Hanita Lenses

FR INTENSITY

INTENSITY| ADVANCED FULLRANGE OPTICS

Technology and initial clinical experience

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ISRAEL

SEE beyond with FULLRANGE LENSES

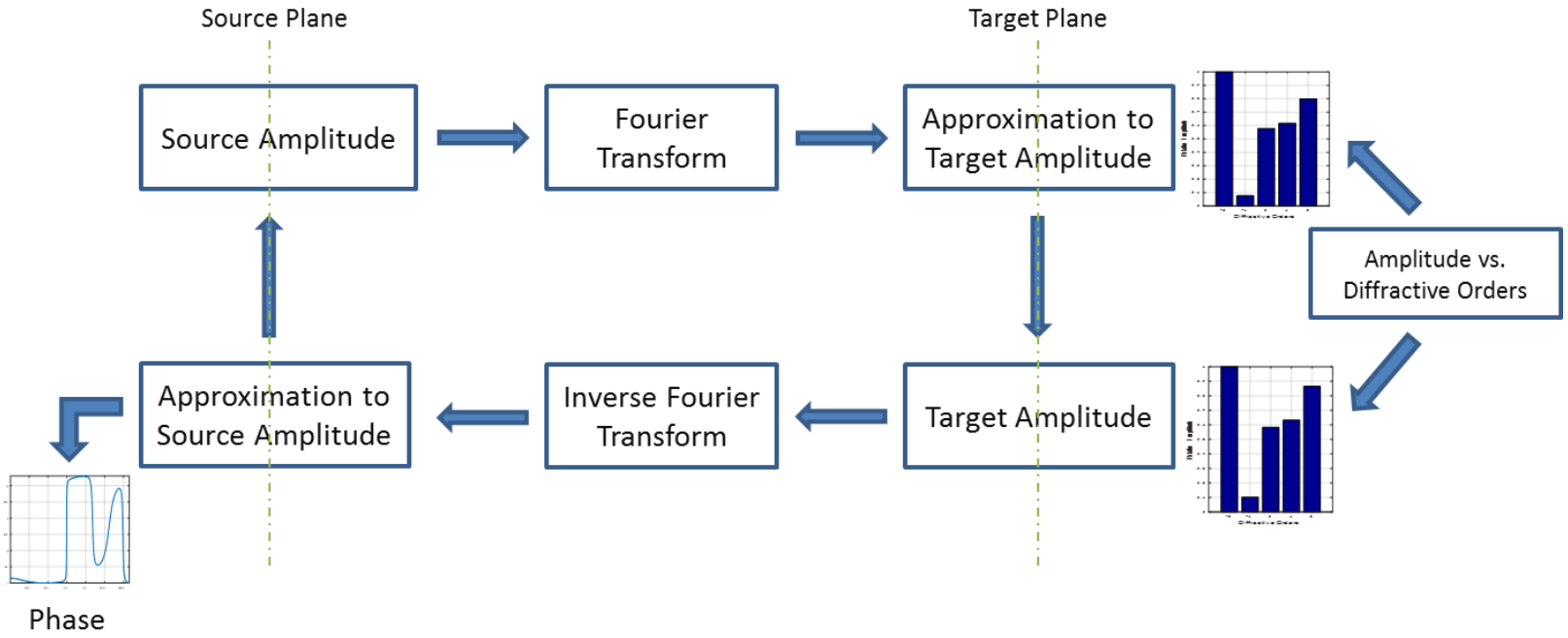
INTRODUCTION

- The FR INTENSITY is a part of the FullRange family of premium products.
- The lens is designed using a unique algorithm Gerchberg–Saxton algorithm along with Hanita merit function (GSH) to optimize diffractive optics.
- The GSH was implemented in the advanced Arizona eye model used in all Hanita Lenses premium lenses.

INTRODUCTION

- Optimization in the GSH was aimed to maximize light intensity utilization in order to get clear vision throughout the range of functional vision between 40 cm to infinity.

INTRODUCTION



LENS SPECIFICATION

Technology/Design	**Intensity optimized GSH algorithm**
Diffractive area	5.2 mm
Geometry	posterior surface: Aspheric –Diffractive Anterior surface: Spheric
Optic type	Zone pupil optimized lens
Refractive index	1.46
Spherical Aberration	-0.13µ
Material	25% Hydrophilic Acrylic
Lens Color	Natural Yellow Violet Filter

Lens Foci

Focus	Addition @ IOL plane	Addition @ spectacle plane	Distance [meter]
Far	0	∞	∞
Far Intensifier	0.9 D	0.75 D	1.33 m
Intermediate	1.5 D	1.25 D	0.80 m
Near intensifier	2 D	1.67 D	0.60 m
Near	3 D	2.50 D	0.40 m

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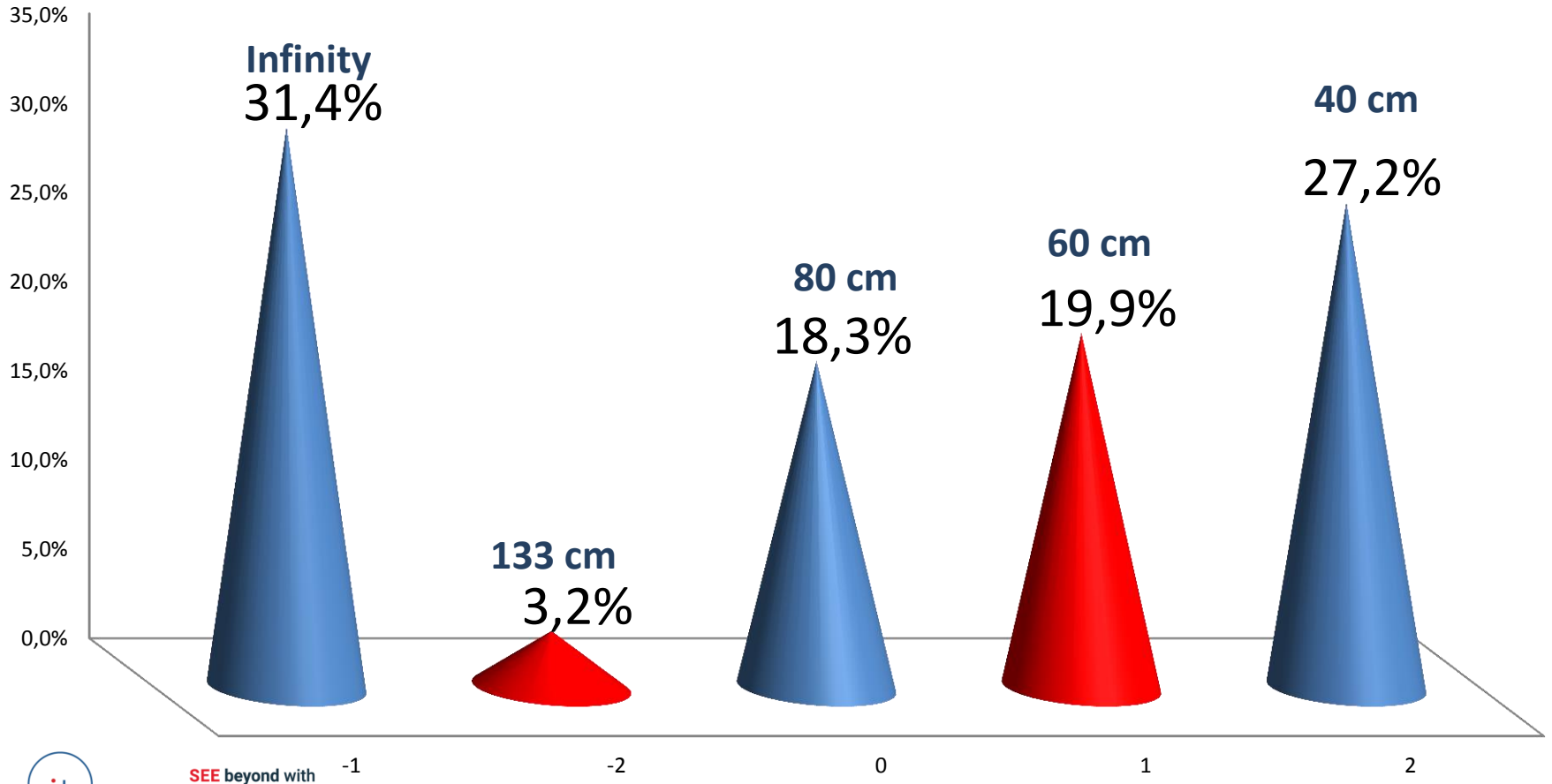
Light Intensity Distribution



