount in one serving of the food. So, if you eat more than one serving, you will get more sodium than the amount listed.

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Low Sodium Sample 1 - Day Menu

Breakfast	<p>$\frac{3}{4}$ cup cooked oatmeal 1 slice whole wheat bread toast, low sodium 1 tablespoon peanut butter without salt added 1 small banana 1 cup 1% milk 2 Eggs, cooked without salt</p>
Lunch	<p>Tacos made with: 2 corn tortillas, low sodium $\frac{1}{4}$ cup black beans, low sodium, rinsed $\frac{1}{2}$ cup roasted or grilled chicken (without skin) 1 tbsp low sodium salsa Squeeze of lime juice 10 baby carrots $\frac{1}{2}$ red bell pepper, raw 10 cucumber slices pepper, herbs or Mrs Dash taco seasoning</p>
Afternoon Snack	<p>1 pear $\frac{1}{2}$ cup cottage cheese, low sodium</p>
Evening Meal	<p>4 ounces herb-baked salmon or other fish 1 baked potato 2 teaspoons olive oil $\frac{1}{2}$ cup cooked carrots, without salt 1 cup cooked broccoli, without salt</p>
Evening Snack	<p>1 apple $\frac{1}{4}$ cup almonds, unsalted</p>

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When cooking, the following items may be used for flavoring instead of salt or seasonings that contain sodium. **Remember:** A little bit of spice goes a long way! Be careful not to over season.

Spice Blend Recipe (makes about $\frac{1}{3}$ cup)

5 teaspoons onion powder, $2\frac{1}{2}$ teaspoons garlic powder, $2\frac{1}{2}$ teaspoons paprika, $2\frac{1}{2}$ teaspoon dry mustard, $1\frac{1}{2}$ teaspoon crushed thyme leaves, $\frac{1}{2}$ teaspoon white pepper, $\frac{1}{4}$ teaspoon celery seed

Food Items	Flavoring
Beef	Basil, bay leaf, caraway, curry, dill, dry mustard, garlic, grape jelly, green pepper, mace, marjoram, mushrooms (fresh), nutmeg, onion or onion powder, parsley, pepper, rosemary, sage
Chicken	Basil, cloves, cranberries, mace, mushrooms (fresh), nutmeg, oregano, paprika, parsley, pineapple, saffron, sage, savory, tarragon, thyme, tomato, turmeric
Egg	Chervil, curry, dill, dry mustard, garlic or garlic powder, green pepper, jelly, mushrooms (fresh), nutmeg, onion powder, paprika, parsley, rosemary, tarragon, tomato
Fish	Basil, bay leaf, chervil, curry, dill, dry mustard, green pepper, lemon juice, marjoram, mushrooms (fresh), paprika, pepper, tarragon, tomato, turmeric
Lamb	Cloves, curry, dill, garlic or garlic powder, mace, mint, mint jelly, onion, oregano, parsley, pineapple, rosemary, tarragon, thyme
Veal	Apricots, basil, bay leaf, currant jelly, curry, ginger, marjoram, mushrooms (fresh), oregano, paprika
Vegetables	Basil, dill, garlic or garlic powder, ginger, lemon juice, mace, marjoram, nutmeg, onion or onion powder, tarragon, tomato, sugar or sugar substitute, salt-free salad dressing, vinegar
Desserts	Allspice, anise, cinnamon, cloves, ginger, mace, nutmeg, vanilla extract, other extracts

Meniere's Disease and Migraines: Grocery List

It is highly encouraged that you get the majority of your nutrition from whole foods such as fresh fruits, fresh vegetables, whole grains and dairy products. However, when the purchase of items such as canned goods or packaged foods are necessary, try to look for products that have few ingredients. Below are just a few examples of brands of low sodium and low sugar products that tend to have few ingredients and do not contain ingredients that may increase your symptoms. Ingredients to avoid include Monosodium Glutamate (MSG), Aspartame, nitrates/nitrites, yeast extract, "natural flavoring", broth, and tenderizer. Always check the nutrition facts label for every item and make sure to choose the low sodium or no salt added versions.

- **Canned Fruit:** Native Forest, Oregon
- **Canned Vegetables:** Green Giant, Allen's, Mitchell's, Libby's, La Sueur, Del Monte, Hunt's tomatoes, Goya black beans
- **Rice and Beans:** Goya dried beans, Uncle Ben's dried rice, Mahatma dried rice, Success precooked rice
- **Salad Dressing:** Braswell's Balsamic Vinaigrette, Annie's Balsamic Vinaigrette
- **Condiments:** Sir Kensington's Mustard, Primal Kitchen Mayonnaise
- **Cereals:** Nature's Path, Simple Truth, Kashi, Quaker Oats
- **Snacks:** Harvest Snaps Lightly Salted, Back to Nature Crackers, Triscuits Hint of Salt, Chickpea Puffs, Red Rock deli chips, Off the Eaten Path chips, Planters unsalted nuts, Smartfood sea salt popcorn, Boom Chicka Pop sea salt popcorn, Kind and Kashi granola bars
- **Canned Meats:** Valley Fresh Chicken, Simple Truth, Blue Harbor Tuna, Bumblebee Tuna
- **Pasta:** Dececco, Private Selection, Delverde, Barilla, Muellers
- **Dairy:** Siggis Yogurt, Fage Yogurt, Chobani
- **Bread:** Dave's Killer Bread, Arnold, Ezekial
- **Soup:** Simple Truth, Amy's, Imagine, Pacific
- **Deli Meat:** Applegate Naturals, Hormel Natural Choice, Boar's Head "all natural"
- **Frozen Fruits and Vegetables:** Without sauce – most brands are a good choice, Alexia, Bird's Eye, Dole, Welch's

Vestibular Migraine

Migraine is often considered the body's way of shutting itself off from the surrounding environment. It is no wonder that stress, allergies and inclement weather are common triggers. In children, it manifests very unusually with what we call cyclical vomiting without any abdominal cause. These patients are most typically disturbed by bright lights and loud sounds and have motion sickness.

