



Crossing the threshold

Professor David Henson has been a key researcher and developer of field assessment instrumentation for several decades now. Previous Henson units are commonplace in most high-street practices. Here they are widely used for suprathreshold screening of patients, often as part of a pre-screening process. Their speedy performance and ease of use makes them ideal as a screening tool, capable of being used reliably by trained auxiliary staff, and producing results that are easy to interpret and indicate whether further investigation is needed. The default suprathreshold strategy of running stimuli at 5dB above a measured threshold value offered enough specificity for it to be easy to pass if 'normal' and enough sensitivity to pick up most significant central loss.

However, reliability requires repeat assessment and there is little in the way of a reliability indication for the operator to interpret the usefulness of the patient response with these older machines. Furthermore, most practitioners (and this is certainly true of most pre-registration optometrists I have ever asked) were unaware of the full threshold strategies available on

Bill Harvey tries out the new Henson 8000 and finds much to commend it as a fast, repeatable, easy to use and versatile instrument for both screening for and investigating field loss

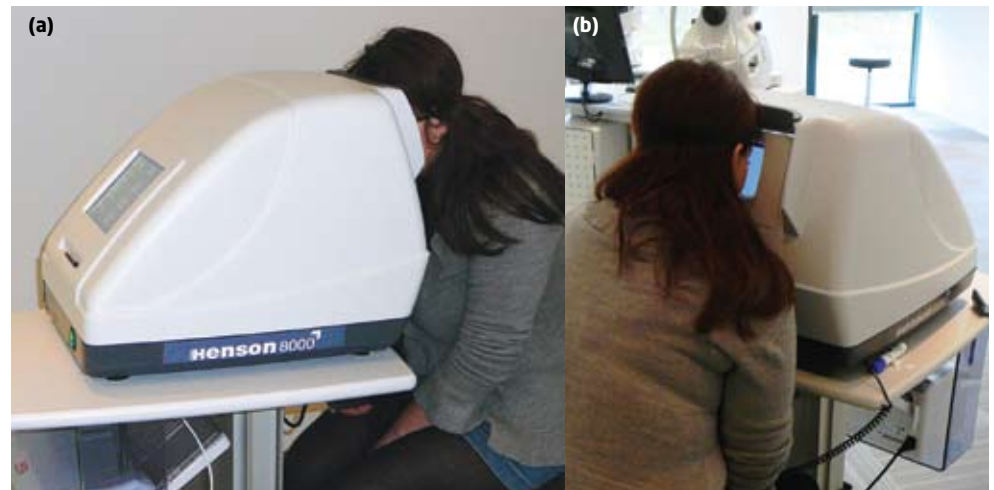


Figure 1 The Henson 8000 has a small footprint for a fields machine and is comfortable for the patient

the units. For any suspect patient, say one with a significant family history of glaucoma or one with suspicious looking discs, the increased sensitivity of a full threshold strategy is essential and indeed now a recommendation of the NICE guidelines as part of an investigative strategy. For those who did change the machine settings to use a full threshold strategy, the nature of the test and the data output were not widely accepted. Also background intensity and stimulus positioning differed from the instruments more likely to be used in hospitals. The introduction of faster full-threshold strategies, such as the SITA Fast on the Humphrey Visual Fields Analyzer (Humphrey VFA), allowed high sensitivity assessment of selected patients to be undertaken much quicker by adapted assessment of areas of field most likely to develop defects with glaucomatous neuropathy. Quicker testing improves specificity as anyone who has undertaken a 10-minute full threshold strategy will testify – normals get bored or distracted and fail longer tests. Furthermore, the data printout was very different to that of the Humphrey (which is widespread in hospitals) and therefore considered less useful by those looking to further investigate and manage the patient.

I recently was able to put the latest Henson instrument, the Henson 8000, through its paces and found that it successfully addresses these concerns.

Henson 8000

The first thing of note is the very sleek design, giving it a small footprint when compared with some other popular field screeners (Figure 1). This would not only mean it would be easy to incorporate into any existing pre-screening area but also might allow it to be easily moved between consulting rooms if necessary (it is 580mm wide, 460mm deep and 430mm high, weighing in at just 14.5kg). My patient found positioning comfortable and I was glad to see no chin rest with which to shackle the patient. I prefer this on instruments and have found that it is easier for even the least flexible to adopt a position whereby they can fix upon the central target comfortably with appropriate moving of the table and themselves.

The home screen offers a useful choice of programs (Figure 2). It clearly operates on Windows XP which does make data printing or transfer easy (it boasts three USB ports). It also includes integral wi-fi connectivity if required. There is still space for suprathreshold testing



FUTURE PLANS

Optician has linked up with the new Johnson & Johnson Vision Care Institute for future instrument trials. The 'Consulting Room of the Future' makes an ideal setting for some of our instrument trials and there are plans to try out several new instruments there in the coming months.

● Find out more about the Institute and its courses by visiting www.thevisioncareinstitute.co.uk



(either with single or multiple stimuli) which might be the default if a 'pre-screener' was operating the machine in a general walk-in high street clinic. My preference is always for a full threshold strategy but I gave the single stimulus option a try first. Program choice and then patient data input (the inclusion of normative data requires input of date of birth and there is one ethnicity option) is via the touch screen. This is quite small, a necessity given the compact size of the unit, and with my chunky fingers I made several errors until I noticed the small 'DS-like' stylus for the screen. This made operation very easy indeed.

