

ICS Impulse

Greater precision...

...faster diagnosis



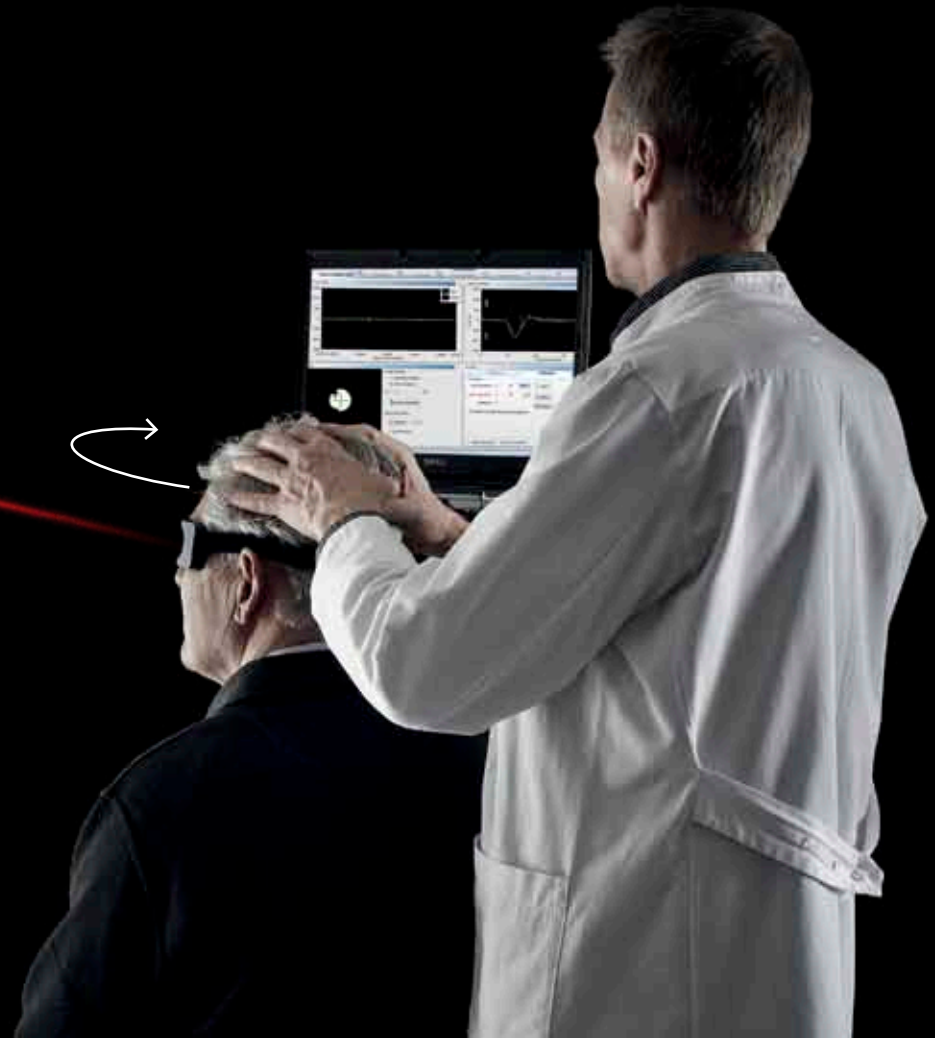
 **otometrics**  
MADSEN · AURICAL · ICS

The head impulse test (HIT) provides quick, clear-cut ear specific assessment of the vestibulo-ocular reflex response to stimuli in the high-frequency range, the natural range of head movements. ICS Impulse from Otometrics is the world's first HIT device to combine gold-standard accuracy with unrivaled patient comfort, enabling you to perform head impulse testing with inarguable results. Fast, simple and precise, ICS Impulse is recommended as the first step in analysis, helping to improve your workflow and spend more time on patient care.

ICS Impulse: **Bringing diagnostic accuracy and efficiency into balance testing**



BALANCE





Balancing accuracy...

...and greater efficacy



**BALANCE**

### **ICS Impulse: A Powerful New Gold Standard in Vestibulo-ocular Reflex Assessment**

More than two decades ago industry pioneers Drs. Michael Halmagyi and Ian Curthoys first described the head impulse test, and the industry has been trying to implement their findings ever since. Now, after almost 20 years of research, Otometrics has emerged with the new gold standard, ICS Impulse: an objective measurement of both head and eye movement using a fast and precise system to assess the gain of the vestibulo-ocular reflex. With unrivaled accuracy and efficacy, the ICS Impulse will forever change the way you work.

