New developments in refractive cataract surgery

Exeter Laser Eye Surgeons

Trends

- Smaller corneal incisions
- Aspheric lens implants
- Toric aspheric lens implants
- Presbyopia solutions
- Light adjustable lens
- Femtosecond laser assisted cataract surgery

Incision size

- 3.2mm to 2.2mm in last few years
- Can go as low as 1.8mm
- Advantage – better astigmatism control
  - Less wound leak
  - More rapid visual recovery

Lens implant trends

- Toric implants – can correct almost any amount of astigmatism and any refractive error – highly stable in capsular bag
- Light adjustable lens – can ‘tweek’ post-op to eliminate residual refractive error
- Presbyopia solutions – bifocal, trifocal, ‘accommodating’
- New solution – diffractive echelette design

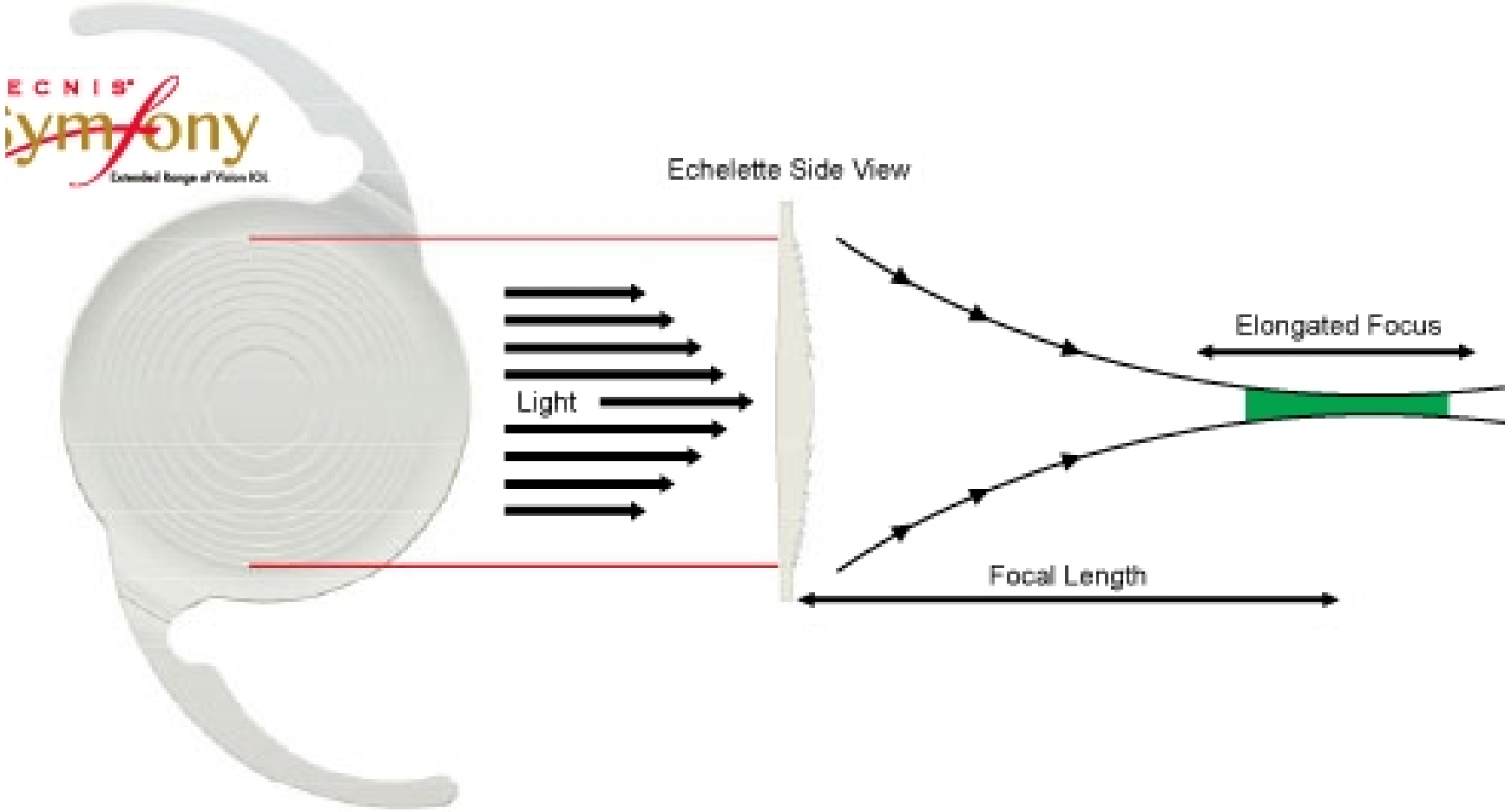
AMO Technis Symfony lens

- Merges 2 complimentary technologies to deliver the first presbyopia-correcting extended range of vision IOL
- Released September 2014

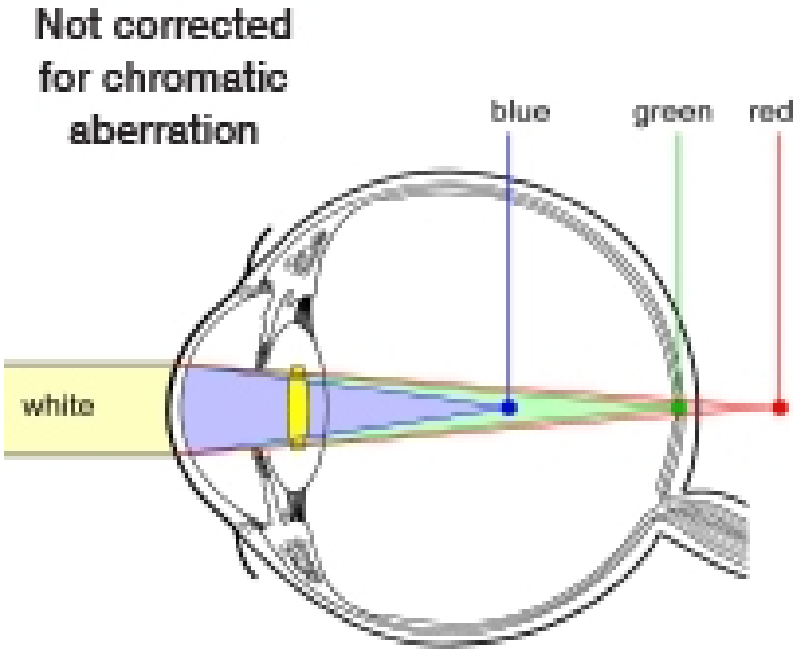
Symfony design

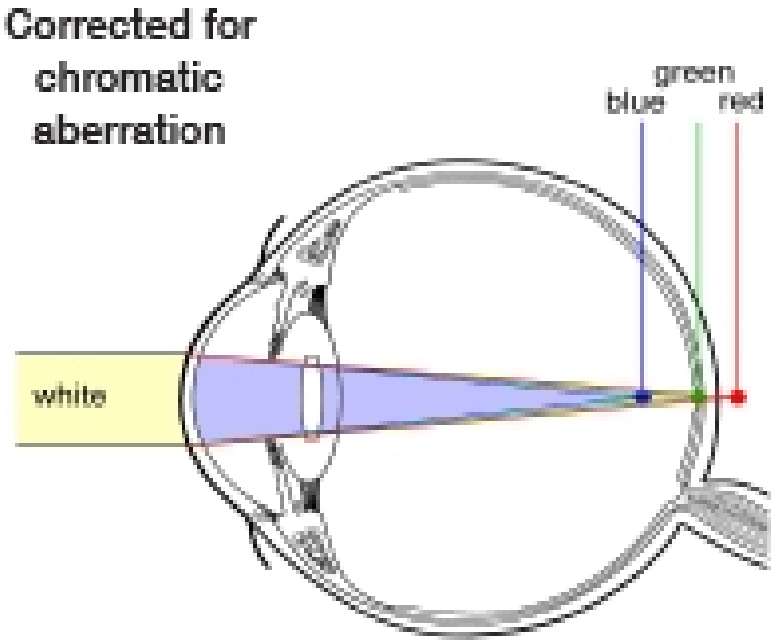
- Diffractive echelette design – elongates the focus of the eye
- Achromatic design corrects chromatic aberration for enhanced contrast sensitivity

