



ADELAIDE  
EYE & LASER  
CENTRE

*The focus of eye surgery at Adelaide Eye & Laser Centre has been directed towards refractive surgery in recent years. However, this edition of the AE&LC newsletter provides an update on cataract surgery, the other principal service provided by the centre. This update outlines the preferences and future directions that the centre views as important.*

## Intraocular Lenses

Laser refractive surgery has highlighted the pivotal role of vision quality in our lives - not just the refractive error. The desire to obtain the highest quality vision is the over-riding factor that influences the choice of implant used in cataract surgery.

With small incision cataract surgery where foldable implants are now routinely used, there has been a tendency to judge surgery by the size of the wound and therefore a trend towards smaller optical zones on IOLs and thinner lenses of higher refractive index. This trend saw the effects of edge design and proximity to the pupil margin come into play with unwanted entoptic phenomena experienced by patients, especially at night. Higher refractive indices in the materials can further influence these effects.

The recognition of the quality issues associated with these lenses has seen a trend towards larger optical zones of 6.0mm and perhaps in the future, 6.5mm as the routine. New injection systems enable the wound size to remain small controlling astigmatism despite the larger optics and haptics that are now available to provide broad capsular contact, improving centration of the optic.

The current IOL used preferentially by AE&LC is the Alcon SA60AT which best provides these desirable features whilst being highly bio-compatible and having a low rate of capsular opacification.

## Multifocal IOLs

Multifocal IOL designs have been available for over a decade starting initially with the diffractive IOL released by 3M. Now discontinued for some years due in part to it being rigid and also because of reduced vision quality, it is being replaced by newer styles of multifocal IOL. These newer multifocal IOLs have concentric rings of near and far focal lengths with some degree of intermediate vision at the transition between rings. These IOLs offer combined near and far vision splitting the light into two focal lengths. The experience of AE&LC with these lenses has been that they are associated with a high incidence of unwanted entoptic phenomena, such as halos, that improve over time, but not always to a satisfactory level. The nature of the IOLs is that they are associated with reduced contrast sensitivity and, in the view of AE&LC, often represent a compromise

between visual convenience and optical quality. It is the opinion of AE&LC that visual quality is paramount and therefore that refractive multifocal IOLs should be reserved for special circumstances. The guidelines for these circumstances are somewhat arbitrary but include;

- A strong desire to be free from spectacles
- Significant bilateral cataract
- The absence of a high requirement for sustained near vision
- Eyes with small but not very small pupils and low astigmatism
- Low requirement for vision under low light conditions
- A non "fussy", patient personality to cope with the visual effects of the IOL

## Accreditation

*Being a fully accredited facility under the Australian Council on Healthcare Standards umbrella, AE&LC does and must continue to strive for improved outcomes in all areas. To assist us in this process we would like to examine the refractive and visual outcomes of our cataract cases by obtaining feedback from you. To this end we will be providing our patients with a **simple feedback form** detailing acuities and refraction, to give to you at their 3-6 week post-operative visit. We would be grateful if you could complete the form and send it back to our rooms in the reply paid envelope provided.*



## Topography Service

## Accommodative IOLs

The correction of presbyopia by using an IOL that can move forward and backward with changing vitreous pressure during attempted accommodation is currently being trialled. Initial reports suggest that about 2 dioptres of pseudoaccommodation can be expected. Question marks exist over the sustainability of this effect, and also over the fact that these IOLs are currently using a 4.5 mm optic and could, therefore, be expected to have an increased rate of edge phenomena and night difficulties.

Evolution of the lens design and time will clarify the merits of this IOL over the coming years. Also, sustainability of the pseudoaccommodation effect over time and the effect of posterior capsular opacification is unknown at this stage.

## IOL Master

Improved accuracy of post-operative refractive error following cataract surgery is largely influenced by the ability to measure the axial length of the eye. Since April 2001 AE&LC has used the IOL Master from Zeiss to provide the most accurately available axial length measurements. The advantage of this technology is that it measures the visual axis, a feature that is especially useful in highly myopic eyes, and does so in a non-contact manner using laser not ultrasound technology. The device incorporates keratometry and anterior chamber depth

AE&LC is able to perform topographies for your patients if you feel that they would benefit. This service is free and not billed to Medicare. An unreported copy of the topography can be

## The future of IOLs

Both the cornea and the natural lens have aspheric optics but still exhibit spherical aberration. Prior to 40 years of age the positive spherical aberration of the cornea is compensated for by the negative spherical aberration of the lens but after 40 years of age the lens develops increasing positive spherical aberration compounding the effects of scatter produced by developing cataract. As all available IOLs are spherical, cataract surgery results in an eye with residual positive spherical aberration from the cornea. This adversely affects contrast sensitivity, especially at night. Newer IOLs are soon to become available that have a prolate anterior surface to help reduce this unbalanced effect from the cornea. Combined with improved biometry and astigmatism control this IOL innovation offers the potential for improved visual quality after cataract surgery, in particular low contrast acuity and night vision.

measurements and a variety of commonly used power calculation formulae. Reproducibility of the measurements is very high and operator independent.

The IOL Master can be limited by dense cataract formation, in particular of the posterior subcapsular type, when conventional ultrasound axial length measurements may be required. Despite this limitation there remains no need to assess cataracts any earlier than the clinical situation would demand.

given to the patient or sent to your office. Please contact Vanessa or Megan on 8274 7000 if you wish to use this service.