Most recently recognized is a subgroup of patients who experience what is now commonly referred to as a vestibular migraine. This is a migraine that affects the vestibular system and causes episodes of vertigo or dizziness lasting from five minutes to 72 hours. The patients must have an associated headache (before, during or after the episode), a headache history or exhibit migraine equivalents such as photosensitivity, motion sickness, or visual auras/ophthalmic migraines.

In addition, these patients often experience what we call visual vertigo. Common complaints consist of dizziness in certain busy, crowded environments or dizziness when driving over a bridge in which the depth of perception is usually difficult to adjust. Twenty percent of vestibular migraine patients may ultimately develop a chronic rocking dizziness called Persistent Postural Perceptual Disorder.

Treatment

Treatment starts with identifying triggers such as allergies and certain food items (see complete nutrition guide for migraine below). If the spells are frequent enough (more than once a week or at least four times per month), anti-migrainous medication may be indicated.

- Nortriptyline (Pamelor®), a tricyclic antidepressant, is a great migraine preventive. It is started at a low dose of 20 mg and we can escalate it as tolerated up to 75 mg. It is not associated with major side effects at this dose. However, certain patients develop a non-dose dependent response with vivid dreams and insomnia, which can be a reason to stop. Other side effects may include dry mouth and constipation. The only contraindication is an arrhythmia and usually an EKG or a cardiac work-up is advised before starting it. In addition, it can cause weight gain and this may be a relative contraindication in an overweight individual. Amitriptyline (Elavil®) is a drug of the same family that is often used for the same indication.

- Topiramate (Topamax[®]) is a seizure preventive medication and it can be used to treat migraines. The dose is carefully increased from 25 mg a day to 50 mg twice a day. Patients tend to tolerate it less but it is a very effective medication. It can also assist with weight loss. It is relatively contraindicated in individuals with a history of kidney stones. The major side effect is what patients describe as “I feel like I am in a fog”. They feel like they have memory problems, attention issues and are not able to concentrate well. It can be stopped without tapering and the symptoms are always reversible.
- Venlafaxine (Effexor[®]) is another antidepressant but it also works for migraine, usually at the dose of 37.5 mg once in the morning.

Finally, certain blood pressure medications can be used for migraines, such as beta-blockers and calcium channel inhibitors. Two representatives of these categories of medications: Propranolol (Inderal[®]) and Verapamil (Calan[®]).

In pregnant women, or if prescription medications are not effective, we can use magnesium supplements, usually Magnesium Gluconate 500 mg tablets two to four tablets twice a day.

Recently, the FDA approved two new classes of medications called calcitonin gene-related peptide antagonists and calcitonin gene-related peptide receptor antagonists or gepants were approved. The former binds to CGRP, the molecule considered central to the physiology of the migraine headache, and the latter binds to the receptor of that molecule. The CGRP antagonist medications are typically injections that are taken monthly (emgality, aimovig) or as an infusion (Vyepi). The gepants are typically oral such as Qulipta, Nurtec ODT, and Ubrovly. The oral medications can be used as abortive medications or as preventive medications. It is important to note that those medications have been approved for the treatment of migraine headaches and research still needs to happen regarding their efficacy in the treatment of the vestibular symptoms. However, we know in patients who have headaches, targeting the headaches helps the rest of the symptoms.

If all medical options fail, the patient may be a candidate for Botox[®] injections according to the PREEMPT protocol. These injections are done every 12 weeks and after the third series of injection, studies show a decrease of the frequency of headaches of 70 percent on average. Of course, treating the headaches will also eventually clear the vertigo episodes.

Talk to our specialists about any of these treatment options for more information and to see what may be right for you.


Nutrition for Migraines

The foods we eat and beverages we drink contain compounds that can cause or make migraine headaches worse. On the other hand, some may help reduce the number and severity of migraines.

Most food triggers will cause a migraine within six hours. Over time, a pattern will appear and you will be able to see what foods are causing your migraines. If you suspect a certain food is triggering your migraine, remove it from your diet for several weeks and see if the migraines stop, are less frequent, or are less severe. Foods should be eliminated one at a time. Anytime you limit or eliminate a food from your diet, you should notify your physician.

Keep a Daily Food Log

Everyone is different in the foods and drinks they are sensitive to. Therefore, you must determine your particular triggers by keeping a daily food log. Write down everything you eat and drink, keep track of non-food triggers, note when you have a migraine and the severity and then eliminate suspected triggers.



The image shows a hand holding a black pen, writing on a daily food log form. The form is divided into sections for different days of the week. The top section is for Tuesday, with a date field to the right. Below the date field, the day 'Tuesday' is written in a green header. The form is divided into columns for different meals: Breakfast, Snack, Lunch, Snack, Dinner, and Snack. The bottom section is for Thursday, with a date field to the right. Below the date field, the day 'Thursday' is written in a purple header. The form is divided into columns for different meals: Breakfast, Snack, Lunch, Snack, Dinner, and Snack. The form is currently blank, with only the pen tip visible on the Tuesday section.

