

Quick Guide

Vestibular diagnosis and treatment

Using EyeSeeCam vHIT to perform Suppression Head IMPulse test (SHIMP test)

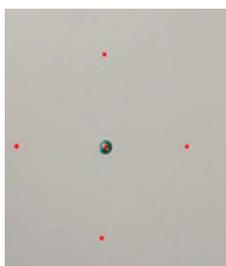
What is SHIMP

SHIMP stands for **S**uppression **H**ead **IMP**ulse test. It is used together with conventional Video Head Impulse Test (vHIT), also now referred to as the **HIMP** or Head **IMP**ulse test. Used along with vHIT, it allows the clinician to determine the extent of vestibular function. In this quick guide we will use the abbreviations vHIT and SHIMP with the understanding that in the literature vHIT is now sometimes referred to as HIMP.

How is the test performed?

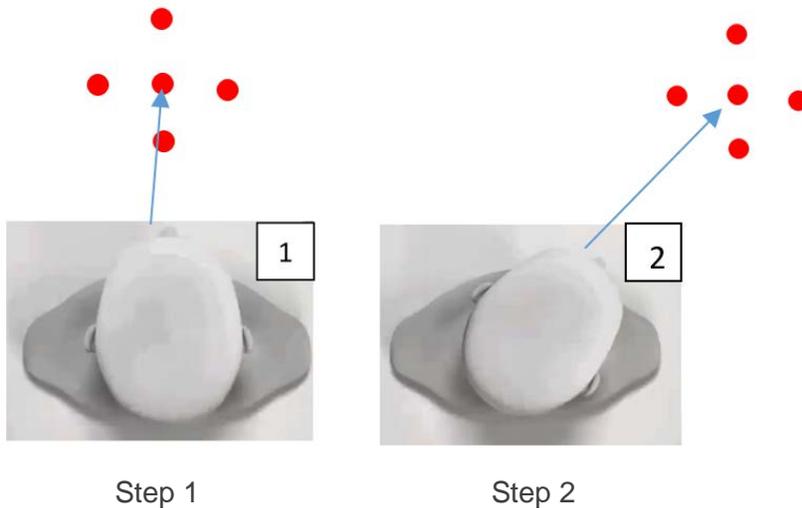
For SHIMP, the goggle is placed on the patient's head in exactly the same way as it is positioned for vHIT. The eye should be centered in the viewing area to ensure that any reflections are beneath the pupil. After adjusting the goggle, centering the laser fixed dots on the wall, and calibrating the head and eye movements, you are ready to perform the SHIMP test. Be sure the "display laser during HIT" in the settings tab is set to always on.

SHIMPs are performed on the lateral canal by turning the head at least 7 times at high velocities to both the left and right sides. The patient should be instructed to fixate on the center dot generated by the head-fixed laser projected on the wall. The laser dot pattern is the same 5-dot pattern that is used for the calibration process (see the EyeSeeCam manual for details). The appearance of five dots instead of one is not a problem; just ask the patient to focus on the center dot. If you have a wall-fixed target already for vHIT you can begin by aligning the center laser-fixed dot on the same wall-fixed target that you use for the traditional head impulse test.



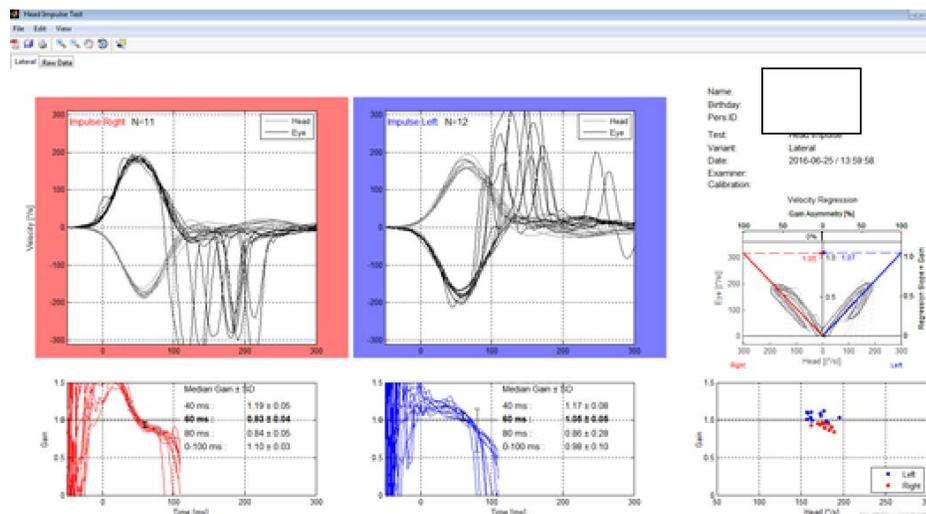
Starting Position using existing vHIT spot on the wall

