



## On the rebound

Bill Harvey tries out the latest in rebound tonometers

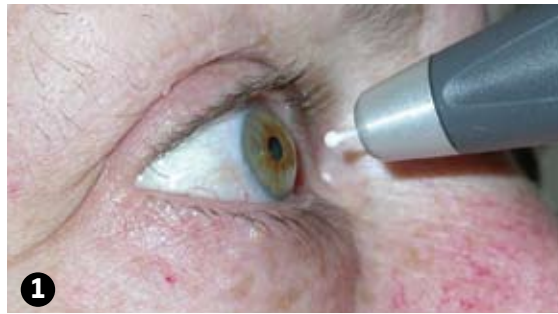
**T**he iCare tonometer has been around for some years now and has established itself as a useful, portable handheld tonometer capable of repeatable readings comparable to those taken with contact applanation tonometers within the standard range of intraocular pressures (IOPs). I would always back up any unusual reading with a contact tonometer, but have been more than happy to rely on the iCare for domiciliary work in recent years. The significant advantages of ease of use and there being no need for anaesthetic combine to make this a useful instrument. Indeed, in a clinic of patients with learning difficulties earlier this year, the iCare was the only way I could achieve a reading at all on a patient with autism.

Several papers have highlighted the usefulness of the instrument for home monitoring of paediatric patients by trained non-professionals.<sup>1,2,3</sup> A comparison of rebound tonometry with Goldmann in 2008 suggested that the two compared well when used by both experienced and inexperienced hands and 'its degree of accuracy in inexperienced hands would make it a useful instrument for health care workers'.<sup>4</sup>

A recent study<sup>5</sup> pointed out that, because of differences in the way they measure IOP, rebound tonometers vary somewhat from Goldmann but 'the differences did not reach statistical significance.'

### Bounce back

The basic design of the instrument incorporates a metal chamber which, by a simple electrical current, may be magnetised such that a small needle-like probe may be inserted and held within. Upon activation by the operator, polarity within the chamber is altered, resulting in the probe being thrust forward by around 1cm. If the unit is held at 4mm from the cornea, the probe bounces back into the chamber with a force which is then converted into an IOP reading



using sensors detecting changes in the magnetic field induced by the moving probe (Figure 1).

The new iCare Pro (Figure 2) has some significant improvements over its predecessor. The probes are smaller and once set into the unit do not fall out. This makes the unit suitable for measuring patients in a supine position (Figure 3) – a big help for some domiciliary situations. An in-built inclination sensor allows the unit to fire only when either vertical or horizontal, to avoid inaccuracy due to an oblique alignment. A large colour display makes data interpretation easy and the unit is capable of storing up to 1,000 readings. These may be scrolled through to allow review of previous patients.

As with the original iCare, taking a measurement is very simple. Once in position, the button is pressed and a reading gained as signified by a short beep. A double beep means an inaccurate reading (perhaps not being in the correct alignment, too far from the patient, or hitting a closing lid), while a long beep tells you that you have completed six accurate readings and can move to the other eye. There is a forehead rest but I preferred to use my hand to steady the instrument. As



always, not one patient complained of any sensation of the probe hitting their unanaesthetised cornea. The instrument fits into a base charger unit and an overnight charge is sufficient for a full clinic session.

### iCare LINK Software

The unit can download data directly to the iCare LINK software via a USB port. The software is free to download and recognises the instrument. It allows IOP to be recorded for any one patient and also allows you to input the pachymetry reading to then offer a corneal thickness-adapted IOP reading. The same software is used for the iCare ONE instrument reviewed last week (16.09.11). The rebound tonometer should be standard kit for domiciliary use and now that the new iCare Pro has sufficient improvements (ease of use, reliability, use on supine patients and data management to name the most important) over the previous instrument, existing iCare users should take a serious look at upgrading. ●

### References

- 1 Meghan S, Flemmons, Ya-Chuan Hsiao, *et al*. Home tonometry for management of pediatric glaucoma. *Am Jour Ophthalmol*, Vol 152, Issue 3, Pages 470-478.e2, 2011.
- 2 Florin Grigorian, Adriana P Grigorian, Scott Olitsky. Effect of introduction of iCare tonometer in the pediatric ophthalmology clinic on number of examinations under anesthesia. *Invest Ophthalmol Vis Sci*, 2011;52: E-Abstract 679.
- 3 Asrani S, Chatterjee A, Wallace DK, *et al*. Evaluation of the iCare rebound tonometer as a home intraocular pressure monitoring device. *J Glaucoma*, 2011; 20(2):74-9.
- 4 Abraham LM, Epasinghe NC, Casson R. *Eye*, 2008; 22(4) 503-6.
- 5 Vincent SJ, Vincent RA, Shields D, Lee GA. Comparison of intraocular pressure measurement between rebound, non-contact and Goldmann applanation tonometry in treated glaucoma patients. *Clin Exp Ophthalmol*, 2011 DOI: 10.1111/j.1442-9071.2011.02670.

● Thanks to Mainline Optical for loan of the instrument. Further information from Mainline on 0121 458 6800