Date: <input type="text"/>	
Tuesday	
Breakfast	
Snack	
Lunch	
Snack	
Dinner	
Snack	
Thursday	
Breakfast	
Snack	
Lunch	
Snack	
Dinner	
Snack	

General Tips



Eat regularly throughout the day

Eat on a consistent schedule from day to day. This will help avoid possibly low blood sugar levels which can trigger or worsen a migraine.



Eat carbohydrates in moderation

Eating large amounts of carbs at one time can cause blood sugar levels to rise too high and then drop too low, which can trigger a migraine.



Drink plenty of fluids during the day

Good sources are water, milk, and 100% fruit juices. The kidneys require water to clean toxins and extra electrolytes out of the body. Also, dehydration can cause headaches.



Eat a low fat diet-Foods high in fats

Particularly linolenic and oleic fats, can increase the frequency, length, and intensity of migraines.



Take care when eating cold foods

Some people are more sensitive to cold foods and this can trigger headaches.



Be aware of non-food triggers

These can include fatigue, exercise, sleep deprivation, bright lights, head trauma, infection, menstration and oral contraceptives. Minimize these triggers when possible.

Balanced Diet

A balanced diet will help reduce the number and/ or severity of migraines. Some of the food below, eaten in moderation, may help.

- Peppermint
- Oatmeal
- Cayenne
- Garlic
- Ginger
- Fish/Fish Oil

Magnesium-Rich Foods

- Spinach
- Whole Grains
- Black Beans

Riboflavin-Rich Foods

- Dairy Products
- Almonds
- Whole Grains
- Eggs
- Soy
- Chicken



Tryptophan-Rich foods

- Black-Eyed Peas
- Turkey
- Pumpkin Seeds
- Walnuts
- Sesame Seeds
- Cheese

Calcium-Rich Vegetables

- Spinach
- Kale
- Broccoli



Migraine Triggering Foods

Phenylethylamine

Phenylethylamine may change how blood flows to the brain and cause the release of norepinephrine, which may cause migraines. Sources include:

- Cheesecake
- Yellow Cheese
- Citrus Fruit
- Chocolate/Cocoa
- Canned Berries
- Red Wine



Aspartame

There may be some evidence that aspartame could trigger or make migraines worse. Sources include:

- *Sugar-free food and drinks
- *Some brands of artificial sweeteners, including NutraSweet® and Equal®



Alcoholic Beverages

If possible, abstain from alcohol completely. Many people are sensitive to alcohol even in small amounts. Some tolerate organically grown, aged and/or sulfite-free wines better than younger, traditionally grown wines with sulfites. In many cases it is not the alcohol that triggers the migraine, but rather the tyramine and/ or histamine in the drink.



Caffeine

Caffeine stimulates the central nervous system which can cause migraines. If you already drink quite a bit of caffeine, remove it from your diet slowly, as caffeine withdrawal can also trigger migraines. Sources include:

- Coffee
- Tea
- Energy Drink
- Diet Pills
- Pain Killers
- Chocolate



Migraine Triggering Foods

Nitrates, Nitrites

Nitrates and nitrites are used to cure meats and also occur naturally in certain foods. Nitrates and nitrites cause the blood vessels in the body to relax and widen and reduce oxygen in the bloodstream, which can trigger a migraine.

Sources include:

- Cured Meats (Ham, Bacon, Salami; for example)
- Beets
- Lettuce
- Celery
- Cauliflower
- Potatoes



MSG (Monosodium Glutamate)

It can trigger a migraine associated with vertigo. Note: it may be hidden on the label as sodium casinate, hydrolyzed protein and/ or autolyzed yeast. Symptoms usually appear within 15-60 minutes of eating MSG.

Sources include:

- Chinese Food
- Frozen Food
- Canned Soup
- Salad Dressing/Sauces
- Processed Meats
- Snack Foods



Histamine

This is another type of amine that can cause blood vessels to relax and lead to migraines. Sources include:

- Bananas
- Beef And Pork
- Beer
- Fish And Shellfish
- Processed Meat
- Tomato, Tomato Sauce, Tomato Paste
- Tempeh, Tofu, Miso, Tamari
- Yeast And Foods Containing Yeast
- Sauerkraut
- Yellow Cheese
- Chicken Liver
- Eggplant
- Wine
- Spinach
- Strawberries
- Pineapple
- Citrus Fruit
- Chocolate



Migraine Triggering Foods

Tyramine

Tyramine is created by the body from tyrosine. Tyramine can cause blood vessels to relax and widen, which can trigger migraines. This is one of the most common causes of migraines. Sources include:

- Pickles
- Olives
- Nuts
- Yogurt
- Salami
- Sauerkraut
- Aged or Blue Cheese
- Beer and Red Wine
- Mincemeat Pie
- Soy Sauce, Miso, Tempeh
- Smoked/Cured/Pickled Meat or Fish



Cochlear Implant

A cochlear implant is a device that provides direct electrical stimulation to the auditory (hearing) nerve in the inner ear.

How Cochlear Implants Work

Sensorineural hearing loss results from highly specialized cells (hair cells) in the hearing organ failing to trigger electrical signals in response to sounds. Even though there is damage to the hearing organ, there are many usable nerve fibers that the cochlear implant can directly stimulate to transmit sounds to the brain. The cochlear implant is a device that uses advanced technologies to enable a person with a severe-to-profound sensorineural hearing loss to detect speech and environmental sounds. The internal portion of the device is surgically placed under the skin behind the ear with an electrode array inserted into the hearing organ (the cochlea). The external portion (speech processor) is worn on or behind the ear. The cochlear implant does not work like a hearing aid. Instead, it is a medical device that bypasses the damaged hearing organ and stimulates the usable nerve fibers that go to the brain to respond to environmental sounds and speech. People can often learn to listen and understand speech and environmental sounds through this stimulation.



