

Residual Astigmatism After IOL Placement: An Update in Rotational Trends

An analysis of data from astigmatismfix.com

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Financial Disclosure

Data analysis was supported with an investigator-initiated grant from Alcon (Fort Worth, USA)

Purpose:

- Analysis of rotational trends for current monofocal toric IOLs available in the United States

Background

History:

2016
ASCRS

2016
DovePress

2018
Ophthalmology

2019
EJO

Summary of lenses not at intended orientation:
(Internal Validation) **OR = 2.43 (99%CI 2.16-2.72)**

Intraocular Lens	Orientation ≥ 5 degrees from intended (n)	Total # of entries	Percentage	P ¹
AcrySof® Toric	3,535	5,552	64	<0.0001
Tecnis® Toric	1,948	2,406	81	
Trulign® Toric	98	177	55	
Staar Toric	67	94	71	
Total	5,648	8,229	69	

AMERICAN ACADEMY OF OPHTHALMOLOGY

Comparison of the Rotational Stability of Two Toric Intraocular Lenses in 1273 Consecutive Eyes

Bryan S. Lee, MD, JD,¹ David F. Cheng, MD^{1,2}

Table 2. Toric Intraocular Lens Rotation: Percentage of Eyes Demonstrating Rotational Stability

	Acrysof Toric	Tecnis Toric
IOL rotation, degrees (95% CI)	2.72 (2.35–3.08)*	3.79 (3.36–4.22)*
Rotation ≤ 5 degrees	91.9%*	81.8%*
Rotation ≤ 10 degrees	97.8%*	93.2%*
Rotation ≤ 15 degrees	98.6%*	96.4%*
Rotation ≤ 20 degrees	98.9%	97.4%
Rotation ≤ 30 degrees	99.5%	99.4%
Rotation > 30 degrees	0.50%	0.60%

CI = confidence interval; IOL = intraocular lens.
*P < 0.05.

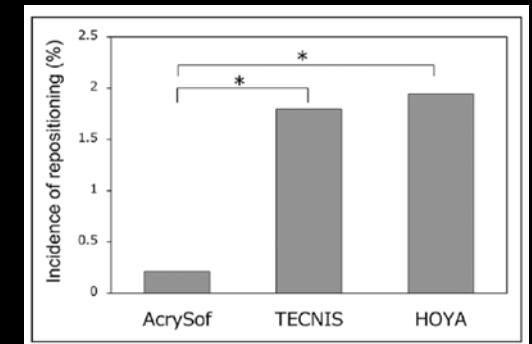
Original Research Article

EJO | European Journal of Ophthalmology

Comparison of incidence of repositioning surgery to correct misalignment with three toric intraocular lenses

Tetsuro Oshika¹, Yoshifumi Fujita², Atsushi Hirota³, Mikio Inamura⁴, Yasushi Inoue⁵, Kazunori Miyata⁶, Teruyuki Miyoshi⁷, Shinichiro Nakano⁸, Tomohisa Nishimura⁹ and Toru Sugita¹⁰

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SAGE



Clinical Ophthalmology

Dovepress
open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

Toric intraocular lens orientation and residual refractive astigmatism: an analysis

