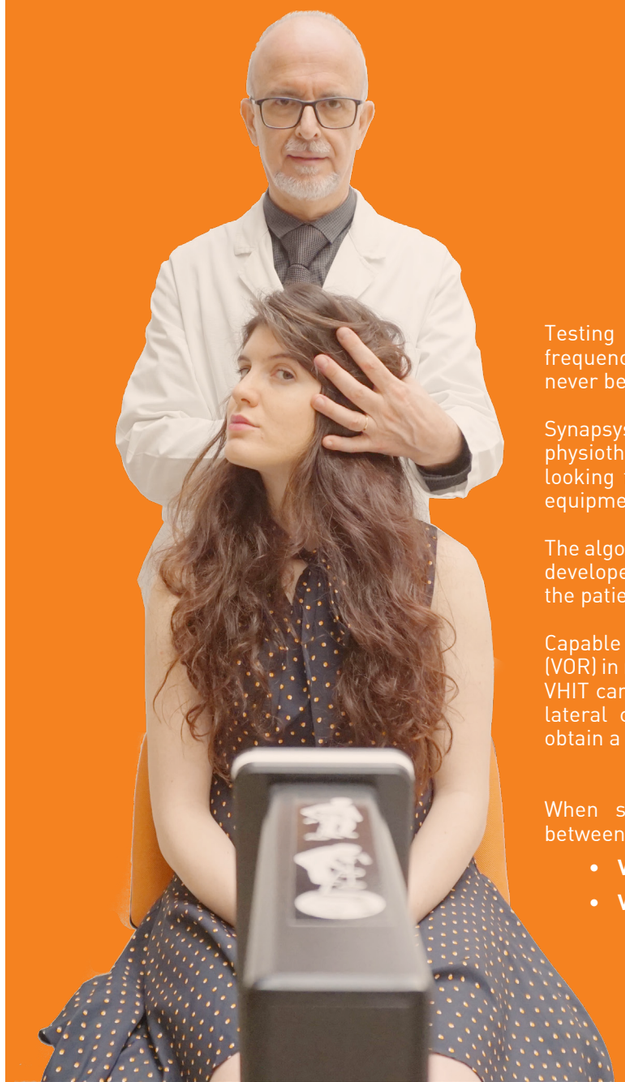
Synapsys VHIT

video head impulse test

inventis
Audiology & Balance

“Synapsys VHIT represents a unique way to perform Video Head Impulse Test (VHIT)”



Testing all the 6 semi-circular canals at high frequency, as well as overt and covert saccades, has never been so **fast** and **simple**.

Synapsys VHIT is the ideal choice for ENT doctors, physiotherapists and balance professionals who are looking for a reliable, accurate and state-of-the-art equipment.

The algorithms used by Synapsys VHIT are specifically developed to simultaneously measure the direction of the patient’s gaze and the acceleration of the head.

Capable of measuring the vestibulo-ocular reflex (VOR) in response to quick head movements, Synapsys VHIT can be combined with Synapsys VNG which test lateral canals at low and medium frequencies, to obtain a complete vestibular analysis.

When selecting Synapsys VHIT you can choose between two scalable software versions:

- **VHIT Basic** for testing lateral canals only
- **VHIT Plus** for a complete six canals analysis

.Innovative Simple. .Unique

Designed and developed with the help of the visionary and world-renowned otologist **Dr. Erik Ulmer**, Synapsys VHIT is a unique product in balance testing.

Thanks to a **revolutionary remote camera system**, Synapsys VHIT is the first and only video VHIT that **does not require the use of goggles** or any kind of other device to be placed on patient’s head.

This results in a total prevention of mask slippage artifacts, a greater patient comfort and an absolute freedom of movement for the practitioner.

Moreover, thanks to its remote camera, Synapsys VHIT is never in direct contact with patient’s skin or body, preventing any need for sanitization/disinfection, or the use of disposables.

No other system offers the opportunity to analyze position graphs (gaze vs. head) and to re-evaluate possible not accepted maneuvers thanks to a **slow-motion playback of the maneuver video**.

