

TerranearPMC Safety Share

Week of March 6, 2017 – Tinnitus

It is quite common that various types of hearing loss and hearing impediments are discussed during Hearing Conservation Program training. One of the topics brought up, but all-to-often only skimmed over, is tinnitus. The U.S. Centers for Disease Control estimates that nearly 15% of the general public; that's over 50 million Americans, experience some form of tinnitus. Roughly 20 million people struggle with burdensome chronic tinnitus, while 2 million have extreme and debilitating cases.

Tinnitus is commonly described as a constant or intermittent “ringing in the ears.” However, other varying symptoms can be exhibited including buzzing, hissing, whistling, swooshing, and clicking. In some rare cases, tinnitus patients report hearing music. Tinnitus isn't a condition, but rather a symptom of an underlying condition, such as age-related hearing loss, ear injury or a circulatory system disorder. And although bothersome, tinnitus *usually* isn't a sign of something serious. Nevertheless, it can worsen with age. Tinnitus can be either an acute (temporary) condition or a chronic (ongoing) health malady.

The most common cause of tinnitus is damage of the tiny sensory hair cells in the cochlea of the inner ear. This damage typically occurs as a result of the normal aging process or from prolonged exposure to excessively loud noise. According to research conducted at the renowned Mayo Clinic, the microscopic hairs in the cochlea (the organ that actually transfers noise stimulus to the brain) form a fringe of the surface of each auditory cell. Hair cells can be frequency-specific and therefore, when specific hair cells are stimulated by corresponding frequencies, these hairs convert mechanical energy into electrical impulses, which are then sent to the brain, causing the brain to interpret a specific pitch. If the hair cells are damaged, they move randomly, sending irregular or non-discriminate electrical impulses to the brain which is perceived as noise or....tinnitus.

Working in noisy surroundings for many years without using proper protective hearing devices, such as ear plugs and ear muffs, can increase the risk of developing tinnitus. Non work-related activities, from the extensive use of MP3 players to chain saws and musical instruments can also cause tinnitus. Aging rock stars typically suffer from tinnitus after having spent years surrounded by large amplifiers and loudspeakers without hearing protection. Even those of us that attend rock concerts can be exposed to these high noise levels, and can leave the venue with our ears ringing. Hopefully, this is only temporary and by the next day, one's hearing is back to normal. Sometimes, the ringing persists or our ability to hear has been permanently diminished. This is why hearing professionals constantly advise us to use ear plugs when attending rock concerts.

Another non work-related activity that has been identified as a high-risk activity for tinnitus is the use of firearms. And as more studies are conducted, head trauma, from aggressive contact sports as well as severe accidents, have been identified as causing tinnitus as well as other adverse effects.

And then there are a variety of medical conditions that can result in tinnitus. This includes tumors that press against blood vessels in the head or neck (vascular neoplasm) and therefore,



can make tinnitus more noticeable. High blood pressure and hypertension may increase blood pressure, and in turn increase the possibility of tinnitus. Other risk factors include high stress, alcohol abuse and increased caffeine intake.

Other causes of tinnitus may include: Blows to the head, large doses of certain drugs such as aspirin, compacted ear wax, middle ear infections, age, Menière's disease (disorder of the inner ear causing vertigo), head trauma, perilymp fistula (a hole in the inner ear, allowing fluid to escape), and dysfunction of the joint connecting the jaw to the bone under the ear.

In general, there are two types of tinnitus: Subjective and Objective Tinnitus.

Subjective Tinnitus: Head or ear noises that are perceivable only to the specific patient. Subjective tinnitus is usually traceable to auditory and neurological reactions to hearing loss, but can also be caused by an array of other catalysts. More than 99% of all tinnitus reported tinnitus cases are of the subjective variety.

Objective Tinnitus: Head or ear noises that are audible to other people, as well as the patient. These sounds are usually produced by internal functions in the body's circulatory (blood flow) and somatic (musculo-skeletal movement) systems. Objective tinnitus is very rare, representing less than 1% of total tinnitus cases.

While there are a number of medications available that advertise as an effective treatment for tinnitus, currently, there is no scientifically-validated cure for most types of tinnitus. There are, however, treatment options that can ease the perceived burden of tinnitus. And sometimes, rather than focusing on the actual symptoms of tinnitus, there are some cases where an identified underlying cause can be administered. At the same time, other treatments reduce or "mask" the noise, making tinnitus less noticeable.

We may have seen commercials on TV that tout an OTC-drug that can help alleviate the symptoms of tinnitus. These products typically contain a mixture of B-vitamins and ascorbic acid (vitamin C). Some contain bioflavonoids, which is the typical medical treatment for reducing the symptoms of Meniere's disease (mentioned earlier). Even here, research has identified such medication as being found in citrus fruits and juices, specifically orange, grapefruit and lemon. Such products may be quite nutritional, but have not been verified to reduce tinnitus symptoms. Other remedies include melatonin; a hormone that is produced by the pineal gland in the brain. Melatonin is typically secreted in coordination with a person's sleep pattern, thereby assisting a person to sleep. Consequently, the purpose of adding melatonin to medications designed to treat tinnitus would be to help patients sleep more soundly by possibly counteracting the disturbances associated with tinnitus.

Imagination will often carry us to worlds that never were. But without it we go nowhere - Carl Sagan

