OPHTHALMIC CONSULTANTS of LONDON

Introduction to Rayner Trifocal Technology

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oclvision

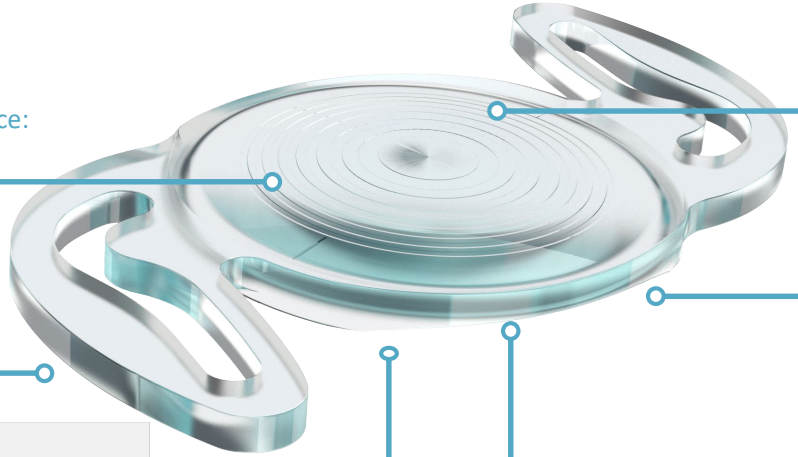
Discussion

- Introduction to Rayner Trifocal technology
- Patient outcomes after bilateral implantation of RayOne Trifocal in 250 eyes
- Preliminary Results of RayOne Trifocal Toric

RayOne Family of Fully Pre-Loaded IOLs:

- Monofocal
  - Aspheric
    - RayOne HYDROPHOBIC ASPHERIC
    - RayOne ASPHERIC
  - Spheric
    - RayOne SPHERIC
  - Toric
    - RayOne TORIC
- Multifocal
  - Trifocal
    - RayOne TRIFOCAL
  - Trifocal Toric
    - RayOne TRIFOCAL TORIC

RayOne Trifocal Toric



Trifocal Diffractive surface:
Anterior

Zero glistenings

Amon-Apple enhanced square edge for minimal PCO (1.7% at 24 months[7])

Based on proven haptic technology for excellent stability[1,2]

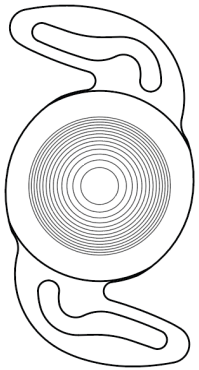
Toric Surface and Orientation marks :
Posterior

Rotational Stability and Centration:
1.83 degrees and 0.08 mm

Model Name:	RayOne Trifocal Toric
Model Number:	RAO613Z
Power Range:	Spherical Equivalent (SE) +6.0 to +30.0 D (increments 0.5 D)
	Cylinder Powers +0.75 D, +1.50D, +2.25D, +3.00D, +3.75D and +4.50

Designed for less pupil dependency

RayOne® Trifocal has fewer rings on the IOL optic surface for **reduced potential visual disturbances and improved night vision.**

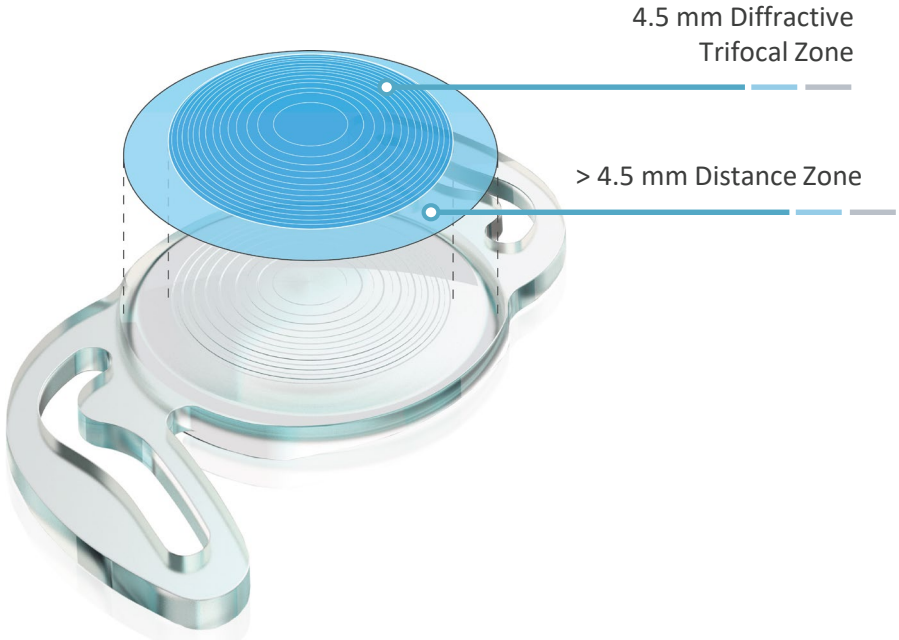


Features:

- 16 diffractive steps / rings
- 4.5 mm diffractive zone
- > 4.5 mm monofocal, distance

Benefits:

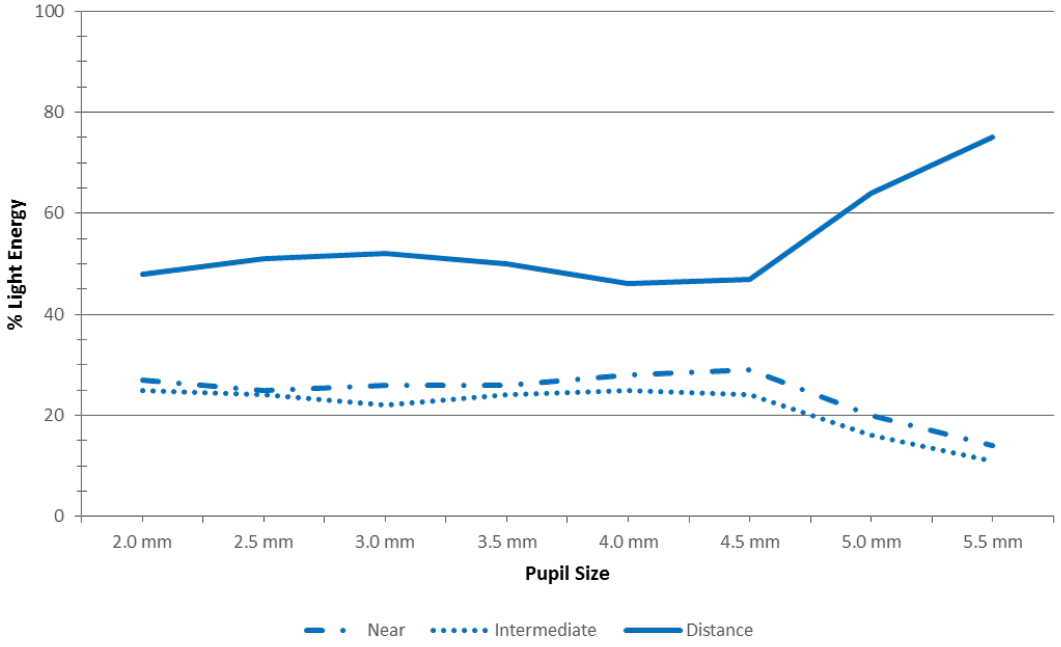
- Reduces visual disturbances
- Developed to be less dependent on pupil size or lighting conditions
- Improves distance vision in mesopic condition