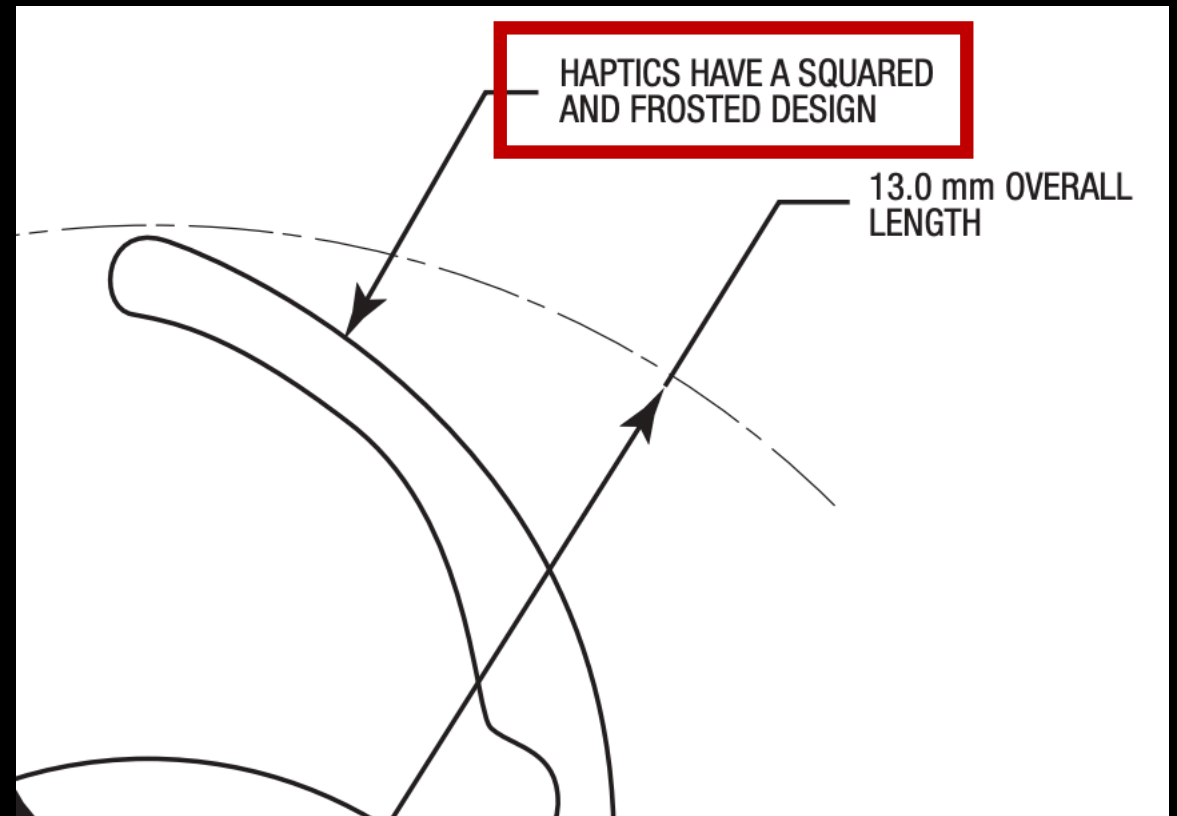
1. Fisher's Exact two-tailed test.

TECNIS[®]

Toric II 1-Piece IOL

Toric II

How are things going?



