REVIEW ARTICLE

CONTENTS

The video head impulse test in routine otorhinolaryngology practice: A scoping review

Oleksandr M. Naumenko, Roman R. Romanenko
BOGOMOLETS NATIONAL MEDICAL UNIVERSITY, KYIV, UKRAINE

ABSTRACT

Aim: To evaluate the role of the video head impulse test (vHIT) in routine otolaryngological practice and to summarize its combined use with other methods.
Materials and Methods: The study was conducted in accordance with the PRISMA-ScR guidelines. The literature search was conducted in PubMed, Scopus, Web of Science, Google Scholar, and the Inventis manufacturer's website using the following keywords: ("video head impulse test" OR vHIT) AND (vestibular OR vertigo OR otolaryngology OR "vestibulo-ocular reflex"), covering the period 2008–2026. Inclusion criteria: original and review articles on the clinical application of vHIT in otorhinolaryngology, combinations with other tests, nosological forms, and subjective scales. Out of 92 sources, 26 publications were selected.
Conclusions: The analysis showed that vHIT outperforms clinical HIT due to the detection of latent saccades and subclinical disturbances of the vestibulo-ocular reflex (VOR). The highest diagnostic value is achieved in combination with cVEMP/oVEMP, HRCT of the temporal bones, and caloric testing. vHIT is informative in cases of acute unilateral vestibulopathy, Meniere's disease, bilateral vestibulopathy, ototoxicity, vestibular schwannoma, and blast-induced vestibulopathy. It is recommended to use vHIT as the primary objective test in standardized algorithms for vestibular diagnosis to improve the accuracy of differential diagnosis, monitor rehabilitation, and standardize clinical practice.

KEY WORDS: vestibulo-ocular reflex, vertigo symptom scale

Wiad Lek. 2026;79(6):1389-1396. doi: 10.36740/WLek/222580 DOI

INTRODUCTION

Dizziness and vertigo are common complaints in ear, nose, and throat clinics, making up 25-30% of visits. Recent studies show that vestibular disorders have increased, partly due to blast trauma from conflicts, which can damage the semicircular canals, otoliths, and other parts of the vestibular system, including both peripheral and central components [1, 2].

The vestibulo-ocular reflex (VOR) stabilizes the image on the retina during head movement by generating compensatory eye movements that are equal in speed and opposite in direction to the head impulse. The reflex arc is made up of the receptors in the semicircular canals, the vestibular nerve, the brainstem's vestibular nuclei, and the oculomotor nuclei. Normally, the vestibulo-ocular reflex, or VOR, has a gain of about 1.0 - this means the eyes move exactly as much as the head, keeping your gaze steady. But if the vestibular system is damaged, either in the peripheral or central parts, the gain drops. To keep your gaze fixed, the brain sends corrective signals to the eyes, making quick adjustments [2, 3].

The head impulse test (HIT), described by Halmagyi and Curthoys in 1988, allows for the detection of gross VOR asymmetry when evaluating the horizontal semicircular canals. However, the subjectivity of the assessment, the inability to quantitatively measure gain, and insensitivity to latent saccades significantly limit the diagnostic capabilities of the clinical HIT. vHIT has overcome these limitations by providing objective quantitative recording of VOR in the high-acceleration range (1500–4000°/s^2, peak velocity 150–300°/s) across all six semicircular canals [2–4].

Most commercial vHIT systems rely on goggles with built-in video cameras and accelerometers, which cause tracking artifacts and discomfort in children, elderly patients, and individuals with neck injuries. Systems with a remote infrared camera that does not physically contact the orbital region have offered an alternative approach that potentially reduces these artifacts and expands the range of testing options available [5].

Despite the growing number of publications on vHIT, there remains a lack of systematic data regarding its clinical application in combination with other diagnostic methods and the correlation between the test's objective parameters and subjective scales, particularly the Ukrainian version of the Vertigo Symptom Scale [6]. This necessitates a scoping review to synthesize the available evidence and determine the prospects for implementing the method in routine practice [7].

AIM

This scoping review aimed to evaluate vHIT's role in everyday ear, nose, and throat practice. It looked at how vHIT works with other diagnostic tools, which conditions it's best at identifying, and how its results - like compensatory saccades - relate to patients' symptoms.

MATERIALS AND METHODS

This study was conducted as a scoping review in accordance with the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) methodological guidelines [8].