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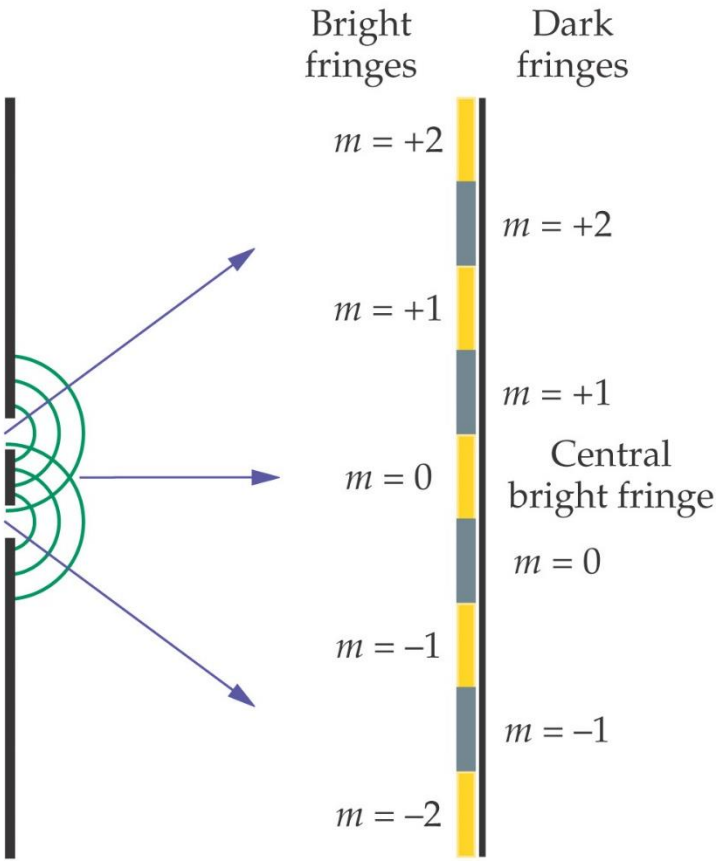
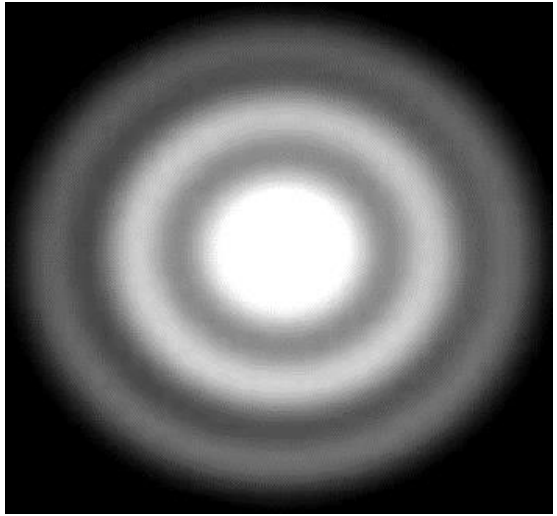
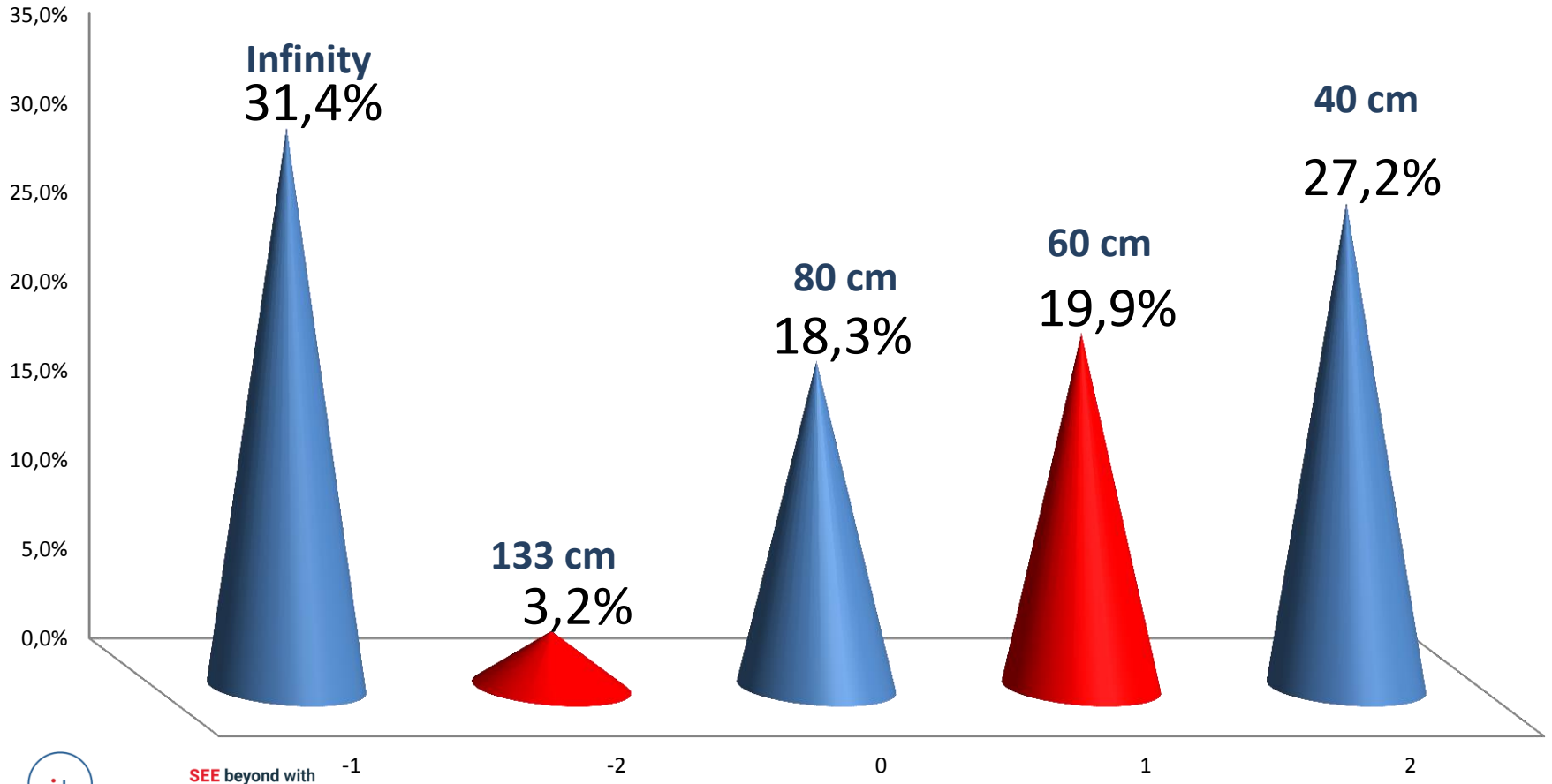




Light Intensity Distribution



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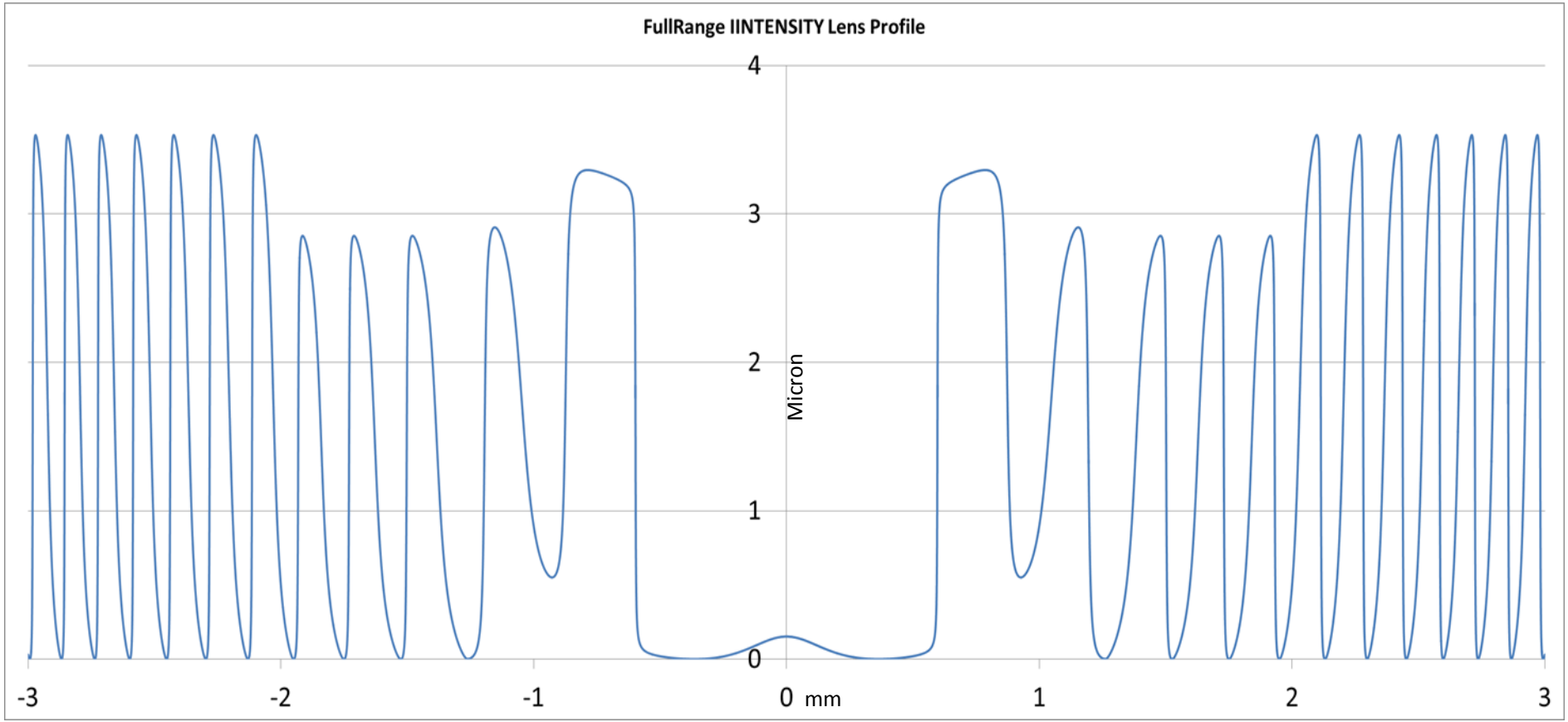

