

Clinicians ask Why vHIT?

Curthoys answers

Author

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First, consider in general terms about what you do;

You conduct tests in dizzy patients to find out which side is affected and which vestibular sense organ is affected (which canal or which otolithic sense organ). To do this you have a variety of tests, foremost is the caloric. This test is very slow and unpleasant and has issues.

Now consider your patients. They are becoming more and more demanding – more and more they will not tolerate tests which are unpleasant. They want fast objective answers, easily, quickly and from tests which are pleasant.

Now consider the future – there will be many more patients needing testing. But finances are already tight. i.e. you will have to test more patients and do it faster. Two or three hours to test one patient is a luxury.

Conclusion; There is thus an urgent need for test(s) which give objective answers quickly and accurately and which are acceptable to patients.

So why vHIT? To find out very quickly, objectively and acceptably which side is affected.

But don't calorics tell you the answer every time?
Of course not!!!

1. Calorics are highly variable. That variability is understandable since people have such variable heads.
2. Calorics depend heavily on alertness and other medications or drugs
3. Calorics are unpleasant
4. Some patients terminate the caloric test half way through so you can't discern what is wrong
5. Often you have to have the caloric test re-done because the data is strange or inconsistent or just unacceptable.
6. Because calorics are so time consuming they are becoming less financially viable. How much does it cost for you to get a proper answer from a caloric test for each patient.

What is the big cost in vestibular testing? Uncertainty! Is it really an abnormal response? Or is it just poor testing technique? With ENG, did the patient go to sleep at this point? So with calorics you have to call the patient back and re-test that patient with a test which they would have found offensive to begin with. (We know that some patients with vertigo problems resist even consulting a specialist at all because they do not want to have to go through what they find is a very offensive test – the caloric test.)

What is needed is a test of canal function which stimulates the semicircular canals in a way which is physiological – the way they are stimulated in everyday life – by rotation. vHIT is a test which can identify in a few minutes which is the affected side, but without the huge cost and safety issues and specialized facilities such as an enclosed dark room for a rotational chair. Up to now most rotational tests have been extremely expensive and difficult. They have used big expensive chairs, with low accelerations which put the patient to sleep. A sinusoidal test at 0.2Hz is not physiological. So the responses from many tests on rotational chairs are unacceptable and often it is not so clear which side is affected.

What is needed is a test using the natural stimulus, rotation, but using natural values of accelerations (which measures show are of the order of thousands of degree/second, not tens of degrees/second) which is quick, simple. vHIT does that.

vHIT uses small angle head turns done by hand which achieve those values so you don't need very expensive motorized rotators. It is very acceptable to patients. It gives answers immediately. It is essentially interactive – you do the testing yourself, with adding extra time to the consultation.

With vHIT:

The test is real time – the operator sees the data on the screen as they deliver each head turn; they see every single head turn. If a head turn stimulus is unsatisfactory (e.g. too slow) then the tester is warned and can present that stimulus again. If there is any uncertainty, any concern, you can just give more stimuli until you are 100% happy. That may take an extra minute or two! Not a great burden to you or the patient

The clinician is in complete control – you don't have to rely on anyone else to deliver the test or interpret the results. vHIT is simple. It gives you confidence in evaluating patients. If you should need to re-test a patient in a few days (e.g. a patient recovering from vestibular neuritis) they will not be frightened to have the test again.

vHIT has the big advantage that if it is given first – you will know the affected side before any of the other tests. Calorics can just confirm what vHIT has established. If the patient discontinues half way though caloric, you already have the answer.

Do vHIT and calorics ever disagree? Of course they do!!! One is testing the canals to the physiological stimulus, rotation. The other is testing canals using a very modest maintained unnatural thermal stimulus, which is very variable across heads.

- vHIT is portable – it can be used in the clinic or the Emergency Room
- It can be performed in a fully lit room
- No special chair or table is needed – the patient just sits in a normal chair
- It can be performed on very young children
- It can be performed even during acute attacks of vertigo. (e.g. in a Meniere's attack or an attack of vestibular neuritis).

Finally vHIT gives objective, accurate measures. It is based on nearly 20 years of research and publications in top-flight international refereed journals (e.g. Neurology).



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Ian Curthoys has been engaged in vestibular research in the laboratory and the clinic since 1968. In that time he has published some 200 papers in esteemed international journals on all aspects of vestibular function, eye movement disorders, and clinical tests of canal and otolith function. In 1988 Halmagyi and Curthoys published the article "A clinical sign of paresis" (Arch Neurol 1988;45:737-739) introducing the Head Impulse Test.

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