#### **Stimuli replicating the patient's everyday situations**

ICS Impulse provides precise, accurate data based on real-life stimuli. The high-frequency stimuli used in HIT is similar to that used in daily activity that occurs when crossing the street, sitting in a restaurant or quickly turning to a sound.

#### **Unsurpassed diagnostic precision in less than 10 minutes**

In addition to providing an accurate, objective measure of the vestibulo-ocular reflex, the ICS Impulse allows clinicians to test patients with spontaneous nystagmus. Both overt and covert saccades can be detected allowing for proper diagnosis and rehabilitation

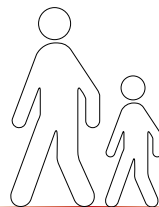
recommendations. The vestibular function of both ears can be assessed and documented in less than 10 minutes from patient entry to reporting.

#### **Improved Patient Care**

Patient comfort is greatly enhanced by the lightest goggles in the industry. Due to the sophisticated cameras smaller velocity head impulses of only 15 to 20 degrees are used, making the test more pleasant for the patient. Direct comparison to the gold standard "scleral coils" has authenticated the ICS Impulse. ICS Impulse detects more abnormalities than visual observation and reduces false negatives. And because results are known immediately, treatment can begin much sooner.

#### **Built on the work of Drs. Halmagyi and Curthoys**

HIT thought leaders Drs. Michael Halmagyi and Ian Curthoys have collaborated with Otometrics to bring to market an assessment tool that optimises their groundbreaking work. It is the first HIT testing device to meet their standards.



The ICS Impulse makes it possible to test children, bed-ridden patients, or anyone for which caloric testing is not an option.

#### **What is Head Impulse Testing?**

- An ear-specific test that detects disorders of the vestibulo-ocular reflex and identifies which ear is affected in cases of peripheral vestibular loss. Patients with a vestibular loss will exhibit a corrective saccadic eye movement (a "catch-up" saccade) either during or after the head impulse and the gain of the head in comparison to the eye will not be equivalent.
- An assessment tool that provides quick, precise information about the vestibulo-ocular reflex to stimuli in the high-frequency range.
- First identified and described by Halmagyi and Curthoys in the 1988 article, "A Clinical Sign of Canal Paresis." Said Halmagyi: "The eyes are the speedometers of the semicircular canals."

▶ Watch videos of clinical applications of HIT and of Dr. Halmagyi's classroom lectures on [www.headimpulse.com/knowledge-center](http://www.headimpulse.com/knowledge-center)



Connecting new ideas...



...to your workflow





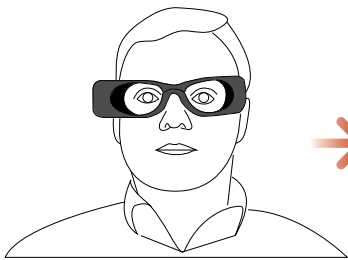
**The unique attributes of ICS Impulse bring a new flexibility to how and where you work**

**Simple, worry-free operation**

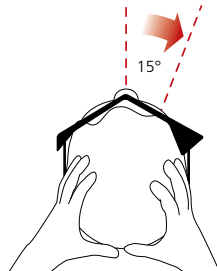
ICS Impulse increases test quality by displaying head velocities which assists in the performance of unpredictable head impulses. Training curves provide a guide to assist you in performing quality head impulses of varying velocities. The only hardware needed is the ICS Impulse goggle and the USB/firewire data transmission box, which allows for a portable system that can be used in any location.

**Superior Pupil Detection and Fast, Simple Calibration**


Superior Pupil detection provides error free data. Calibration can be performed anywhere using Impulse goggles with built-in lasers. All you need is a small surface on which to project the laser dots. In seconds, you are ready to test.



The goggle has been designed for quick and easy placement. At a mere 60 grams there is virtually no slippage. Calibration is quick and easy, using two lasers that are incorporated into the goggle itself, eliminating the need for any additional hardware.



A 15° angle is all that is required. Move the head quickly to the right or left and stop. After a short break return the head to the center, and repeat using varying velocities and unpredictable head impulses.

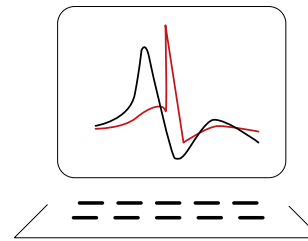
 Watch the ICS Impulse training videos at [www.icsimpulse.com](http://www.icsimpulse.com)

**Easier analysis and normative data**

View analysis in 2D or 3D. Both display a gain graph with built-in published normative data. A clear 3-D picture facilitates easy identification of saccades. A powerful, dedicated database stores the patient's current status and charts progress by comparing results from multiple test sessions. Comparison of test sessions allows for validation of vestibular rehabilitation success.