Synapsys VHIT is your only solution when it comes to testing **children**. Goggles attached tightly to the head are clearly not tolerated by infants. This remote camera system allows to simply perform Video Head Impulse Test in infants as young as 3 months old.

Synapsys VHIT is designed to be fast and simple to use.
Just **5 maneuvers per canal** are needed to obtain reliable results and this allows to test all the 6 semi-circular canals in less than **5 minutes**.

Thanks to the **display and sound information**, the software is able to guide the doctor and help him/her perform the maneuvers correctly.

Detecting direction of patient’s head movements, the camera automatically recognizes the investigated plane (horizontal, vertical RALP or vertical LARP), thus allows the operator to perform the entire examination without ever leaving the patient.

Synapsys VHIT does **not require any calibration** procedure, thanks to the fixed focus of the camera at 90 cm. It is only necessary to position the patient at the right distance in order to obtain sharp images: an easy operation thanks to the motorized camera that allows fine and fast positioning adjustments.

INNOVATIVE JUST LIKE YOUR CLINIC.

UNIQUE AS ALL YOUR PATIENTS.

Normative Values of semicircular canal Vestibulo-Ocular reflex gain in infants and children

Aim. Assess normative values of semicircular canal VOR gain in infants and children using a Video Head Impulse system with a remote camera

Results. Data show a non-linear and monotonous evolution: VOR gain increases rapidly up to the age of about 6 years old (with variation among canals), then progresses more slowly to reach adult values by the age of 16.

Conclusions. Remote video recordings and adapted protocols permit HIT in children as young as 3 months old in less than 10 min. The remote camera system allowed to determine the evolution curve of the VOR gain over time.

[Wiener-Vacher, Sylvette R., and Sidney I. Wiener. Frontiers in neurology 8 (2017): 434].

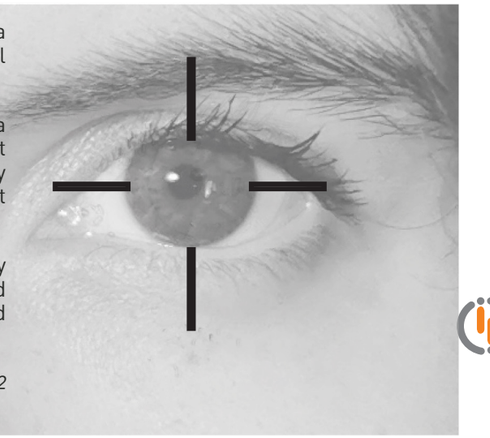
Clinical Utility of Remote-Camera Video Head Impulse Testing in Children under 3 Years

Aim. Demonstrate the feasibility and clinical utility of remote-camera video head impulse testing (vHIT) for assessing semicircular canal function in very young children at risk for vestibular dysfunction.

Results. In five clinical cases (ages 6–31 months), remote-camera vHIT successfully provided reliable, ear-specific information about vestibular function. In some cases, it detected dysfunction missed by first-tier screening (cVEMP), while in others it confirmed or ruled out rotary chair findings—avoiding unnecessary repeat testing.

Conclusions. Remote-camera vHIT is a feasible, practical, and highly informative tool for evaluating vestibular function in infants and toddlers. It provides ear-specific results that enhance diagnosis and support timely referral to pediatric vestibular rehabilitation.

[Janky, K.L., Patterson, J., and Kelly, E.A. The Laryngoscope 134.12 [2024]: 5201–5206].



A WORD FROM THE EXPERTS

Sylvette Wiener-Vacher

"The VHIT technique has revolutionized the vestibular system assessment by allowing the analysis of VOR gains at high speeds on each of the semicircular canals.

In my pediatric practice (600 children per year), the Synapsys VHIT is an essential tool, absolutely not comparable to the others. Thanks to its remote camera, no devices are needed on the head of the child, giving you complete freedom while performing the exam. This is really important, because you can perform just 2-3 maneuvers and move on to the next plain preventing the child to get annoyed. At the end you can go back and complete the 5 required maneuvers per canal to get a complete result."

