

A NEW Addition to I-Portal®

crHIT

What is it?

The I-Portal® crHIT (computer-controlled rotational Head Impulse Test) is a whole-body impulse test that objectively and repeatedly assesses horizontal semicircular canal function and the vestibular ocular reflex (VOR).

The test profile ramps the whole body up to a peak velocity then ramps down gradually for 12 pseudo-random left and right impulses and takes approximately two minutes to run.¹ The short, 1,000 degree per second² acceleration impulse has been well-tolerated by the many patients tested.

Such acceleration requires a motor that has the power and control to deliver a smooth, “S” curve profile with a 750 to 1,000 deg/sec² whole-body rotational impulse. Only Neuro Kinetics has a patented rotational motor that has the power to execute the crHIT profile.

Neuro Kinetics, with support from the National Institutes of Health, collaborated with Dr. Joseph Furman at the University of Pittsburgh, to design and develop this new test. In a limited study, the results suggest that crHIT is more sensitive, and with a repeatable and measurable stimulus profile.

crHIT – Clinical Advantage:

- Objective and repeatable.
- FDA cleared.
- Whole-body stimulus - rotating from center to lateral of 35+ degrees (measurable range of approx. 20 degrees) capturing from 10 to 20 data points at 100 Hz (subject dependent).
- Aids in the identification of peripheral loss of horizontal semicircular canal function.
- Does not require a highly trained clinical examiner.
- Results do not vary due to examiner technique.
- Comfortable and well-tolerated – “S” curve motion profile at 1,000 deg/sec² peak acceleration with a gentle deceleration versus 3000+ deg/sec² manual jerk of the head.
- Test time – a couple minutes!

I-Portal Test Battery:

The crHIT is the only whole-body rotational impulse test cleared by the United States FDA and is another addition to Neuro Kinetics’ expansive clinical test battery. Neuro Kinetics is not aware of another commercial system with a more comprehensive test battery.

There is no other way to learn as much more about your patients in less time than by running a comprehensive oculomotor and vestibular test battery using high quality I-Portal® data.

Reimbursement:

- Consult your reimbursement specialist

¹ These are default settings; the test can include up to 20 impulses and run at 750 deg/sec²; 1000 deg/sec² is recommended.

Relevant Research Articles/Books:

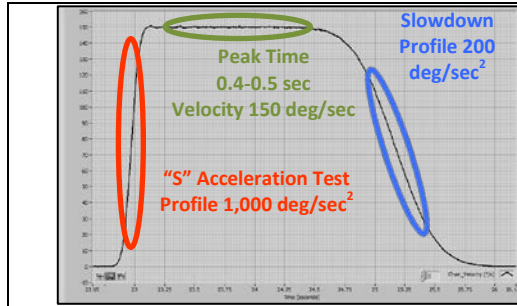
- Furman J, Roxberg J, Shirey I, Kiderman A, The computerized rotation head impulse test (crHIT), Journal of vestibular research, Volume 24, Numbers 2,3, 2014, Specials issue, Abstracts from XXXVIII Barany society meeting, Buenos Aires, Argentina, May 25-28, 2014
- Furman, Joseph M., Martini, Alessandro, and Stephens, Dafydd, Textbook of Audiological Medicine: Clinical Aspects of Hearing and Balance, 2003.
- Halmagyi, G., and Curthoys I., A Clinical Sign of Canal Paresis, 1988, Arch Neurol; 45; 737-9.
- Wuyts, F., Principle of the Head Impulse (Thrust) Test or Halmagyi Head Thrust Test (HHTT), 2008, B-ENT, 4, Suppl. 8, 23-25.
- Newman-Toker, D., Neuro-vestibular Examination; The Johns Hopkins University School of Medicine, Baltimore, MD.

Patient Weight Acceleration Profile:

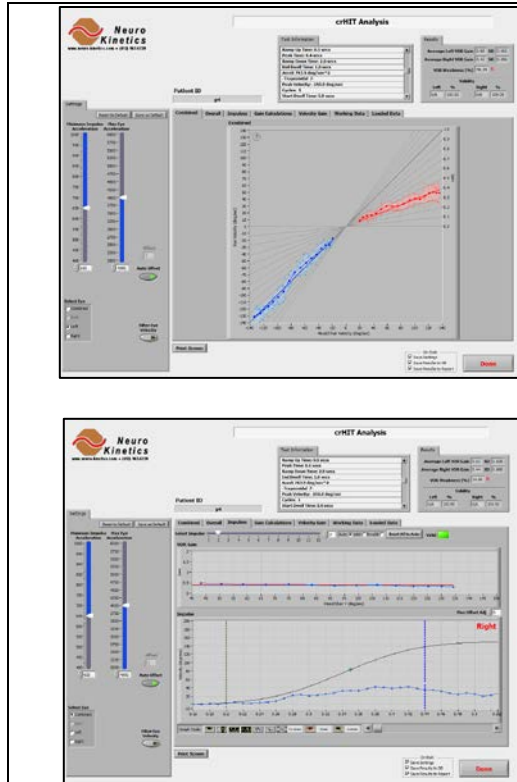
The table below depicts the actual acceleration stimulus for I-Portal NOTC-S, -P and -C systems at a given patient weight.

Patient Weight Lbs.	I-Portal® NOTC -S&-P Small Motor Deg/sec ²	I-Portal® NOTC-C Large Motor Deg/sec ²
100	1,000	1,000
125		
150		
175		
200		
225		
250		
275		
300		
325		
350	544	
375	508	937
400	475	877

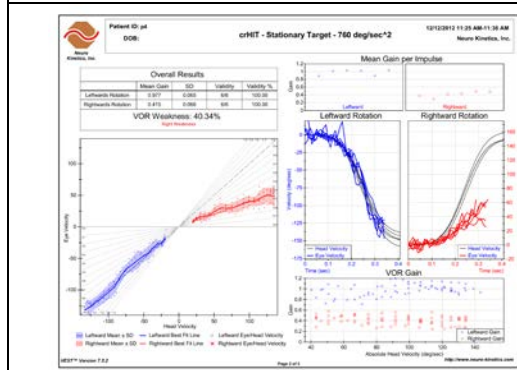
The default protocol is set for 1,000 deg/sec² acceleration. For heavier patients, actual deg/sec² acceleration, per chart above, will be matched up with patient response during analysis.



- Pictured at left – Impulse Profile from crHIT test.
- Computer-controlled rotation delivers consistent whole body (head) impulse.
 - Short 1,000 deg / sec² impulses have been well tolerated by numerous test subjects.
 - “S” curve profile designed to minimize artifacts and maximize patient comfort.



- Pictured at left – sample crHIT analysis in VEST™.
- Compares eye velocity to head (chair) velocity.
 - The analysis algorithms average data from the multiple (12) pseudo-random cycles to generate a clinically reliable set of measurements for the clinician to easily evaluate horizontal semicircular canal functionality.
 - Results are both objective and repeatable due to computer controlled impulses.
 - Whole-body rotation avoids the discomfort associated with the manual Head Impulse Test.



Pictured at left – crHIT Report
 This comprehensive report provides efficient visualization of the results, facilitating a quick assessment of VOR function.

For more information on the Controlled Rotation Head Impulse Test (crHIT) and NKI's I-Portal platforms, please contact:

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