Lahey CLINIC

The Balance Center
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Lahey Clinic
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Reference Guide for Vestibular Testing

Lahey Clinic's Balance Center offers a wide range of diagnostic and therapeutic treatments to manage balance and mobility disorders. Patients with acute and chronic balance disorders are evaluated using state-of-the-art technologies.

Electronystagmography (ENG): The most familiar test used to evaluate inner ear function is electronystagmography (ENG). It evaluates each ear independently. Although this test is essential to diagnosing BPPV and a unilateral vestibular weakness (UVW), it cannot evaluate how a patient integrates all components of the balance system (visual, vestibular and somatosensory). In addition, if a UVW is found, the ENG cannot determine if the patient's balance system has compensated for this abnormality. This is why we believe it is important to perform a comprehensive evaluation.

Posturography: This test provides objective information that isolates specific causes underlying the patient's functional limitations and disabilities. The assessment is divided into two different categories–sensory and motor impairments.

- *Assessment of sensory impairments (SOT):* This assessment evaluates the patient's effective use of visual, vestibular and somatosensory information for balance under a variety changing task conditions.
- *Assessment of motor impairments (ADT):* This test assesses a patient's ability to minimize sway when irregularities and unexpected changes in surface properties occur. Sequences of platform rotations in the toes up or toes down direction elicit automatic motor responses. This destabilizes the patient's balance. The first (unexpected) trial responses are corrected by secondary responses in the opposing muscles. With each subsequent trial, initial reactions are attenuated and secondary responses strengthened to reduce overall sway. Encounters with irregularities and changes with surfaces are common in daily life activities. Patients performing abnormally on the ADT tend to have difficulty on unstable surfaces. One or a combination of causes can effect this. ADT difficulties can also be caused by ankle joint weakness and restricted range of motion.

Rotary Chair: Unlike caloric testing, this test does not create uncomfortable vertiginous symptoms often associated with the caloric test. The size and shape of the external and middle ear, scarring or thickness of the TM do not affect rotary chair. As a result, a more accurate stimulus-response relationship is possible. The rotational stimulus is more natural than caloric irrigation in that it attempts to simulate natural environmental motion.

In addition, the nystagmus can be measured at various acceleration levels, enabling the vestibular system to be tested over a wider portion of its operating range. Multiple gradations of the stimulus can be presented in a short time period. The rotational stimulus is controlled more accurately and the response measured irrespective of anatomic variability, allowing small changes within the vestibulo-ocular reflex to be monitored more effectively. The primary disadvantage is both labyrinths are stimulated simultaneously, which is why ENG is still an integral part of a comprehensive evaluation.

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