1. The first step is to have the patient relax his neck, open his eyes wide and fixate on the center dot in the 5-dot pattern.
2. The second step is to turn the patient's head either to the right or the left. The 5-dot laser pattern will move with the head so the dots are now located in a new position.
3. The patient is instructed to keep his eyes on the center dot, so when the head moves the eyes should be focused on the newly positioned center dot.

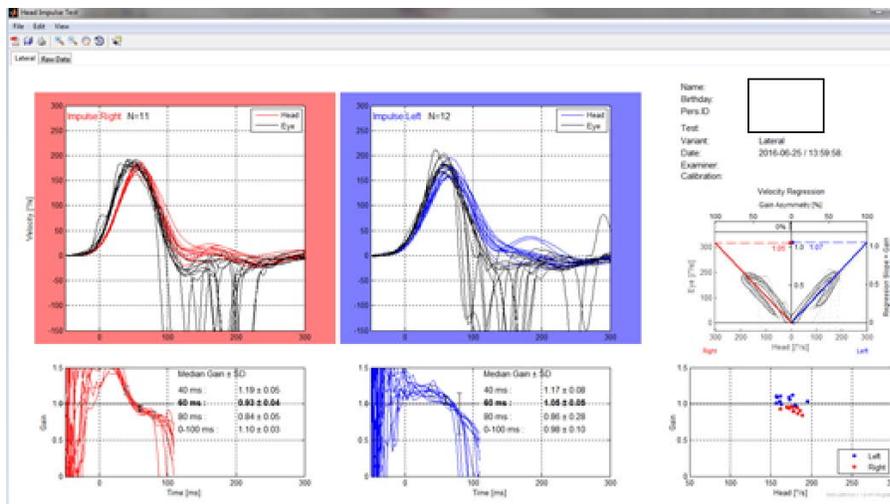


Results

The VOR gains should be similar in vHIT and SHIMP tests. However, the pattern of saccades generated is different. vHIT rarely generates catch-up saccades in healthy patients, while in SHIMP testing, healthy subjects will make a large saccade at the end of the head turn (see figure below). This is referred to as a “SHIMP saccade”. This pattern of result is exactly opposite for impaired patients. An impaired VOR system will lead to a catch-up saccade on the vHIT but no (or very few) SHIMP saccades.



This is an example of healthy subject's SHIMP results



This is the same patient with results in mirrored view.

When the VOR is impaired the eyes and the target move with the head during head impulses. Therefore, when the SHIMP test is performed on an impaired patient, the eyes always stay on the target, hence no need to make a catch-up saccade. On a healthy subject, when the head is turned (e.g., to the right) the VOR will drive the eyes in the opposite direction (e.g. to the left) and the patient will need to correct for the resulting offset in eye position by making a saccade back to the laser target, hence creating a SHIMP saccade. In an abnormal patient, e.g. someone with an acute unilateral vestibular neuritis, the patient will have no or very few SHIMP saccades for head turns toward the side of lesion.

Summary

Conventional Head Impulse Testing vHIT (or HIMP) is used clinically to identify a deficit in the VOR. When using an earth-fixed target, patients with vestibular losses cannot correct for the head movement so they lose fixation on the target, which results in the patient making a catch-up saccade to return to the target. A healthy person should not lose focus on the earth-fixed target because the VOR keeps the eyes on the target during the head movement. **For vHIT, a saccade indicates an impaired vestibular system.**

On the other hand, the SHIMP testing is used clinically to provide additional information regarding the VOR function. People with functioning vestibular systems must make a corrective saccade to follow a head-fixed target, while a person with a vestibular loss can follow the target without making a saccade because their eyes move with their head, hence they are always looking at the target. **For SHIMPS, a saccade indicates a functioning vestibular system.**

It is helpful to use both tests on each patient since they provide complementary results. For e.g. in cases where vHIT is hard to interpret alone (low gain) the SHIMP test can help in determining if the vestibular system is functioning. SHIMPs can also be used for corroborating the level of residual function to help realistic patient expectations before starting rehabilitation.