Benefits of the Cochlear Implant

People who receive the cochlear implant report feeling more connected to the world around them. They can hear environmental sounds like birds singing, telephone ringing, cars approaching, and the turn signal clicking, to name a few. People with cochlear implants often understand speech. This connection to their environment often results in feeling less isolated and more independent and self-confident.

Children who generally benefit the most from their cochlear implants are those who are deaf for a short period of time, receive a cochlear implant at a very early age, are in good auditory training programs, and have families who are strongly committed to the training process.

For adults who have already developed spoken language, the cochlear implant provides an opportunity to regain personal communication. It also allows individuals to have a sense of security, more freedom, and an opportunity to be more socially engaged. Currently, there are no definitive tests that can be

administered prior to cochlear implantation to determine the precise degree of benefit an individual may receive, but nearly all show significant benefit.

Cost of the Cochlear Implant

Virtually all insurance carriers provide full or partial coverage for the cochlear implant and the associated costs. MUSC will submit the proper documentation to your insurance carrier for approval. The amount of coverage, however, depends on your specific insurance carrier. MUSC Financial Counseling will work with you and your insurance company to help secure the maximum insurance coverage available.

FDA Candidacy Criteria

For Adult Patients:

- 18 years of age and older (there is no upper limit)
- Significant hearing loss in at least one ear (moderate to profound)
- Limited or no benefit from amplification (hearing aids)
- Motivated to communicate better

For Children:

- 9 months of age and older
- Significant hearing loss in at least one ear (moderate to profound)
- Limited or no progress in auditory development
- Willing and motivated to be actively involved in therapy

Candidacy determination can be a complex process. The above guidelines should only serve as a broad indication for cochlear implantation and not as the only cases for which a cochlear implant would be appropriate. If you or someone you know might be a candidate for a cochlear implant, please contact our program for more information.

Do Cochlear Implants Affect Balance?

A variety of studies have shown that improving hearing can improve the performance of individuals on balancing tasks, whether it is with hearing aids or with cochlear implantation. This has been the basis of a variety of studies looking at the effect of electrical stimulation of the inner ear to improve balance. Vestibular implants are still being studied in research and are not ready to be used as a standard of care for patients with balance problems

On the other hand, the risk of the cochlear implant negatively affecting the balance function of the inner ear is extremely small. At MUSC, we test your balance function as part of your cochlear implant workup to help inform our best practices and intervene before surgery to improve your balance beforehand.

