

Science **made** smarter

Solutions and
services that
support your daily
workflow

A complete solution

Vestibular assessment
made complete



Interacoustics

Audiometry

Tympanometry

ABR

OAE

Hearing Aid Fitting

Balance
~~~~~

# Vestibular investigation

## Prevalence of vertigo

More than 40% of patients will experience dizziness or vertigo that is serious enough to go to a doctor.

An estimated 65% of individuals over the age of 60 experience dizziness or imbalance.

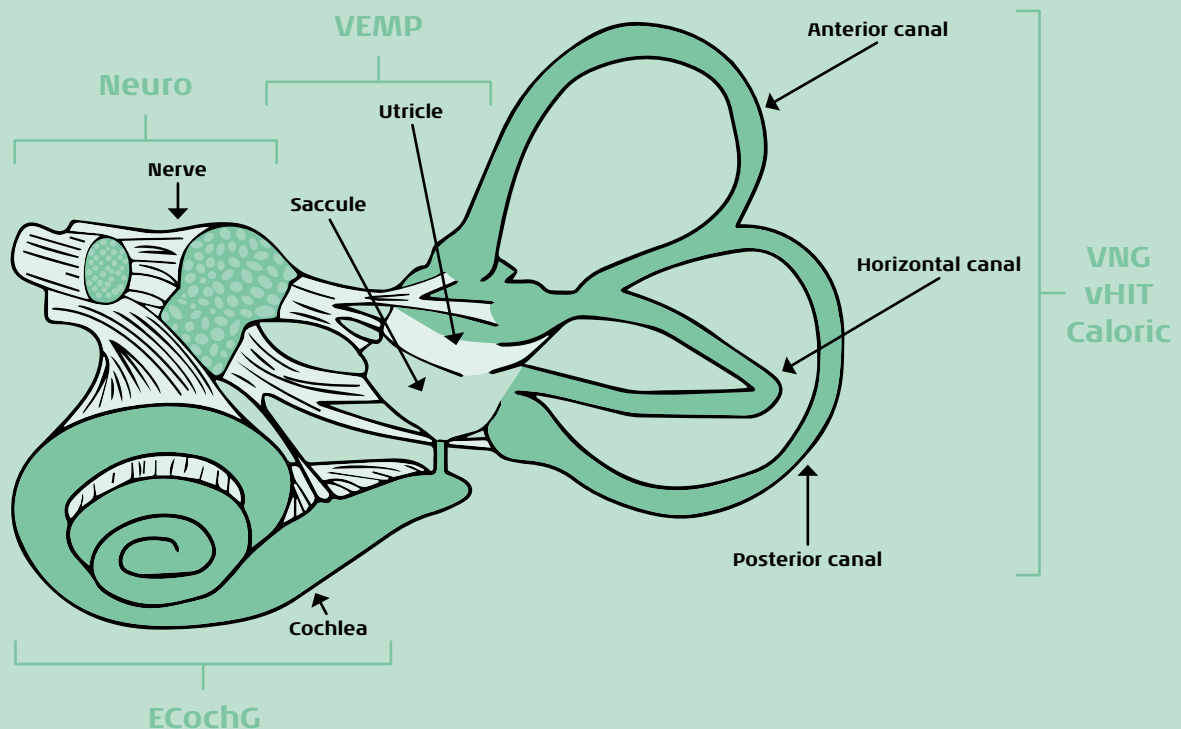
The incidence of vertigo will increase in correlation with longer life expectancies.

The need for efficiency in a balance clinic will increase in order to handle the increased patient load.

The vestibular system is housed within the inner ear and shares connections with the hearing (auditory) system.

If one of the vestibular organs is affected by illness, it is not unusual that the other vestibular organs are affected as well.

It is common for a "dizzy" patient to also have hearing loss and/or ringing or buzzing in the ears. Similarly, a problem with the balance system may also cause abnormal eye movement as the brain tries to decipher why it is receiving inappropriate information.



# Pre-examination

**Obtaining otoscopy, tympanometry and audiometry information is essential prior to balance assessment. Interacoustics offers a variety of options for these tests.**

## **Video otoscopy**

Otoscopy is a fundamental part of your practice prior to any audiological evaluation. It may determine alternative strategies during the patient's examination. The Viot™ video otoscope is a compact instrument for otoscopy and medical documentation. Viot™ objectively views the external auditory canal before, during and after any audiological procedure.

## **Tympanometry**

Analyzing the middle ear is an essential part of the pre-examination. Interacoustics offers a wide range of tympanometers, including the Titan which utilizes wideband tympanometry (WBT). WBT produces many tympanograms from 226 Hz to 8 kHz, making it easier to detect and differentiate between middle ear pathologies.

## **Audiometry**

A hearing loss may indicate that something is wrong in the outer or inner ear. Hence, performing audiometry is a vital part of the initial examination. Depending on your clinic's needs our portfolio includes screening, diagnostic and clinical audiometers.



Workflow steps:

# Initial vestibular examinations

- Identify nystagmus
- Look for BPPV
- Screen for vestibular neuritis
- Observe utricular function

Observation of eye movements is a necessary technique for clinical assessment of dizziness and balance disorders. Simple tests can be completed using a video goggle for measuring nystagmus, such as in BPPV (VisualEyes™ 505) or checking for low VOR gains, such as in vestibular neuritis (EyeSeeCam vHIT). These instruments

can be used to screen for many disorders and provide a faster and easier way to decide whether you need to do VNG or rotary chair testing.

Otolith function is important for sensing gravity and linear accelerations. The ability to record torsional eye movements with high level of accuracy allows clinicians to use the ocular counter roll (OCR) test (VisualEyes™ 525) to assess the otoliths and their central connections.

Video Frenzel, vHIT or OCR for the initial vestibular examination



Video Frenzel - Superior video quality. VORTEQ Assessments bundle can be added to VisualEyes™ 505 for further initial exams.



EyeSeeCam vHIT. A simple USB connected goggle and a laptop make this test easy to complete in any clinical setting.



OCR software interface and VNG goggles.



# Advanced vestibular examinations

## Oculomotor and caloric testing

VNG, including caloric and rotary chair testing, is the gold standard for differentiating peripheral from central vestibular abnormalities and for evaluating bilateral weaknesses. The advanced stimuli for oculomotor testing and the large "full field" LCD screen allow you to accurately assess all patients, including children. The streamlined protocols, normative data and real time analysis save you significant time, allowing you to complete more necessary tests in less time.

