

The NICoE's four week program includes a complete hearing or *audiology* assessment for all service members (SM). The NICoE's hearing specialists, also known as audiologists, evaluate the SMs' hearing and balancing abilities through the vestibular system in order to provide the SM with the most accurate diagnosis and the best treatment plan. By documenting the SMs' hearing complaints the NICoE audiologists are able to determine very specific diagnoses such as central auditory processing disorder, tinnitus, and/or hearing loss. Working together with other providers at the NICoE, the audiologists are able to effectively treat their patients' hearing, balance, and neurological problems. Patient treatment often includes the fitting of hearing and/or tinnitus ear-level devices, providing education about both the ear and hearing process, and counseling about how to employ strategies that can help improve their listening capabilities.

## Audiology Schedule

- **Week One** – The service member meets with the audiologist for an hour long basic hearing evaluation. If indicated, the audiologist schedules a follow up appointment in week two for aural rehabilitation
- **Week Two** – In the second week every service member is seen by both the audiologist and the physical therapist for a two-hour long vestibular evaluation.

## Types of Audiology Assessment Testing

### Week One:

- **Pure Tone Test:** This test is designed to determine the softest tones a person can hear at selected pitches (frequencies). Tones are delivered one ear at a time via earphones.
- **Tinnitus Evaluation:** A questionnaire about how tinnitus affects the SM is completed by the patient and then scored and reviewed by the audiologist, who quantifies the severity of the impairment.
- **Speech Recognition Testing:** A list of words is read to the patient at a comfortably-loud level; the patient is asked to repeat those single syllable words. Then SMs are asked to recognize words in the background to measure the patient's ability to hear in a real-world environment.

### Week Two:

- **Vestibular-Evoked Myogenic Potential (VEMP):** The purpose of this test is to determine if a part of the inner ear (sacculle) and the vestibular nerve are intact and working normally. Electrodes are placed near the neck of the patient and a sound is delivered to the patient's ear. The brain's response to these sounds is then measured.
- **Caloric Testing:** Warm or cold air is flushed into the ear. If all nerve pathways are intact, the patient will experience vertigo and involuntary eye movement (nystagmus). This is a test of the acoustic nerve, which helps with balance.
- **Oculomotor tests:** SMs follow visual targets with their eyes and the audiologists look to see how well the eyes respond to information from the vestibular system.
- **Rotary Chair Testing:** A test to see how the eyes and balance systems interact to keep focus when one's head moves. The main purpose of this test is to determine whether or not a patient's dizziness may be due to a disorder of the inner ear or brain, and particularly to determine whether or not both inner ears are impaired at the same time.

### Most Common Diagnoses

**Tinnitus:** The perception of a sound in the absence of corresponding externally-made sound. In lay terms, this is described as "ringing in the ears."

**Vestibular System:** provides us with our subjective sense of movement and orientation in space in order to stabilize our gaze and maintain our head and body posture.

**Sensorineural hearing loss:** A type of hearing loss due to problems of the inner ear, also known as nerve-related hearing loss.

**Central Auditory Processing Disorder:** The ability to hear normally, but with difficulty hearing or poor perception of speech and non-speech sounds amidst a background noise. Is characterized by poor perception of speech and non-speech sounds despite normal hearing sensitivity and normal peripheral auditory function, and involves central-auditory system structures in the brainstem and brain.