MUSC Physical Therapists

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NORTH CHARLESTON

MUSC Health

Tel: (843) 876-5310

MUSC Peds Leeds Ave

Tel: (843) 792-2880

MT PLEASANT

MUSC Health

Tel: (843) 876-8060

WEST ASHLEY

MUSC Health

Tel: (843) 876-5171

**MUSC Health Neurologic
Rehabilitation Institute**

(843) 985-0914

Draisin Vision

Neuro- optometry

Tel: (843) 556-2020

ORANGEBURG

MUSC Orangeburg Clinic

3000 St Matthews Rd 29118

Tel: (803) 395-2804

SANTEE

MUSC HealthPlex

111 John Lawson Ave, Santee

Tel: (803) 395-2090

CHESTER

MUSC Health Chester

Tel: (803) 581-9417

COLUMBIA

**MUSC Outpatient
Rehabilitation Services
Northeast**

Tel: (803) 865-4921

LUGOFF/KERSHAW

MUSC Health

Tel: (803) 438-0896

FLORENCE

MUSC Health

Tel: (843) 661-4360

MARION

MUSC Health

Tel: (843) 431-2634

LANCASTER

MUSC Health

Tel: (803) 286-1576

Regional Physical Therapists

SOUTH CAROLINA

CHARLESTON AREA

Southeastern Spine Institute

Bassam S. Kassab, DPT, CVR,
Cert. DN, CKTP

Physical Therapy Manager

1625 Hospital Dr., Ste. 310

Mt. Pleasant, SC 29464

Tel: (843) 284-4779

Fax: (843) 654-8871

bassam.kassab@southeasternspine.com

Private Physical Therapy Services

Tel: (843) 766-2121

Balance Physical Therapy and Wellness

Mt. Pleasant

Tel: (843) 969-2201

Carolina Physical Therapy and Sports Medicine

Mt. Pleasant

Tel: (843) 388-7667

BenchMark PT

Johns Island

Tel: (843) 718-0221

Coastal Movement Therapy

Johns Island

Tel: 843 900 6202

BEAUFORT

Beaufort Memorial Outpatient Rehabilitation

Beaufort

Tel: (843) 522-5956

BLUFFTON

Fyzical Balance

Tel: 843 969 1000

COLUMBIA

The Sigurd Center

West Columbia

Tel: (803) 926-7204

Prisma Health Physical Therapy Specialists

Downtown Columbia

Tel: (803) 434-7750

Columbia Carolina Physical Therapy and Sports Medicine Locations

- Columbia, SC

(803) 788-8484

- Downtown Columbia

Tel: (803) 256- 0303

- Forest Acres – Columbia, SC

Tel: (803) 771-0370

- Gilbert – Lexington Area

Tel: (803) 756- 4690

- Lexington

Tel: (803) 359- 0505

Regional Physical Therapists

LEXINGTON

Lexington Hospital

West Columbia SC

Tel: (803) 791-2397

GREENVILLE/CLEMSON

Roger C. Peace Rehabilitation Center/

Prisma Health Greenville Memorial

Medical Campus

Tel: (864) 455-7791

GREER, SC

SRHS - Pelham Medical Center

Campus- Greer SC

Tel: (864) 530-6480

CLEMSON

Name: ATI Clemson - West

Tel: (864) 654-0431

MYRTLE BEACH

MURRELL'S INLET/CONWAY

Tidelands Health Neurological

Rehabilitation Center

Murrells Inlet

Tel: (843) 652-8250

Tidelands Health Rehabilitation
Services at the Market Common

Myrtle Beach

Tel: (843) 848-5220

LITTLE RIVER, SC

McLeod Health Seacoast Therapy

(843) 390-8254

OKATIE

The Wellness Institute

Tel: (843) 547-4058

ROCK HILL

Ivy Rehab Physical Therapy

Tel: (803) 670-3067

Carolina Physical Therapy

Tel: (803) 658-4073

SUMTER/CLAREDON

Carolina Physical Therapy

and Sports Medicine

Tel: (803) 938-5395

SPARTANBURG

Finley Physical Therapy

Tel: (864) 342-0180

Mary Black Outpatient

Rehabilitation

Tel: (864) 216-4681 (front office)

Regional Physical Therapists

NORTH CAROLINA

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Steele Creek PT and Balance Center

Tel: (704) 504-2194

GEORGIA

AUGUSTA

Augusta ENT

Tel: (706) 868-5676

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Bryan Bost, PT, Dsc

Tel: (912) 572 7054

SAVANNAH TO STATESBORO

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Danielle Tolman PT DPT

Statesboro GA 30458

Tel: (912) 299 -2394

ENT Associates of Savannah

5201 Fredrick St. Savannah, Ga 31405

SAVANNAH PROPER

St. Joseph's Outpatient Center

Savannah, GA 31419

Tel: (912) 819-8822

Compounding Pharmacies

Pitt Street Pharmacy

111 Pitt Street

Mt. Pleasant, SC 29464

Tel: (843) 884-4051

Fax: (843) 884-9117

(\$65 for 30 day supply – Betahistine 16mg tid)

Sweetgrass Pharmacy and Compounding

Long Grove Dr, Suite# 1

Mt. Pleasant, SC 29464

Tel: (843) 654-4013

Fax: (843) 654-4014

Plantation Pharmacy, LLC

531 Wappoo Road

Charleston, SC 29407

Tel: (843) 556-1994

Fax: (843) 556-1991

(\$65 for 30 day supply- Betahistine 16mg tid)

Medicine Man

404 Old Trolley Rd

Summerville, SC 29485

Tel: (843) 871-6944

Beaufort Pharmacy and Compounding

968 Ribaut Road, Suite 1

Beaufort, SC 29902

Tel: (843) 379-3278

Fax: (843) 379-3232

(\$58 for 30 day supply - Betahistine 16mg tid)

Bluffton Pharmacy

167 Bluffton Road B

Bluffton, SC 29910

Tel: (843) 757-4999

(\$58 for 30 day supply – Betahistine 16mg tid)

usually ready in one day

Burke's Main Street Pharmacy

1101 Main Street

Hilton Head Island, SC 29926

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Fax: (843) 681-9392

The Medicine Shoppe Pharmacy

1061 North Fraser Street

Georgetown, SC 29440

Tel: (843) 546-2880

Fax: (843) 545-9834



Compounding Pharmacies

Pharmacy Innovations

640 Congaree Rd,
Greenville, SC 29607
Tel: (864) 241-0477
Fax: (864) 241-0843
(\$75.75 for 30 day supply – Betahistine 16mg tid)

Greenhill Pharmacy

2531 Woodruff Rd #107
Simpsonville, SC 29681
Tel: (864) 520-1550
Fax: (864) 520-1505
(\$90-\$100 for 30 day supply – Betahistine 16mg tid)

The Pharmacy/Moss Compounding Pharmacy

2500 Hoffmeyer Rd
Florence, SC 29501
Tel: (843) 665-0289

Sumter Cut Rate Drugstore

32 South Main Street
Sumter, SC 29150
Tel: (803) 773-8432
Fax: (803) 436-5533

Barney's Pharmacy

2604 Peach Orchard Rd, Ste 300
Augusta, GA 30906
Tel: (706) 849-4161
Fax: (706) 798-9683
(\$80 for 30 day supply- Betahistine 16mg tid)



Vestibular Disorders Association



Life Rebalanced C H R O N I C L E S

Life Rebalanced Chronicles documents the stories of nine vestibular warriors. None of them expected to be knocked down by a vestibular disorder. All of them looked fear, anxiety, and loneliness in the face and said, “You will not define me.” Their message is one of hope for everyone who struggles with invisible chronic illness and others who are navigating life’s challenges. The new six-episode docuseries which started airing starting August 10, in conjunction with Balance Awareness Week (Sept. 19-25, 2021). The series is a collaboration between the Vestibular Disorder Association (VeDA) and Kimberly Warner, filmmaker and founder of Unfixed Media.