Exceptional Light Usage

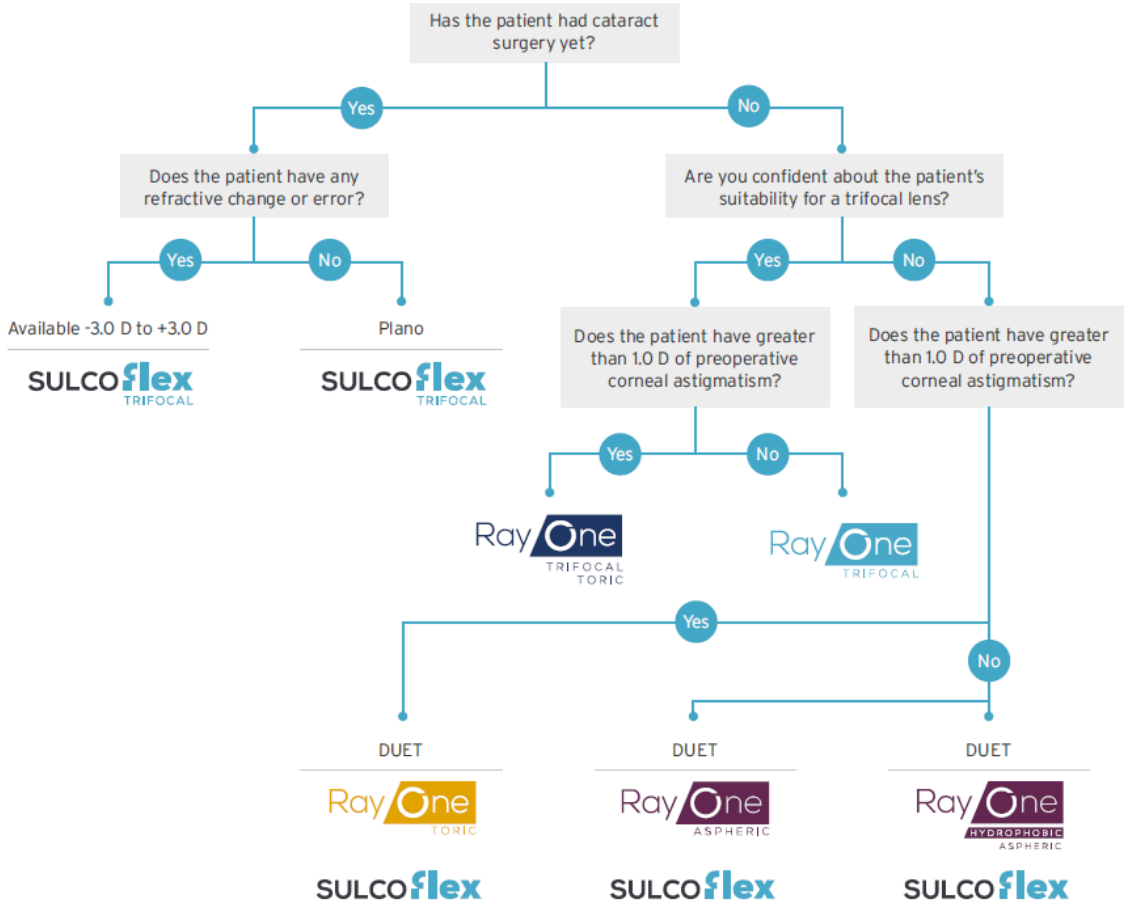
Patented diffractive step technology reduces **light loss to only 11%**

- It transmits 89% of light to the retina with a pupil of 3 mm
- Allocates half the light for distance
- Divides the rest between near and intermediate vision
- Light Energy Split at 3.0 mm pupil
  - **52% Distance**
  - **22% Intermediate**
  - **26% Near**



SULCOflex
TRIFOCAL

Trifocal IOL solutions for more patients:



RayOne Trifocal- Results & Summary

- **Distance visual acuity**

Snellen	LogMAR	No. of patients	Cumulative %
6/4	-0.18	6	43 %
6/5	-0.08	8	78 %
6/6	0.00	1	83 %
6/7.5	0.10	1	89 %
6/9	0.18	2	100 %

Near visual acuity

Roman chart	LogMAR	No. of patients	Cumulative %
N4	0.10	5	33 %
N5	0.20	9	93 %
N6	0.30	1	100 %

Post-op refraction

- 89 % of eyes within +/-0.5D
- 100 % of eyes within +/-0.75D (spherical equivalent)

Issues

- 3 patients developed Posterior capsular opacification
- All patients reported night-time haloes although none complained of this phenomenon (i.e. non disabling, mild)

Summary

- High percentage of patient achieving 6/6 distance vision and N5 reading vision unaided

Post-Op observations

- Vision tended to improve between one week and one month of follow up.
- Often patients accepted a refraction of -0.25 to -0.50 in the first postoperative week which tended to emetropia as the the capsule fibroses
- All patient reported halos at night but none of them complained of this phenomenon i.e. they were mild
- Neuroadaptation very fast and patients very happy at one week follow up
- Forgiving lens with patients tolerating small amounts of refractive and cylindrical error

Post-Op observations

- One patient has required a laser enhancement
- Two patients (RH) had a large angle kappa and so centration was not ideal but again not complaining i.e. forgiving of angle kappa
- One patient with zonulopathy – CTR used. One eye has 1mm superior IOL decentration and symptomatic of dysphotopsia at night
- PCO rate is low (less than 5%)
- High percentage of patients achieving better than 6/6 vision and N4 for reading unaided

Preliminary outcomes from RayOne Trifocal Toric

- Multicentre study across 5 sites in Japan, UK and Germany
- Bilateral implantation in 10 patients

- Measurements:
  - Post-Operative Subjective Refraction of Sphere and corrected Cyl
  - Monocular and binocular UDVA, UIVA (70 cm) and UNVA (35 cm)
  - Patient Satisfaction
  - Surgeon feedback using RayOne questionnaire

Pilot Case Series with a diffractive trifocal toric IOL

Multicentre evaluation assessing Visual acuity, subjective refraction and cylinder reduction and patient satisfaction after bilaterally implanted RayOne Trifocal Toric RAO613Z IOL.