## Rotary chair testing

The gold standard for a bilateral weakness is rotary chair testing. Rotary chair testing is often better tolerated by difficult-to-test populations compared to caloric stimulation. Children are a prime example, as they are easily tested in the rotary chair. Rotary chair testing can also be performed on patients with middle ear pathologies for which caloric testing is not possible. Rotary chair testing provides information on compensation

of unilateral weaknesses and can be used to monitor vestibular conditions over time. The Orion Auto-Traverse and Comprehensive rotary chairs allow for subjective visual vertical (SVV) testing to assess otolith function.

## VEMP testing

Vestibular evoked myogenic potentials (VEMPs) are evoked responses that provide additional information about the vestibular system. cVEMP and oVEMP tests, when utilized with other vestibular tests, can be used to improve differential diagnosis.

## oVEMP

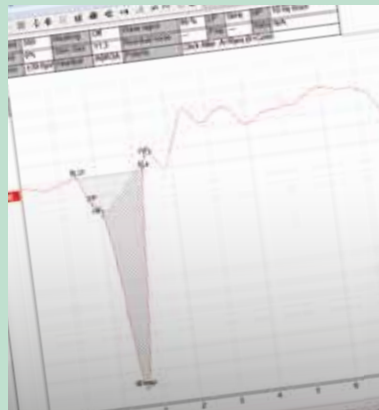
The ocular vestibular evoked myogenic potential (oVEMP) is an evoked potential measured from the inferior oblique muscle and is used to test the integrity of the utricle and its afferent pathways through the superior vestibular nerve. The oVEMP response provides information to assist in the diagnosis of disorders such as superior vestibular neuritis and superior semicircular canal dehiscence (SSCD).

## cVEMP

The cervical vestibular evoked myogenic response (cVEMP) is an evoked potential measured from the sternocleidomastoid (SCM) muscle and is used to test the saccule and its afferent pathways through the inferior vestibular nerve. It is used to diagnose saccular hydrops/Ménière's disease, SSCD and inferior vestibular neuritis.

## ECochG

Electrocochleography (ECochG) is a measure of the electrical potentials of the cochlea. The ECochG is primarily used to diagnose Ménière's disease, particularly cochlear hydrops. By using the area ratio calculation, the sensitivity of detecting Ménière's disease is increased (Ferraro et al., 2009).



Unique ECochG Area Ratio Calculation implementation.



# Advanced therapy

## **TRV Chair BPPV treatments**

The TRV Chair aids in performing safe and routine positioning maneuvers to treat BPPV in a single visit with safe and reliable results.

Quick and accurate identification and monitoring of underlying vestibular abnormalities is critical for providing the patient with the necessary medical intervention or balance therapy needed to bring them back to their daily activities.

## **vHIT advanced semicircular canal testing**

The vHIT is able to provide VOR gain measurements of all six semicircular canals as well as identify the presence of catch-up saccades in the compensation process. The suppression head impulse (SHIMP) protocol is also available for monitoring compensation. This can inform additional treatment and provide follow-up information.



By courtesy of Dr Thomas Richard Vitton

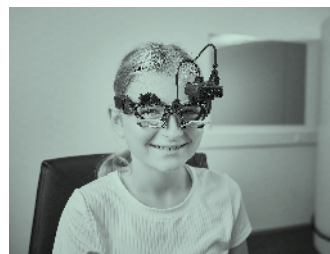
# The balance clinic



**Video Frenzel**



**VNG**



**vHIT**



**TRV Chair**



**VEMP**



**ABR, ECoG**



**Audiometry**



**Tympanometry**

# A variety of our products for balance assessment



## VisualEyes™ 505

### Video Frenzel

- Spontaneous nystagmus detection algorithm
- Built-in fixation light
- High-end USB camera system
- OtoAccess® integration
- Optional VORTEQ™ Assessment with DVA, GST and fvHIT™
- Can be upgraded to VisualEyes™ 515/525



## VisualEyes™ 515

### Vestibular Analysis

- Rapid data transfer and real time analysis in Spontaneous Nystagmus, Positional, Dix-Hallpike and bithermal/ monothermal Caloric test protocols