In 2015, Kimberly was diagnosed with cervicogenic vertigo and Mal de Débarquement Syndrome (MdDS) that manifests as a constant perception of rocking, bobbing and swaying. The Life Rebalanced Chronicles documents nine vestibular patients who are learning to live with disorders such as vestibular migraines, MdDS, Meniere’s Disease and vestibular neuritis.

Through intimate conversations, they explore parts of the human experience impacted by their vestibular dysfunction — mind, body, spirit, relationships, self and life. They also share their personal toolkits for living and thriving with their disorders and provide strategies from meditation, yoga and journaling to advocacy and finding meaning and purpose within their “new normal.”

“This honest and inspiring docuseries shines a light on invisible balance disorders and brings more awareness and empathy to the vestibular experience,” says Cynthia Ryan, Executive Director of VeDA. “We are honored to work with filmmaker and vestibular patient Kimberly Warner,

Vestibular Disorders Association

who brings lived experience to each episode as she compassionately helps each individual share their unique journey toward healing and hope.”

“When I developed MdDS and vestibular migraine, my life turned upside down and my sense of self dissipated as my career, dreams, friendships and confidence crumbled,” says docuseries filmmaker Kimberly Warner.

“Returning to filmmaking and telling stories of those with chronic conditions has helped me rediscover my sense of purpose. Not only have I discovered our shared experiences and found solidarity, but I see how important these messages are for everyone who is navigating a challenge in their life, not just those with chronic illness. This series is about something bigger than a diagnosis; it’s about human perseverance and healing — even when there isn’t always a cure.”

Life Rebalanced Chronicles will premiere exclusively on The Disorder Channel (available through Amazon Fire and Roku) starting August 10th with new episodes airing weekly. After a one week debut window, episodes will be released weekly through VeDA and Unfixed channels.

About Unfixed Media

Unfixed Media Productions was created by award-winning producer and filmmaker Kimberly Warner and focuses on stories of humans living with chronic, incurable conditions. People love fixer-upper stories, miracle cures and answers but many wake up each day without any of these. The world needs more models for how to live a meaningful, unfixed life – a life liberated from fixed notions of how we must feel in order to live fully. The Unfixed portfolio of projects demonstrates that living well is not about eradicating our wounds and weaknesses but understanding how they complete our identities and equip us to help others. Programming includes Life Rebalanced Chronicles docuseries, the MS Confidential webcast series, the Unfixed Podcast, and the ongoing Unfixed monthly docuseries (and future feature film) available on The Disorder Channel and the Unfixed Community YouTube Channel. **For more information, visit <http://www.unfixedmedia.com>**

<https://vestibular.org/life-rebalanced-chronicles-docuseries/>

About VeDA

For almost 30 years, VeDA has been a highly respected source of scientifically credible information on vestibular disorders. Through publications and an online community, VeDA has reached millions of vestibular patients with critical information and support. The organization provides education and emotional support to patients with dizziness and imbalance. They connect patients with medical specialists through a provider directory of clinics that specialize in diagnosing and treating vestibular disorders. VeDA advocates on behalf of all who are impacted by vestibular disorders.

VEDA
VESTIBULAR.ORG



For more information please visit: <https://vestibular.org/>

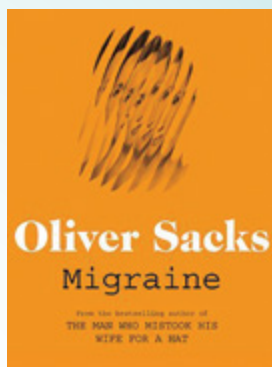
Dr. Rizk is proud to be a board member of VeDA.

Recommended Reading

Migraine

by Oliver Sacks, M.D.

Oliver Sacks was born in 1933 in London and was educated at Queen's College, Oxford. He completed his medical training at San Francisco's Mount Zion Hospital and at UCLA before moving to New York, where he soon encountered the patients whom he would write about in his book *Awakenings*.



See more at: <http://www.picador.com/books/migraine#sthash.XkiMCBmj.dpuf>

Dear Meniere's - Letters and Art: A Global Meniere's Project

by Julieann Wallace, Anne Elias, Heather Davies, and Steven Schwier

An insightful and revealing collection of letters and art about the journey of people living with Ménière's disease. Take a look inside and see why it is the most liveable disease that no doctor wants, and why many celebrities and people are unable to continue in their careers.

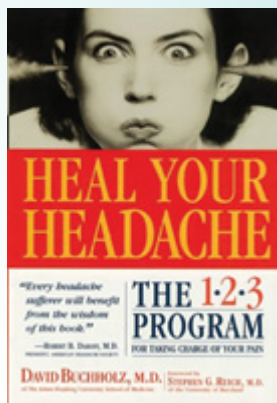


Recommended Reading

Heal Your Headache

by David Buchholz, M.D.

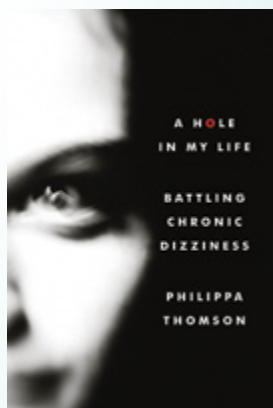
Dr. David Buchholz, an Associate Professor of Neurology at Johns Hopkins, has a private practice in Baltimore, Maryland. The former head of the Division of General Neurology at Johns Hopkins and Director of the Neurological Consultation Clinic, he has published more than 150 papers and delivered more than 450 lectures, nearly all on the subject of headaches.