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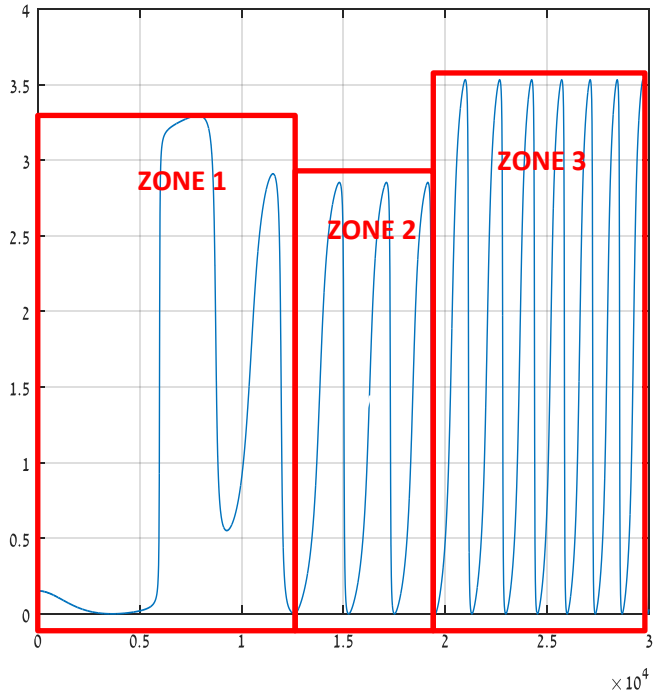
EYE PUPIL APERTURE OPTIMIZATION

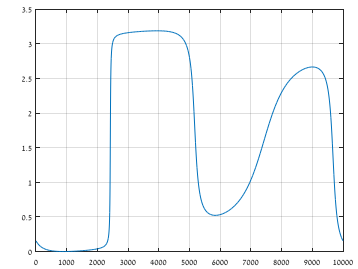


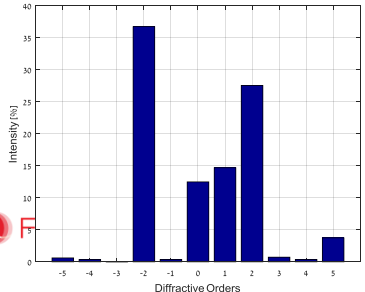
- All zones are optimized by GSH
- Zone smooth shapes allow higher efficiency in desired target intensity
- Multiple areas allow better performance for different eye pupil apertures
- Higher MTF at Far Vision for large Eye Pupil

DIFFERENCE BETWEEN ZONES

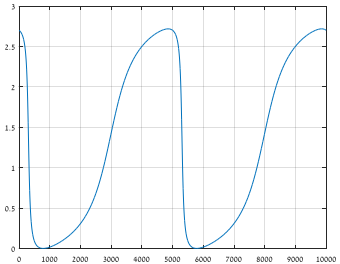
The difference between zones will modify the intensity distribution at each foci

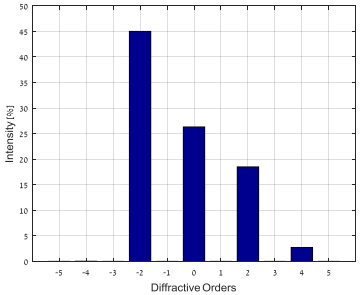
ZONE 1



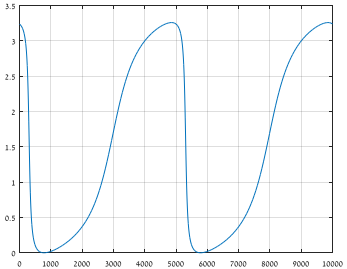


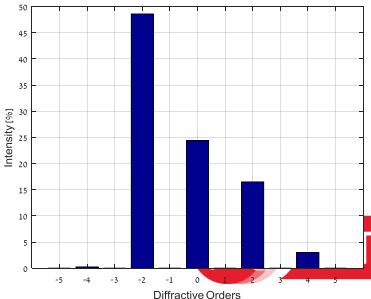
ZONE 2





ZONE 3





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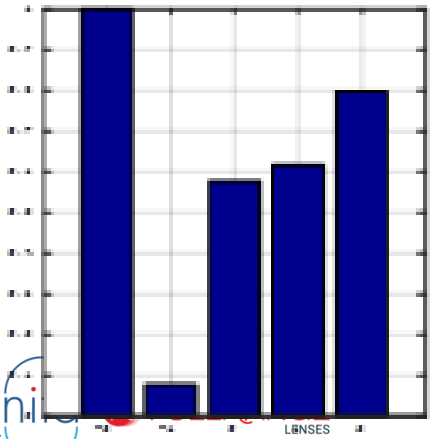
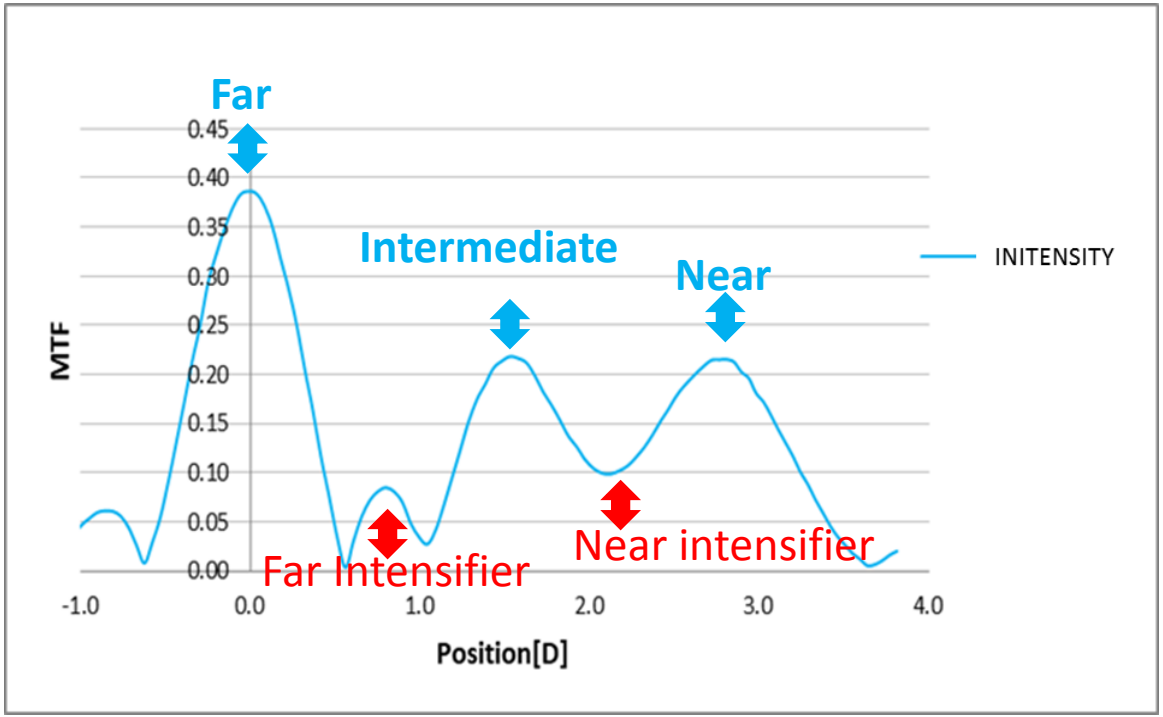
TENSITY

