

# COMPARISON OF DEPTH OF FOCUS AND MESOPIC CONTRAST SENSITIVITY IN SMALL-APERTURE INLAY, ACCOMMODATING IOL, AND MULTIFOCAL IOL PATIENTS

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# Financial Disclosures

- Acufocus
- Abbott Medical Optics
- Clarity Medical
- Bausch + Lomb (Valeant)
- TearLab

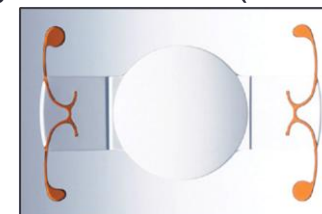
# Purpose

- To compare monocular defocus curves and binocular mesopic contrast sensitivity of a small-aperture intracorneal inlay to three premium IOLs.

KAMRA Inlay



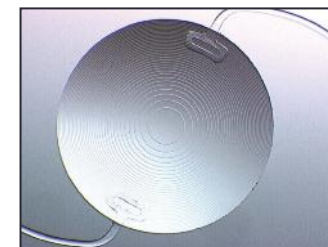
Crystalens AO (AT-50AO)



ReSTOR 3.0 (SN6AD1)



Tecnis Multifocal (ZMA00)

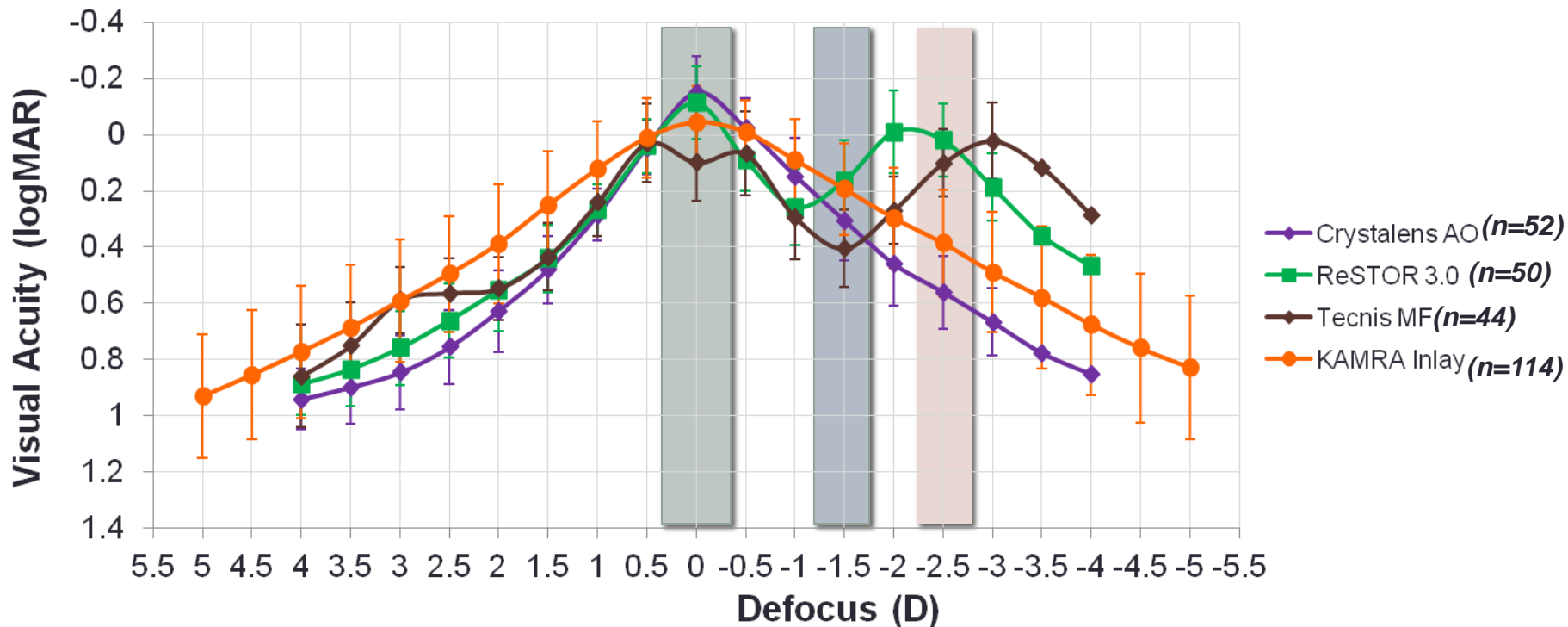


# Methods

- Retrospective comparison of 6-month data from a prospective three-arm study on IOLs to 12-month data from a prospective, clinical trial on KAMRA inlay patients
- **Monocular depth-of-focus curves** were measured from
  - Inlay: +5.0D to -5.0D in 0.50D steps
  - IOLs: +4.0D to -4.0D in 0.50D steps
- **Binocular mesopic contrast sensitivity** was measured with and without glare in 1.5, 3, 6, and 12 cycles/degree using the Optec 6500/6500P Vision Tester (Stereo Optical Co., Chicago, IL)
  - All patients tested with distance correction