Symfony design

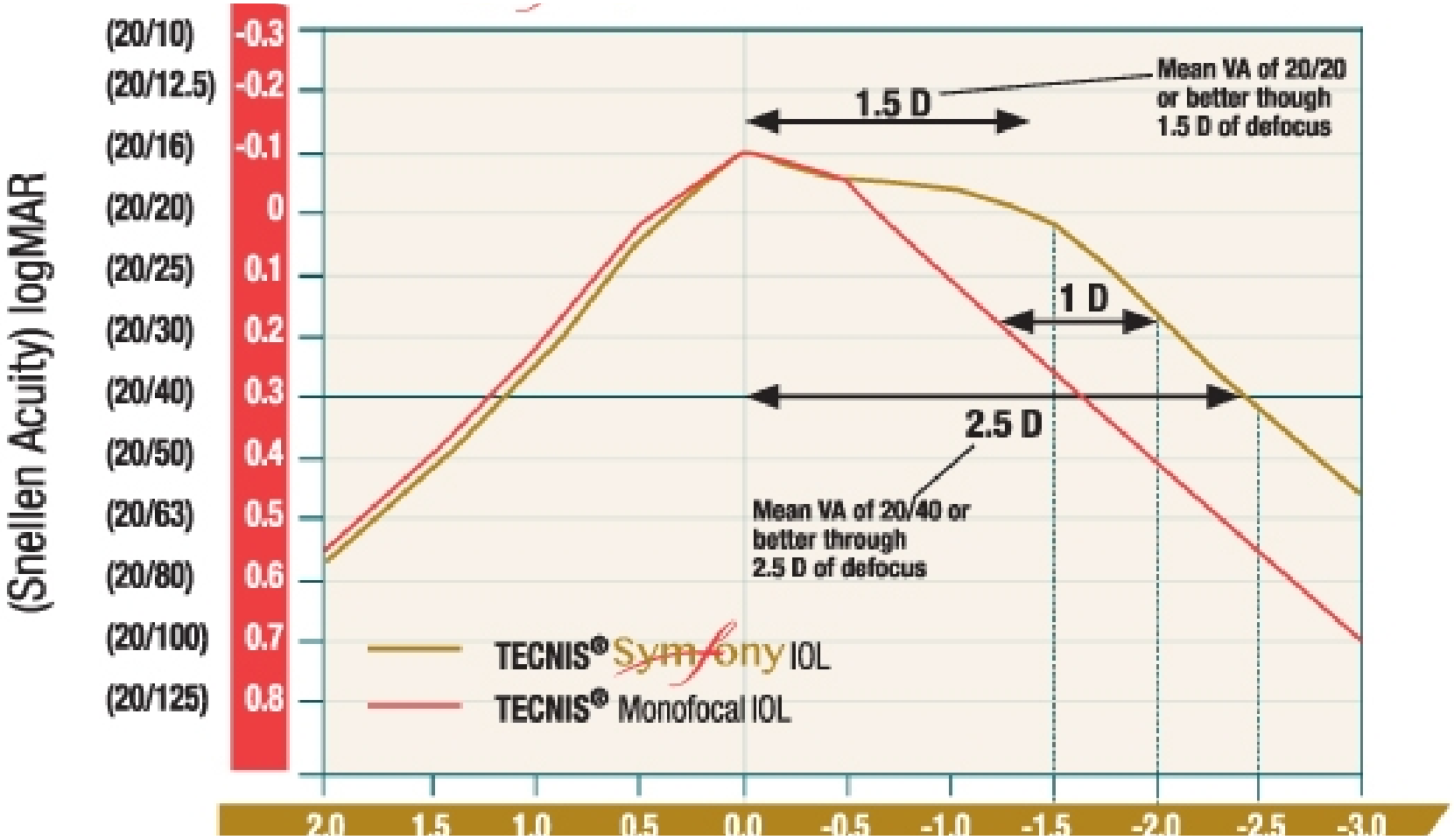


Chromatic aberration correction

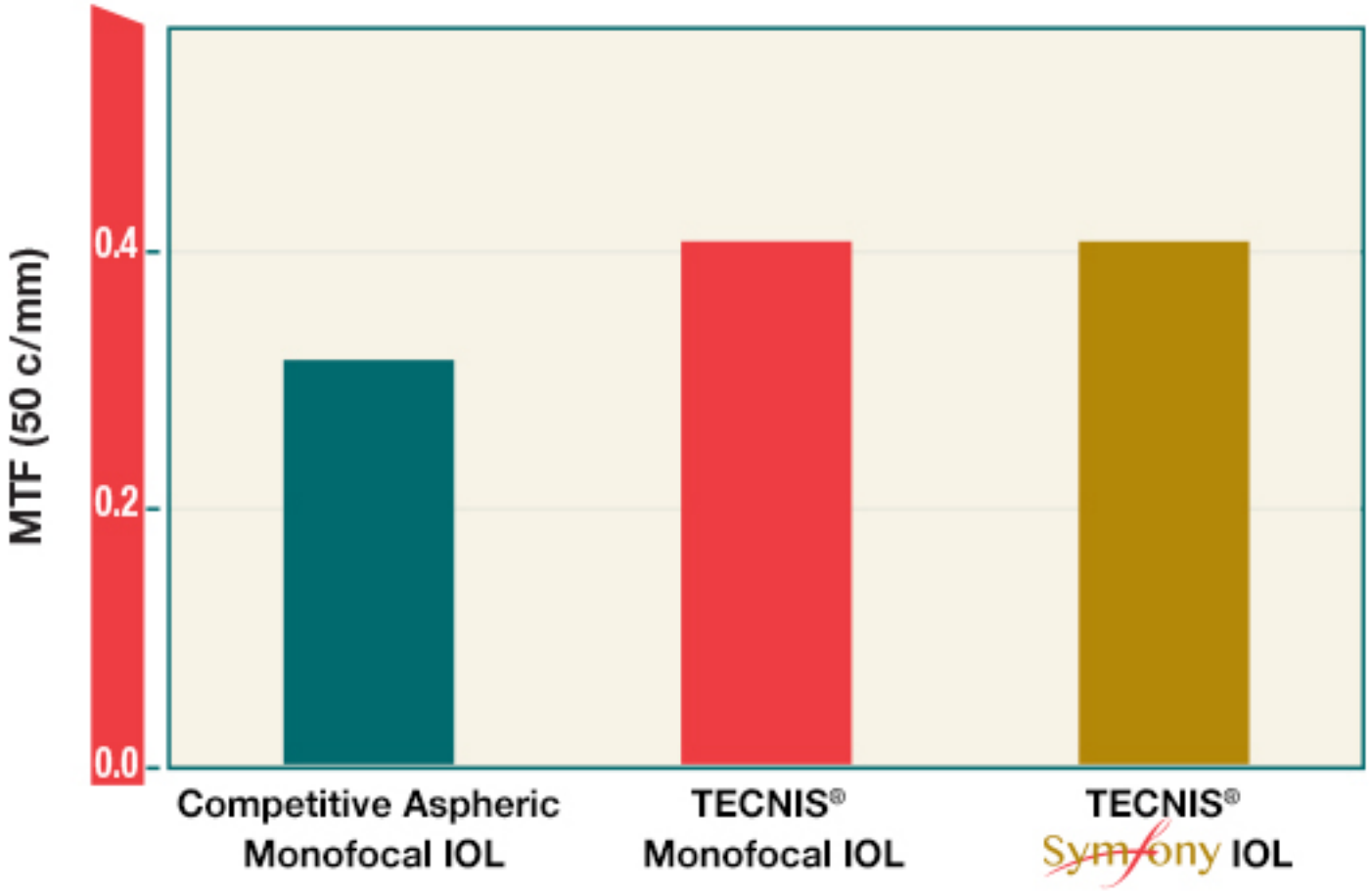




Defocus curve- 3 month data



