Quality of vision and visual outcomes with implantation of an extended vision IOL targeted for slight myopia in the non-dominant eye

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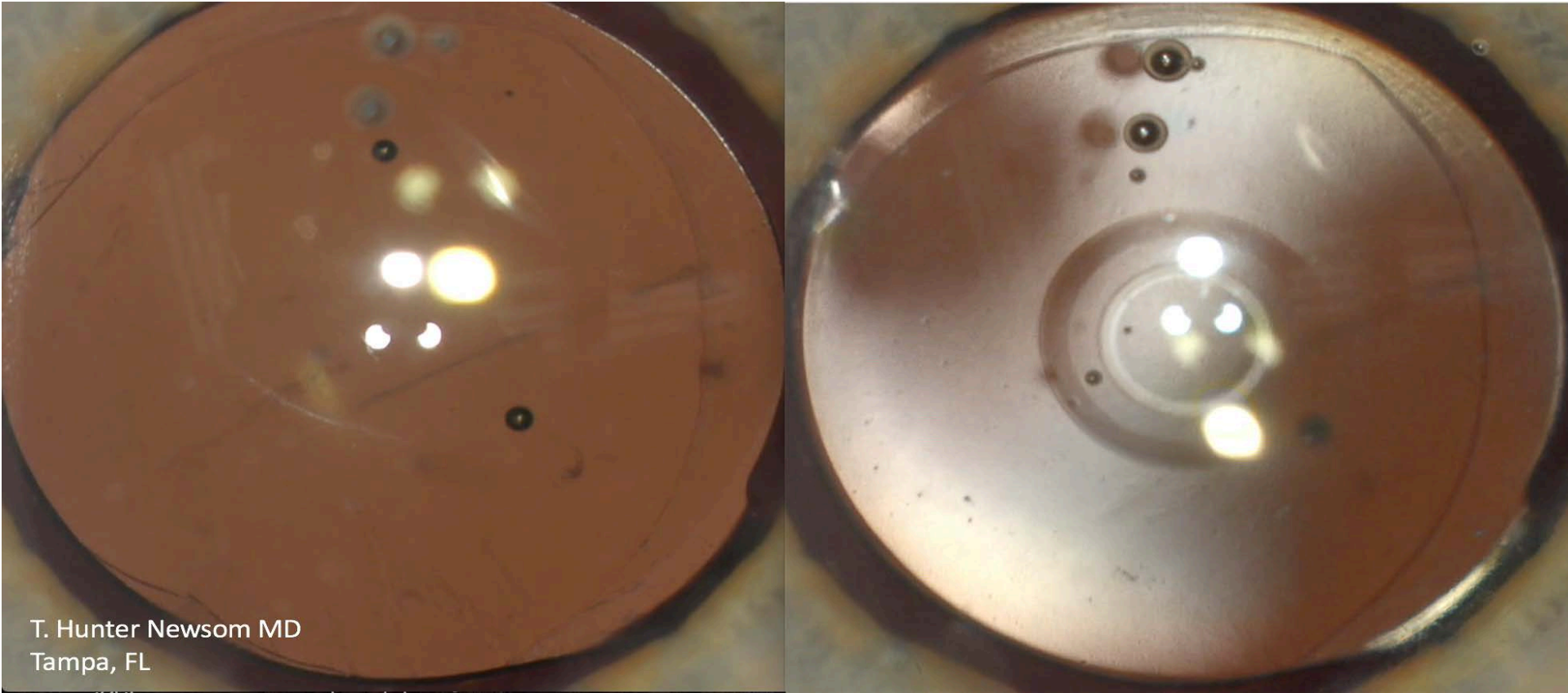
Vivity IOL in vivo