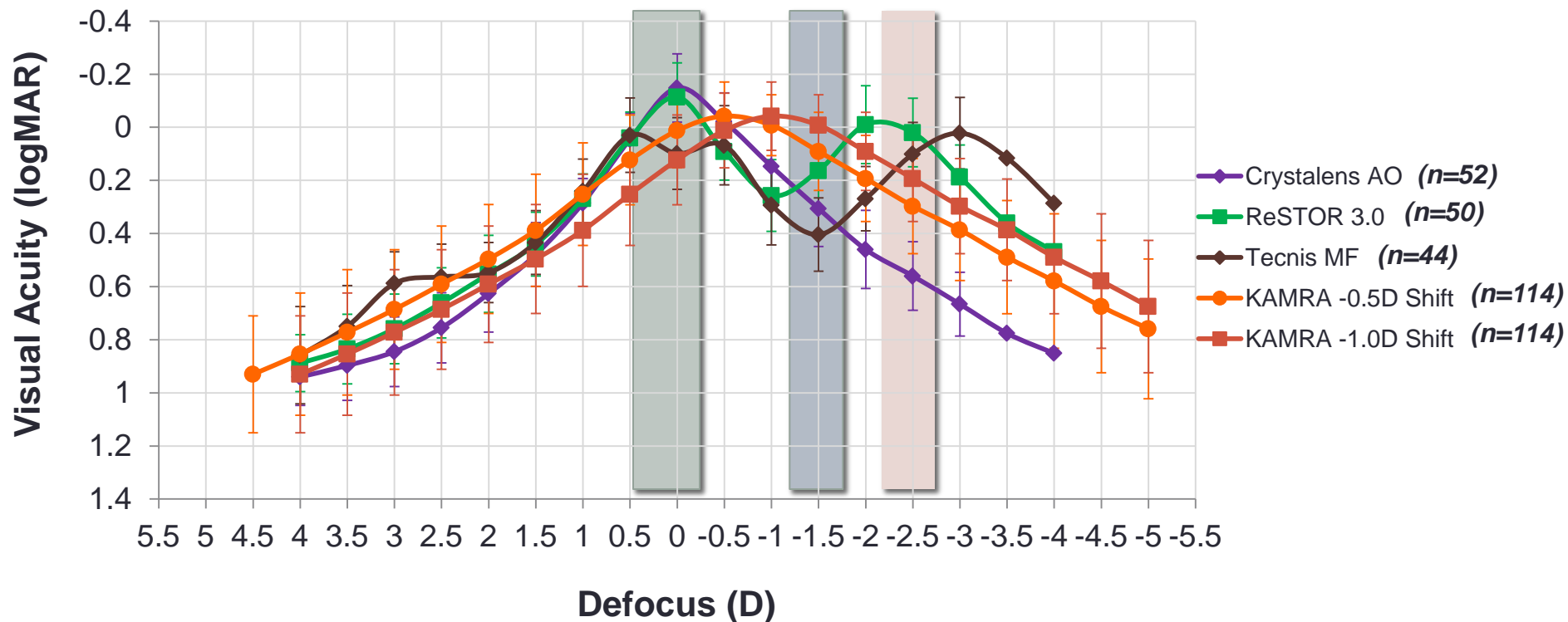
# Monocular Defocus Curve

- Inlay patients show continuous functional vision of 20/40 or better over 4.0D
- Inlay patients showed better functional vision at intermediate dioptric ranges when compared to all three IOLs



# Monocular Defocus Curve

- When paired with a small amount of myopia (-0.50D or -1.00D), the range of vision provided by the small aperture inlay significantly improves versus the IOLs



# Range of Vision

- The small aperture inlay performs better at most distances versus the IOLs with the addition of a small amount of myopia in the inlay implanted eye

