



Optos has launched a new OCT in the UK this spring. As well as providing tomographic data on anterior and retinal structures, it also includes a microperimetry function allowing a real-time assessment of retinal function superimposed over the data on retinal structure. I was able recently to put it through its paces for a few weeks at the City University Bath Street clinic (Figure 1).

User requirements

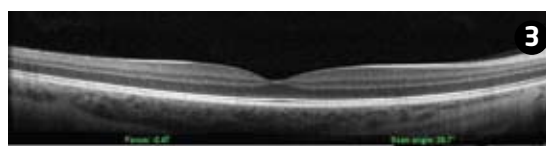
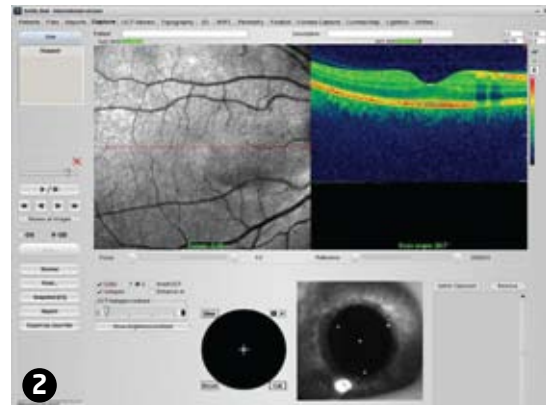
In my view, an OCT must be easy to operate as many will be wanting to delegate data gathering to ancillary staff. It must also provide data in an easily understood format and include reference to a well researched normative database to aid any diagnostic decision. Data must also be easy to transfer and manipulated. Ideally there should also be a high resolution capture so that a scan may provide useful visual information as well as numeric information. I can happily report that the new Optos OCT ticks all boxes with regards to these requirements.

As might be expected, it takes some practice to achieve high quality data but as I hope the figures here show, this was possible after just a morning's scanning of patients.

Once details are entered into the patient management system (including ethnicity for purposes of normative comparison), selection of any particular patient takes you to the capture screen (Figure 2). Pressing the 'Live' button makes a pop-up appear asking which particular type of scan is required. For retinal scanning this includes a single line scan, a 3D retinal topography scan, a raster scan and a radial scan. If I wanted the highest resolution capture through the retina, perhaps to look at retinal layer detail or note elevation of a lesion I would select the line scan (Figure 3). Assessing the extent of an atrophic area might be better analysed with the 3D scan, the impact of an elevation about any single focal area via a radial scan. For optic nerve analysis you have the option for either a retinal nerve fibre layer (RNFL) scan or a 3D optic nerve topography scan. The former would reveal any areas of thinning of the RNFL outside normal limits which would be a useful indicator of possible glaucoma progression, the latter would reveal subtle optic disc changes that may be related to neuropathy and which might otherwise be missed by

Tomography meets microperimetry

Bill Harvey tries out the new Optos OCT SLO and finds that it not only performs well with functions one would expect from a modern OCT but also includes some interesting and useful additions



ophthalmoscopic means.

When in position the patient looks at the fixation target. The target is fully controllable in terms of position (bottom left of Figure 2 shows the fixation control panel), whether it is flashing or not, and what it actually looks like. As well as a variety of smaller and larger targets to select from, you can actually import your own images – even use your own face as a fixation target if you wanted. Before scanning you can select the 'Max Frame Count' of either 32 frames or 64 frames. The 'Max Frame Count' is the maximum sequential captured frames of OCT and SLO images, which are

captured and displayed as individual frames or as a movie. This is useful as it allows you to edit out useless scans at a later date, and also ensures accuracy by gathering large amounts of data with any single scanning operation. To start scanning, ensure that the patient's eye is properly aligned on the alignment CCD camera window (bottom right of Figure 2) and that the external image of the eye is well focused. The three white dots viewed on the eye will be at their smallest size. You can use either the 'Start' or 'Stop' button on the Capture tab or the thumb button on the joystick to start and stop scans. For auto-focusing, click on the 'Auto-Focus' step (the steps are located on the left hand side of the screen). The program will automatically set the focusing of the SLO and OCT on the retinal surface. It will then continue to perform 'Auto-Reference' to find the OCT reference (coherence) position.