The literature search was conducted from January to March 2026 in the following electronic databases and platforms: PubMed/MEDLINE, Scopus, Web of Science, and Google Scholar. The search strategy included the following combinations of keywords and logical operators: ("video head impulse test" OR vHIT) AND (vestibular OR vertigo OR otolaryngology OR "vestibulo-ocular reflex" OR VEMP OR "computed tomography" OR "temporal bone"). The search time frame was 2008–2026. There were no language restrictions on the publications; however, only works with full-text versions in English or Ukrainian were selected for analysis.

Inclusion criteria: original studies and reviews dedicated to the clinical application of vHIT in otorhinolaryngological practice; publications containing data on the combination of vHIT with other diagnostic methods for the vestibular system; studies analyzing nosological forms of vestibular disorders or subjective symptom assessment scales. Exclusion criteria: conference abstracts, letters to the editor; publications without the full text.

The initial search identified 92 sources. After removing duplicates and screening by title and abstract, 47 publications were selected for full-text review. After a detailed analysis of the full texts, the final set consisted of 26 scientific papers. (Fig. 1.) In addition, the Ukrainian version of the Vertigo Symptom Scale [6] with the full text of the questionnaire was included in the analysis.

This study is a scoping review and is based exclusively on an analysis of publicly available scientific data published in peer-reviewed journals, clinical guidelines, and official manufacturer sources. No primary collection of patient information was conducted, no personally identifiable data were used, and no new clinical interventions or experiments were performed.

The vHIT SYNAPSYS system by Inventis, Italy, was selected as the glasses-free vHIT registration system.

ETHICS

The authors fully adhered to the ethical principles of the World Medical Association's Declaration of Helsinki, as well as the international standards of publication ethics recommended by the International Committee of Medical Journal Editors (ICMJE, 2024). No part of this work contains plagiarism, fabrication, or falsification of data. All sources of information used are correctly cited and formatted in accordance with the journal's requirements. Consequently, approval from a local bioethics committee was not required.

REVIEW AND DISCUSSION

The vHIT method measures the vestibulo-ocular reflex (VOR) at high-frequency acceleration, something the caloric test and Barani chair rotation test cannot do. It works by rotating the head briefly and passively, with an acceleration of 1500–4000°/s^2. A healthy vestibulo-ocular reflex will generate an eye movement that is equal in speed and opposite in direction. If the reflex is damaged, the eyes cannot keep up, and the brain has to make corrective movements to get the gaze back on track. These movements, called saccades, can happen after the stimulus is over or during it. The ones that happen after are visible, but the ones during are almost invisible to the clinician. The detection of covert saccades is a key advantage of vHIT over the clinical head impulse test (HIT): they appear earlier, often under conditions of sub- or pseudonormal gain, and indicate active central compensation for peripheral vestibular deficits. Traditional vHIT systems rely on the use of goggles with built-in cameras and accelerometers, which can lead to goggle slippage, patient discomfort, and limitations in certain populations.

Comparative studies of vHIT systems with and without glasses demonstrate that contactless systems with a remote infrared camera provide greater reproducibility of results and better tolerability in patients with neck injuries and post-traumatic stress disorder [10]. Remote recording technology eliminates one of the key technical artifacts of traditional vHIT, making the method more widely applicable in routine otolaryngological practice, including in children and patients affected by mine-blast injuries [11].