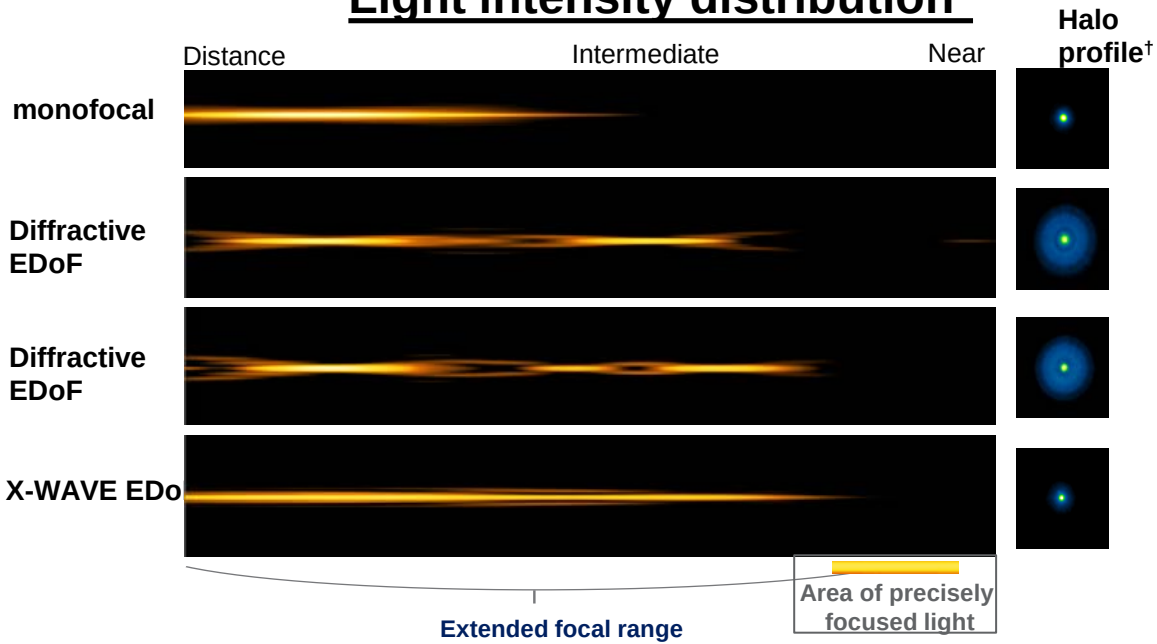


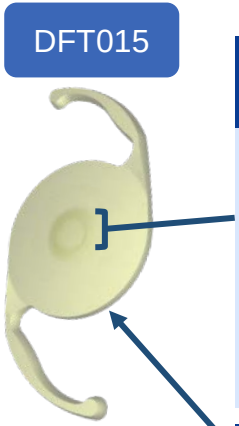
Mechanism of Action

AcrySof IQ Vivity® IOL (model DFT015) is a non-diffractive extended depth of focus (EDoF) IOL with novel wavefront-shaping X-WAVE™ technology

Intended benefit: Extended range of vision but have a visual disturbance profile of a monofocal IOL (SN60WF)

Light intensity distribution*





7× magnification of central element for illustrative purposes

2.2 mm wavefront-shaping X-WAVE™ optic

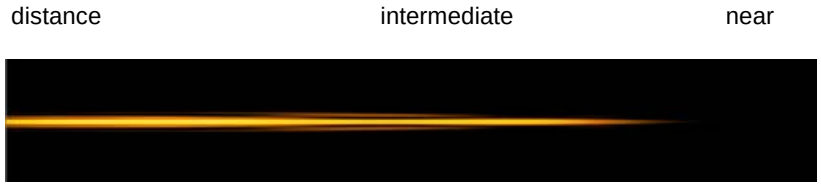
- **Stretches and shifts** the wavefront
- **Avoids light splitting**
- Results in an **extended focal range** rather than multiple focal points

SN60WF base power

*Simulated photopic through-focus point spread function (light intensity [energy]) – polychromatic; †Optical bench data of pinhole images to simulate halo effects (logarithmic scale images of halos around point source); Alcon Vision LLC. Data on File. Optical Evaluations of Alcon AcrySof IQ Vivity®, TECNIS Symfony®, and ZEISS AT LARA® intraocular lenses

Purpose

If we push the Light intensity distribution right, can we improve near function, and what happens to quality of vision?