A Hole in My Life

by Philippa Thomson

Philippa Thomson is a researcher, editor and writer. She enjoyed success in the creative world of picture research, holding the posts of picture manager on Macmillan's multi-volume Dictionary of Art as well as picture editor at Phaidon Press, among others. She put her full-time publishing career on hold to raise her children, the youngest of whom was born severely disabled as a result of a rare chromosome disorder. This memoir is her first book. She lives near Edinburgh in Scotland.



Recommended Reading

Dizziness: Why You Feel Dizzy and What Will Help You Feel Better

by Gregory T. Whitman, M.D. & Robert W. Baloh, M.D.

Gregory T. Whitman, M.D., is an otology and laryngology instructor at Harvard Medical School and an otoneurology specialist at Massachusetts Eye and Ear Infirmary and Brigham and Women's Hospital.

Robert W. Baloh, M.D., is a professor of neurology and head and neck surgery at the David Geffen School of Medicine, University of California–Los Angeles and the director of the Neurotology Clinic and testing laboratory at the Ronald Reagan UCLA Medical Center.



The Dizzy Cook: Managing Migraine with More Than 90 Comforting Recipes and Lifestyle Tips

by Alicia Wolf

Alicia Wolf is a vestibular migraine patient and creator of The Dizzy Cook, a website for those living with migraine disorders, with an emphasis on vestibular migraine. She is an ambassador for the Vestibular Disorders Association, with contributions to Healthline, MindBodyGreen, and Migraine Again. Her bestselling cookbook, *The Dizzy Cook: Managing Migraine with More Than 90 Comforting Recipes and Lifestyle Tips* is available everywhere books are sold.

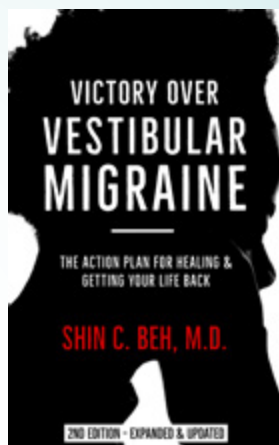


Recommended Reading

Victory Over Vestibular Migraine

by Shin C. Beh, M.D.

Dr. Shin Beh is a neurologist specializing in vestibular disorders. He completed a neurology residency at UT Southwestern Medical Center, followed by a tri-center fellowship training program in otoneurology, neuro-ophthalmology, and neuro-immunology at UT Southwestern Medical Center, Johns Hopkins University Hospital, and New York University. He was Assistant Professor of Neurology and founded and directed the Vestibular & Neuro-Visual Disorders Clinic at UT Southwestern Medical Center. He is a Fellow of the American Academy of Neurology, American Headache Society, and the Royal Society of Medicine. Dr. Beh founded the Beh Center for Vestibular & Migraine Disorders, a one-of-a-kind neurology clinic built to cater to the needs of patients with neurological disorders that cause vertigo, dizziness, and ataxia.



Recommended Apps

Migraine Buddy – Track Pain

Rated the #1 Headache and Migraine Tracking App. Join close to 3 million users who are taking control of their headaches and migraine.

Migraine Buddy's Best Features to Track, Identify, Analyze and Take Control:

- Track attacks, manage symptoms and find triggers
- Analyze attacks across time and discover patterns
- Customizable Attack Recording
- Trigger Management
- Automatic Sleep Recording
- Exportable Reports for your Doctor
- Diary Report
- Migraine Impact Report,
- An Active Community
- Migraine Insights & News



An in-app news feed with regular posts related to migraine. Learn about migraine, know more about the app and be aware of the latest migraine news. Answer questionnaires and learn about the other users.

Want specialized help? Get MBplus!

MBplus is optional for users — the core features of the app are always free for everyone.

Please check out Migraine Buddy on the Apple App Store or Google Play for more information on its features.

Recommended Apps

Vertigo

The Vertigo Tracker

Kristy Carabello

With the Vertigo iOS app, vertigo sufferers can discover potential triggers and track episodes with the click of a button.



Frustrated by dizziness and vertigo that seem to come out of nowhere? Wish there was a way to take back control of your life? We're here to help! The Vertigo app is the only vertigo tracker which helps you identify trends and gives you a weekly and bi-weekly report of your daily habits.

Entering data into your Daily Summary integrates into a report that allows you to identify triggers that could be exacerbating your vertigo. Our app was created by someone who suffers from vestibular disorders and understands the feelings of confusion, anxiety, and sometimes, helplessness. Take the first step in gaining control of your vertigo and realizing your spiritual & physical potential, and bringing balance back into your life!

The Benefits of Using Vertigo:

- Quickly and efficiently track your habits to identify what outside influences (food, stress, weather, etc) are contributing to your feelings of dizziness, off-balance, and vertigo
- Ability to track weather, stress, screen time, movement, sleep, foods, caffeine and water intake, medications and womens' cycles
- Track vertigo episode length and severity
- At a glance, view all tracked items in Daily Summary
- Weekly and bi-weekly reports give an overview in an easy to read line graph
- Share findings with your doctor to discover patterns and coordinate care

Recommended Apps

myfitnesspal

MyFitnessPal: Calorie Counter
Macro, Diet & Fitness Tracker
MyFitnessPal, Inc.

Track progress toward your nutrition, water, fitness, and weight loss goals with MyFitnessPal. This all-in-one food tracker and health app is like having a nutrition coach, meal planner, and food diary with you at all times.

Knowledge is power.

“Studies show people who keep a food diary are more likely to hit their goals. MyFitnessPal simplifies nutrition and calorie tracking, provides the data you want, and helps you make sense of it all.