THROUGH FOCUS RESPONSE

Far	Infinity
Far intensifier	+0.90
Intermediate	+1.50
Near intensifier	+2.0
Near	+3.0





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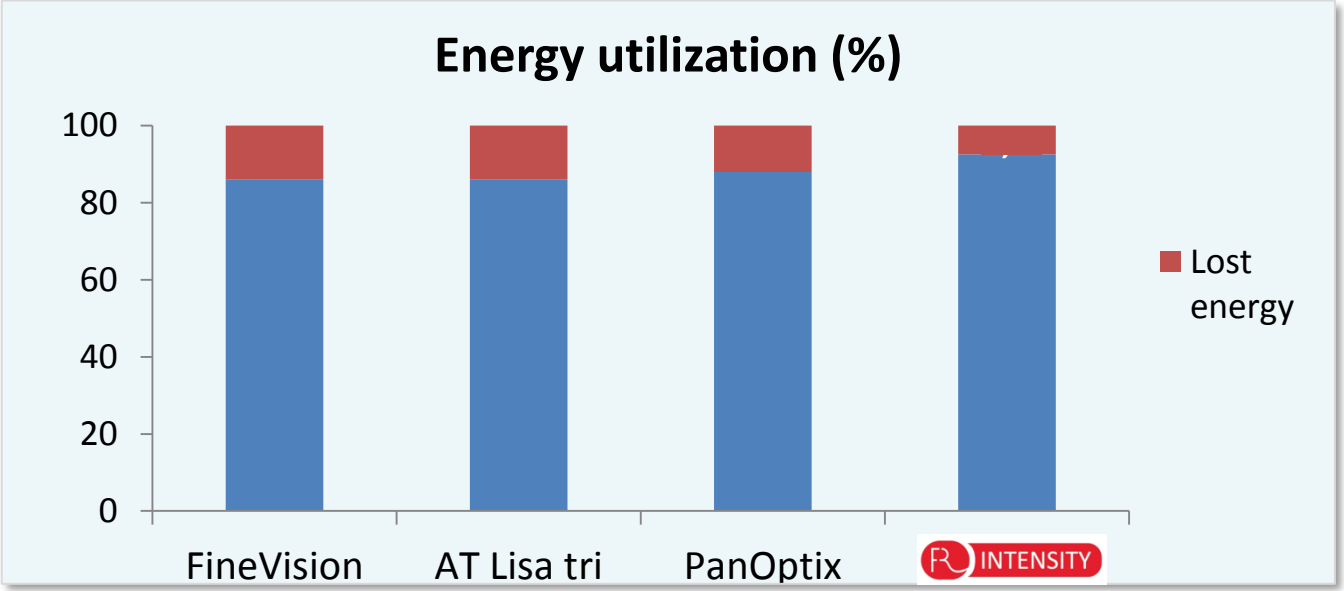
LOWEST ENERGY LOSS

40% decrease in lost light >> decreased visual disturbances



US AIRFORCE TARGET – 2 MM PUPIL

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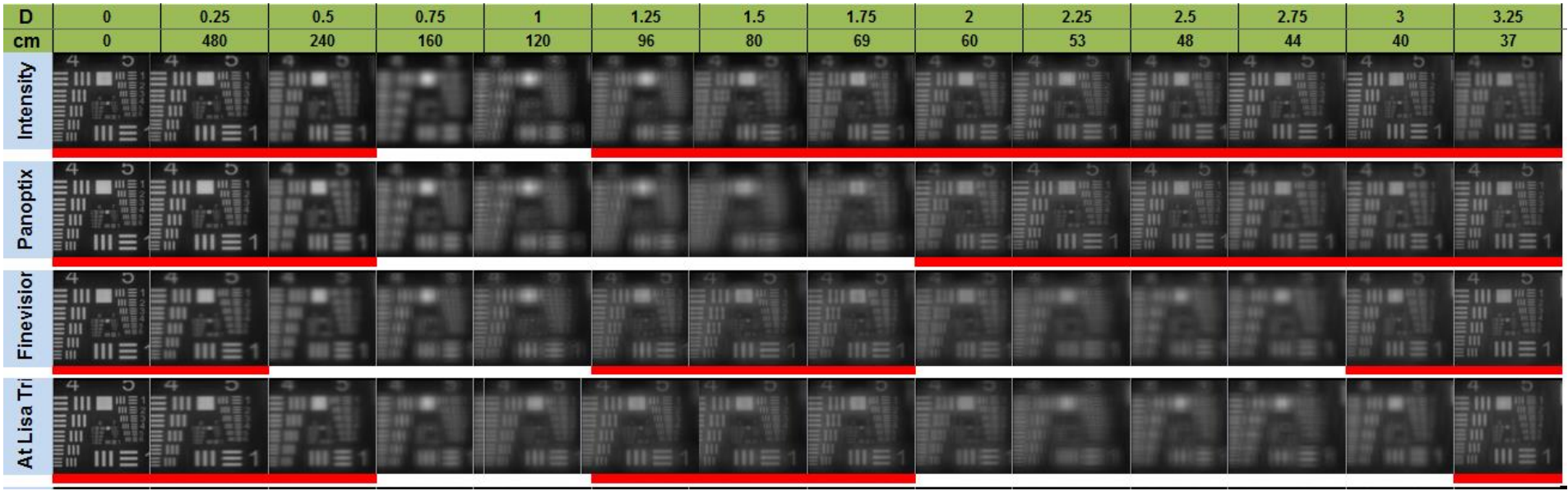
US AIRFORCE TARGET – 3 MM PUPIL



D	0	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.25	2.5	2.75	3	3.25
cm	0	480	240	160	120	96	80	69	60	53	48	44	40	37
Intensity														
Panoptix														
Finevision														
At Lisa Tri														



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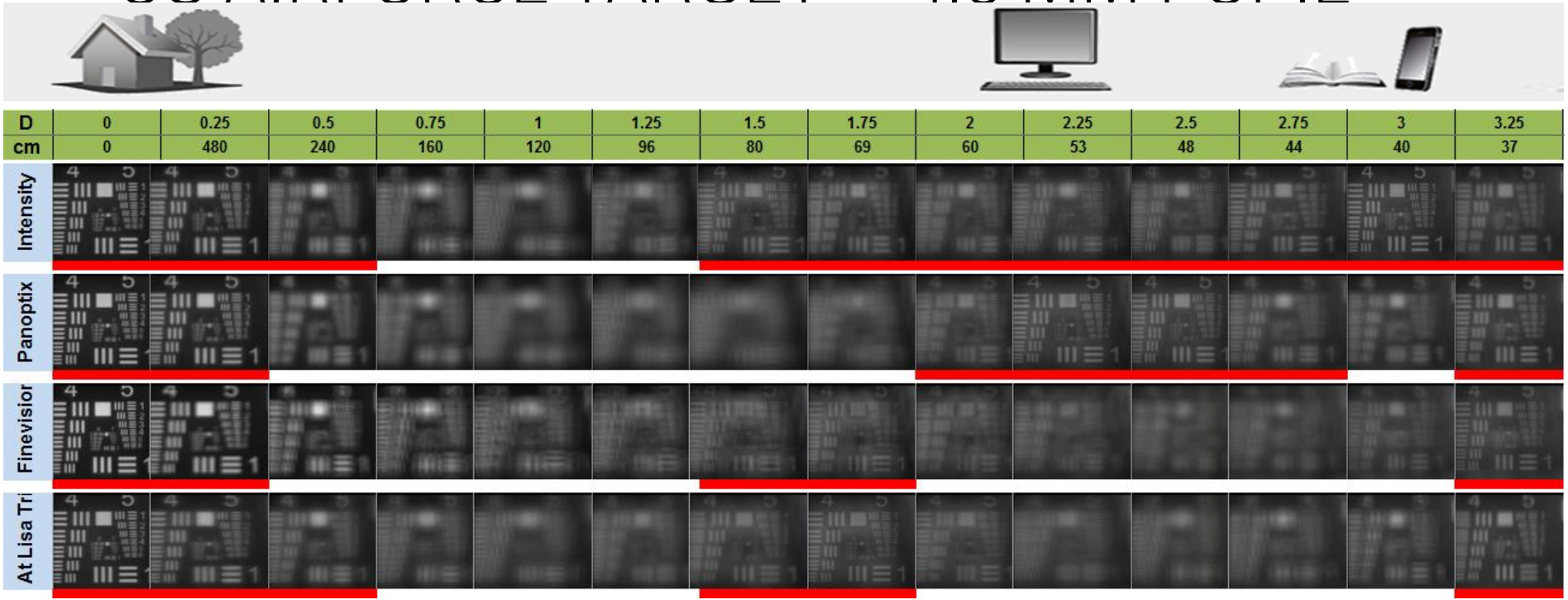
US AIRFORCE TARGET – 4.5 MM PUPIL