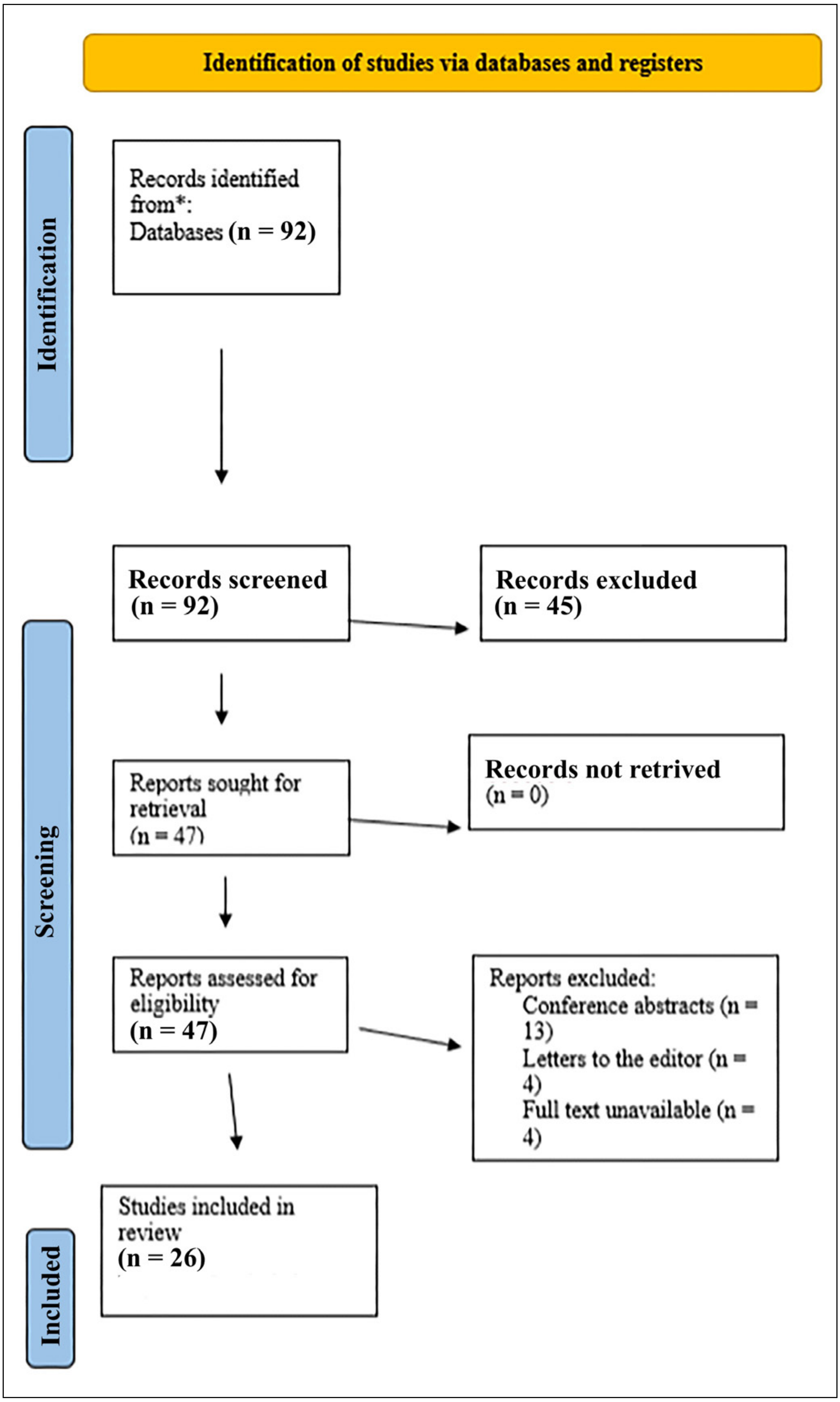

Fig. 1. PRISMA flow diagram
Compiled by the authors

The standard vHIT procedure involves the following position: the patient sits 1–1.5 m away from a stationary visual target at eye level. The physician stands behind or to the side of the patient, holding the patient's head with both hands at the temporal region. To test the horizontal semicircular canals, the head is tilted forward 30° from the horizontal. To test the vertical canals in the RALP and LARP planes, the head is tilted 45° toward the corresponding plane from the sagittal axis (Fig. 2).

Fig. 2. Demonstration vHIT in a seated patient. The examiner holds the patient's head firmly at the temples and performs rapid, unpredictable horizontal head rotations while the patient fixates on a stationary target
Picture taken by the authors