Methods

Date: 8/18/2019

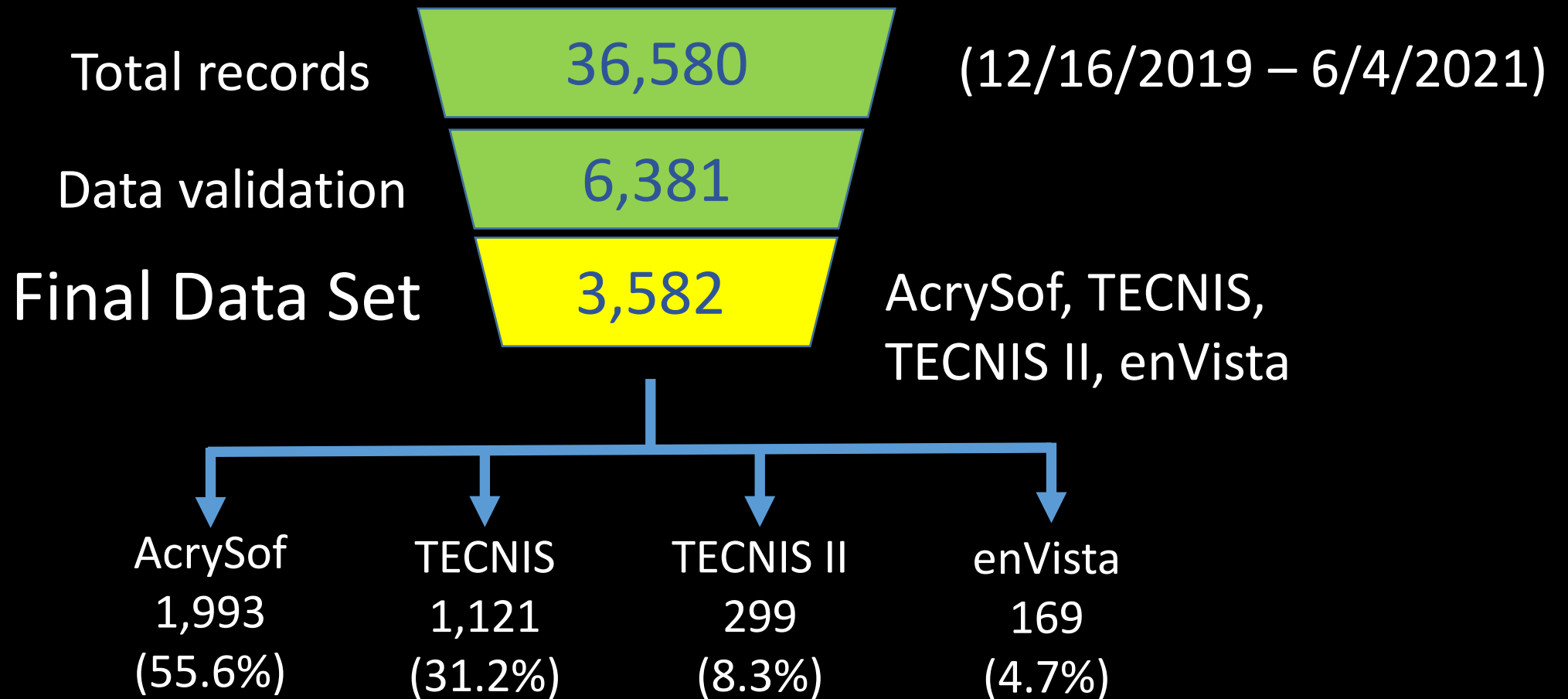
RE: Determination that Research or Research-Like Activity does not require IRB Approval

Study #: 19-1913

Study Title: Residual Astigmatism after Toric IOL Placement: An Update on Rotational Trends

This submission, Reference ID 249969, was reviewed by the Office of Human Research Ethics, which has determined that this submission does not constitute human subjects research as defined under federal regulations [45 CFR 46.102 (e or l) and 21 CFR 56.102(c)(e)(l)] and does not require IRB approval.

astigmatismfix.com: cleaning the data



Results

Misalignment Rate

Rotation Rate:

Intraocular Lens	Orientation ≥ 5 degrees from intended (n)	Total # of entries	Percentage Rotated
AcrySof	1426	1993	71.6%
TECNIS	929	1121	82.9%
TECNIS II	203	299	67.9%
enVista	134	169	79.3%
Total	2692	3582	75.2%

Rotation Rate:

AcrySof

	TECNIS v. AcrySof	TECNIS II v. AcrySof	enVista v. AcrySof
Odds Ratio:	1.92	0.84	1.52
95% CI:	1.60 to 2.31	0.65 to 1.09	1.04 to 2.24
P-Value	<0.0001	0.1938	0.0322

Rotation Rate:

TECNIS II

	AcrySof v. TECNIS II	TECNIS v. TECNIS II	enVista v. TECNIS II
Odds Ratio:	1.19	2.29	1.81
95% CI:	0.92 to 1.54	1.72 to 3.05	1.16 to 2.82
P-Value	0.1938	<0.0001	0.0088

Rotation Rate:

TECNIS

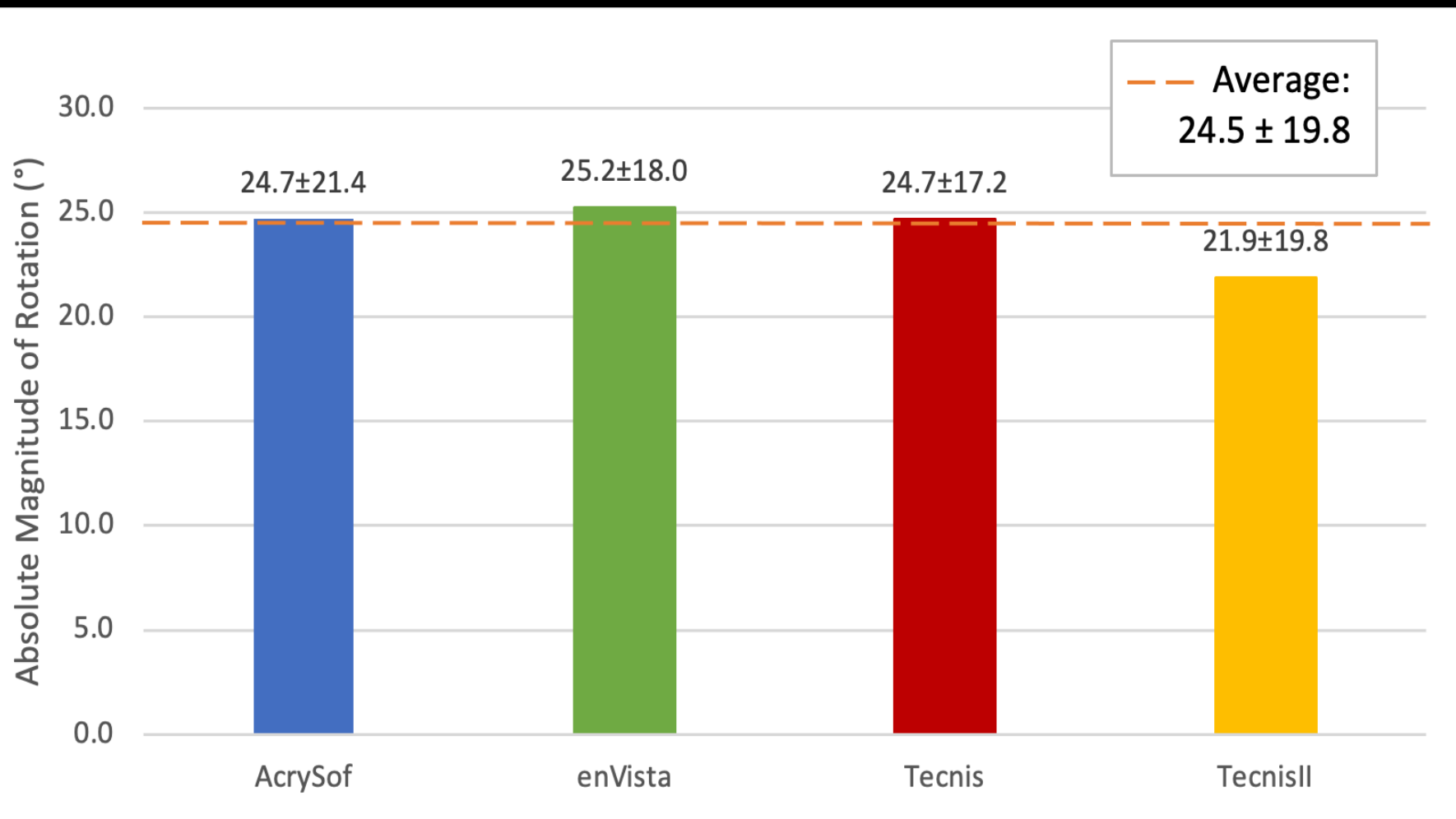
	AcrySof v. TECNIS	TECNIS II v. TECNIS	enVista v. TECNIS
Odds Ratio:	0.52	0.44	0.79
95% CI:	0.43 to 0.62	0.33 to 0.58	0.53 to 1.18
P-Value	<0.0001	<0.0001	0.2551