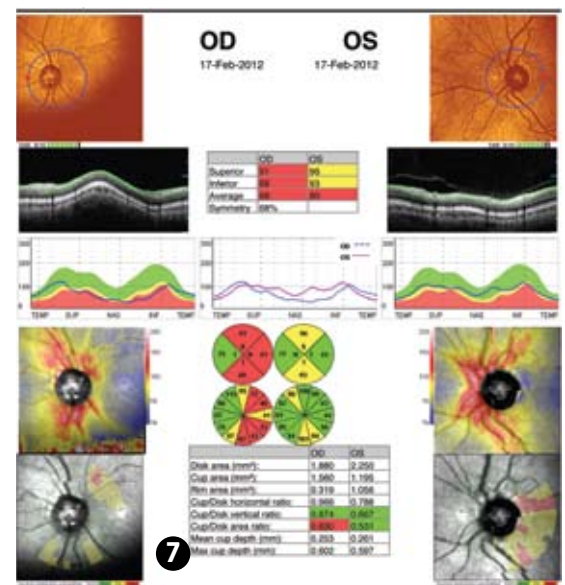
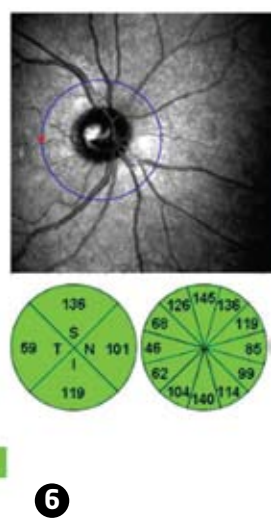
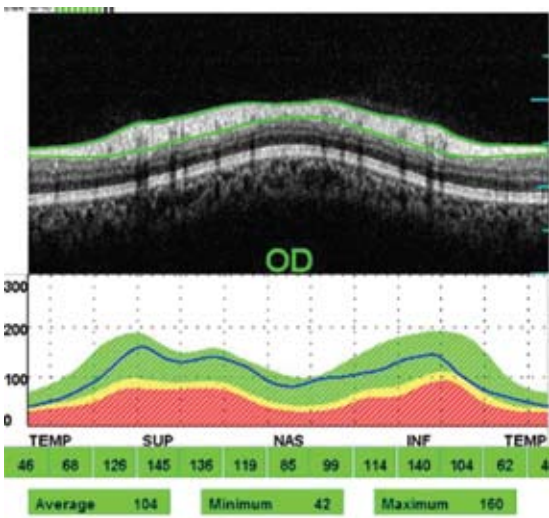
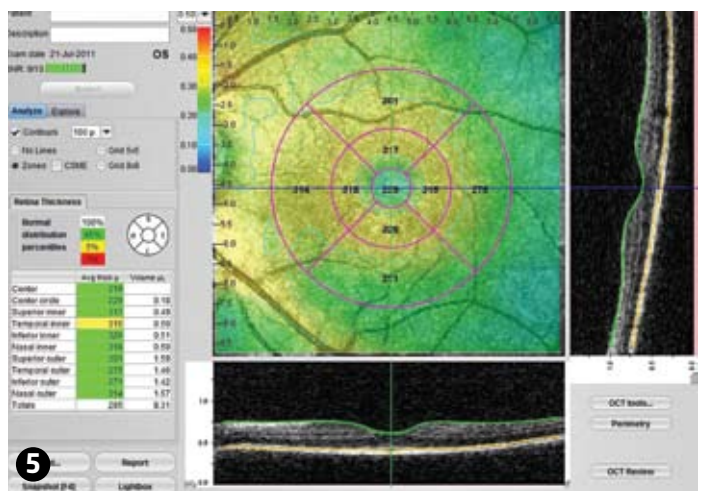
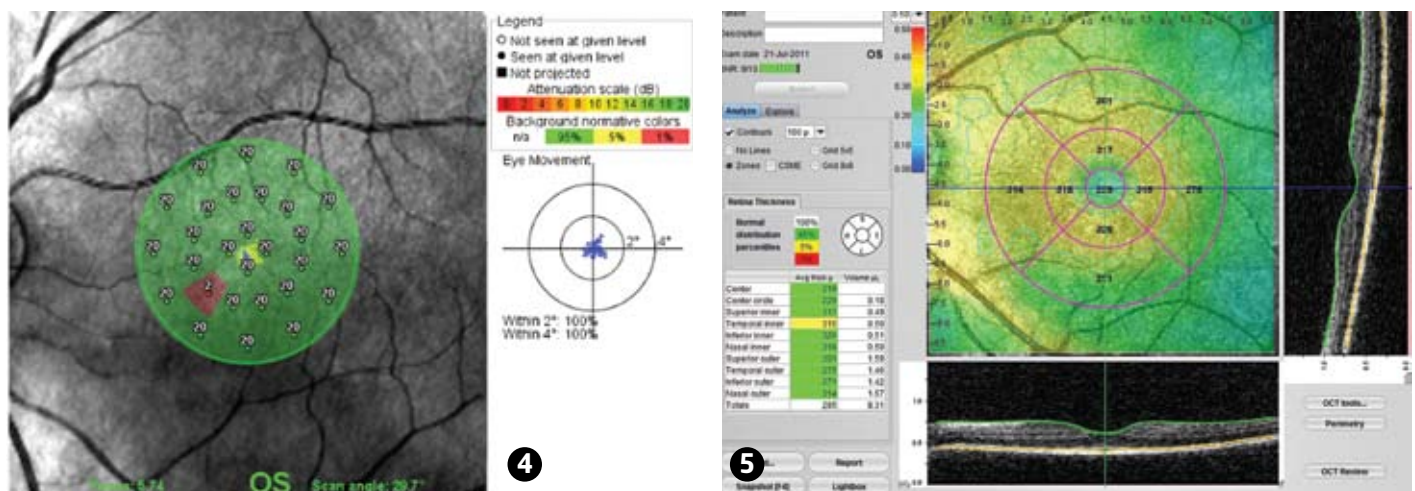
A live image of the scanning laser ophthalmoscope (SLO) view appears on the screen (top left of Figure 2) and this can be focused using the joystick. I found it was essential to include the refraction of the patient (mean sphere) to get best focus. A signal to noise ratio (SNR) cursor over the screen shot moves between 1 and 10 and a good image will be assumed if this is scoring 8 or above. Once the scan is initiated the OCT image appears to the right. Gentle movement of the joystick centres the OCT image. If too near the patient, the OCT image will be inverted (as with other instruments). Again, an SNR indicates capture quality for the OCT scan and a score of 8 or more was aimed for every time. Corneal capture requires the addition of a lens to the machine. It is then possible to assess the cornea and produce pachymetry maps, or the focus on the limbus and gather data about the anterior angle.