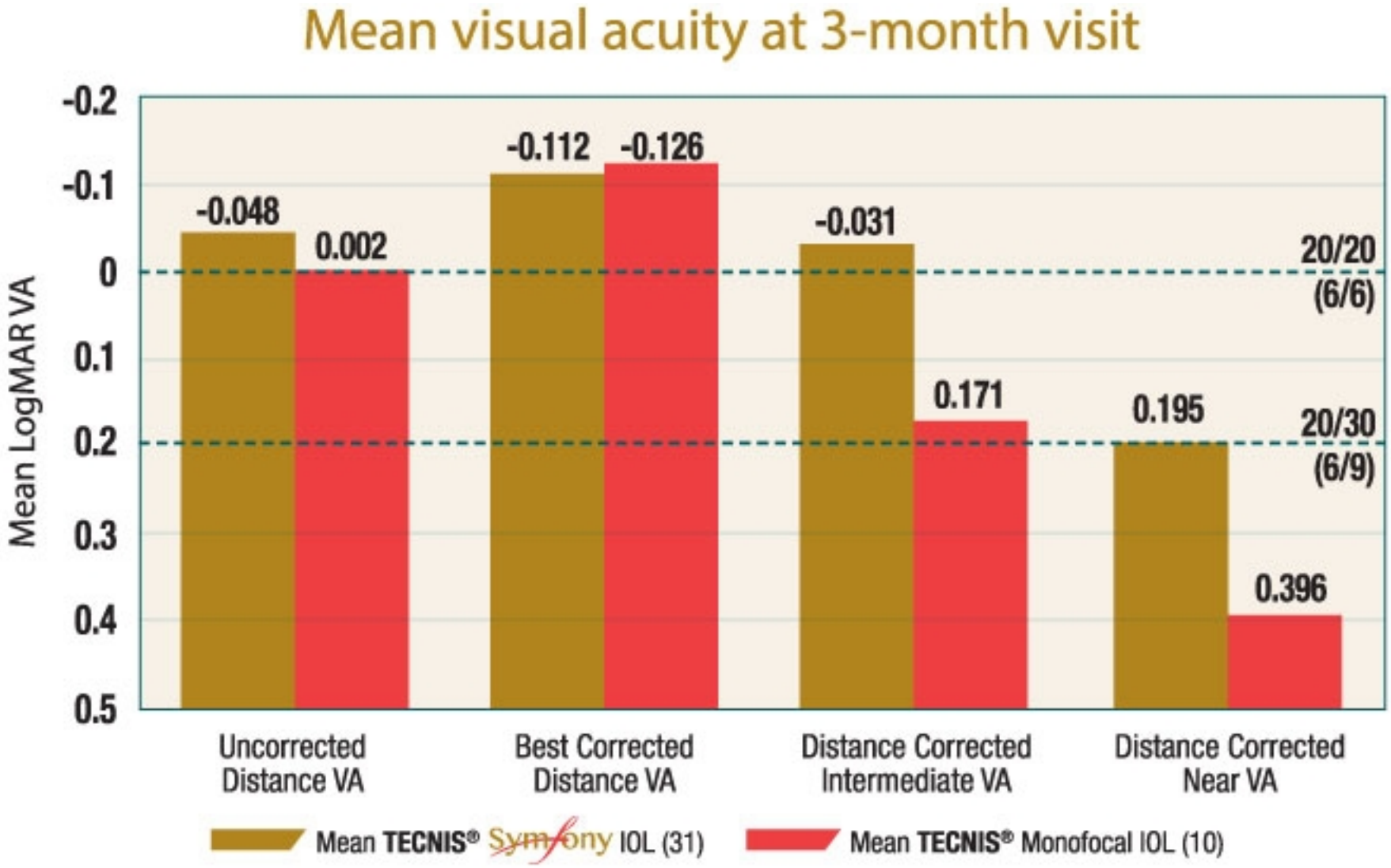
Contrast sensitivity equivalent to Technis Monofocal lens implant



Symfony trial results (NZ)

- No compromise of distance vision
- 100% no distance spectacles
- 94% no intermediate vision spectacles
- 87% no reading spectacles
- No spontaneous reports of halo or glare
- No significant reduction in contrast sensitivity found in patient studies