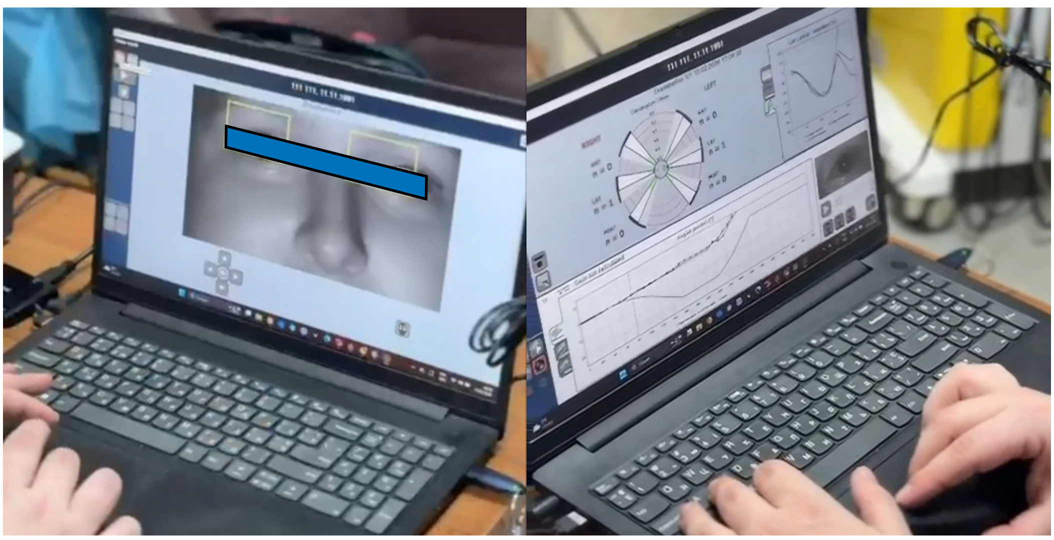

Fig. 3. Demonstration of eye-tracking module in the vHIT system. Live feed (center) shows pupil tracking with calibration cross; side panels present synchronized head and eye velocity traces, highlighting the software's capability to capture high-frequency VOR responses and latent saccades
Picture taken by the authors

The impulse is applied suddenly, with no warning, at 1500–4000°/s^2 and reaches a top speed of 150–300°/s. It should only move 10–20° at most. For accurate results, the patient must not know which way they'll be turned and should keep their eyes still before the impulse starts. Aim for 10-20 good impulses per channel, but any with interference, poor focus, or calibration issues are automatically dismissed by the software and don't factor into the gain calculation.

To calculate gain, we look at the ratio of eye velocity to head velocity during the first 40-60 milliseconds of a saccade. We consider it a compensatory saccade if the peak eye velocity deviates from the baseline. Covert saccades happen within 0-200 milliseconds of the stimulus, while overt saccades occur after 200 milliseconds. (Fig. 3) If a person has spontaneous nystagmus greater than 4°/s during testing, we need to correct for it or be cautious when interpreting the results, since nystagmus can hide or mimic abnormal saccades. Interpretation of vHIT results is based on two main parameters: VOR gain and the number of compensatory saccades (overt and covert). To standardize the assessment, data from an open dataset [12] and generalized values from the literature are used (Table 1).

Low VOR gain values, combined with compensatory saccades, are a sign of a problem. Covert saccades,

Table 1. Normal VOR gain values for vHIT systems (from the Figshare dataset)

Semicircular canal	Average gain (±SD)	Lower limit	Notes
Horizontal right	0.98 ± 0.08	≥ 0.85–0.90	The most stable parameter
Horizontal left	0.97 ± 0.09	≥ 0.85–0.90	Asymmetry < 0.15 is considered normal
Anterior right (RALP)	0.95 ± 0.10	≥ 0.75–0.80	Higher risk of artifacts
Posterior left (RALP)	0.94 ± 0.11	≥ 0.75–0.80	—
Front left (LARP)	0.96 ± 0.10	≥ 0.75–0.80	A decrease of 0.05–0.10 after age 70
Rear right (LARP)	0.95 ± 0.11	≥ 0.75–0.80	Physiologically lower values in children under 7 years of age

Source: compiled by the authors based on [4]

which can't be seen during a clinical test, are particularly useful for diagnosis. Normal gain values change with age: in babies, horizontal VOR gain is around 0.6 to 0.7, and it takes until age 7 to reach adult levels. After 65, gain values naturally drop due to muscle and hair cell loss. Using adult standards for children and older adults can lead to misdiagnosis. If the difference in VOR gain between the right and left canals is more than 0.15, it's a problem, no matter what the actual values are. This is a better way to spot one-sided damage than just looking at low gain values.

The HINTS Protocol is the only validated way to tell peripheral vestibular syndrome from central vestibular syndrome in patients with acute vestibular syndrome. It has three parts: checking the vestibulo-ocular reflex, looking at the type of nystagmus, and doing a skew deviation test. If the vestibulo-ocular reflex test is abnormal, the patient has unilateral horizontal nystagmus, and no skew deviation, it points to a peripheral problem - a result doctors consider safe. But a normal test result can be alarming, especially in cases of ischemia in certain brain areas, where the vestibular nerve might still be intact. The HINTS Protocol's accuracy depends on the doctor's expertise - non-specialists tend to get lower sensitivity scores [13].