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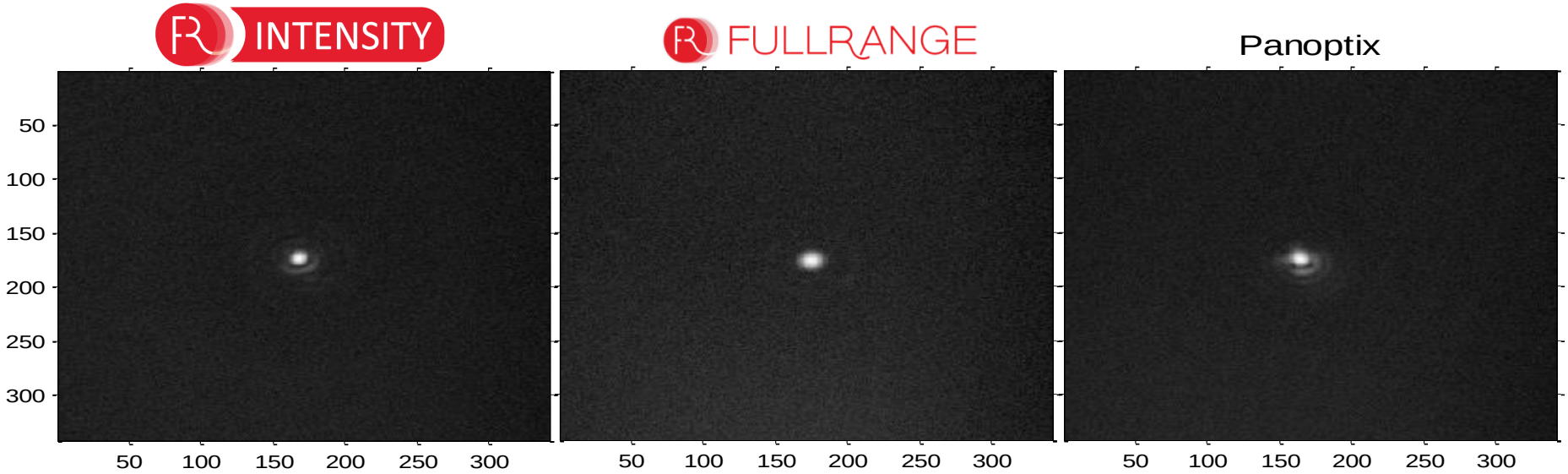
HALO ESTIMATION



- CLINICAL STUDY

FR INTENSITY

OBJECTIVES

PRIMARY AIM:

To evaluate the monocular & binocular visual acuity for far, intermediate and near distance after the INTENSITY implantation.

SECONDARY AIM:

To measure the defocus curve and patient satisfaction.

STUDY DESIGN

This study is a prospective, single arm, single center, open label study.

The aim of this study is to evaluate safety and performance of the INTENSITY IOL.

Population:
Men and women diagnosed with cataract who require cataract surgery procedure that meet the inclusion criteria.

INCLUSION CRITERIA

Age over 45 years and under 75 years.

Patients with bilateral age related cataracts, require bilateral cataract phacoemulsification combined Intraocular Lens implantation;

Patients with axial length of 22-24.5mm.

Normal corneas with less than 0.75D of regular corneal astigmatism.

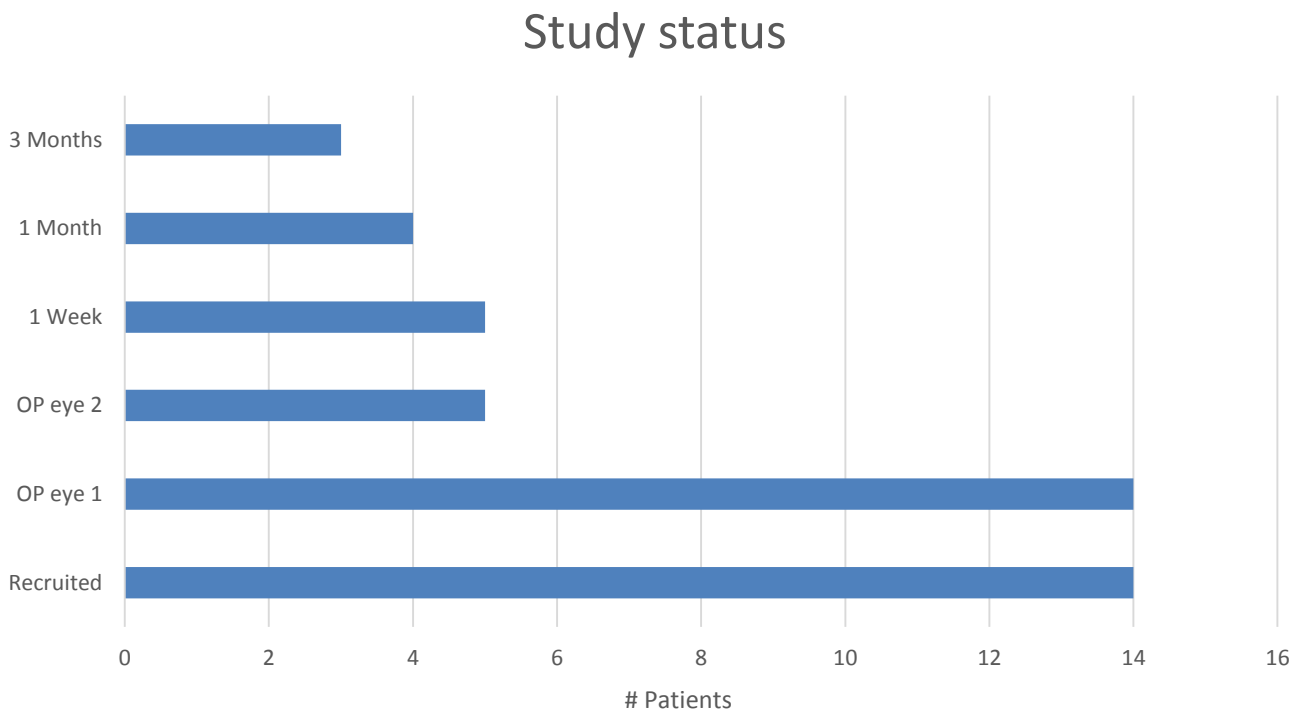
Post-operative best corrected visual acuity projected to be 0.3 logMAR or lower.

Patient motivated for multifocal IOL after screening by surgeon.

Fundus visualization is possible.

Absence of retinal or optic nerve diseases

ENROLLMENT



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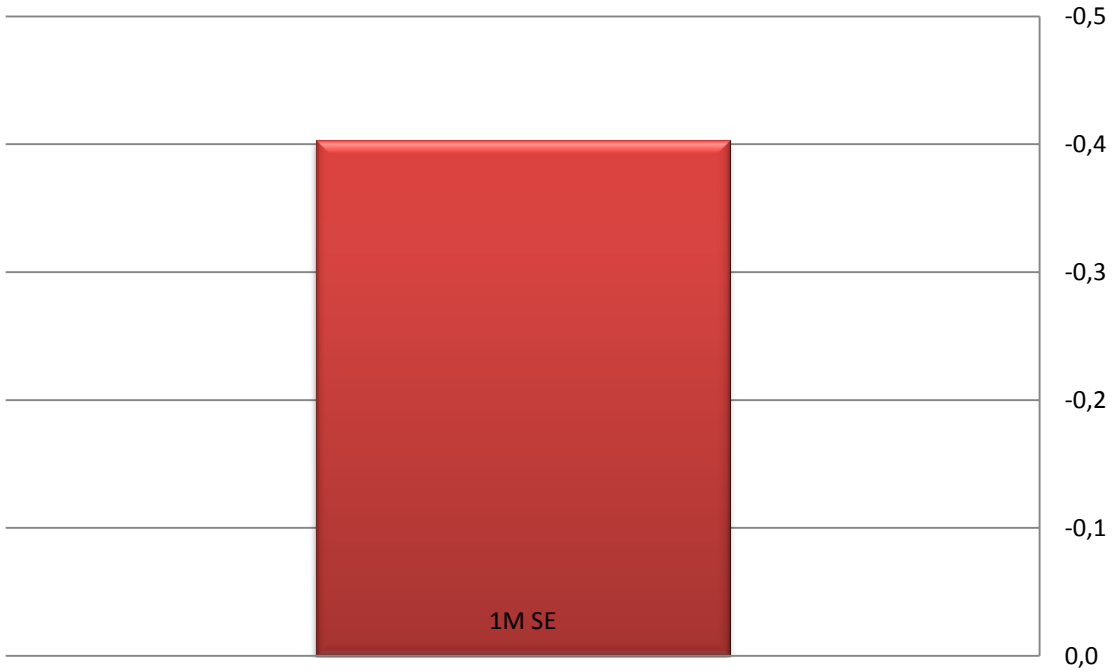
PRE OPERATIVE BIOMETRY &VA