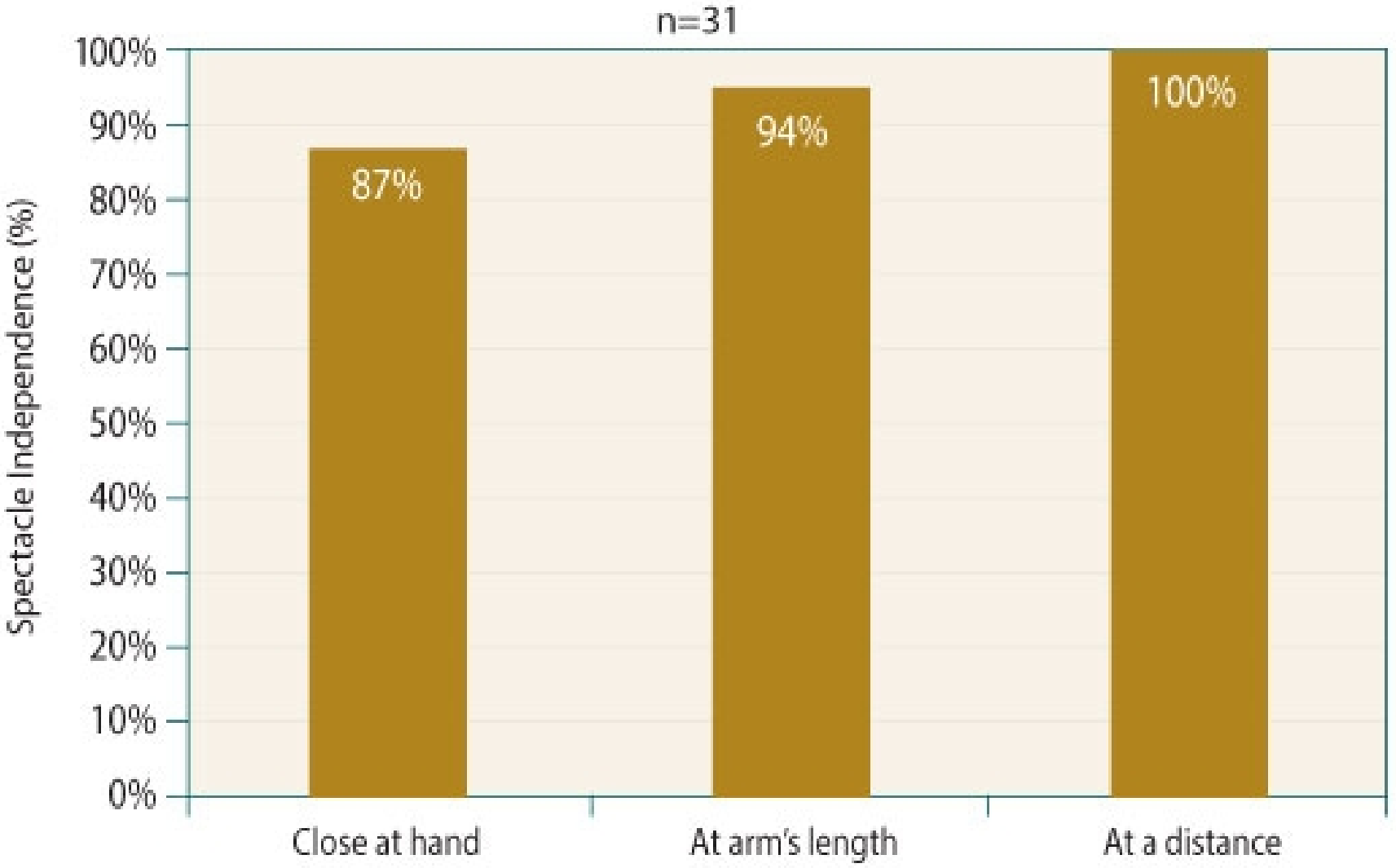
Near & Intermed VA



Rationale for use of Symfony

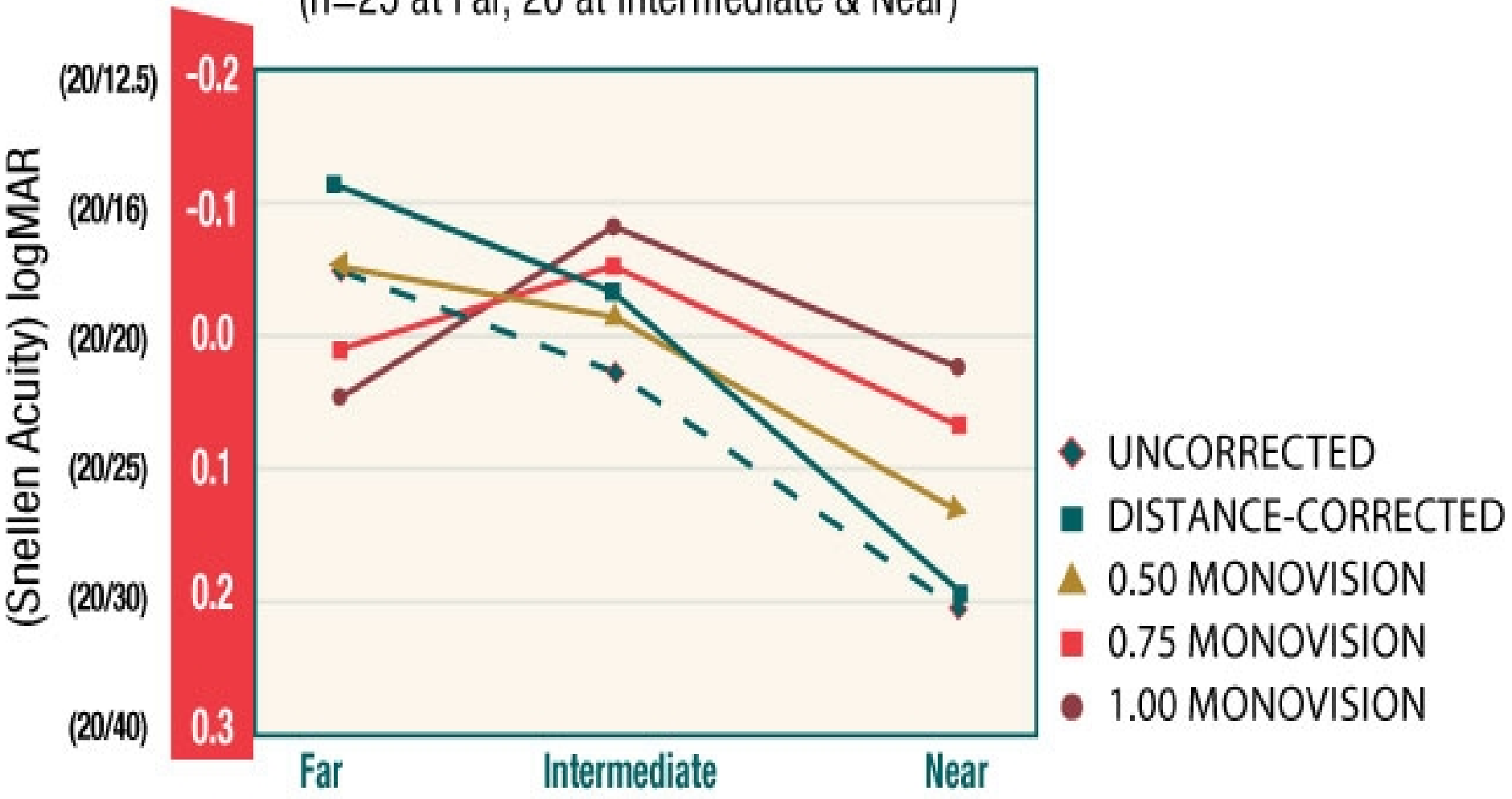
- Presbyopia correction with much reduced problems compared with bifocal & trifocal IOLs
- Aim for plano in 1 eye and -0.75 in the second eye to get excellent reading and distance vision

Percentage of TECNIS® Symfony IOL Patients Who Reported Never Wearing Glasses



TECNIS® Symfony IOL Mean Visual Acuities[2]

(n=25 at Far, 26 at Intermediate & Near)



Laser cataract surgery

- Why femtosecond laser assisted cataract surgery?
  - Precise capsularrehexis
  - Precise corneal incisions
  - Lens is divided into small segments, allowing removal with less or no ultrasonic (phaco) energy
  - May be safer than normal techniques in some situations
  - Precision limbal relaxing incisions possible for smaller astigmatism corrections
  - ‘Blade free’