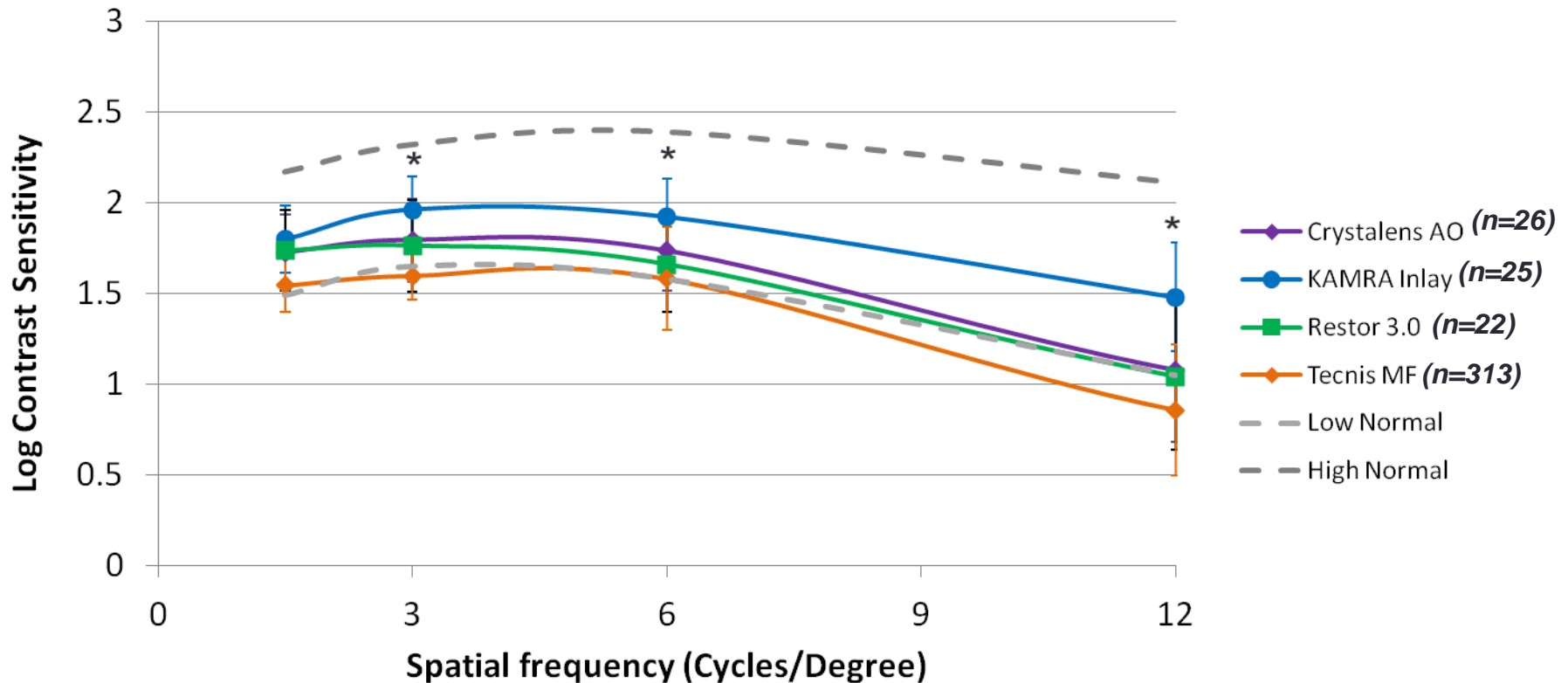
Small Aperture Inlay vs Crystalens						
Range	No Shift	p-value	-0.5D	p-value	-1.00D	p-value
Distance	worse	0.0001	<b>better</b>	0.0781	<b>better</b>	0.0001
Intermediate (60 cm)	<b>better</b>	0.0001	<b>better</b>	0.0125	worse	0.5896
Near (40 cm)	<b>better</b>	0.0001	<b>better</b>	0.0001	<b>better</b>	0.0001

Small Aperture Inlay vs ReSTOR 3.0						
Range	No Shift	p-value	-0.5D	p-value	-1.00D	p-value
Distance	worse	0.001	<b>better</b>	0.2105	<b>better</b>	0.0001
Intermediate (60 cm)	worse	0.2838	<b>better</b>	0.0001	<b>better</b>	0.0001
Near (40 cm)	worse	0.0001	worse	0.0001	worse	0.2838

Small Aperture Inlay vs Tecnis Multifocal						
Range	No Shift	p-value	-0.5D	p-value	-1.00D	p-value
Distance	<b>better</b>	0.0001	<b>better</b>	0.407	<b>better</b>	0.0001
Intermediate (60 cm)	<b>better</b>	0.0001	<b>better</b>	0.0001	<b>better</b>	0.0003
Near (40 cm)	worse	0.0001	worse	0.3258	<b>better</b>	0.0001