Assess the visual acuity, spectacle independence and quality of vision of patients with a target of slight myopia in the non-dominant eye after bilateral Vivity implantation

Extended focal range

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Methods

- Prospective, single arm unmasked study
- 35 subjects bilaterally implanted with the AcrySof® IQ Vivity® non-diffractive extended vision IOL
- Non-dominant eye targeted for slight myopia
- 5 visits (preop, operative, 1 day, 1 month, 3 months)

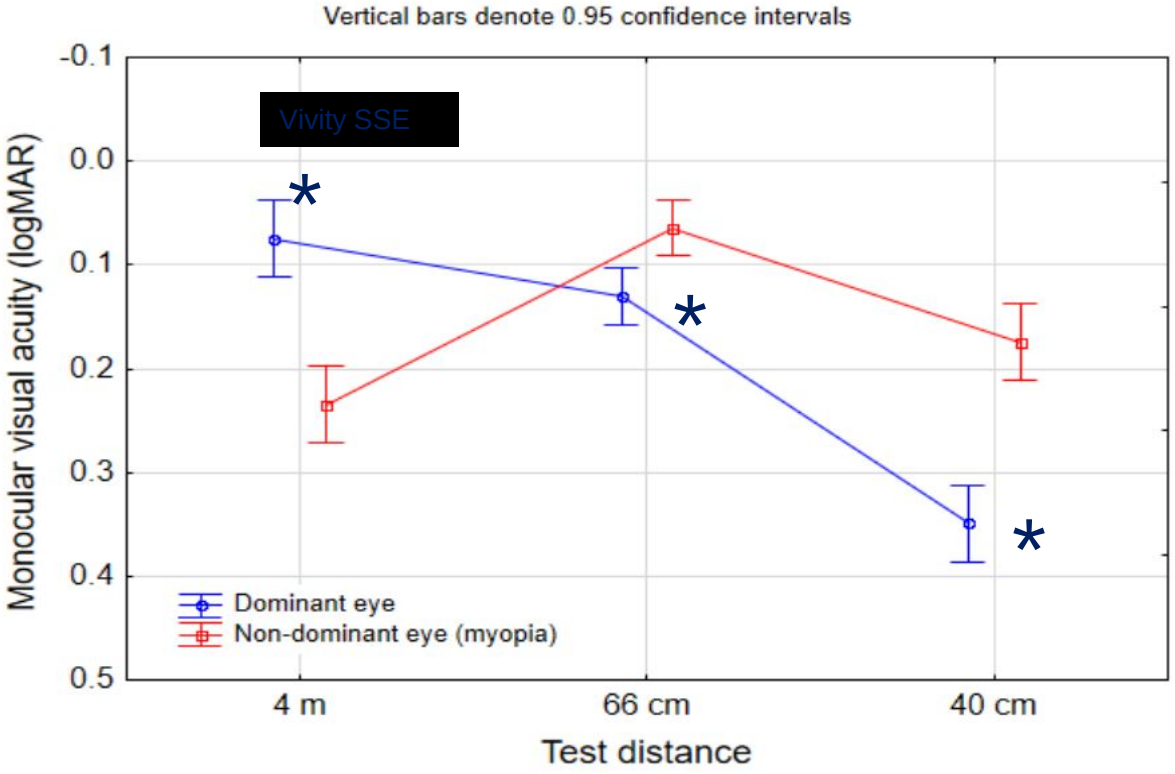
3-Month Visit

- Manifest refraction
- Uncorrected binocular VA at distance, 66 cm, 40 cm
- Best distance-corrected binocular VA at distance, 66 cm, 40 cm
  - non-dominant eye, distance correction to -0.75D monovision
- Patient Reported Spectacle Independence Questionnaire (PRSIQ) scores
- Questionnaire for visual disturbance (QUVID) scores

Results

- 33 bilaterally implanted subjects completed a 3-month visit
- 18 females/8 males
- Age: 70.0 ± 5.5 years (57 to 80)

Monocular uncorrected VA at 3M (n=33)



- MRSE
  - Dom: 0.01 ± 0.31
  - Non-dom: -0.71 ± 0.39
- Dominant eye matches data on Vivity Direction for Use (DFU)*

