# equipment

June 2017

Optometry AUSTRALIA

New technologies and treatments in eye care


## EYE CHECK TECH

Indispensable tools for 21st century practice

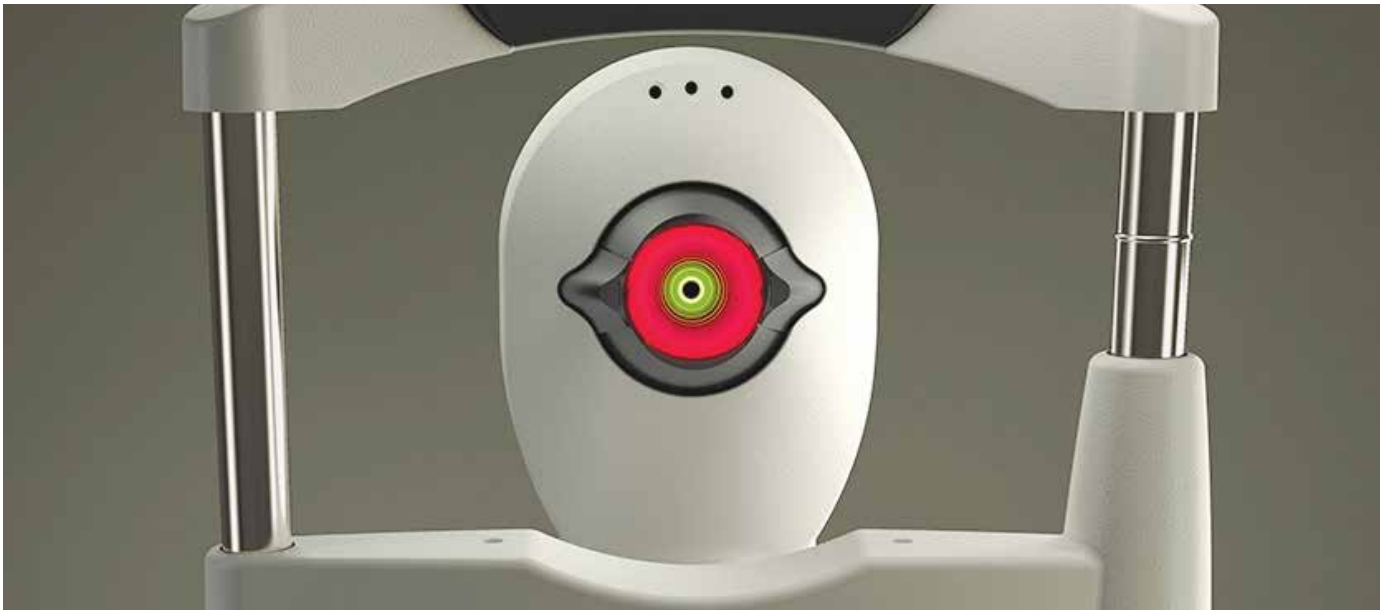
### OCT overview

Step-by-step guide to scan interpretation

### Anterior eye

Expert advice from the CCLSA

# Vital in contemporary optometry



**Richard Vojlay**
BScOptom LOSc FVCO DipTherap DipHuman(Music)
Associate Professor, University of Melbourne
Vision Camberwell VIC

**Product**
Medmont E300

**Supplier**
Medmont

SINCE 1992, Vision Camberwell Optometrists has focused on advanced contact lens fitting for keratoconus, corneal graft fitting and orthokeratology. We have two Medmont E300 topographers in our practice, one for each consulting room. Accurate, easy to use and reliable, they are an essential part of our day-to-day assessment of our patients.

The ability to easily manipulate topography maps on the E300 also allows easy interpretation of complex data. All of the standard topographical maps are available: axial, tangential and elevation. To accurately identify the significant changes on any topographical map, it is essential to set the appropriate power range on the display, otherwise the image can be misleading. Altering the power range is straightforward on the E300. Difference maps are easily accessible to establish change over time, which is essential in orthokeratology and for determining progression in keratoconus.