Prospective pilot study in cataract patients

- Multicentre, 5 sites across Germany, UK and Japan
- Multi-surgeon 5 surgeons
- Total of 20 eyes (10 patients)

First Results and Visual Performance

20 eyes (10 patients) underwent bilateral RayOne Trifocal Toric implantation

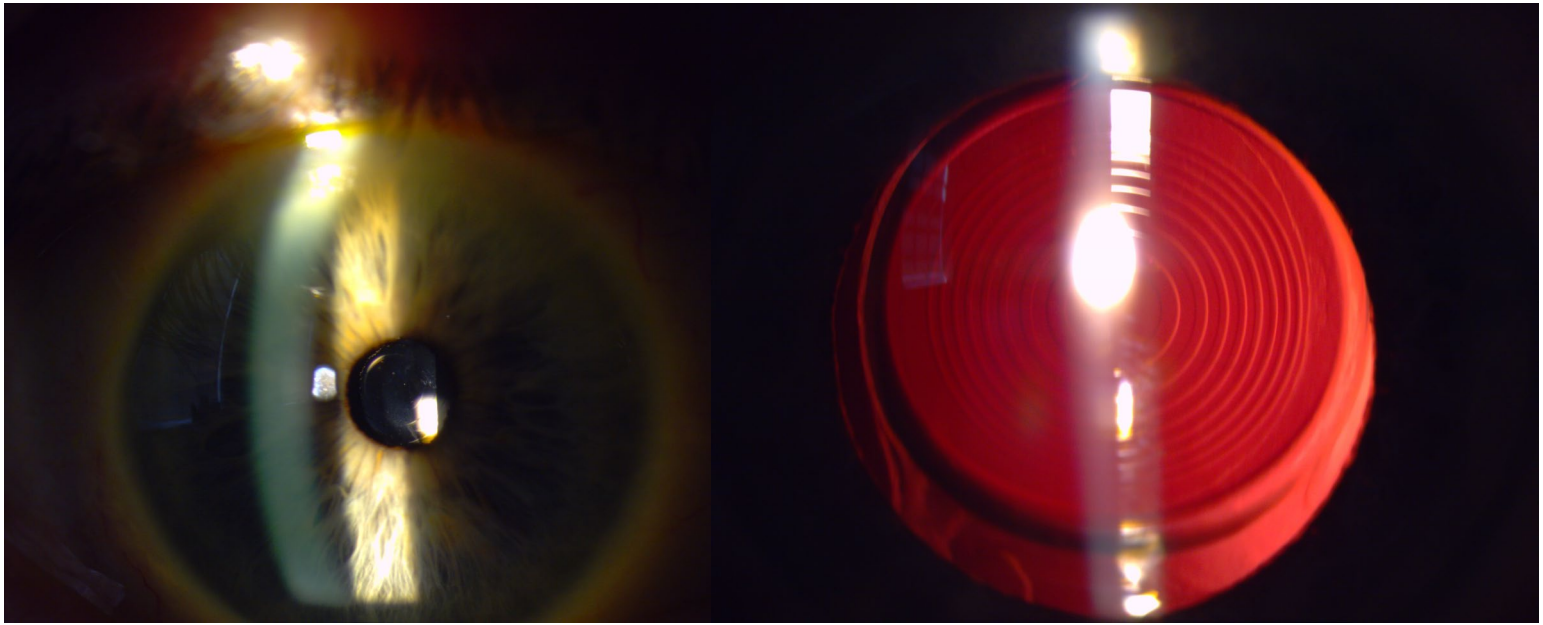
End Measures:

- Post-Operative Subjective Refraction of Sphere and corrected Cyl
- Monocular and binocular uncorrected distance visual acuity, intermediate visual acuity (70 cm) and near visual acuity (35 cm)
- Patient Satisfaction
- Surgeon feedback using RayOne questionnaire

Inclusion Criteria:

- Age-related cataract
- patients presenting more than 0.75D of preoperative Corneal astigmatism
- Normal findings in the medical history and physical examination unless the investigator considers an abnormality to be clinically irrelevant.
- Normal macular analysis and thickness with Macular OCT imaging
- Patient willing multifocal implantation and with realistic expectations.

