Best Practice Guide to Tinnitus and Vertigo

By Alan Lowell, BC-HIS, ACA

The fundamental role of today’s dispensing professional in the hearing health equation hasn’t really changed from that of dispensers practicing in the 1970s and 1980s. What has changed are the means by which dispensers achieve their results, for example, through the use of real-ear measurements, tympanometry, cerumen management, video otoscopy and hearing aid programming. In order to compete effectively in today’s environment, dispensers must be sufficiently knowledgeable, skilled and must successfully communicate these qualities to their patients. That way, a patient can make an informed decision relative to their hearing health. In addition, today’s dispensing professional must have the desire to provide the best products and services available, the drive to acquire knowledge and skills and be committed to keeping current with the latest techniques and rapid technological advancements.

This article focuses on the knowledge today’s dispensing professional should acquire about tinnitus, dizzy patients and positional vertigo. In the course of delivering daily routine patient care we regularly discuss these topics with our patients. Knowledge in these areas may be somewhat limited because treatment for these disorders is often thought to be outside of the scope of practice or marginally effective.

Tinnitus

In any given day the most common complaint we hear from new patients concerns clicking, buzzing, hissing, chirping or ringing type head noises known as tinnitus. It is estimated that more than 50 million Americans suffer from this disorder. While most are able to cope rather easily without any interference in their daily routine, for some it is profoundly debilitating. In fact, some patients afflicted with this disorder have either contemplated or attempted suicide.

Tinnitus is divided into two key categories; subjective and objective. Subjective tinnitus is head noises heard only by and evident to the sufferer. Objective tinnitus, on the other hand, can be heard and measured externally. Different types of head noises are often caused by different conditions.

A clicking tinnitus can be either objective or subjective in that it stems from a chronic middle ear disorder involving the function of the eustachian tube. Leudet tinnitus is an objective type of tinnitus and is characterized by a dry clicking sound caused by the eustachian muscle. Pulsatile tinnitus is heard as a pulsing sound caused by a vascular abnormality or other arterial related disorders. A heart murmur or a tumor on the jugular vein known as a glomus tumor can also cause pulsatile tinnitus. Noises heard intracranially are known as cerebri tinnitus. Noises that localize to either one or both ears are referred to as aurium tinnitus. Both cerebri and aurium tinnitus are subjective. Last but certainly not least and perhaps the most referred to by the dispensing community is intractable tinnitus. This is simply a form of tinnitus that is resistant to treatment.

If we were to prioritize causes of tinnitus, sudden exposure to excessively loud noise and long time exposure to high levels of lower frequency sounds (noise induced) would rank among the highest. It’s interesting that those conditions represent the primary contributing factors to high frequency hearing loss. In addition to those already mentioned, other causes include physical trauma to the head or neck, hypertension, acoustic neuroma, thyroid disease, temperomandibular joint disorder (TMJ), wax impactions and nutritional deficiencies. More serious medical disorders such as an aneurysm or diseases such as multiple sclerosis (MS) can also cause tinnitus.

Additionally, there are over 200 prescription and over-the-counter drugs listed in the Physicians’ Desk Reference that may cause or contribute to a tinnitus disorder. Generally, tinnitus will either lessen or disappear when the medications are discontinued.

Different treatment strategies have been somewhat successful in ameliorating the effects of tinnitus. These strategies include counseling, stress reduction exercises and medication therapy. Some of the medications currently being prescribed include anesthetics, anti-depressants, anti-convulsants, anti-anxiety agents and antihistamines.

As many of us observe in our practice, a high percentage of patients with hearing impairment complain of tinnitus. In fact, 70 percent of all patients with tinnitus have hearing loss. Conventional hearing aids often abate the stress of tinnitus and provide patients with selective gain to effectively mask the tinnitus. Conversely, there are situations whereby conventional aids intensify tinnitus or have no observable effect.

Time and technology have not been quite as rewarding to tinnitus patients as other segments of the hearing impaired population. As far back as can be remembered tinnitus maskers have generally been fit on a trial basis. This
is due to tinnitus patients having a lower performance expectation for these devices. The use of maskers is known as clinical masking whereby white noise is introduced at intensity levels comfortably below the tinnitus level and between a frequency range of 3000 to 12,000 Hz. If a patient wears a tinnitus masker in conjunction with a hearing aid, the hearing aid should be worn with the volume control set at the patient’s most comfortable listening level. Typically, patients are monitored over a six-month period.

Alternate treatments include tinnitus retraining therapy (TRT) which is based upon a connection between the brain and tinnitus. TRT attempts to interfere with the perception of tinnitus. It does so by applying two broadband maskers worn for eight hours per day set at a substantially lower level than that of the perceived tinnitus. The patient is monitored over an 18–24 month period.

Other tinnitus treatments include biofeedback, relaxation techniques, bedside and tabletop maskers, vitamins and herbs, nutritional and dietary supplements, magnets, lasers, hyperbaric oxygen and chiropractic and acupuncture treatments. Some patients may find it helpful to contact the American Tinnitus Association for updated information or seek out a support group near their home. However, in the final analysis encouraging patients to accept and adapt to a tinnitus disorder with education and support is very sound advice.

**Dizziness**

Patients specifically reporting episodes of dizziness fall substantially short of those with tinnitus. However, dizziness remains among one of the nine otologic red flag conditions that dispensers are required to address. It is the number one complaint among patients over 70 years of age. In addition, it is the third most common complaint reported to physicians by patients of all ages, exceeded only by headaches and lower back pain. Eighty-five percent of all dizziness and vertigo can be attributed to an inner ear disorder. Considering the prevalence of this complaint, dispensers should be sufficiently knowledgeable about dizziness so they can engage in a substantive discussion with their patients.

