VORTEQ

AHR - ACTIVE HEAD ROTATION
VHIT - VIDEO HEAD IMPULSE TEST
DVAT - DYNAMIC VISUAL ACUITY TEST
VORTEQ™ has long been used by Micromedical to measure the Vestibular – Ocular Reflex (VOR) gain and symmetry. Other gold standard tests that measure VOR gain are the caloric tests and rotational chair tests. VORTEQ provides unique testing paradigms necessary to accurately measure VOR over a range of frequencies.

**VISUALEYES VNG WITH VORTEQ OPTION**

VORTEQ is available as an option on either the VisualEyes VNG mid-tower or laptop systems. The AHR/VHIT/DVAT tests are integrated into the VNG software protocol for a comprehensive evaluation of the balance disorder patient.

Micromedical’s high performance solid state angular velocity sensor that slides on to the back of the VisualEyes goggles

**VHIT STAND-ALONE SYSTEMS**

VHIT may also be acquired as a stand-alone system when discrete VHIT testing is desired. Stand-alone systems are configured with the Micromedical V-Link.
VAORTEQ

VHIT - Video Head Impulse Test

The Head Impulse Test (HIT), also known as head thrust test, has been used for years to identify vestibular deficits using unpredictable, examiner applied, rapid horizontal head movements while observing compensatory catch up saccades indicative of a vestibular loss in the stimulated semicircular canal. Today, Micromedical employs years of objective VOR measurement experience to record these saccadic intrusions while measuring the VOR gain. As a subtest of VORTEQ, Micromedical utilizes the rate sensor and VisualEyes binocular high speed video cameras to perform the HIT with video eye tracking, making it much easier to measure VOR gain and record compensatory saccades when each canal is tested. Tests consist of horizontal canal testing (Lateral) and vertical canal testing which consists of RALP (right anterior/left posterior) and LARP (left anterior/right posterior).

PATIENT TESTING

Testing technique is quite important to achieve accurate results. The examiner must firmly grasp the patient along the jaw line to avoid interfering with the goggles during the head thrust and to avoid scalp slippage.

VHIT TESTING

Horizontal eye movement video and waveform is collected while the examiner rapidly moves the patient’s head in the plane of the canal being tested. The software automatically alerts the examiner with audio visual cues if head impulse velocity criteria are not met.

VHIT ANALYSIS

Abnormal VHIT showing left vestibular deficit. VOR gain and asymmetry are measured and graphed while covert corrective saccades (during head motion) and overt corrective saccades (post head motion) are visible in the waterfall display.

ADVANTAGES OF MICROMEDICAL’S VORTEQ VHIT INCLUDE:

• Full binocular video at up to 250 Hz.
• Patient comfort optimized and slippage reduced by full face goggles.
• Binocular recording limits misinformation due to disconjugate eye movements, lazy eye or poor eye tracking.
• Spontaneous nystagmus test included in stand-alone system.
• Customizable head thrust acceptance criteria.
• Instant audio-visual feedback on technique after each head thrust.
The VOR normally serves to stabilize gaze in space during head movements by generating equal and opposite compensatory eye movements.

**PATIENT TESTING**
During VORTEQ active head rotation testing, patients simply shake their head “yes” (vertical VOR test) or “No” (horizontal VOR test) to the beat of an electronic metronome over a frequency range specified for that test.

**VORTEQ AHR DATA COLLECTION**
Sample waveform collected form a normal subject showing eye position and head position.

**AHR ANALYSIS SCREEN**
Easy to interpret VORTEQ analysis screen. Gain, Phase and Asymmetry are calculated.
Dynamic Visual Acuity (DVA) is essential for retinal image stability when performing tasks where relative motion exists between the individual and the visual information which they must acquire and resolve in order to successfully perform a task (e.g. driving, flying, athletics). The DVA-Test provides valuable information about the Visual Vestibular Ocular Reflex (VVOR) in well subjects (pilots, athletes) as well as in patients with vestibular or neurological deficits (TBI, MS).

**PATIENT TESTING**
The static acuity level must first be determined. Then, during testing, the patient head velocity must exceed a pre-set threshold for the character to appear on the screen. The characters are increased in size from the static acuity level until they can be accurately read by the patient during headshaking. Eye movement recording is not required. Passive or active head shake and even head impulse testing can be used.

**DVAT TEST SCREEN**
Acuity character sets appear on screen only when the subject's head velocity exceeds threshold. The “head velocity bar graph” provides visual feedback to the subject. Character sets are presented with possible up / down / right / left orientations and increased in size from the static acuity level until they can be accurately read aloud.

**DVAT ANALYSIS SCREEN**
Comparisons between static and dynamic acuity at selected test frequencies can be quickly evaluated. The DVA-Test is scored using the log Mean Angle Resolvable (logMAR) scale that allows visual performance scores to be precisely quantified and statistically analyzed.
To Preserve and Improve Balance

VORETQ SENSOR SPECIFICATIONS
Micromedical’s solid state sensor measures head angular velocity using a state-of-the-art silicon ring gyroscope. This technology has unsurpassed accuracy and durability.

• Frequency range from 1 Hz and up
• Velocity Range: +/- 500 degrees/second
• Size 1.25” x 0.65”
• Weight: 1.6 oz

TURNKEY SYSTEM HARDWARE
Computer: Choose either Mid-Tower or Laptop configuration with Windows® OS. (Computer hardware shown in photos may differ from what is supplied with your system due to our commitment to provide you with the latest technology)

Target Stimulus: Choose 32 or 42” TV; Digital Light Bar or LCD Projector

All systems include Micromedical’s proprietary EyeMax™ video recording and management where video is recorded. Stand-alone systems include V-Link.

ALSO AVAILABLE FROM MICROMEDICAL
THE SYSTEM 2000 IS AVAILABLE IN THE FOLLOWING CONFIGURATIONS:
• Reclining
• Comprehensive
• Auto Traverse Micro-Centrifuge
  Child & Infant seat for assessing children - optional

VNG AND OPTIONS
• VisualEyes VNG – add nystagmus and caloric testing
• EOG - Electrode Capability
• Air Fx air caloric irrigator
• Aqua Stim water caloric irrigator
• Vorteq – Active Head Rotation Testing
• DVAT – Dynamic Visual Acuity Test
• VHIT – Video Head Impulse Test

CUSTOMER CARE
MICROMEDICAL’S KNOWLEDGEABLE STAFF IS DEDICATED TO ASSISTING YOU AND MAXIMIZING YOUR INVESTMENT BY:
• Providing on-site installation and training using factory representatives
• Providing technical, operational and interpretation assistance from Micromedical’s experienced support staff
• Sponsoring continuing education courses
• Including a one year hardware warranty
• Including one year of free software updates

QUALITY AND REGULATORY STANDARDS
All equipment is designed and manufactured under our ISO 13485 certified quality management system to meet U.S. FDA; Canadian; European and International Standards.
• CMDCAS
• ANSI S3.45-2009
• Medical Device Directive (MDD) to comply with EC Directive 93/42

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