Using vHIT to assess the HIT component makes the evaluation less subjective and more reliable. In otolaryngology, HINTS is most useful for cases of acute vestibular syndrome that last more than 24 hours and cause persistent vertigo and nystagmus. This is different from episodic vertigo, where HINTS doesn't apply.

The highest diagnostic accuracy of vestibular testing is achieved with a comprehensive approach (Table 2). No single test provides a complete picture of labyrinth function, as different tests cover different frequency ranges and different structures of the vestibular system.

One of the key aspects of modern vestibular diagnostics is the comparison of objective instrumental data with the patient's subjective perception. Clinical experience and a review of the literature indicate a well-known discrepancy between the objective degree of vestibular deficit and the severity of symptoms: some patients with a significant reduction in gain have minimal complaints due to successful central compensation, while others with normal or subnormal gain subjectively experience a pronounced functional deficit. A synthesis of the data shows that the traditional VOR gain parameter often does not correlate sufficiently with symptom severity, whereas compensatory saccades (overt and covert) are a more sensitive marker of subclinical vestibular dysfunction that persists despite normal gain [20].

Based on a synthesis of the included publications and similar correlational studies using validated vertigo scales (the Vertigo Symptom Scale in its international versions), a statistically significant association is predicted between the frequency of compensatory saccades on the vHIT and scores on the Ukrainian-language version of the VSS [6]. Verification of these correlations in our own patient cohort is the subject of a planned prospective study by the authors. For comparison, we present data from similar studies that used the original version of the VSS [20–22].

vHIT has limitations, mainly operator dependence, which requires precise stimulus delivery. It is also prone to false positives in patients with severe eye movement disorders. The results can differ from caloric tests in 30–50% of cases, as they measure different parts of the vestibulo-ocular reflex. Patients with blast trauma pose specific challenges, including neck injuries and PTSD, which demand adjustments to the testing protocol.

Prospects for Further Research. Expanding the use of vHIT in pediatric otolaryngology: the method has been proven effective in children as young as 3 months, opening up opportunities for early, objective diagnosis of congenital and acquired vestibulopathy in pediatric patients for whom subjective tests are not applicable.

Development of standardized protocols combining digital vestibular examinations, particularly for a cohort of patients affected by mine-blast injuries. It is critically important to have a validated multimodal algorithm that allows for the objective documentation of vestibular deficits for medical, social, and forensic medical examinations [20].

Table 2. vHIT in modern diagnostic algorithms: clinical scenarios, expected patterns, and clinical decisions