Ziemer Z8

The first truly mobile refractive cataract femtosecond laser

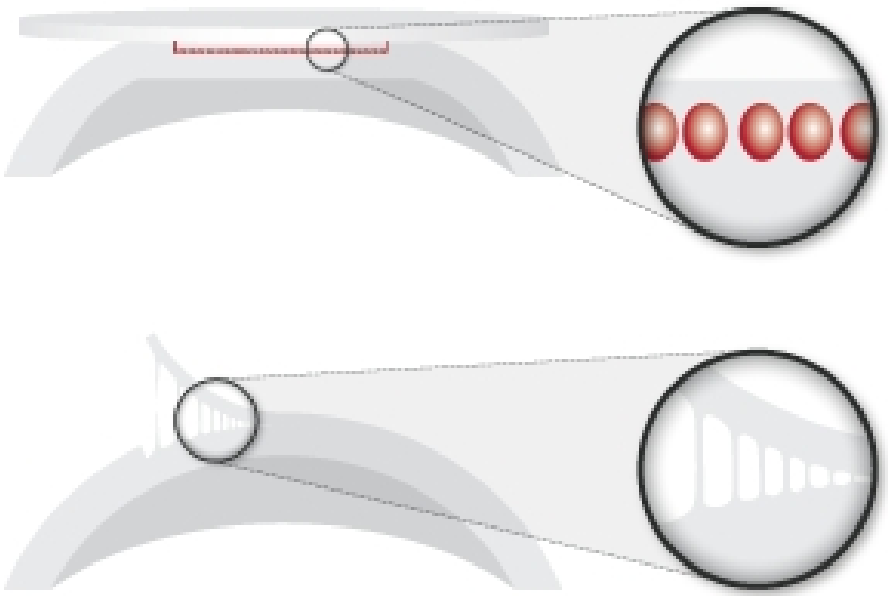
Now CE approved

Our experience

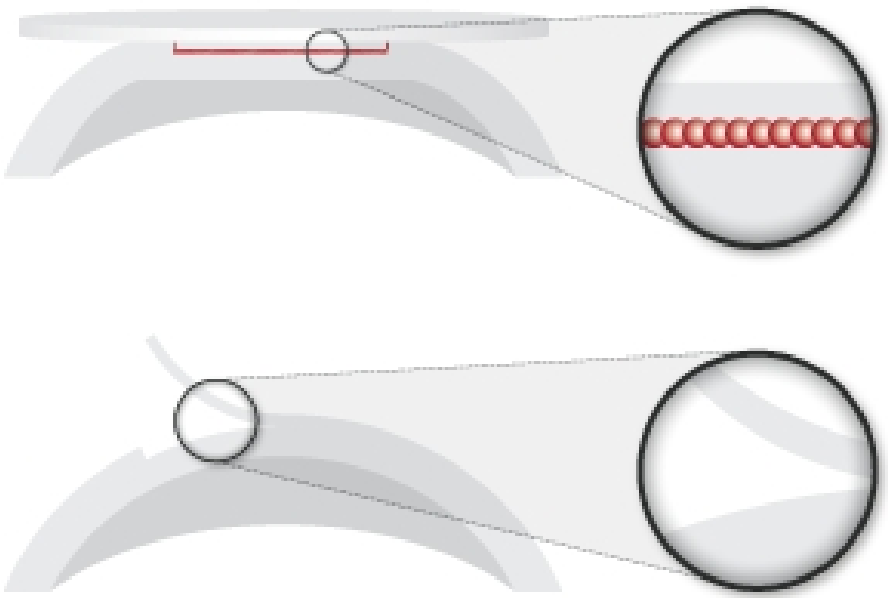
- We use the Ziemer femtosecond laser for LASIK
- New Ziemer Z8 laser combines laser cataract and LASIK flap capabilities
- Integrated OCT to scan anterior segment & lens to automatically derive treatment plan
- Fluid interface – low increase in IOP, no corneal folds

Ziemer Z8

- Operates in megahertz range – all others kilohertz (1000x faster)
- Very short focal length, high pulse repetition rate – little collateral tissue damage cf all other lasers – much less inflammation
- Mobile



Conventional
laser systems



Ziemer's
FEMTO LDV
systems