**Extensive reporting and Data Sharing**


With documentation taking away an increasing amount of time from patient care, Otometrics designed the ICS Impulse with a customised report function to meet documentation requirements. Third-party data-sharing interfaces directly with third-party EMR systems. ASCII export is also available.

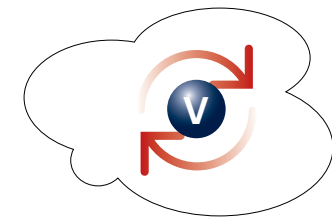


Visuals in the software provide immediate feedback on the quality of the head impulse.

**How does ICS Impulse fit into your workflow?**

- It's the first step towards diagnosis and subsequently early treatment. Since the head impulse test is quick and won't produce an adverse patient reaction it's recommended that the test be performed at the beginning of the assessment workflow. This enables a quick assessment of the vestibulo-ocular reflex.

 For a comprehensive, informative whitepaper on the clinical application of video head impulse testing, go to [www.headimpulse.com/knowledge-center](http://www.headimpulse.com/knowledge-center)



Our proprietary OTOsuite™ Vestibular software captures, consolidates, and saves patient measurement data, allowing comparisons of multiple sessions through the use of progress graphs and data. The software also offers multiple reporting facilities and integration with third-party systems.



Cutting-edge technology...

...tested and documented



### Years of research bring validity to ICS Impulse

#### More than two decades of testing

ICS Impulse is the first and only HIT system to be approved by Drs. Michael Halmagyi and Ian Curthoys, whose groundbreaking work first brought HIT to the attention of the world in 1988. Having developed both the prototype and the algorithms, Drs. Halmagyi and Curthoys were highly qualified to test and evaluate Otometrics' ICS Impulse. Their consensus was that it did indeed optimise their findings, providing thorough, precise results and excellent documentation.

### Lightweight goggle brings significant benefits

ICS has developed the lightest video goggle in the industry, a fact that belies their strength. At 60 grams, the goggle virtually eliminates any possibility of slippage. A high-speed camera (250 Hz) facilitates the identification of covert and overt saccades. The goggle is designed to guarantee accurate data collection while ensuring the patient's comfort, which in turn makes the process easier for the tester.

### OTOSuite™ Vestibular software

- The OTOSuite™ Vestibular software optimises workflow by capturing, automatically saving and displaying analysis, and sharing patient measurement data. It provides analyses (2-D and 3-D) with published normative data.
- Multiple test sessions can be compared using progress graph and progress data.
- Real time trace allows the clinician to monitor the patient's eye movement during head impulse testing.
- Record the eye movement at any time using the Video Record mode. Recorded eye movement can be played back in slow motion.



More about OTOSuite™ Vestibular  
[www.icsimpulse.com/downloads](http://www.icsimpulse.com/downloads)



**1 High-speed camera (250 Hz)** The superior camera provides the best available technology for measuring fast eye movements. This provides the ability to record the eye while providing high-frequency head movements. Both covert and overt saccades can be identified.

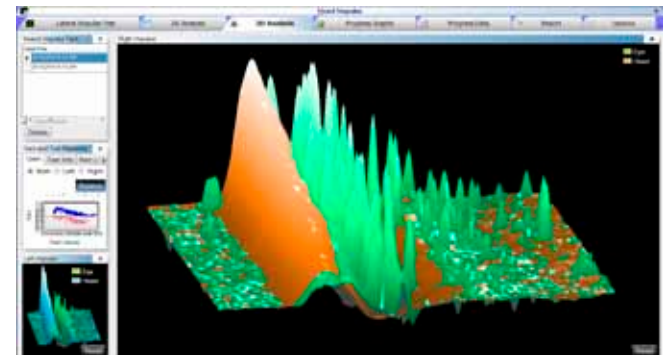
**2 Built-in gyroscopes** Dual-axis gyroscopes measure the head movement accurately allowing for direct comparison in head and eye velocities. They also provide instant feedback on the quality of the head impulse manoeuvre.

