The Meniett Low Pressure Pulse Generator
Sarah Schlatter, Biomedical Engineering, University of Rhode Island

The two main functions of the ear are hearing and balance. Ear divided into 3 parts. First the outer ear: the external, visible portion of the ear and the ear canal. Second is the middle ear consisting of the eardrum and three small bones (malleus, incus, and stapes). Lastly the inner ear: the cochlea (hearing canal), endolympathic sac, semicircular canals (balance canals), and the hearing and balance nerve. Sound is collected and amplified outer ear and middle ear. The inner ear converts sound waves to signals sent to the brain via the vestibulocochlear nerve and is responsible for maintaining the body's orientation and sense of balance.

We are able to hear because the outer ear and ear canal collect sound waves and guide them to the eardrum which makes the eardrum vibrate. The vibration of the eardrum then vibrates the three tiny bones of the middle ear which conduct the sound waves to the cochlea (hearing canal) in the inner ear. The sound waves cause movement of endolympathic fluid in the cochlea, stimulating thousands of tiny, delicate hearing cells (hair cells) inside the cochlea to sway back and forth. These hair cells are connected to tiny nerve fibers that join together to make up the hearing nerve. As the tiny hair cells move, they initiate electrical impulses that travel along the nerve fibers and auditory nerve to the brain. The brain compares the electrical impulses it receives to the sounds that it "knows", gives meaning to the sound, and we hear.

Some people have balance and hearing disorders such as Meniere’s disease which are caused by fluid levels in the ear. Ménière's disease is an inner ear condition that causes dizziness or vertigo, hearing loss, and ringing in the ears (tinnitus). The disease usually affects one ear, but can occur in both. Symptoms include vertigo, an extreme dizziness that makes you unable to stand or sit up, often with nausea and vomiting, hearing loss, and a feeling of pressure in the ear. Symptoms are often unpredictable, which can make it difficult to live a normal life and perform daily activities. It can take several days to recover from a severe vertigo attack.

The Meniett Low Pressure Pulse Generator is a device that gives less invasive therapy to patients suffering from vertigo. Its micropressure therapy reduces swelling and pressure in the inner ear. First, a tiny ventilation tube is inserted in your eardrum by the doctor. This allows the pulses to pass through the eardrum to the inner ear. Doctors typically prescribe three Meniett treatments per day, and each treatment lasts 5 minutes. A treatment session consists of holding a special earplug in the outer ear which is attached to a tube that goes into the Meniett device, and sends low-pressure pulses to your inner ear. The micropressure pulses are controlled by a small computer inside the device. The Meniett device then performs a leakage test to verify that the earpiece is properly sealed in the external ear canal. The device then begins sending pressure pulses that are transmitted to the middle ear through the ventilation tube. The Pressure pulses help reduce excess endolympathic fluid and restore the balance of the inner ear. When treatment is completed, the volume of endolympathic fluid in the inner ear has been reduced. Your body continues to produce the fluid, therefore it is necessary to repeat the procedure daily to continue to remove the excess fluid produced.

References:
• http://www.vestibular.org/vestibular-disorders/symptoms.php#vertigo
• http://www.meniett.com/get_your_meniett.html