Clinical scenario	The Role of vHIT	Diagnosis (Bárány Society / ICD-11)
Persistent dizziness + nystagmus ≥ 24 hours; symptoms > 3 hours but < 24 hours at the time of examination	H-component of HINTS: horizontal channel VOR gain + presence of corrective saccades. A normal vHIT during the acute vestibular syndrome (AVS) is considered a 'red flag', as the peripheral vestibulo-ocular reflex (VOR) may be preserved in strokes involving the anterior inferior cerebellar artery (AICA) territory [14]. Diagnostic accuracy of HINTS among specialists: sensitivity 97–100%; among emergency physicians and non-specialists — 21–59% (κ = 0.10) [7–9].	AVS acute unilateral vestibulopathy (AUVP) ICD-11: AB31.0 Diff.: ischemic stroke (posterior fossa), AICA infarct
Intermittent vestibular syndrome (episodes lasting 20 minutes to 12 hours, plus fluctuating sensorineural hearing loss, tinnitus, and a sensation of fullness in the ear)	Caloric–vHIT dissociation: abnormal caloric test (canal paresis ≥ 22–34%, depending on the protocol) + normal vHIT gain = a sign of low-frequency damage with preserved VOR [10]. Critical note: vHIT gain alone does not distinguish Menière's disease (MD) from VM—the mean difference in gain between the groups is statistically insignificant (p = 0.497) [15]. It is the caloric–vHIT dissociation and the presence of saccades that have diagnostic value. A decrease in gain between attacks indicates progression and transition to stage II–III	MD ICD-11: AB31.1 Diff.: vestibular migraine (VM), VM-MD overlap
Oscillopsia during movement, unsteadiness in the dark and on uneven surfaces	Bilateral reduction in VOR gain is the primary diagnostic criterion [16]. Testing all 6 channels increases the sensitivity of the method and detects isolated lesions in the vertical channels [17]. vHIT is the priority test and should be performed first [12–13] The Suppression Head Impulse Paradigm (SHIMP protocol) should be used when results are inconclusive	BVP ICD-11: AB30 Diff.: neurodegeneration, ototoxicity
Subacute unilateral vestibulopathy + SNHL and/or tinnitus	Reduced gain + compensatory saccades on the affected side. The posterior canal is affected first due to the specific blood supply of the inferior branch of the vestibular nerve. A normal vHIT does not rule out a tumor: central compensation may mask the deficit [14–16]	Vestibular schwannoma (VS) ICD-11: 2A00.0 Diff.: AUVP, meningioma, bilateral vestibular schwannoma (neurofibromatosis type 2), posterior semicircular canal dehiscence [15–16]
Vestibular disorders following blast trauma (combat injury, primary–tertiary blast, mTBI)	Dissociative pattern: normal or subnormal gain with an increased number of covert saccades—reflects active central compensation in the presence of an unstable VOR [2]. The vertical canals are affected more frequently than in other forms of vestibulopathy. Covert saccades are the key parameter; it is they, rather than gain, that document the deficit	Blast-induced vestibulopathy ICD-11: AB31.Y Diff.: AUVP, PPPD, central vestibular syndrome (TBI)
Transient positional vertigo (< 1 min) triggered by a change in head position; without auditory symptoms	In typical benign paroxysmal positional vertigo (BPPV), vHIT is normal: canalolithiasis does not disrupt the VOR reflex arc. Abnormal posterior canal gain is found in ~55% of mixed posterior semicircular canal -BPPV cohorts and up to 73–88% in atypical forms (cupulolithiasis, short-arm); in typical first episodes, it is significantly less common. Abnormal vHIT in the presence of positional symptoms indicates a central origin or concomitant vestibulopathy. vHIT is not mandatory in a typical first episode	BPPV ICD-11: AB31.2 posterior canal (80%), horizontal canal (15%) Diff.: central positional nystagmus (posterior fossa tumor/stroke)
Occasional vertigo with a history of migraine (episodes lasting from 5 minutes to 72 hours; headache or photophobia; no persistent sensorineural hearing loss)	vHIT values are typically normal between attacks—there is no structural damage to the VOR. During an attack, a transient decrease in gain may occur in ≤ 30% of patients. Abnormal vHIT values between attacks warrant investigation for Menière's disease (MD) or a history of AUVP [1–3, 11]	Vestibular migraine (VM) ICD-11: 8A80.3 Diff.: MD (VM-MD overlap ~20 %), PPPD, transient ischaemic attack (vertebrobasilar)
Chronic non-systemic dizziness and unsteadiness lasting ≥ 3 months; (worsens when standing, during movement, and in visually stimulating environments; often following a vestibular episode)	vHIT is typically normal—PPPD is a functional disorder without structural damage to the VOR. Abnormal vHIT in PPPD indicates an organic trigger that caused the disorder. Gain does not correlate with symptom severity [21, 23]	PPPD ICD-11: 8A85 Diff.: VM, compensated AUVP, MD (interictal)
Changes in VOR during treatment (serial assessment during vestibular rehabilitation and pharmacotherapy)	The dynamics of corrective saccades are the primary marker of central vestibular compensation; they correlate more strongly with subjective scales than gain [15, 16]. Gain is a secondary parameter: it may normalize before symptoms resolve. The combination of vHIT + VEMP + posturography + subjective scales provides the highest diagnostic accuracy [17–19]. The absence of saccade dynamics after ≥ 3 months of vestibular rehabilitation therapy (VRT) requires a review of the program [23]	AUVP — monitoring of central compensation BVP — effect assessment VRT MD — follow-up intratympanic therapy blast traumatic brain injury/ documentation [24–26]

Source: compiled by the authors based on [1-3, 7-26]

Conducting prospective cohort studies on the correlation of compensatory saccades with the Ukrainian VSS in patients with concussion: existing data have limitations related to retrospective design and heterogeneity of groups; prospective studies will allow determining the prognostic value of vHIT parameters regarding vestibular function recovery [21, 26].