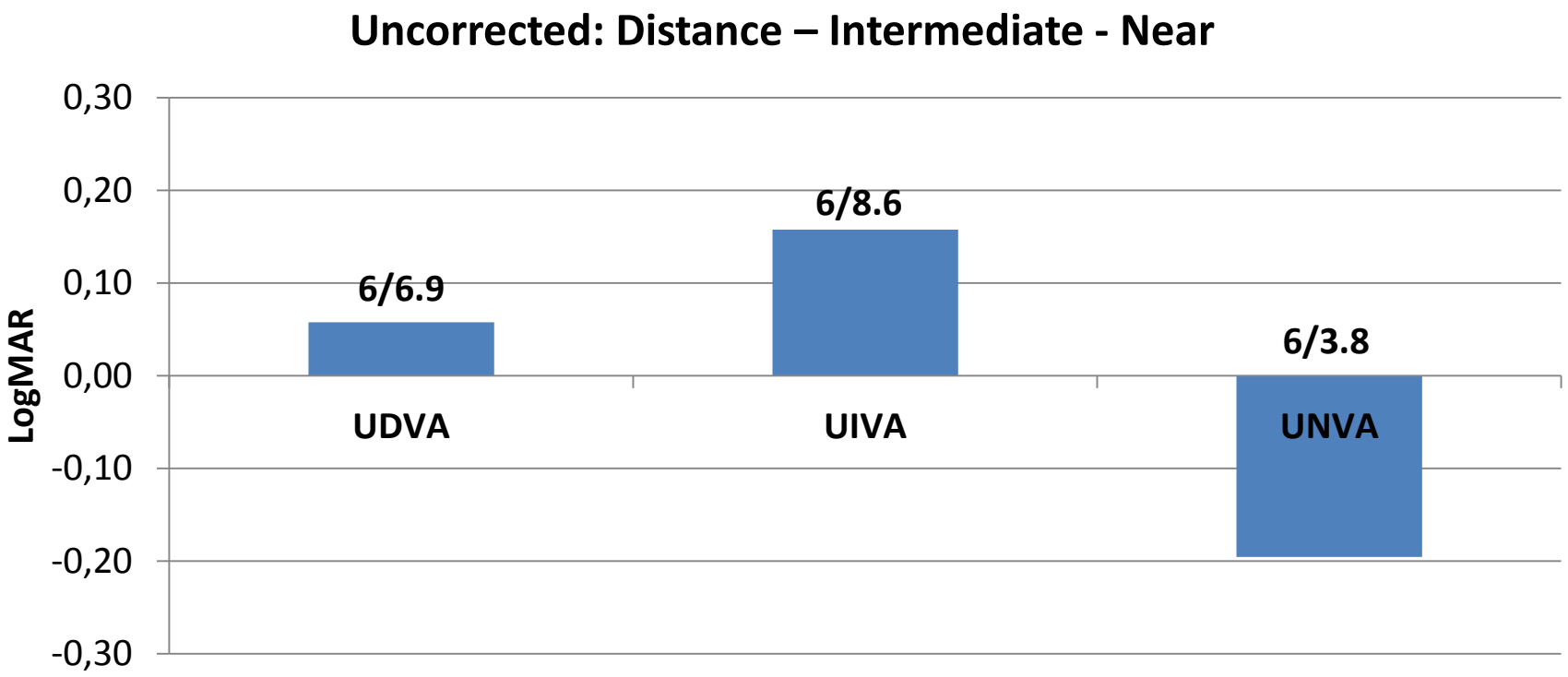
Parameter	Average
SE [D]	-0.26
UDVA [LogMAR]	0.41
CDVA [LogMAR]	0.11
K1 [D]	44.14
K2 [D]	44.63
Cyl [D]	-0.49
AL [mm]	23.14

movie

Spherical Equivalence 1 month post op



VISUAL ACUITY 1 MONTH POST-OP - UNCORRECTED



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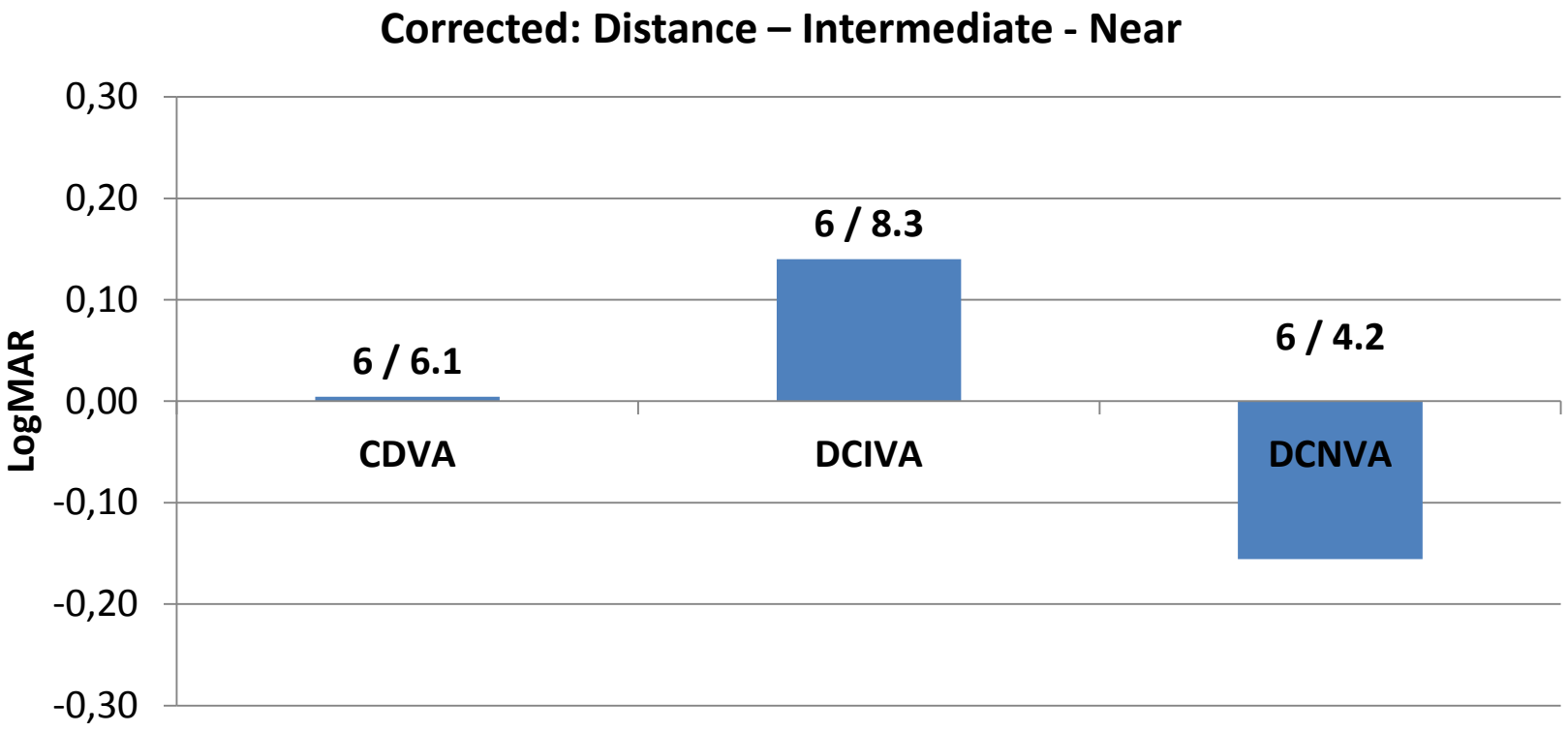
VISUAL ACUITY 1 MONTH POST-OP - CORRECTED