- Create your own protocols with the template designer
- Industry leading eye tracking and analysis algorithms
- Synchronized eye and waveform video play back

## VisualEyes™ 525

### Vestibular and Oculomotor Analysis

- Advanced oculomotor testing
- Ocular counter roll test with torsional eye tracking and optional 3D head models
- Saccadometry
- Optional VORTEQ™ Assessment with DVA, GST and fvHIT™ testing
- Optional EyeSeeCam vHIT add-on



## Orion Reclining

### Reclining rotary chair

- Multiple goggle options
- USB high-speed infrared cameras
- Multiple pupil tracking options
- Uses the VisualEyes™ 525 software
- Recline angles for caloric and positional assessments

## Eclipse

### Neuro

- Automated latency calculation
- Latency data
- Residual Noise calculation
- Bayesian Weighting



## VisualEyes™ EyeSeeCam

### Video Head Impulse Test (vHIT)

- Test all six semicircular canals
- Data export for clinical research
- 3D head model
- Built-in head sensor
- Interchangeable ball-and-socket camera for eye tracking



## TRV Chair

### BPPV Treatment

- Unique tool for the diagnosis and treatment of BPPV
- 360-degree rotation along the plane of each semicircular canal
- Lock the patient in any position for a detailed look at each semicircular canal



## Orion Auto-Traverse and Comprehensive

### Enclosed rotary chairs

- Built-in laser fixation target and optokinetic drum
- Static SVV with Comprehensive chair
- Static and dynamic SVV with Auto-Traverse chair
- Full-field optokinetics when combined with VisualEyes™ 525
- Pediatric add-on package
- EOG add-on option

## Eclipse

### ECoChG

- Unique area ratio and AP/SP calculation
- Default protocols for ECoChG testing
- TM-starter kit included



## VORTEQ™

### Assessment Package

- Add-on to VisualEyes™ 505, 515 and 525
- 3D head model in the software to guide you through the Advanced Dix-Hallpike and Lateral Head Roll tests
- Torsional eye tracking to document BPPV
- Separate headband allowing Dynamic Visual Acuity, Gaze Stabilization and fvHIT™ Testing
- Functional Assessment package allows for standalone DVA, GST and fvHIT™ testing utilizing only the headband and the VORTEQ sensor



## VORTEQ™

### Diagnostic Package

- Add-on to VisualEyes™ 525
- VORTEQ™ vHIT
- VORTEQ™ Active Head Rotation (AHR)
- vHIT with VNG goggles



## Air FX

### Caloric Air Irrigator

- Otoscope handle with illumination and magnification
- Cooling and heating ability: 20°C to 50°C
- Lighted and magnified otoscope
- Self-contained cooling ability
- Integrated with the Interacoustics VNG software VN415 / VO425 v. 7.06 or later



## Aqua Stim

### Caloric Water Irrigator

- An external water tank eliminates the need for a drain or water supply in the examination room.
- 30°C cold and 44°C warm irrigations
- LED illumination and start button in handle



## Eclipse

### VEMP

- EMG-scaling compensates uneven left and right muscle tonus - a reliable result
- Instant visual feedback of EMG tonus - increased quality
- Automated VEMP ratio calculation for easy evaluation



# Science made smarter

## Interacoustics is more than state-of-the-art solutions

Our mission is clear. We want to lead the way in audiology and balance by translating complexity into clarity:

- Challenges made into clear solutions
- Knowledge made practical
- Invisible medical conditions made tangible and treatable

Our advanced technology and sophisticated solutions ease the lives of healthcare professionals.

We will continue to set the standard for an entire industry. Not for the sake of science. But for the sake of enabling professionals to provide excellent treatment for their millions of patients across the globe.

[Interacoustics.com](http://Interacoustics.com)

Interacoustics A/S

Audiometer Allé 1  
5500 Middelfart  
Denmark

+45 6371 3555  
[info@interacoustics.com](mailto:info@interacoustics.com)

[interacoustics.com](http://interacoustics.com)