ENT doctor - Center for Evaluation of Balance Disorders in Children (EFEE), Robert Debré University Hospital, Paris, FR

Olivier Dumas

"I have been using Synapsys VHIT for 14 years now in the vestibular rehabilitation field, and this device has become essential to me. The speed and accuracy with which examinations are carried out are surprising, and the fact that there is no need for calibration is a considerable time saving.

The use of a remote camera greatly simplifies the exam practice learning, as I observe it daily during my teaching activities.

Moreover, the Synapsys VHIT allows to perform a precise analysis of early saccadic function, making this device an important rehabilitation tool."

Vestibular Physiotherapist, Lyon, France - Professor in vestibular assessment, Lyon Sud University Hospital, Lyon, FR

Vincenzo Marcelli

"My practice as a Synapsys VHIT user with remote camera has beeEarly identification of vestibular dysfunction in children is essential to optimize motor and cognitive development.

With the advent of objective and non-invasive methods such as remote camera VHIT, accurate evaluation is now possible even in very young patients.

VHIT is a valuable, feasible, and reproducible tool that can detect dysfunction even in the absence of symptoms, and universal vestibular screening, beyond high-risk or symptomatic populations, should be considered to prevent diagnostic delays."

Specialist and Consultant in Audiology and Vestibular Sciences at the University of Naples 'Federico II, Naples, IT

Kristen Janky and Jessie Patterson

"We have been performing pediatric vestibular testing at Boys Town National Research Hospital for more than 30 years and the addition of remote camera vHIT has proven to be an invaluable tool in our clinical practice.

It is quick, well-tolerated, and provides ear-specific results without the need for goggles or electrodes, which is especially important in infants, toddlers, and individuals with Down syndrome. In many cases, it is the only assessment children could complete successfully, and it provides complementary information to other tests of vestibular function.

Remote camera vHIT has become essential in our clinical and research protocols for accurately identifying vestibular dysfunction in difficult-to-test populations."

Audiologists at Boys Town National Research Hospital, Omaha, NE

academia.

Key benefits

- It takes **only 5 minutes** to complete a full test!
- **No goggles!** Synapsys VHIT makes use of a remote camera placed in front of the patient.
- **Test children** of all ages!
- **Test independently** all six semi-circular canals
- **Save money** on disposables, Synapsys VHIT doesn't have any!
- Observe **simultaneously** eye and head movements
- Automatic detection of canal under test
- Scalable software accordingly to your needs

Synapsys VHIT is fully controllable by the software Maestro, the core of your Inventis equipment set-up. With Maestro you can manage patient data, run, review and combine exams.

Check out more on www.inventis.it

Check the video on YouTube

	Synapsys VHIT
Hardware specifications	Remote camera Motor-free: no device movements needed for camera framed area adjustments Height adjustment through monopod
Software specifications	Analysis of VOR (Vestibulo-Ocular reflex), overt and covert saccades Canalogram Ulmer and results table Voice messages Video recording and playback for each maneuver
Sensor specifications	Type: CMOS Mono Max Resolution: 1456 x 1088 pixels (cropped to 752 x 400 pixels) Pixel size: 3.45 x 3.45 µm Sensor class: 1/3" Shutter type: Global
Timings	Max used Frame rate: 100 fps Exposure time: 2.4 ms
Camera properties	Focal length: 20 mm / 0.787 in. Field of vision (total): 6.8° (Horizontal), 5.2 ° (Vertical)
Camera controls	Gain control: automatic Exposure control: manual (fixed)
Computer interface	Connection: through USB 3.0 port USB cable length: 3 m / 118.1 in.
Models	10738 Synapsys VHIT Basic 10739 Synapsys VHIT Plus

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INVENTIS s.r.l.
CORSO STATI UNITI, 1/3
35127 PADOVA – ITALY
PHONE: +39.049.8962 844
FAX: +39.049.8966 343
info@inventis.it
www.inventis.it