## CASE REPORT

SG has been a patient since 1997 and is now 42 years old. He was diagnosed with keratoconus when he was 23 years. His mother also has keratoconus and has had bilateral penetrating keratoplasties.

Refraction: R +5.00/-9.0×82 VA 6/8-2 L Plano/-0.25×100 VA 6/5+ (2006).
SG was aware that a spectacle correction was not possible due to the high degree of anisometropia.

He had previously tried wearing standard RGP keratoconus designs in his right eye, in 1997 and 2006, as well as a Limbal Lift design in 2008. All lenses had acceptable fitting patterns and gave good visual acuities of 6/5-2. However, SG was unable to achieve any level of reasonable comfort with these RGP designs. He certainly appreciated the improvement in his quality of vision but was never able to achieve any regular, comfortable wear and consequently gave up the idea of having quality stereoscopic vision.

He returned for a review in December 2016 as he had become more aware of poor vision in his right eye, especially when driving and with prolonged screen work. We discussed the option of trying a scleral lens in his right eye to improve his comfort and vision.

Unaided vision: R 6/120 L 6/10-

Refraction: L -0.75/-1.00×105 VA 6/5-

Slitlamp showed central striae on the right cornea with no abnormalities on the left cornea.

SG was fitted with an Innovative Contacts scleral lens (5zRS). The axial power map showed a central nipple cone. (Figure 1)

Topography: 51.37 @ 173
58.36

The elevation map generates the best fit sphere. Areas coloured in blue are below the best fit sphere and areas coloured in red are above the best fit sphere. The best fit sphere indicates the