* Vivity DFU data

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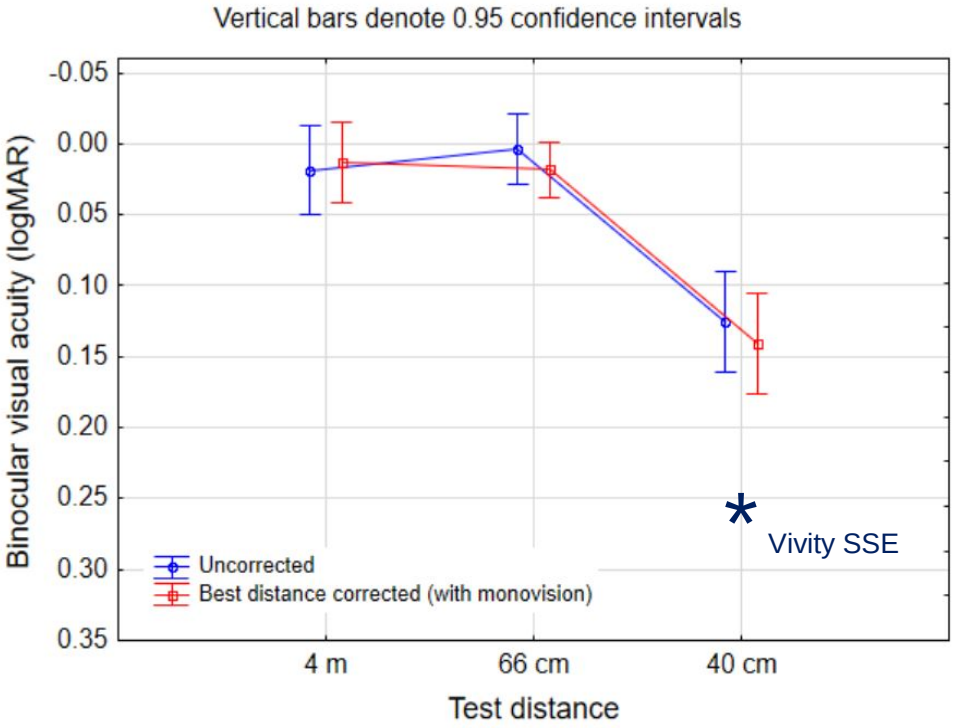
Binocular visual acuity at 3 months



No significant difference between uncorrected and distance-corrected VA

Binocular near VA was better than the data on Vivity Direction for Use (DFU)*

* Vivity DFU data

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Patient Reported Spectacle Independence (PRSIQ)

	Distance	Intermediate	Near	Overall
Never wear glasses, or wear only a little	88%	88%	75%	81%

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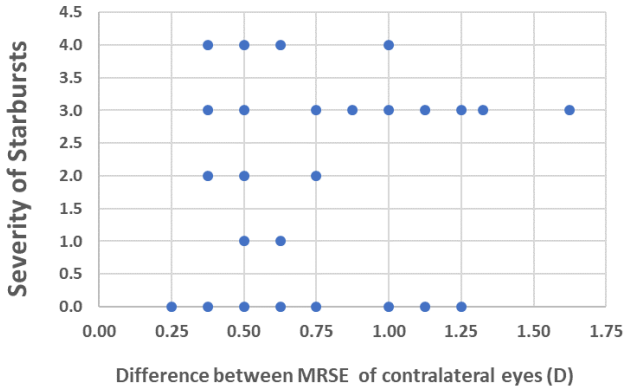
Quality of vision scores

Correlation Coefficient

	Starbusts			Halo			Glare		
Variable	Frequency	Severity	Bother	Frequency	Severity	Bother	Frequency	Severity	Bother
MRSE_Dom	-0.14	-0.14	-0.04	-0.15	-0.05	0.00	0.11	0.03	0.18
Cyl_Dom	-0.23	-0.33	-0.15	-0.04	-0.06	0.09	-0.01	-0.01	-0.11
MRSE_NonDor	-0.14	-0.19	-0.10	-0.06	-0.02	0.08	0.02	0.03	0.10
Cyl_NonDom	-0.02	-0.10	-0.34	0.21	0.22	-0.03	0.04	0.03	-0.02
MRSE diff	0.03	0.09	0.08	-0.06	-0.02	-0.09	0.06	0.00	0.03

Severity of Starbursts by level of MRSE difference (example, r=0.09, P>0.05)



There was no statistically significant correlation between quality of vision scores for *frequency*, *severity* or *degree of bother* related to starbursts, halos or glare and myopic offset between contralateral eyes and the myopic refraction in the non-dominant eye (i.e., none were significantly higher with higher degrees of myopia).

- This result appears quite different from previous diffractive EDOF lens designs

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Conclusions

- The Vivity non-diffractive extended vision IOL can be used with slight myopia in the non dominant eye to significantly improve near vision
- Visual disturbances do not appear to increase significantly with higher degrees of myopia
- 81% of patients showed spectacle independence