

Video Head Impulse Test (vHIT)

For the examination room · As of September 2026

Check first – contraindications

- Cervical spine trauma or acute disk herniation
- Fractured nasal bone, facial or head trauma
- Recent eye surgery
- Blindness · ptosis on the measured eye · very frequent blinking
- Heavy eye make-up · no injured skin

Patient and room

- Age 6 and older, physically fit enough. Remove glasses.
- **Fixation target** at eye level, about 1 m away
- **Chair** stable, without casters or headrest
- **Lighting** normal, no glare or reflections
- Ask the patient: **don't let go of the fixation target**, neck relaxed

Fitting the goggles

- Hair back, remove mascara
- Place centered and straight, cushion rests all the way around
- Head strap as firm as tolerable – slipping produces artifacts
- Sensor axis = axis of the impulse. Check the fit after every section.

Pre-test – before the test sequence bar

- **Eye monitor:** ROI on pupil and iris – not on eyelashes or the lid margin. Focus and brightness then adjust automatically.
- **Head monitor:** set the head zero position – with the head **level** (Reid's plane horizontal)

Pre-test

Lateral

LARP

RALP

Spontaneous

Lateral impulses

- 1 Stand behind the patient, hold the head **at the crown or the lower jaw** – not the head strap. Jaw grip: have the patient clench their teeth
- 2 Head **tilted about 20° forward** (lateral canals horizontal), gaze straight ahead, neck relaxed
- 3 **10–20°, 150–250 °/s, about 100 ms** – small, fast, passive
- 4 Vary direction and timing **at random**
- 5 Leave the head at rest at the end – no rebound; guide it slowly back

LARP and RALP

- 1 Turn the head **30–40°** to the side – right = LARP, left = RALP
- 2 Patient keeps looking **straight ahead**; the eyes stay eccentric
- 3 Move the head **vertically** up and down, not toward the nose
- 4 Downward = anterior, upward = posterior canal
- 5 **10–20°, 100–150 °/s** – as lateral, slightly slower; still random

Gain thresholds

Lateral semicircular canals	< 0.7	abnormal
Vertical semicircular canals	< 0.6	abnormal
Canal deficit	-	clearly below, with catch-up saccades
Bilateral vestibulopathy	< 0.6	bilaterally, horizontal

Thresholds depend on the device and are freely configurable on Merlin.
What matters is gain **and** saccade pattern.

Artifact spotted – what to do

Goggle slip biphasic deflection in the head trace	Retighten the head strap, set the zero position again, repeat
Blink / eyelashes apparent deceleration then acceleration, looks like a saccade	Have the patient blink before the impulse, then open the eyes wide; reset ROI and focus
Eyes centered instead of eccentric LARP/RALP only: gain ↓, no saccades	Fixation target straight ahead, turn only the head
Head not in the test plane head velocity too low, gain too high	Tilt about 20° forward for lateral, turn 30–40° for LARP/RALP; observe the head orientation range

Rule of thumb

A low gain **without** catch-up saccades is first of all a suspected **measurement error**. Check goggle fit, head alignment and gaze direction before saving and passing the measurement on.

How many impulses?

It is quality that counts, not quantity: according to Wenzel et al. (Mannheim 2019), **two** fast, artifact-free and reproducible impulses from an experienced examiner are sufficient. The number of circles in the impulse counter is configurable on Merlin.

After the measurement

- **Save data** writes to the database, order completed
- **Discard** discards; the order remains and can be repeated later
- **Cancel** discards; the order is cancelled for good

Clean between two patients – always.

According to the manufacturer's instructions. On Merlin: housing, cover, face cushion **ZB125.AR1** (Mikrozid universal wipes) · mirror **ZB115.AR1** (lens cleaning cloth)