Microperimetry

Microperimetry literally means perimetry over a small area of retina, and this function allows you to



Instruments



establish retinal stimulus threshold in areas that have been scanned. When microperimetry is carried out, the patient is asked to fixate and then press a button if stimuli of varying intensity are presented within a defined area of their vision. The machine can then establish retinal function within this area. There are several programs to choose from, the simplest being four stimuli around fixation, while other programs include a peripapillary assessment and a modified 10-2 screening. As might be expected, patients maintain fixation better with the shorter programs, especially if the testing is being performed as part of an overall OCT assessment. Figure 4 shows a data plot from a simple central scan showing a missed point and also the fixation tracker which helps you to check on patient reliability. Microperimetry is a technique that we will hear much about in the coming years and I am impressed that Optos has incorporated this function. It adds much useful functional information to the anatomical data and will help you to better monitor the impact of

progressive eye diseases. Figure 5 shows the topography plot for a normal patient. Serial scanning would allow you to detect change over time. Figure 6 shows an RNFL plot for a normal patient while Figure 7 shows how I was able to find a significant RNFL defect in the right eye of a patient who is now being treated for glaucoma. Figure 8 shows use of the mouse magnifying tool to help assess the posterior vitreous face in a patient who had noted transient photopsic disturbance. Figures 9 and 10 show corneal cross-section and angle assessment of a patient with borderline pressures. The pachymetry function offers either a high resolution single scan or a raster scan which will produce a thickness map. I would suggest the Optos SLO OCT is a welcome addition to the market, easy to use and with some nice new features, not least of all the microperimetry function. Look out for some case studies in *Optician* from the machine in the coming months. ●

● More details from Optos: 0808 1004546