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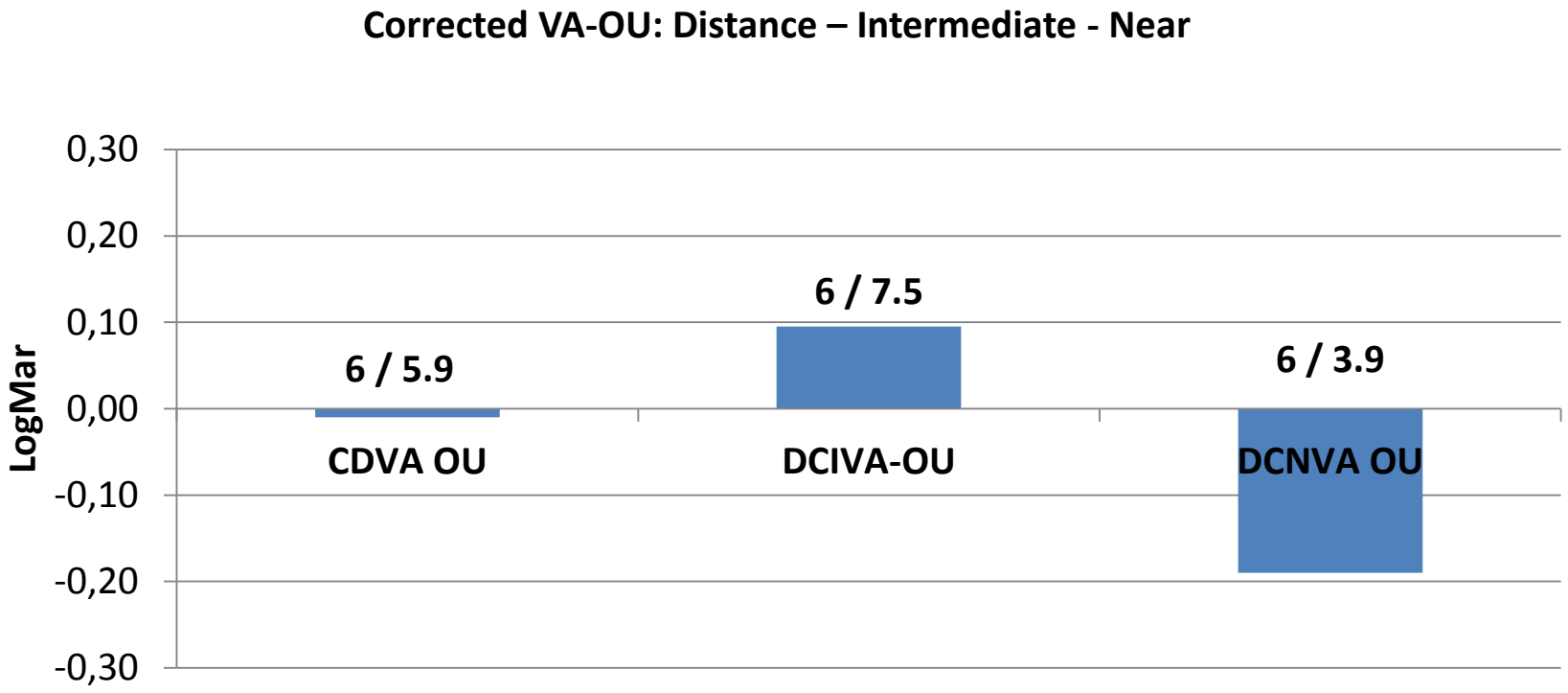
VISUAL ACUITY 1 MONTH POST-OP - CORRECTED BOTH EYES



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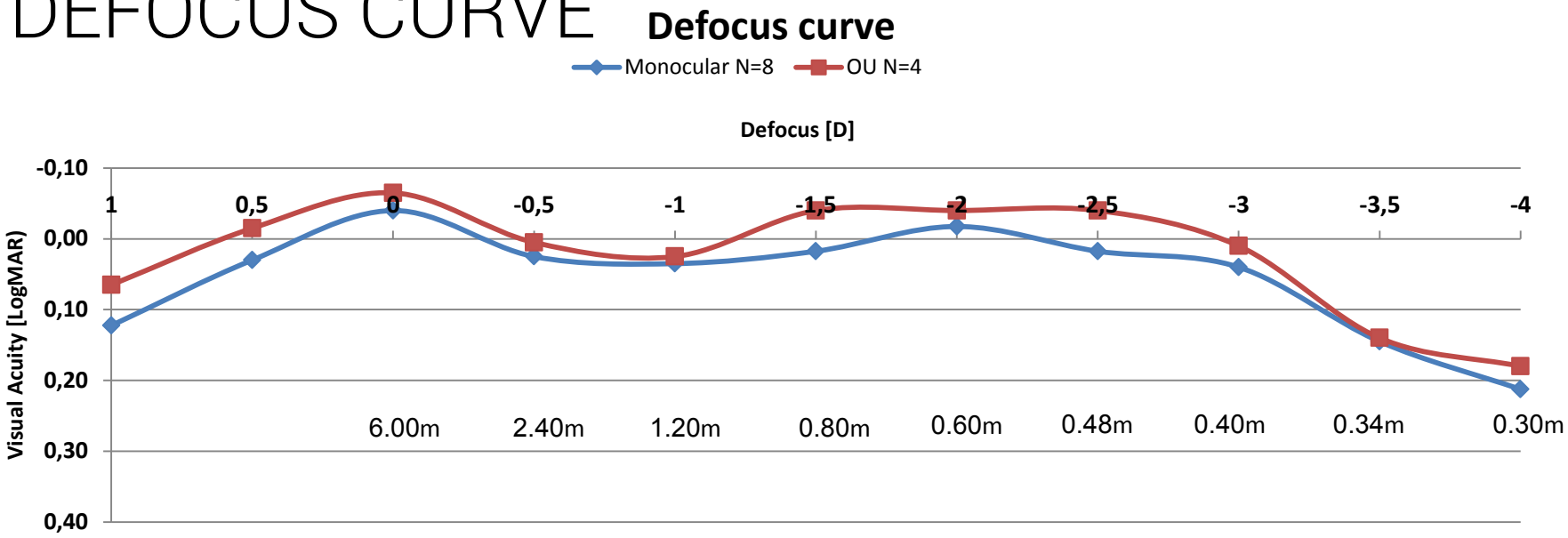
DEFOCUS CURVE



Monocular:	LogMAR	Snell
Min VA range +0.5 to -3	0.12	6/7.9
Max VA range +0.5 to -3	-0.1	6/4.8

OU:	LogMAR	Snell
Min VA range +0.5 to -3	0.1	6/7.6
Max VA range +0.5 to -3	-0.1	6/4.8

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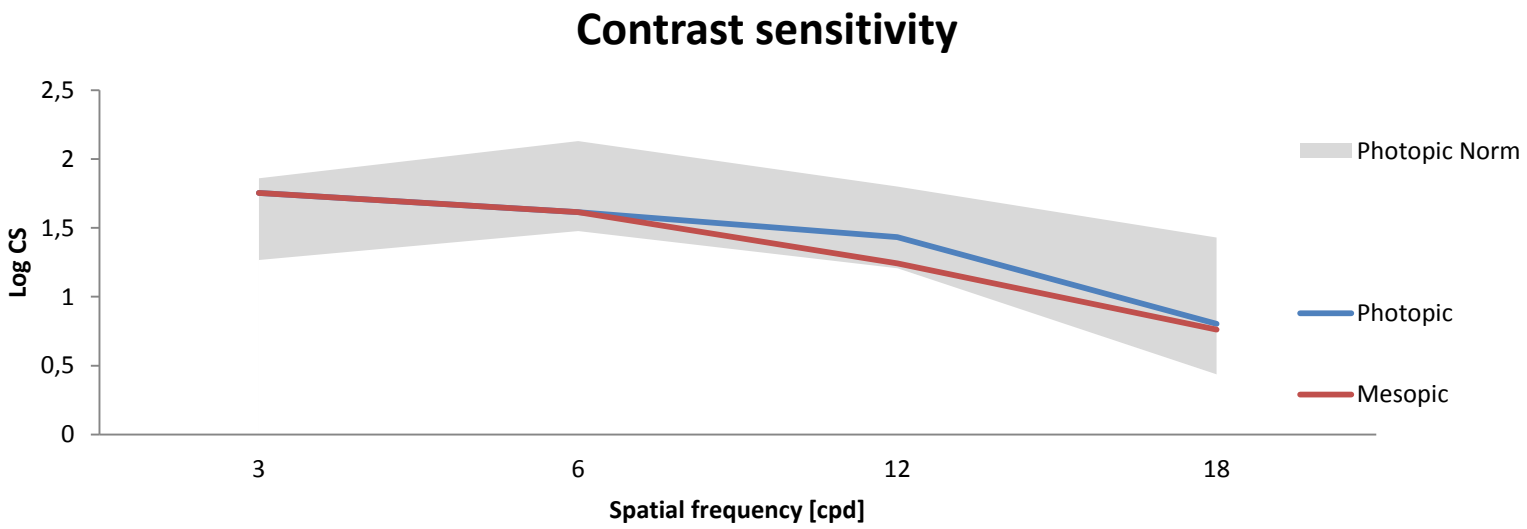
CONTRAST SENSITIVITY