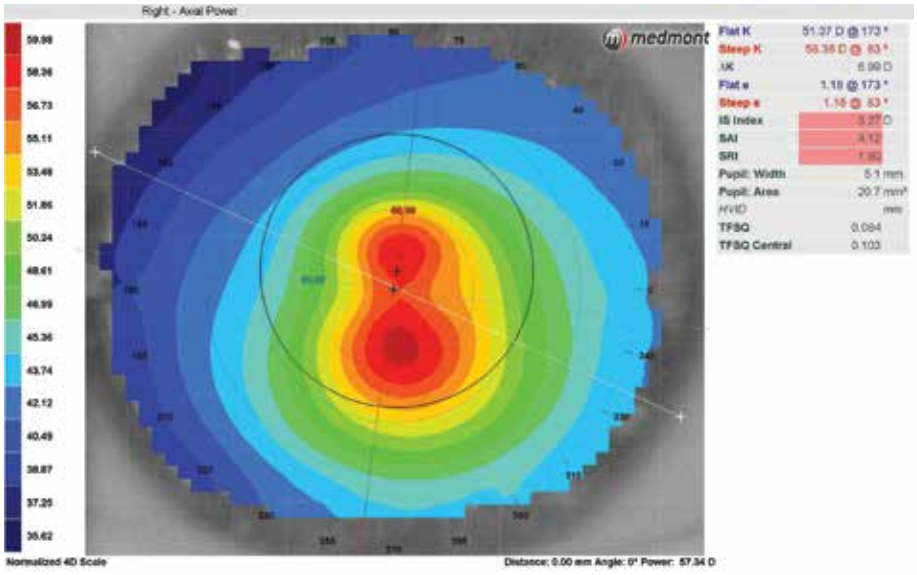



Figure 1. Axial power map

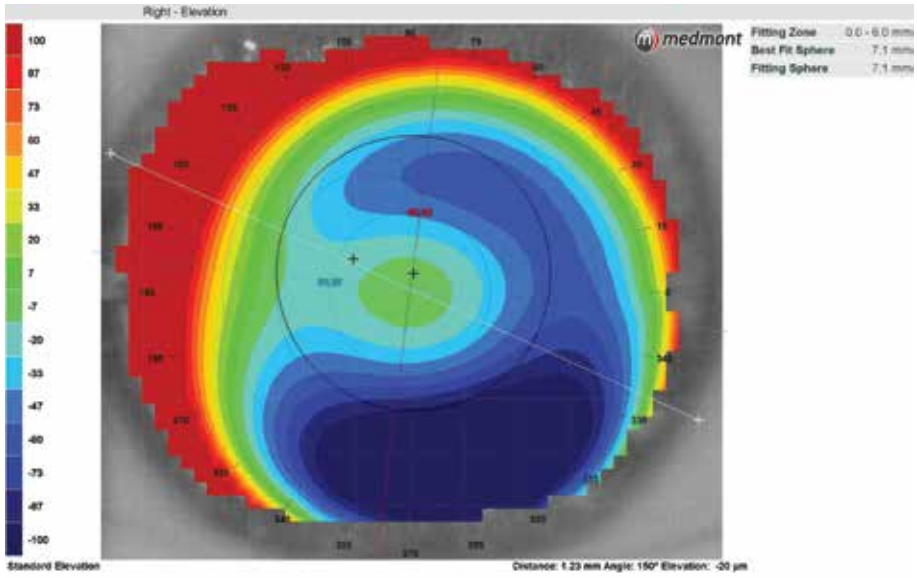



Figure 2. Elevation map

base curve of the trial lens that would best match the overall shape of the cornea over a selected diameter.

Best fit sphere: 7.1 mm (Figure 2)

The horizontal visible iris diameter (HVID) is used to determine the diameter of the scleral trial lens.

HVID: 12.06 mm (Corneal HVID > 11.50 mm, recommended lens diameter 17.50 mm (Figure 3)

The E300 provides extensive analysis of the topographical maps. The sag measurement (height) of the cornea at a 10 mm chord (weighted average) allows us to select the sag of the trial lens that will vault the cornea.

Analysis details: weighted average @ 10 mm: 1969.9 µm (Figure 4)

Innovative Contacts 5zRS scleral lenses are specified by a sag measurement at a 15 mm chord. The higher the sag, the deeper the lens; 2000 µm is added to the measured sag (weighted average) of the cornea at 10 mm to establish the sag at 15 mm.

Trial lens: 7.8 (17.50) 4260 steep

Anterior OCT (Topcon 3D OCT-2000) of the trial lens on insertion showed a central post lens tear film thickness (PLTT) of 284 µm. Due to settling on the sclera, the PLTT often reduces in the range of 50-100 µm over 30 minutes and in this case, had reduced to a central clearance of 232 µm after one hour. (Figure 5)

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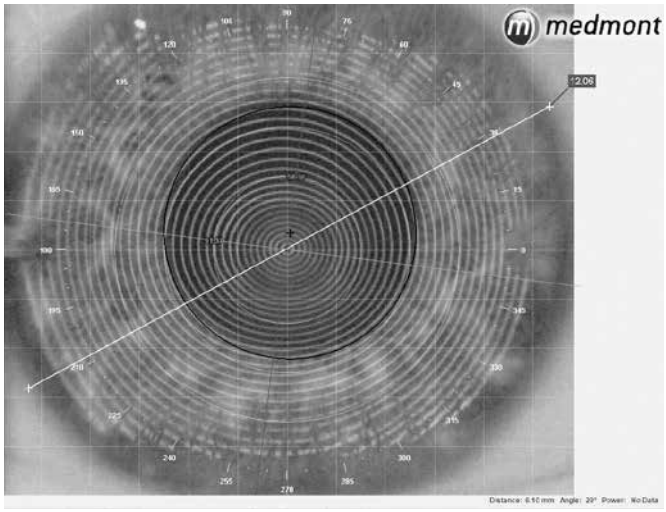


