

# Common Vestibular Function Tests

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## FACT SHEET



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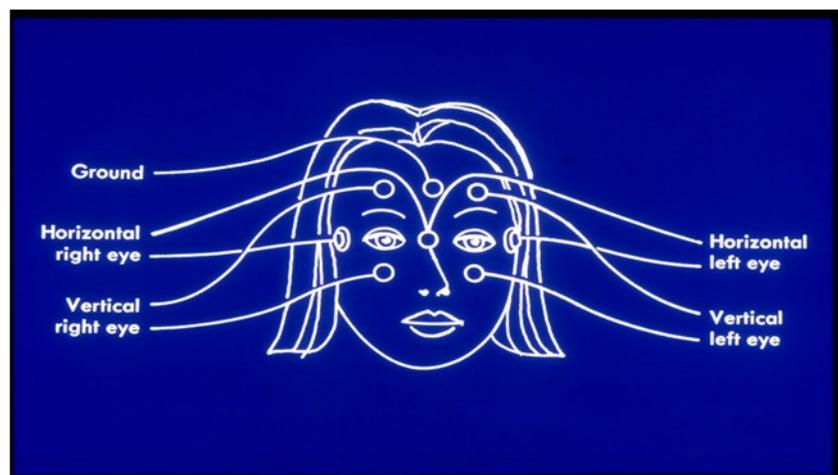
The purpose of Vestibular Function Tests (VFTs) is to determine the health of the vestibular portion of the inner ear. Some VFTs are used to determine if your dizziness, vertigo, or balance problem is caused by brain disorder. These tests are commonly administered by ENTs, Audiologists, and Otolaryngologists

### *Electronystagmography or Videonystagmography*

Electronystagmography (commonly called an ENG test) or Videonystagmography (VNG test) tests evaluate the inner ear. Both record eye movements during a group of tests in light and dark rooms. During the ENG test, small electrodes are placed on the skin near the eyes to record eye movements. For the VNG test, eye movements are recorded by a video camera mounted inside of goggles that are worn during testing.

Electronystagmography and VNG tests evaluate eye movement during different tasks such as following a visual target (tracking test), during rapid eye movement (calibration test), during head position changes (positional test), or in response to cool or warm air (or water) placed in the ear canal (caloric test). If there is no response to warm or cool air or water, ice water may be used in order to try to elicit a response. The caloric test helps to determine if there is a difference between the left and right inner ear. During this test, you may experience dizziness. You will be asked questions (math questions, city names, alphabet tasks) that distract you from focusing on your response to the test.

A routine test of hearing (audiogram) is an important part of the examination of a patient with dizziness and is frequently completed prior to the ENG or VNG.



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The rotary chair test is used to help determine if your symptoms are due to a disorder of your inner ear or a disorder of the brain. Eye movements are recorded with small electrodes similar to those used during the ENG test. Not all individuals need a rotary chair test to assist with diagnosis and many health care facilities do not have access to a computerized rotational chair. The rotary chair test allows measurement of responses to movements of the head that are closer to speeds encountered in daily activities. During this test, the patient sits in a computerized chair that moves. The rotary chair test is very useful in determining if an individual has a problem with both sides of the vestibular system (bilateral vestibular loss).

### *Computerized Dynamic Visual Acuity (DVA)*

Computerized DVA testing helps to determine how your vestibular problem affects your vision during activities such as walking, riding in a car over bumpy roads, or turning your head from side to side. This is a useful test to help measure change in the vestibular ocular reflex (VOR) after vestibular rehabilitation and determine if your brain has compensated for a vestibular problem. The VOR allows objects to be kept in focus while the head is moving. Individuals who have problems with the VOR may have oscillopsia, or bouncy, jumping vision, and are not able to keep objects in focus during head movements.

During this test you will be asked to view the letter “E” and determine the direction it is pointing. The test is then repeated with head movement. As the degree of vestibular loss increases, an individual’s dynamic visual acuity (DVA) decreases.

A similar test uses an eye chart. Again testing begins with the head still and is then repeated with head movement at a designated speed. The lowest line visible is determined for each test condition. Patients with bilateral vestibular loss often have difficulty reading the smaller letters when the head is moving.

### *Computerized Dynamic Posturography (CDP)*



This test evaluates how well you are able to use the visual, vestibular and sensory systems during balance. The Sensory Organization Test (SOT) measures body sway under six different test conditions that are each completed three times. You will be tested with your eyes open and eyes closed, with the platform on which you are standing stationary or moving with your sway, and several combinations of these test conditions.

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Two other tests, the Adaptation Test and the Motor Control Test, are part of CDP. These tests measure reflexive responses to unexpected movements of the platform on which you are standing. The platform tilts up or down during the Adaptation Test and moves forward or backward during the Motor Control Test. Throughout the test, you are wearing a harness that will protect you from falling.

Computerized Dynamic Posturography is frequently administered by a physical therapist and is useful for measuring the results of vestibular rehabilitation. It is also useful when combined with tests of vestibular function.

### *Subjective Visual Vertical*

The subjective visual vertical (SVV) test evaluates the utricle which is one of the inner ear organs responsible for sensing gravity. During the SVV test you will be in a dark room and be asked when a projected image of a line is oriented in a vertical or horizontal position. Typically, you will complete ten trials of this test. This test has been found to be useful for patients with vestibular neuritis, injury to the inner ear, or injury to the nerve that transmits information from the inner ear to the brain. A new clinical test has recently become available whereby one looks in a bucket to determine subjective visual vertical.

### *Vestibular Evoked Myogenic Potential (VEMP)*

The purpose of this test is to determine if the saccule (one of the inner ear organs) and the vestibular nerve are working normally. The saccule is sensitive to sound and this response can be measured by recording electrical activity in a muscle located in the front of your neck, the sternocleidomastoid muscle. Small electrodes are applied to the neck. Repetitive loud clicks or sounds are given to each ear and the electrical response of the muscle is recorded. Because this test relies on sound, hearing must be intact in order for the test to be completed. Patients with other disorders of the vestibular system such as vestibular neuritis, acoustic neuromas, bilateral vestibular loss due to medication use (ototoxicity), Meniere's disease, or SCC dehiscence syndrome may have VEMP responses that are lower than normal or absent. The test helps the physician determine if one part of your ear is not functioning well (the saccule).

### *Video Head Impulse Test*

The Video Head Impulse test (VHIT) uses high speed cameras and angular velocity sensors (mounted in goggles) to observe your eye movements during quick movements of your head. The VHIT is used to assess the function of the six semicircular canals (vertical canal pairs and horizontal canal pairs) and is most useful in determining how well patients with known unilateral or bilateral vestibular loss have compensated for this loss of function. The VHIT may be used in combination with the VNG and the Rotary Chair Test help determine how well your inner ear is functioning.