The Volk Eye Check (Figure 1) is a simple-to-use, handheld diagnostic assistance device, which provides optometrists and ophthalmologists with automatic real-time measurements of seven key eye features, to assist in detecting and diagnosing various eye conditions.

Powered by patented IRISS Medical Technology, the Volk Eye Check is a first-of-its-kind diagnostic assistance device, which automatically measures and objectively records seven different eye features including pupil size, iris measurements (visible iris diameters), eye apertures and lid positions, and manifest strabismus. Data from the device is aggregated in a unique Cloud-based system and provides a large repository of normative eye data, which is available to its clinician user base.

Clinical information in a flash

The Volk Eye Check will accurately measure pupil size and, most critically, alerts the optometrist to the presence of anisocoria, document ptosis, provide ground-breaking data for the contact lens practitioner and detect and measure strabismus.

The Volk Eye Check offers two clinical modules:

• Eye Check for general ophthalmic diagnostics including strabismus detection and measurement. Most optometrists using the device use this mode routinely on all patients to gather clinical data (Figure 2)

• Contact Lens which provides data to guide the practitioner in choosing an optimum lens, saving chair time by avoiding a lens choice that is unlikely to provide optimum optics or designing a custom lens (Figure 3). This module is also used by oculoplastic and ophthalmic surgeons specialising in eyelids to document eye id position (MRD)

Versatile Volk Eye Check

Pupil size

Pupil size is very difficult to measure sometimes simply because the patient has dark iridies and yet, if an optometrist fails to detect anisocoria, a serious anomaly such as Horner syndrome may be missed. Acquired Horner syndrome can be partial and subtle with only a small difference in pupil size in the presence of a subtle ptosis. Such a condition can be indicative of a systemic disease such as a tumour of the anterior lobe of the lung.

Even if the practitioner can view the pupils, measurement with a millimetre ruler is very inaccurate. The Volk Eye Check accurately measures the pupil size typically to within 0.2mm. Because data can be captured in different lighting levels, the effect of ambient illumination on pupil size can easily be accurately measured. In Horner syndrome, the affected pupil will dilate less in dimmer light.

Case example: Figures 4a and 4b show a patient who presented with mild...
ptosis following neck surgery. A Volk Eye Check detected a 0.27mm anisocoria, which increased to 0.37mm in dimmer ambient light. This confirmed the presence of Horner syndrome.

**Pupil eccentricity**

For the first time, the optometrist is informed of the position of the pupil within the iris. This can be critical in terms of choosing patients who are likely to succeed with multifocal contact lenses. If a contact lens centres perfectly on the cornea or rides slightly temporally and the pupil is situated nasally displaced, the centre of the multifocal optic will not be positioned correctly and is a major cause of poor visual performance with these lenses. The optometrist can avoid wasting time trying to fit patients for whom the Eye Check data would predict failure. In addition, a number of major contact lens manufacturers around the world are working to offer a custom lens design service to take pupil eccentricity into account.

**Visible iris diameter (including HVID)**

For the contact lens practitioner or fitter, an accurate measure of visible iris diameter is important with respect to the total diameter of the contact lens. Whereas sophisticated topographers provide measurements, these are not always the horizontal visible iris diameter (HVID) but may be an oblique measurement that can differ by nearly 0.5mm for the true horizontal measurement. The Volk Eye Check provides vertical, oblique and HVID.

**Strabismus**

All optometrists will claim that their cover test will detect the smallest strabismus. However, research suggests that strabismus is not always detected and studies have also shown wide variations in the estimation of the size of strabismus when measured by expert hospital orthoptists.

Optometrists know that some young children can be difficult to assess. A fallback test is the Hirschberg test in which symmetry of corneal reflections are assessed but, like measuring pupil size with a millimetre ruler, it is a gross test because even 1mm of asymmetry is equivalent to over 20Δ of strabismus.

The Volk Eye Check has an 84 per cent sensitivity and 99 per cent specificity for detecting strabismus, measures the size and documents if there is no manifest deviation detected or the size of strabismus if present (Figures 5a and 5b). The presence of documentation is important for medico-legal reasons and whilst not replacing the cover test, is an important safeguard for the optometrist examining children. It is also useful to show to parents the ‘no manifest deviation’ display when epicanthus is important safeguard for the optometrist examining children. It is also useful for medico-legal reasons and whilst not replacing the cover test, is an important safeguard for the optometrist examining children. It is also useful to show to parents the ‘no manifest deviation’ display when epicanthus is a major cause of poor visual performance with these lenses.

**Eyelid position**

The position of the eyelids is defined by the ‘margin reflex distance’ (MRD) with MRD 1 being the distance from the corneal reflection (Purkinje image) to the margin of the upper eyelid, and MRD 2 to the margin of the lower eyelid. For the first time, optometrists can investigate and document eyelid position and whether ptosis is impinging on vision. In the USA, the largest medical insurance provider, Novitas, demands evidence that MRD 1 must be less than 2mm to be medically covered for surgery. In the UK, users of the Volk Eye Check show the data to explain the patient’s ptosis condition, and the measurements provide impressive data when making a referral for an ophthalmology opinion.

**Easy to use**

The camera is easy to use and whilst the data obtained for each patient are invaluable, most practitioners delegate the capture of the photographic images to a clinical assistant. The patient’s ID and date of birth are entered by keying them in on the touch screen. A Volk Precision Sticker is placed on the patient’s forehead. The instrument guides the practitioner to ensure the device is at the correct distance. Typically, two or three photographs are taken with the instrument and within a few seconds, an array of data is displayed on the device’s screen and simultaneously uploaded through the enabled internet to the practitioner’s computer or tablet. The data are used in two ways. Firstly, measurements are displayed in a format that visually alerts the optometrist or ophthalmologist to any measurement that falls outside the normal. For example, anisocoria greater than 0.49mm will be flagged. The other use is the measurements themselves, for example, data that will assist the optometrist with contact lens design or fitting (Figures 2 and 3).

**Summary of clinical power**

- Fast and easy-to-read diagnostic tool for eye specialists
- Quickly identifies areas for investigation (strabismus, anisocoria, ptosis) and provides an objective electronic record of the readings
- Assists the clinician in identifying best-fit contact lenses; reducing drop-out rates and saving chair-time and money; assists in the design of custom made lenses
- Objective electronic medical record of eye features and eye conditions for compliance, referrals and litigation
- Suitable for babies and young children – even at six months old
- Monitoring of treatment progress (pre-op/post-op)
- Reduces inter-clinician variability – standardises testing across practices and clinicians in optometry chairs
- Oculoplastics: accurate measurement of lid position for lid and cosmetic surgery – saves time and provides an objectives record

**Conclusion**

The Volk Eye Check is a revolutionary, versatile ophthalmic device that provides an amazing range of eclectic eye data that will transform aspects of optometric practice and provide improved patient care and clinical documentation.

**About the author**

Dr Simon Barnard PhD, FCOptom, FAAO, FEAOO, DipCLP, DipClinOptom, DipTh (IP) is in practice in north London with his partner Alex Levit and a longstanding member of the National Eyecare Group. He is a director and chief medical officer of IRISS Medical Technologies, which is partnered with Volk Optical to bring the Volk Eye Check to market.

*Birmingham Optical Group is the distributor of Volk technology in the UK.*