Figure 3. HVID measurement

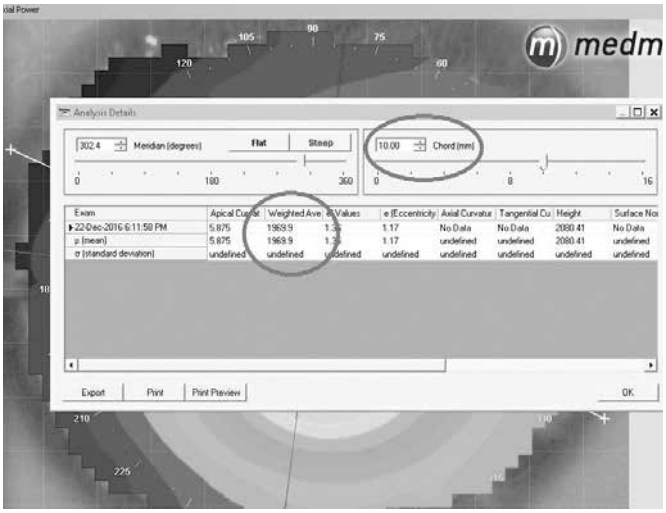


Figure 4. Weighted average @ 10 mm

# Essential in orthokeratology

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Refraction over the trial lens gave a visual acuity of 6/6+.

If the scleral lens is not bearing evenly in all meridians, the lens will flex or bend in the steeper meridian. This flexure can be measured by performing topography over the trial lens and is recorded as an astigmatic cylinder. In this case, the induced cylinder was -0.38 D @ 109 degrees (Figure 6). A topography scan over the lens allows calculation of the amount of sag needed to correct the lens flexure by increasing the sag in the steeper meridian.

The final base curve was slightly steeper than the trial lens but moderately flatter than the best fit sphere to ensure adequate limbal clearance. The vertical meridian was steepened by 150 µm to reduce inferior limbal clearance. The Scleral Landing Zone (SLZ) was flattened slightly in the vertical meridian to maintain good alignment at the landing zone on the sclera.

Ordered lens: 5zRS (Innovative Contacts) 7.5 (17.50) -0.50, (Flat meridian) 4200/SLZ - steep // (Steep meridian) 4350/SLZ - standard

VA with 5zRS: 6/6+

SG was very happy with the quality of vision and overall comfort level of his right scleral lens, and was able to achieve all-day wear after a few weeks, when he felt his overall quality of vision was natural and seamless. SG was not prepared to entertain the idea of a scleral lens for his left eye and preferred to use a spectacle correction with a right plano Rx.

The Medmont E300 topographer allows us to easily extract the information required to accurately assess our patient's condition and determine the performance of a trial lens. It is a worthwhile investment to allow us to deliver the ongoing quality of care expected of optometry in the 21st century.

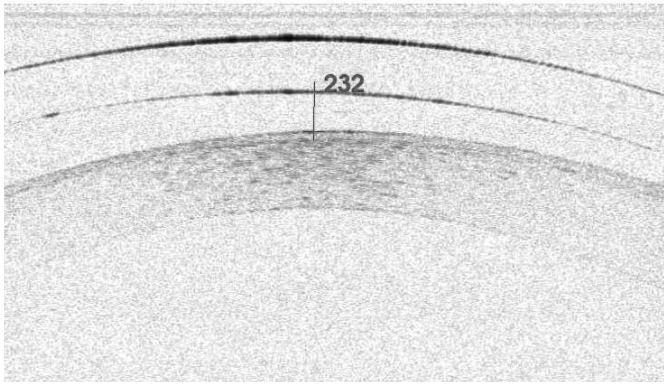


Figure 5. Anterior OCT: central post lens tear film thickness under the trial lens

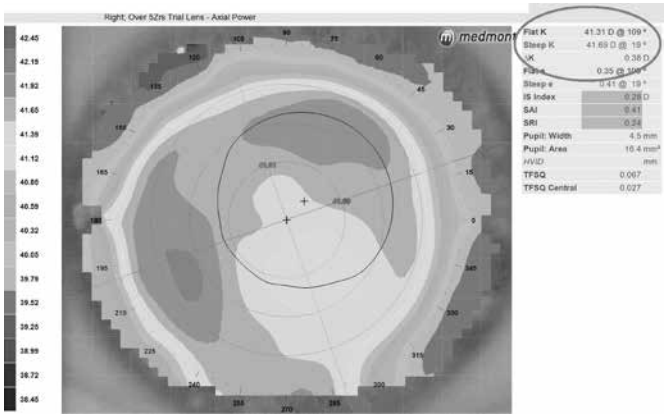


Figure 6. Topography over trial scleral lens