Healthy eating is a continuous journey of self-discovery. And the more you track, the more empowered you'll become to make healthy choices that support your goals.”

—Stephanie Nelson, MyFitnessPal Registered Dietitian

The Benefits of Using myfitnesspal:

- Track food, fitness and fasting: Tracking calories and macros is easy with the barcode scanner and device integration.
- Learn what works: Personalized nutrition insights reveal what's working so you can make smarter choices.
- Change your habits and reach your goals. Now you have the tools and knowledge to build healthy habits for life.
- Sync steps, weight, workouts and more.
- Track your food with 18 million global foods included
- Get a personalized daily plan after you take the quiz.



Available Research Studies

If you experience dizziness or vertigo, you may be eligible for one of the following research studies:

Registry studies:

- HEADS Registry



Link: <https://headsregistry.lumiio.com/home>

- UCLouvain Vertigo International Survey



Link: <https://sites.uclouvain.be/redcap/surveys/?s=AF34NPNNF8KWHNN7>

- VeDA Patient Registry

Ongoing studies at MUSC:

- Dizziness and Driving
- Environmental Impact on Vestibular Disorders
- Otolith Labs Vertigo Study
- Otolith Labs VIBRANT-VM Clinical Trial
- Proinflammatory Cytokines in Meniere's Disease and Vestibular Migraine

If interested, please scan the QR code below for further instructions:



Link: https://docs.google.com/forms/d/e/1FAIpQLSe-JdHNUg5PQrvhRxnvUBv9sontOctY0tCb6tU1IXx4xJngkQ/viewform?usp=sf_link

Studying the temporal bone and Temporal Bone Donation

Many of the disease states affecting the hearing and balance function of the ear are difficult to study in that the pathology lies inside the temporal bone, which cannot be accessed by a biopsy. Thanks to those who have contributed (or donated) their temporal bones to research or further study, many advances in understanding and treating ear disorders have been made. However, there are many other disorders that we still need to learn more about. Those living today who agree to donate their temporal bones after death can make a great contribution.

How do you study the temporal bone? Researchers study both a donor's temporal bone and medical records. A small part of the temporal bone (containing the middle and inner ears) is surgically removed soon after death. The structures of the inner ear can then be prepared for a variety of research analyses, including microscopic procedures that allow for the identification of molecular characteristics of certain hearing and balance disorders.

Researchers examine each sample to learn more about the ear structure and the causes of the donor's ear problem. With this knowledge, researchers can develop new ways to diagnose and correct ear disorders in others.

Will the temporal bone removal affect the outer appearance of the donor? The removal does not affect the appearance of the donor's outer ear, face, or head.

What conditions have benefited from studying the temporal bone?

- **Presbycusis** (Hearing loss due to aging): Temporal bone studies allowed researchers to determine multiple types of presbycusis depending on the type of sensory hair cells or other structures affected.
- **Otosclerosis**: Temporal bone studies showed how this condition can cause both a conductive as well as a sensorineural hearing loss. This has led to a better understanding of stapedectomy, which is the surgical procedure used to treat individuals with Otosclerosis.
- **Benign paroxysmal positional vertigo** (BPPV): This condition was long thought to be vascular and related to blood flow. Temporal bone studies showed that the cause was crystals or otoliths that are free floating or stuck against the sensor of the three semicircular canals inside the inner ear. This also allowed the medical community to develop appropriate physical therapy exercises geared to reposition those crystals and improve symptoms.
- **Meniere's disease**: It is thanks to temporal bone studies that researchers were able to identify the phenomenon of hydrops or swelling of the fluid inside the ear that is associated with this pathology.

Further information on the above disorders, as well new information on other disorders, remains to be discovered.

Can I donate my temporal bones if I have normal hearing and do not have balance or dizziness problems? Yes, it is important to have normal hearing individuals of all ages contribute to temporal donation programs in order to have a more comprehensive view of what happens in the hearing and balance organs at various stages of life.

Am I too old to be a temporal bone donor? Age does not affect the scientific value of your temporal bones.

Is there a cost to the donor's family or estate? The medical professionals who remove the temporal bones donate their time or are paid by the laboratory receiving the temporal bones.

Can I donate my body to science for anatomical study and donate my temporal bones? It depends. The policies of donor programs for anatomical study vary. Discuss this with your local body donor program to determine whether it is possible to donate to one or both programs.

Can I donate other organs for transplantation as well as my temporal bones? Yes. The removal of your temporal bones would simply be delayed a few hours so that transplantable organs can be removed first.

What is the role of my next-of kin? In some states, the next of kin makes the final decision about organ or body donations. Inform them and your doctors of your wish to be a temporal bone donor. Be sure that they understand that their cooperation is needed.

Are you interested in becoming a donor? If you are a South Carolina resident and interested in donating your brain, eyes, ears, or other tissues for research, please visit the website of the Carroll A. Campbell Jr Neuropathology Laboratory (CCNL) also known as the Brain Bank, housed at the Medical University of South Carolina (see link below). You can access a Donor registration form or contact the CCNL coordinator for more information (Phone number 843-792-7867, Email: ccnl@musc.edu).

<https://medicine.musc.edu/departments/pathology/division-of-experimental-pathology/ccnl/how-to-become-a-donor>.

While the CCNL ("Brain Bank") initial focus is in neurodegenerative disorders, all the temporal bone harvested will be studied by the hearing and balance researchers at MUSC.

If you have any additional questions, please contact Dr Habib Rizk at rizkh@musc.edu or 843-876-0112.



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