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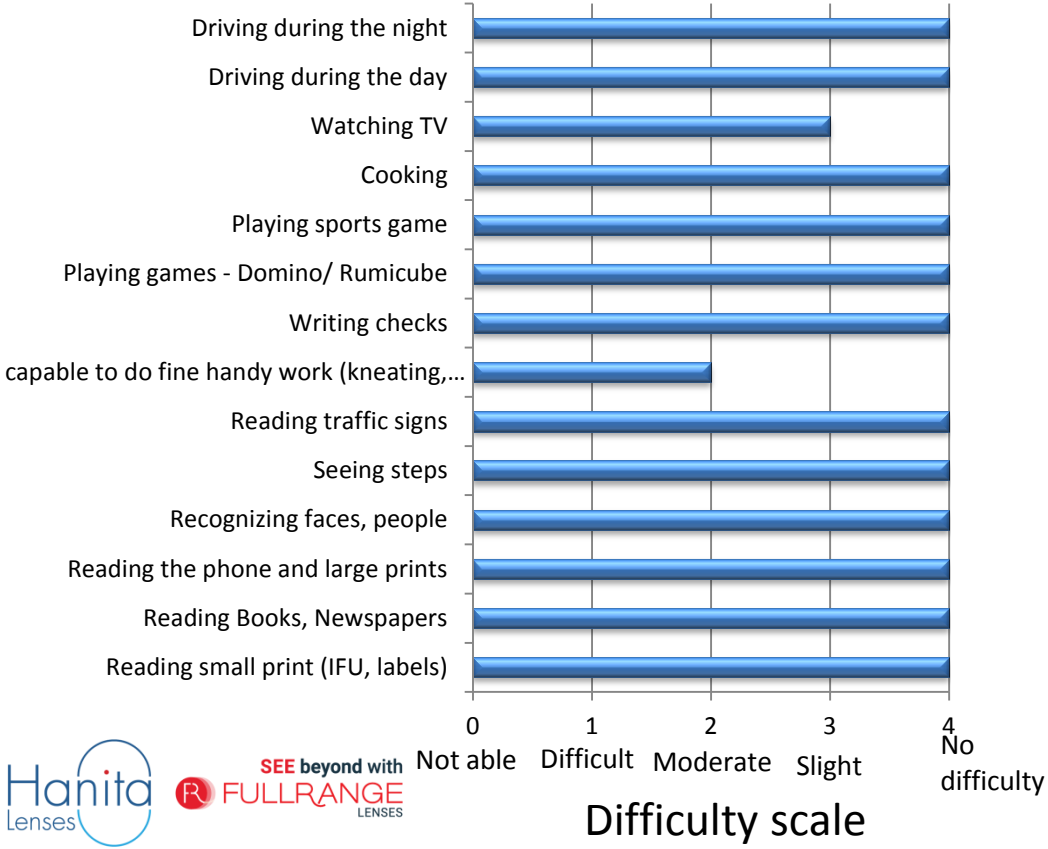
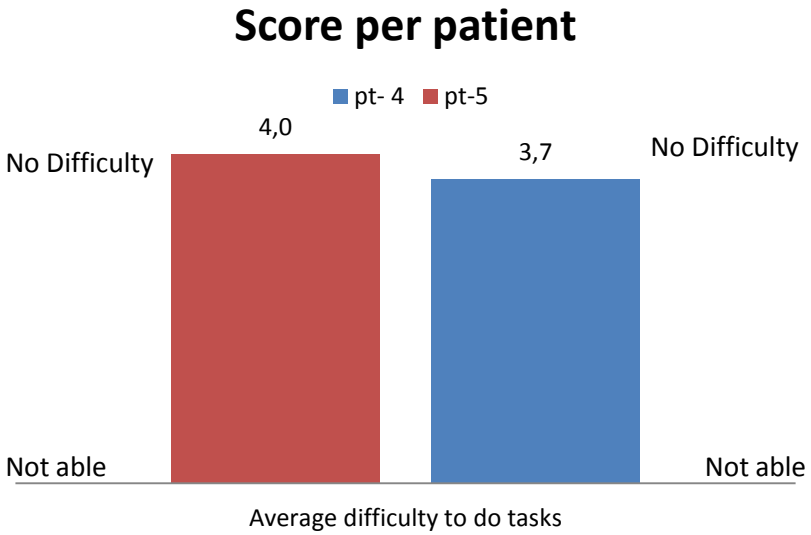
FUNCTION AND SATISFACTION

Difficulty to do tasks; 3 months N=2





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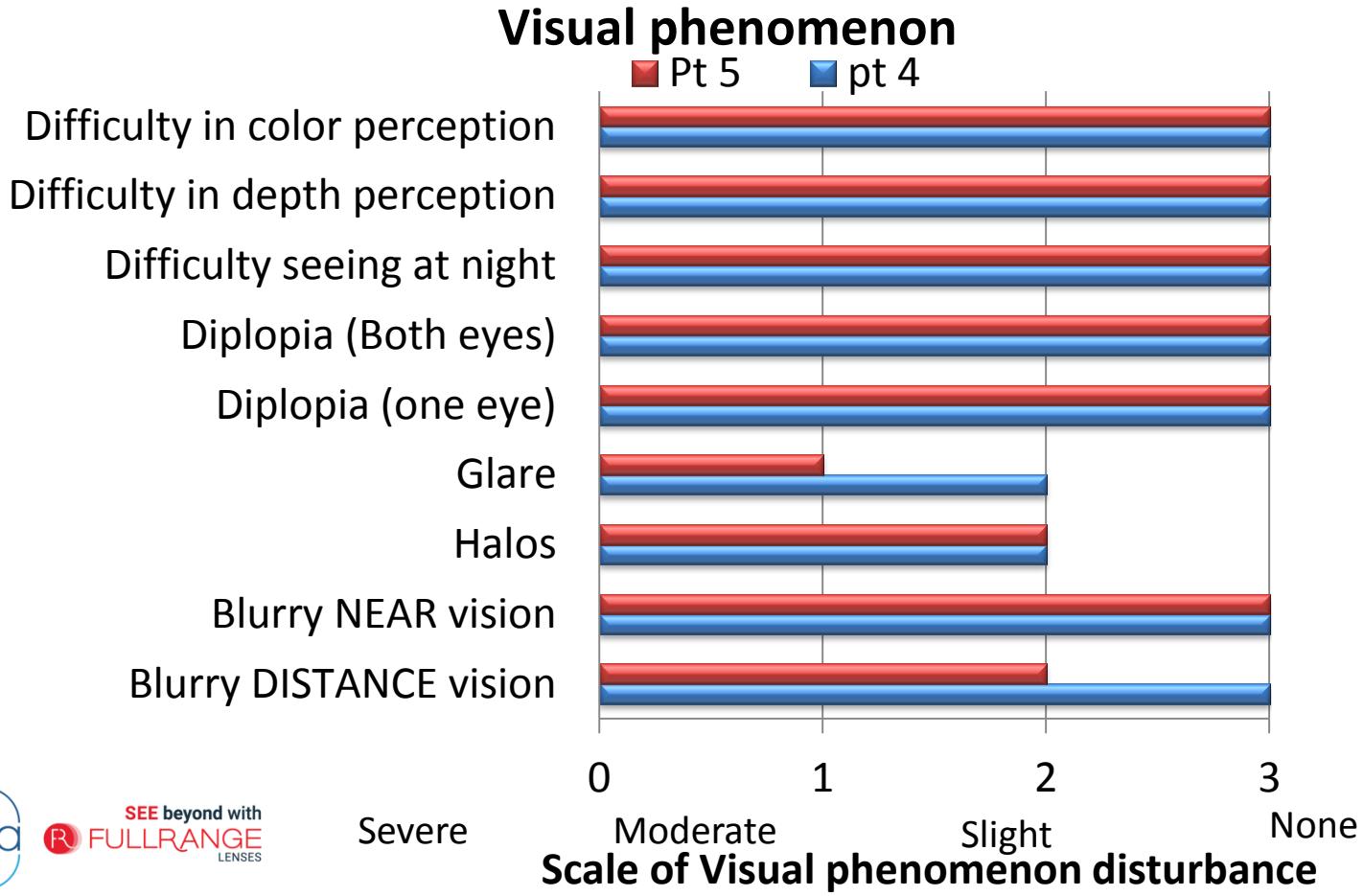
FUNCTION AND SATISFACTION



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FUNCTION AND SATISFACTION

Glass dependency

Use glasses for distance vision?	Never ✓
Use glasses for Intermediate vision?	Never ✓
Use glasses for near vision (Reading)?	Never ✓

FUNCTION AND SATISFACTION

Satisfaction

Are you satisfied from the treatment in your general feeling	Very Satisfied ✓
Would you go over the treatment again?	Yes ✓

SUMMARY

- A promising new lens design that may truly provide a good depth of focus and spectacle freedom to presbyopic patients.
- Initial results show a remarkable defocus curve that, with exceptionally good near and intermediate vision, with visual acuity above 0.05 (6/6.7) throughout infinity to 40 cm.
- High Patients satisfaction.
- Still requires to evaluate a need to adjust the A-constant of the lens from the approximated constant with which the study initiated.

THANK YOU

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