RayOne Trifocal Toric – Centration



RESULTS – Subjective refraction

- All eyes were within ±0.50 D of emmetropia and 57% of eyes were within ±0.25 D
- All eyes were within 0.75 D Cyl correction and 71% of eyes within 0.50 D.

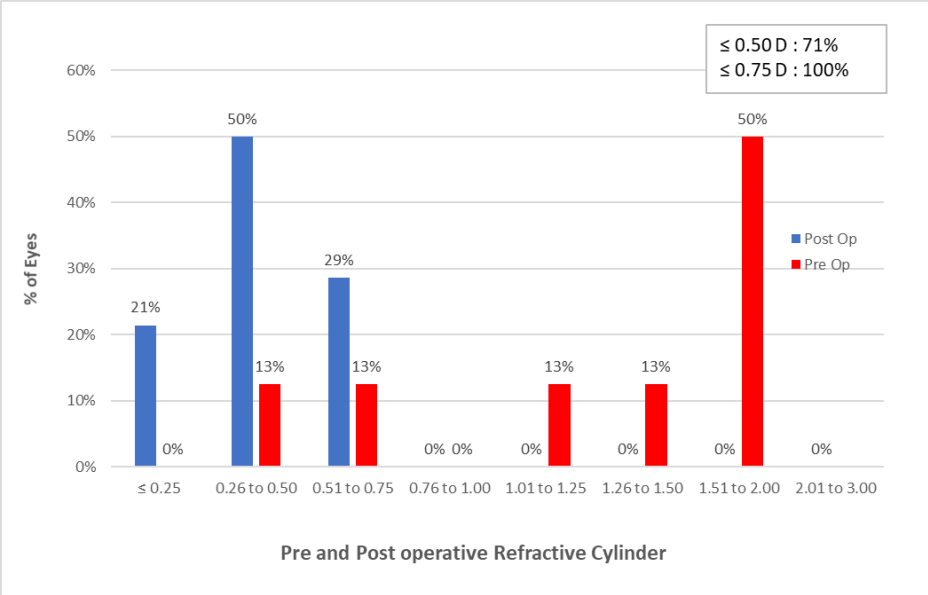


TABLE 1
Preoperative and Postoperative Characteristics

Characteristic	Preoperative	Postoperative	
Age at time of surgery (y)		**IOL Plane Cyl**	
Mean ± SD	66 ± 7.65	0.75 D	35%
Range	52 to 78	1.5 D	35%
		2.25 D	18%
Sex		3.0 D	12%
Female	70%	3.75 D	0%
Male	30%	4.5 D	0%
Sphere (D)			
Mean ± SD	1.06 ± 3.00	0.00 ± 0.20	
Range	-5.12 to 4.25	-0.25 to 0.50	
Cylinder (D)			
Mean ± SD	-1.44 ± 0.94	-0.41 ± 0.27	
Range	-2.75 to -0.50	-0.75 to 0.00	
Spherical Equivalent (D)			
Mean ± SD	2.73 ± 3.31	0.21 ± 0.23	
Range	-6.50 to 3.38	-0.50 to 0.25	

D= diopters, SD= standard deviation. The RayOne Trifocal Toric 613Z intraocular lens is manufactured by Rayner, Worthing, United Kingdom.

RESULTS – Visual Acuity

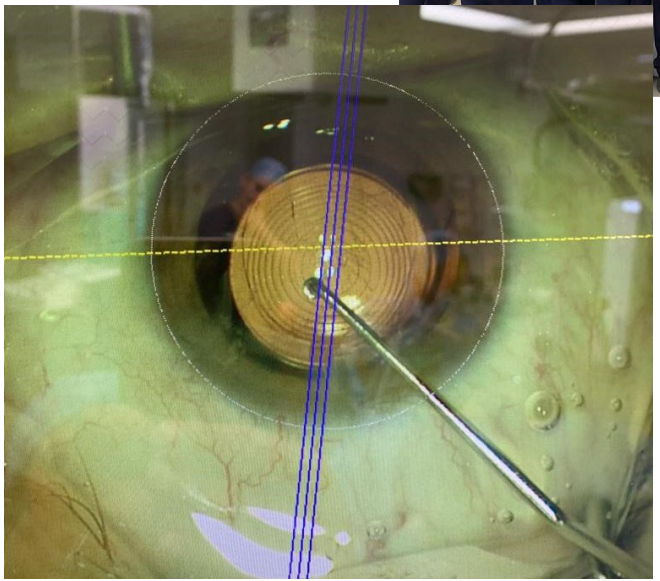
- 90% of patients achieved Monocular and Binocular UDVA, UIVA and UNVA of 0.1 LogMAR or better.