Standardization and validation of mobile software for vHIT screening, which is particularly relevant for primary care in resource-limited settings.

Integration of artificial intelligence for the automatic detection and classification of saccades: machine learning algorithms can reduce the variability of manual identification of covert saccades, which is one of the main causes of interlaboratory discrepancies in vHIT results [23, 25, 26].

CONCLUSIONS

The scoping review answered our three research questions. Otolaryngologists can use vHIT in their daily practice. It is an objective and efficient way to assess the vestibulo-ocular reflex, covering all six semicircular canals at high frequencies that the caloric test cannot match. vHIT also detects hidden eye movements that help diagnose vestibular problems that are not immediately apparent. This makes it useful for a broad range of patients, from children to the elderly and those with combat injuries.

Nosological forms with the highest diagnostic value for vHIT: The method demonstrates the clearest and most reproducible results in acute unilateral vestibulopathy, Meniere's disease, bilateral vestibulopathy and ototoxicity, vestibular schwannoma, and vestibulopathy resulting from blast trauma.

vHIT can be recommended as an objective instrumental test in standardized diagnostic algorithms for vestibular disorders in otorhinolaryngological and neurological practice. The implementation of this method in combination with other instrumental and subjective methods will improve the accuracy of differential diagnosis, ensure objective monitoring of the effectiveness of therapy and rehabilitation, and contribute to the standardization of vestibular practice in Ukraine.

REFERENCES

1. van Stiphout L, Szmulewicz DJ, Guinand N et al. Bilateral vestibulopathy: a clinical update and proposed diagnostic algorithm. Front Neurol. 2023;14:1308485. doi: 10.3389/fneur.2023.1308485. DOI
2. Halmagyi GM, Chen L, MacDougall HG, Weber KP, McGarvie LA, Curthoys IS. The video head impulse test. Front Neurol. 2017;8:258. doi: 10.3389/fneur.2017.00258. DOI
3. Akin FW, Murnane OD, Hall CD et al. Vestibular and balance function in veterans with chronic dizziness associated with mild traumatic brain injury and blast exposure. Front Neurol. 2022;13:930389. doi: 10.3389/fneur.2022.930389. DOI
4. Kitazawa M, Morita Y, Yagi C et al. Test batteries and the diagnostic algorithm for chronic vestibular syndromes. Front Neurol. 2021;12:768718. doi: 10.3389/fneur.2021.768718. DOI
5. Inventis. Expert's Echo – SYNAPSYS vHIT system. Technical specifications and clinical applications. https://www.inventis.it/world/Expert-s-Echo [Accessed 12 March 2026]
6. Dieieva YV, Dovhych SV. Kulturna adaptatsiia ta validatsiia ukrainskoi versii ankety otsinky vyrazhenosti symptomiv zapamorochennia (holovokruzhinnia) – Vertigo Symptom Scale. [Cultural adaptation and validation of the Ukrainian version of the Vertigo Symptom Scale]. ScienceRise: Medical Science. 2024;4(61):20–28. doi: 10.15587/2519-4798.2024.324728. (Ukrainian) DOI
7. Tarnutzer AA, Seo T, Fujimoto C et al. Front Neurol. 2023;14:1244367. doi: 10.3389/fneur.2023.1244367. DOI
8. Tricco AC, Lillie E, Zarin W et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Ann Intern Med. 2018;169(7):467–473. doi: 10.7326/M18-0850. DOI
9. Janky KL, Patterson JN, Vandervelde C. Goggle Versus Remote-Camera Video Head Impulse Test Device Comparison. Ear Hear. 2024. doi: 10.1097/AUD.0000000000001547. DOI
10. Bárány Society. ICVD. Classification of vestibular disorders. https://www.thebaranysociety.org/icvd [Accessed 15 March 2026]
11. Staab JP, Eckhardt-Henn A, Horii A et al. Diagnostic criteria for persistent postural-perceptual dizziness (PPPD): consensus document of the committee for the classification of vestibular disorders of the Bárány Society. J Vestib Res. 2017;27(4):191-208. doi: 10.3233/VES-170622. DOI
12. Figshare. vHIT Normal Study data. 2019. https://figshare.com/articles/dataset/vHIT_Normal_Study_data/8247104 [Accessed 10 March 2026]
13. Kattah JC, Talkad AV, Wang DZ et al. HINTS to diagnose stroke in the acute vestibular syndrome: three-step bedside oculomotor examination more sensitive than early MRI diffusion-weighted imaging. Stroke. 2009;40(11):3504-10. doi: 10.1161/STROKEAHA.109.551234. DOI
14. Arshad Q, Cousins S, Golding JF, Bronstein AM. Factors influencing clinical outcome in vestibular neuritis - a focussed review and reanalysis of prospective data. J Neurol Sci. 2023;446:120579. doi: 10.1016/j.jns.2023.120579. DOI