# Binocular Mesopic Contrast Sensitivity Without Glare

- Inlay patients had statistically significantly better mesopic contrast sensitivity at 3, 6 & 12 spatial frequencies, when compared to all three IOLs for the no glare condition

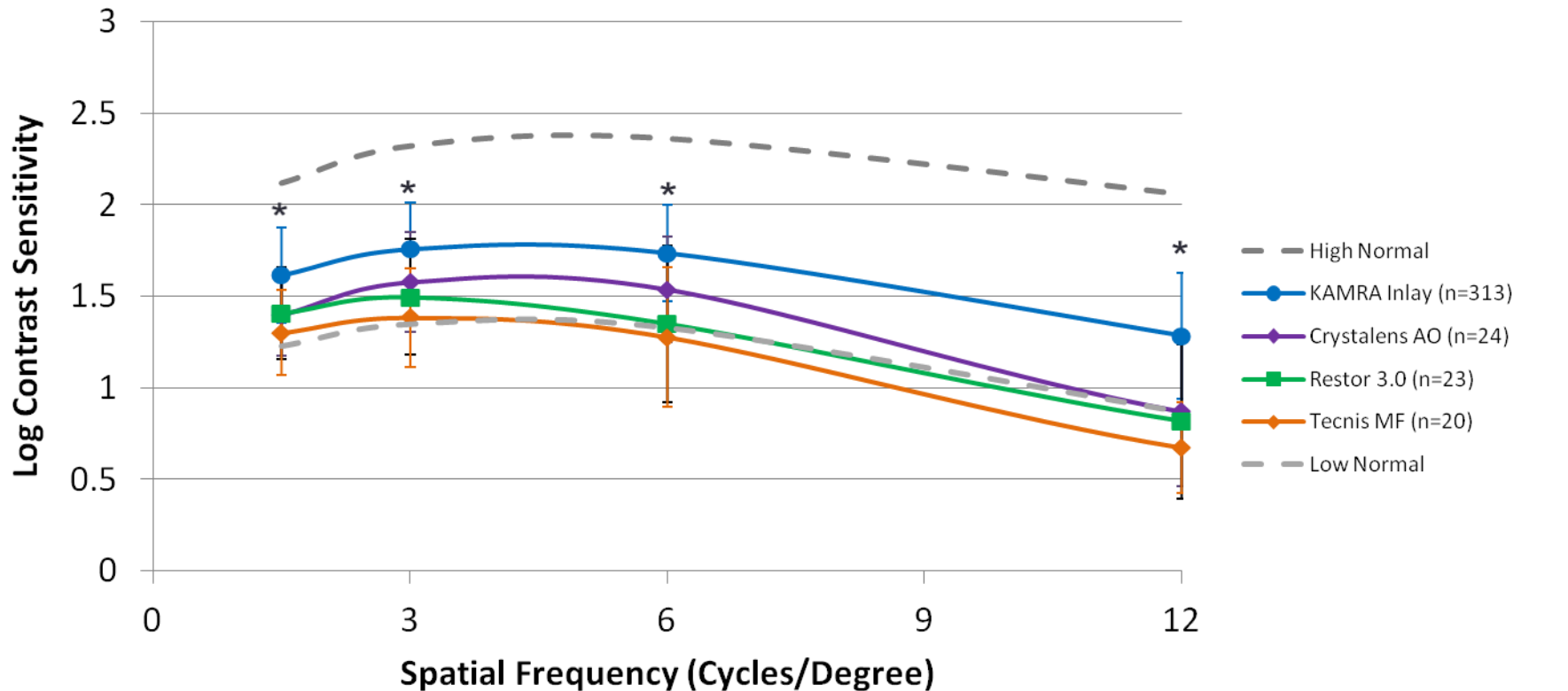


\* Unpaired t-test  $p < 0.05$



# Binocular Mesopic Contrast Sensitivity With Glare

- Inlay patients had significantly better mesopic contrast sensitivity at all spatial frequencies, when compared to all three IOLs for the glare condition



\* Unpaired t-test  $p < 0.05$

# Conclusion

- Multifocal IOLs had better near vision at 40 cm, but at the cost of significantly reduced contrast and increased scatter
- Pairing a small amount of myopia (-0.50 D to -1.00 D) with the small aperture inlay significantly improves performance across all distances versus the IOLs
- Patients implanted monocularly with a small aperture inlay achieved better mesopic contrast sensitivity, with and without glare, than patients implanted with either accommodating or multifocal IOLs