Fast results

The suprathreshold test of the patient's left eye at the default locations took around two minutes. It is possible to manually add test locations if required. The printout from the test is shown in Figure 3. The familiar slide scale indicating normal from defect is there along with threshold values and, were any points missed, indication of their seen value at 5, 8 and then 12dB above threshold. All familiar to Henson users I am sure.

I am a fan of the SITA programs on the Humphrey VFA. The ability to offer an adapted full threshold program that is quicker (by the incorporation of response values in areas seen that are glaucoma sensitive in the selection of subsequent stimulus points) make this sensitive enough for a useful glaucoma assessment, while quick enough for even the most distracted or frail patient to perform comfortably (better specificity). The new Henson includes the ZATA Fast and ZATA Standard tests (Zippy Adaptive Threshold Testing). As Henson himself explained in a recent issue (*Optician* 03.12.10) this works on the same principles as SITA but with two further modifications. Firstly it will adapt a test by incorporating previous data for the patient from the hard drive. This may help speed up the process by, for example, avoiding unnecessary testing of a known absolute scotoma previously recorded. Secondly, previously measured threshold values may allow for a speedier threshold establishment where a patient may have variations across their field that would need extra time to re-establish. More time is given to higher threshold areas where change is more critical to record.

Fixation can be monitored throughout by use of a video camera which may be viewed as an inset on



Figure 2 The home screen

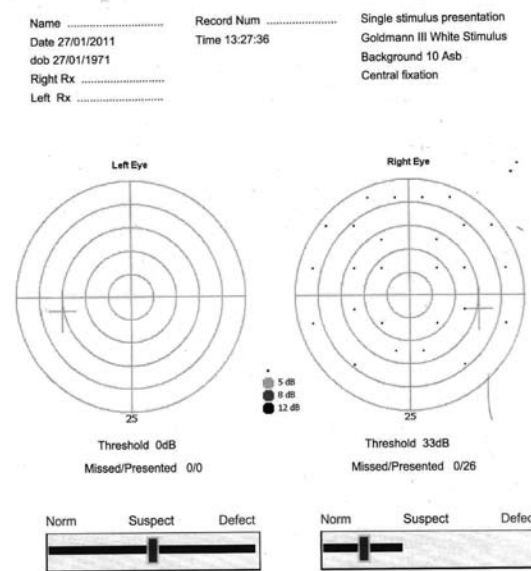


Figure 3 Suprathreshold test printout

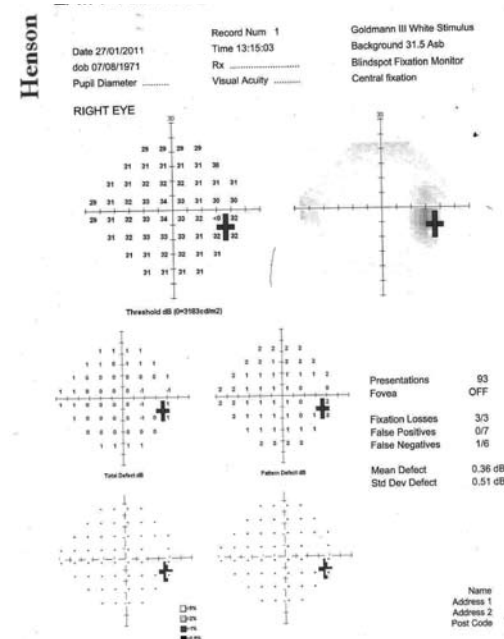


Figure 4 The printout is familiar to anyone with experience of the Humphrey VFA

the data screen. The instrument also employs a Heijl-Krakau technique by firing stimuli at the established blind spot to ensure fixation is steady and recording errors on screen. The single fixation point may be expanded to a four-point presentation if the patient has poor central acuity.

The ZATA fast assessment of my albeit healthy patient took around four minutes and was reported as easy to perform. The patient preferred me to remove the 'beep' sound that may be linked to stimulus presentation. The printout (Figure 4) is familiar to anyone using the Humphrey VFA and, importantly, would be easily interpreted by any hospital to which you might be referring on the patient.

Data

Reliability indices are present with a record of fixation loss, and false positives and negatives. The threshold data plot showed a spread of 29-34dB for my corrected 39-year-old patient and a total defect plot is able to reflect whether the field profile is comparable to an age-matched norm, while the pattern defect plot shows whether there is significant variation within the field. Any recorded variation from the normal is hatched to represent the probability value of the recorded response. Numeric values are recorded for both the mean defect and pattern standard deviation defect. All this should be familiar to readers with Humphrey machines. I like the fact that a patient with lens opacities and early glaucomatous scotomata would show as a total defect across the plot but a pattern defect of an arcuate nature. This is how these machines are able to offer information about more than one problem with the field.

Verdict

On ease of use (by patient and practitioner), speed of use, size and weight, data interpretation and transfer, and ease of comparison with the current 'gold standard' instrument, the Henson 8000 meets all requirements. At around £6,000 per unit it is an attractive proposition. I was impressed and would happily recommend it for any practitioner looking to buy a new instrument. Full threshold strategies are the future and I would argue we should not be using a suprathreshold program on many patients we see. ●

● Thanks to Topcon for loan of the instrument. For further information please contact 01635 551120.