15. Nilsen KS, Nordahl SHG, Berge JE et al. Vestibular tests related to tumor volume in 137 patients with small to medium-sized vestibular schwannoma. Otolaryngol Head Neck Surg. 2023;169(5):1268-1275. doi: 10.1002/ohn.399. DOI
16. Sarna B, Abouzari M, Merna C et al. Perilymphatic fistula: a review of classification, etiology, diagnosis, and treatment. Front Neurol. 2020;11:1046. doi: 10.3389/fneur.2020.01046. DOI
17. MacDougall HG, Weber KP, McGarvie LA et al. The video head impulse test (vHIT) detects vertical semicircular canal dysfunction. PLoS One. 2013;8(4):e61488. doi: 10.1371/journal.pone.0061488. DOI
18. Strupp M, Kim JS, Murofushi T et al. Bilateral vestibulopathy: Diagnostic criteria Consensus document of the Classification Committee of the Bárány Society for Neuro-Otology. J Vestib Res. 2017;27(4):177–189. doi: 10.3233/VES-170619. DOI
19. Seemungal B, Agrawal Y, Bronstein A et al. The Bárány Society position on "Cervical Dizziness". J Vestib Res. 2022;32(4):249–279. doi: 10.3233/VES-220202. DOI
20. Comacchio F, Mion M, Armato E, Castellucci A. Sequential Vestibular Neuritis: Report of Four Cases and Literature Review. J Audiol Otol. 2021;25(2):89–97. doi: 10.7874/jao.2020.00360. DOI
21. Guinand N, Boselie F, Guyot JP, Kingma H. Quality of life of patients with bilateral vestibulopathy. Ann Otol Rhinol Laryngol. 2012;121(7):471–477. doi: 10.1177/000348941212100708. DOI
22. Newman-Toker DE, Kerber KA, Hsieh YH et al. HINTS outperforms ABCD2 to screen for stroke in acute continuous vertigo and dizziness. Acad Emerg Med. 2013;20(10):986–996. doi: 10.1111/acem.12223. DOI
23. Strupp M, Mandalà M, López-Escámez JA et al. Peripheral vestibular disorders: an update. Curr Opin Neurol. 2019;32(1):165–173. doi: 10.1097/WCO.0000000000000649. DOI
24. Scripnikov A, Khomenko O, Napryeyenko O. Effects of Ginkgo biloba extract EGb 761 on neuropsychiatric symptoms of dementia: findings from a randomised controlled trial. Wien Med Wochenschr. 2007;157(13–14):295–300. doi: 10.1007/s10354-007-0427-5. DOI
25. Bielka K, Kuchyn I, Horoshko V et al. Psoas compartment block efficacy and safety for perioperative analgesia in the elderly with proximal femur fractures: a randomized controlled study. BMC Anesthesiol. 2021;21(1):252. doi: 10.1186/s12871-021-01473-9. DOI
26. Cousins S, Kaski D, Cutfield N et al. Predictors of clinical recovery from vestibular neuritis: a prospective study. Ann Clin Transl Neurol. 2017;4(5):340–346. doi: 10.1002/acn3.386. DOI

CONFLICT OF INTEREST
The Authors declare no conflict of interest

CORRESPONDING AUTHOR
Roman R. Romanenko
Bogomolets National Medical University
9 Volodymyr Vynnychenko St., 04053 Kyiv, Ukraine
e-mail: findromanenko@gmail.com

ORCID AND CONTRIBUTIONSHIP
Oleksandr M. Naumenko: 0000-0002-9001-7580 A E F
Roman R. Romanenko: 0009-0008-3101-3011 B D

A – Work concept and design, B – Data collection and analysis, C – Responsibility for statistical analysis, D – Writing the article, E – Critical review, F – Final approval of the article

RECEIVED: 07.02.2026
ACCEPTED: 28.05.2026