Four key elements are associated with dizziness and vertigo: the oculomotor system, the vestibular system, nystagmus and neuritis. The oculomotor system involves the neural pathways that control the movements of the eyes. The vestibular system is a biological system that works in conjunction with the oculomotor system and other proprioceptive systems. It functions to maintain one’s sense of equilibrium, acceleration and gravity and also influences eye movement.

The vestibular system is contained in the labyrinth (inner ear). It consists of the vestibule and the semicircular canals. The vestibule contains two sacs known as the saccule and utricle that are predominately responsible for one’s sense of linear motion (acceleration and gravity). The semicircular canals consist of three individual bony structures: the superior, lateral and posterior canals. The semicircular canals contain sensory epithelia that respond to angular motion and relate to one’s sense of balance.

Nystagmus is associated with many variations of vertigo. It is characterized as a pattern of eye movement with a slow beating component in one direction and a faster beating component in the other. This occurs as a result of an anatomical connection between the oculomotor and vestibular systems.

Neuritis, another cause of vertigo, occurs from an inflammation of the vestibular section of the cranial nerve VIII (auditory/vestibular nerve). Vestibular neuritis often produces severe episodes of vertigo. An inflammation of the auditory portion of the VIII nerve results in an *acoustic neuritis* that often contributes to an acute retro-cochlear disorder. Both vestibular and acoustic neuritis can be viral in nature and can take days or weeks to subside.

As with tinnitus, vertigo is either *objective* or *subjective* and stems from different types of disorders. Patients with objective vertigo experience a sensation of external objects spinning around them. Those with subjective vertigo feel as though they are spinning or whirling. Aural vertigo is a more generic label for sensation of motion due to a disorder of the inner ear.

Other types of vertigo include *apoplectic vertigo* that comes on suddenly, is severe, causes nausea and is often a result of vestibular neuritis. *Reflexogenic vertigo* stems from pressure on the stapes that can be caused by tympanometry or pneumatic otoscopy. *Positional vertigo* occurs from the head being placed in a certain position. However, head movement alone will not necessarily trigger episodes of positional vertigo. *Paroxysmal vertigo* triggers sudden and brief episodes of dizziness and may often be accompanied by nausea.

The most common form of vertigo is *benign paroxysmal positional vertigo* known as BPPV. A recurrent, acute form of vertigo that occurs in clusters, BPPV responds to positional changes of the head and, generally, does not have a corresponding cochlear involvement. BPPV is the leading cause of dizziness in patients over the age of 60.

According to Richard Ganz, PhD, founder and executive director of the American Institute of Balance in Seminole, Florida, on average BPPV requires 4.5 physician visits before it is correctly diagnosed. Properly treated, BPPV has a 95 percent or greater success rate.

In most cases of BPPV, residue known as otolithic debris is found floating freely or imbedded within the gelatinous substance lining the posterior semicircular canal. As the head is placed in a certain position, movement of the otolithic debris causes an onset of brief and acute vertigo. Generally, these episodes last less than one minute without a corresponding hearing loss, tinnitus or otalgia (ear pain).

Diagnosing BPPV requires that a patient’s head be rotated at 45- and/or 90-degree angles to trigger an episode of vertigo. Various maneuvers are used to help identify the site(s) causing the disorder. These maneuvers include the Hallpike, the Semont Liberatory, the Modified Hallpike, and the Roll Test among others. The appropriate maneuver is typically selected based on the patient’s physical limitations, if any. Ninety percent of BPPV is unilateral in origin.
Continuing Education

Often, patients presenting with binaural BPPV have suffered some type of head trauma.

Treatment is determined based on whether the otolithic debris is free floating or imbedded in the gelatinous substance containing the vestibular hair cells. Dizziness caused by free-floating otolithic debris (known as canalith or canalithiasis) is treated using the Canalith Repositioning Maneuvers. Ninety percent of all BPPV patients have canalith involvement. On the other hand, otolithic debris imbedded in the gelatinous substance (known as cupula or cupulolithiasis) is treated with the Semont Liberatory Maneuver. This requires moving or rotating the patient’s entire body in order to dislodge the debris from the cupula. Other treatment methods for cupulolithiasis that include tapping or vibrating the mastoid often produce unrewarding results.

Generally, only one treatment is necessary for a patient diagnosed with BPPV. Patients will receive minimal restrictions for up to one week. Other than a follow-up visit to ensure that the otolithic debris was cleared from the affected ear or that it didn’t migrate to another location, no other treatment or restrictions are recommended. Complications from treatment can result in the otolithic debris failing to clear and falling into the utricle with sustained, unabated symptoms or the otolithic debris migrating into the horizontal canal.

Summary

Any dispensing professional who wishes to participate in the treatment and rehabilitation of patients with vestibular disorders must be highly proficient and sufficiently knowledgeable to execute his/her responsibilities to these challenging patients.

In closing, it bears mentioning that the purpose of this article is to raise the awareness of the dispensing community about tinnitus and vertigo. This is certainly not to suggest that dispensers diagnose or treat these conditions. Rather, this is meant to provide information to educate dispensers, thereby allowing them to enlighten patients about a disorder(s) that in some instances affects them 24 hours a day.

References
1. American Tinnitus Association: Informational brochure
2. Ganz, Richard E., PhD; “Rethinking Treatment of Dizzy Patients and Balance Disorders” in The Hearing Review Vol. 6 No 4 April 1999