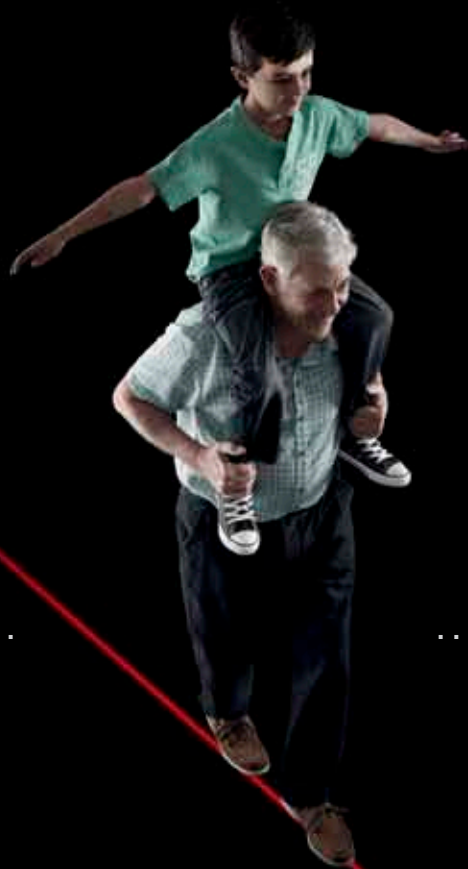
**3 No slippage** Weighing 60 grams the goggle ensures no slippage and therefore providing accurate data collection without missing any important eye movements.

**4 Built-in calibration laser** With a built-in calibration laser, the test can be performed anywhere there's a wall for calibration. There's no need for additional hardware.

**5 USB/Firewire data transmission** The USB/Firewire interface box allows fast, accurate data transfer to the computer.

Otosuite Vestibular provides 3D analysis allowing you to rotate the data 360 degrees making viewing of saccadic eye movement simple. Published normative data in the gain graph makes determining if results are abnormal quick and easy.





Correct diagnosis...

...increased patient satisfaction



**BALANCE**

**Meet us online to learn more about the features and benefits of Otometrics' ICS Impulse and head impulse testing.**

#### **Questions, comments, conversation**

Join the conversation about ICS Impulse and head impulse testing. Ask questions, get answers from colleagues and balance experts or share your experiences and opinions.

#### **More about ICS Impulse**

[www.icsimpulse.com](http://www.icsimpulse.com) opens up a wealth of information and resources to enhance your knowledge about ICS Impulse and HIT. A library of educational material offers white papers, articles by experts and e-learning options that include instructions on how to perform head impulse testing. Visit our blog and dialogue with the people behind the ICS Impulse and other balance experts.



 [www.icsimpulse.com](http://www.icsimpulse.com)

#### **More about head impulse testing**

At [www.headimpulse.com](http://www.headimpulse.com) you can explore both the science and practical application of head impulse testing. The library houses research material, including videos of Dr. Halmagyi's classroom lectures and examples of HIT test results. Access a list of upcoming events to see the experts of HIT live. You can learn more about how head impulse testing works and why it has made such a difference in the industry.



 [www.headimpulse.com](http://www.headimpulse.com)

#### **Features and Benefits**

##### **High speed camera (250 Hz)**

- Ultra-sensitive, requiring head turns of just 15°
- Records fast eye movements that allow for identification of overt and covert saccades
- Test takes less than 10 minutes from patient entry to reporting

##### **Built-in gyroscopes**

- Ensure accurate head velocity measurement
- Provide instant feedback on proper head impulse manoeuvre
- Compare head and eye movement to assess VOR gain

##### **Built-in calibration lasers**

- Calibration is quick and easy, using two lasers incorporated into the goggle itself
- No need for additional hardware
- Test can be performed anywhere


##### **Built-in head impulse algorithms**

- Developed by HIT pioneers Drs. Michael Halmagyi and Ian Curthoys
- Inaccurate head impulse data is automatically discarded
- Only accurate data is analysed

##### **Plug-and-go solution**

- Small and compact for ultimate portability
- Easy and efficient for bedside testing
- Enables accurate testing of immobile patients

##### **Video recording**

-  Read the flyer about enhanced documentation of abnormalities

[www.icsimpulse.com/downloads](http://www.icsimpulse.com/downloads)

-  See all the benefits of ICS Impulse online at [www.icsimpulse.com](http://www.icsimpulse.com)

# ICS Impulse

Bringing diagnostic accuracy and efficiency into balance testing

## ICS - the leader in vestibular testing

ICS is a leading global provider of diagnostic devices for balance disorders. Founded in 1981, the company has a history of developing ground-breaking products that provide pinpoint accuracy for balance testing. ICS is an expert brand of GN Otometrics.



**BALANCE**

Meet us online to learn more about our thinking, ideas, solutions and the way in which we support you in your endeavours. We're always ready for and welcome a dialogue.

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