



Figure 1



Figure 2



Figure 3

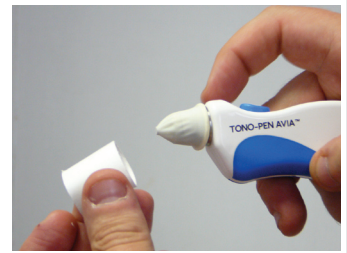


Figure 4



Figure 5



Figure 6



Figure 7



Figure 8

Tonometry on the move

Bill Harvey finds the latest version of the Tono-Pen both reliable and very easy to use

Working in a busy practice about 12 years ago the desktop NCT broke down and I had to learn how to use the Perkins pretty quickly. I still use it on domiciliary visits and find its portability and compatibility with the Goldmann useful. Variation in fluorescence with different levels of fluorescein in the tear film along with some induced error due to patient movement and subjective interpretation of the semi-circle targets necessarily led to some error. However, hospitals still rely on contact applanation despite these increasingly recognised error sources (not to mention corneal thickness influences) so it seems prudent to use a comparable test when deciding on whether to refer to the hospital on pressure readings.

The Tono-Pen

I was impressed by the new version of the Reichert Tono-Pen at this year's Optrafair (Carleton stand) and so was happy for the chance to test it on a few patients. Like the previous version, it is a simple, small hand-held instrument which is gently tapped against the patient's anaesthetised eye. Several readings are taken, which are then averaged out to give an overall reading.

The new unit, called the Avia, is visibly different and has a more ergonomic design, allowing it to be

easily gripped penlike to minimise shake error (Figure 1). The instrument has a blue power pack which is simply pushed into the handle ready for use – so there are no longer any awkward battery fittings. To ensure accuracy on initial use (or resetting after a sequence of unusual readings) the instrument needs to undergo a verification process. You simply hold the activation button down for five seconds while the instrument is pointing downwards. Fifteen seconds later, a beep signals that the instrument must be held upright, at which point either 'pass' or 'fail' appears in the small LCD window. Reasons for failing usually involve damage or soiling of the probe tip.

To ensure accurate readings, as well as inter-patient hygiene, a disposable pen cover is used for each patient. Careful placement is required (Figures 2, 3 and 4) as too tight or too loose a fit can affect readings. It is also essential that the unit is left for half an hour to reach room temperature, as another source of error stems from temperature changes.

Taking a reading

The operation of the instrument is simplicity itself. The patient does not require anaesthesia (Figure 5) and then must be asked to fixate on a suitable target. Holding the pen in a comfortable grip, the activation button is pressed and the green LED indicates there is 10 seconds to start taking the readings. This is done by gently

tapping the probe onto the central cornea. The process may be made easier by steadying one's hand on the patient cheek. I found that, depending on the patient position, I altered how the instrument was steadied for each patient (Figures 6 and 7).

When tapping the cornea, a quiet 'beep' indicates the instrument is 'firing' and the display shows the number of readings taken. Once 10 have been taken – something like 10 seconds – a longer 'beep' sounds and then two numbers appear. The larger is the averaged pressure reading (14 in Figure 8) while the smaller one is the reliability index – 95 in this case, representing that the readings were reliable and standard deviation of the valid measurements is 5 per cent or less of 14. Values of 80 per cent confidence or less should be ignored and readings repeated, though this did not happen once during my use of the instrument.

Easy to use

The ease of use – a reading was managed on all patients without any problems or reported discomfort – portability, design and reliability of reading make the Avia an excellent development. I would certainly consider replacing my Perkins with one and recommend it, particularly where portability is important. ●

● For further information contact Carleton on 01494 775811.