TABLE 2

Monocular and binocular logMAR distance visual acuities

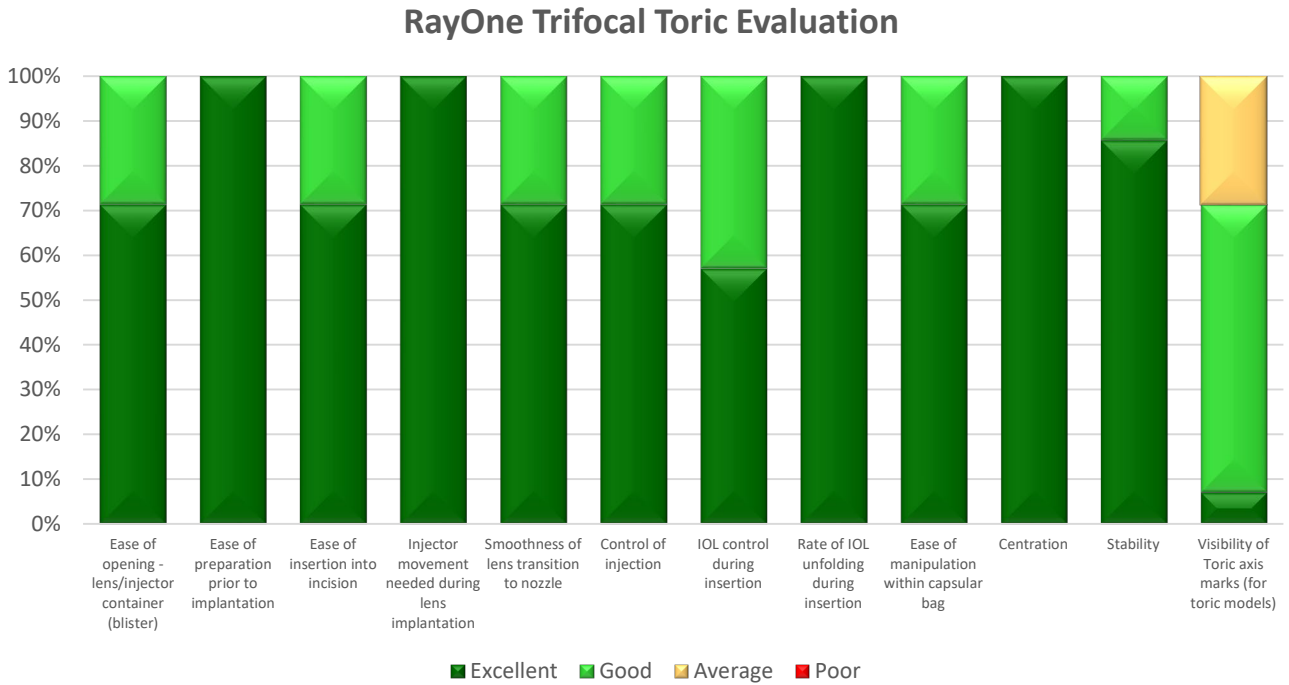
Visual Acuity	Monocular	Binocular
UDVA		
Mean ± SD	0.04 ± 0.10	0.00 ± 0.09
Range	-0.10 to 0.30	-0.10 to 0.20
UIVA		
Mean ± SD	0.01 ± 0.05	-0.03 ± 0.05
Range	-0.10 to 0.10	-0.10 to 0.10
UNVA		
Mean ± SD	0.09 ± 0.12	0.05 ± 0.05
Range	-0.10 to 0.20	-0.10 to 0.18

D= diopters, SD= standard deviation, UDVA= uncorrected distance visual acuity, UIVA= uncorrected intermediate visual acuity, UNVA= uncorrected near visual acuity. The RayOne Trifocal Toric 613Z intraocular lens is manufactured by Rayner ,Worthing, United Kingdom.



RESULTS – Surgeon satisfaction

- High surgeon satisfaction with usability of injector system
- The incision size ranged from 1.9 to 2.4mm and all surgeries were performed into the capsular bag.
- All surgeons would use RayOne Trifocal Toric again



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Questions