Rotation Rate:

enVista

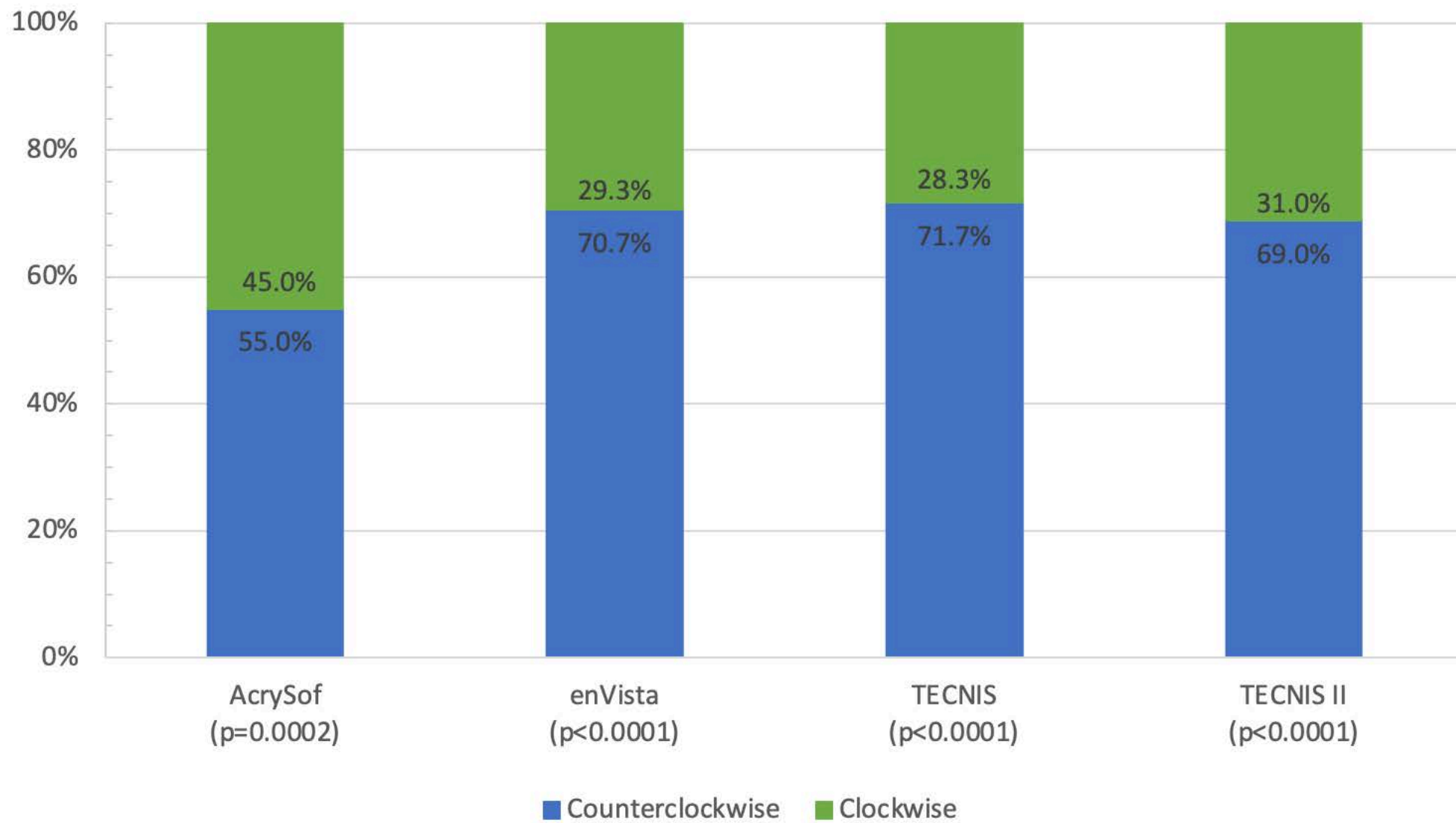
	AcrySof v. enVista	TECNIS v. enVsita	TECNIS II v. enVista
Odds Ratio:	0.66	1.26	0.55
95% CI:	0.45 to 0.97	0.84 to 1.89	0.35 to 0.86
P-Value	0.0322	0.2551	0.0088

Magnitude of Rotation



p-Value (student T test)	
AcrySof v TECNIS	0.9974
AcrySof v TECNIS II	0.0772
AcrySof v enVista	0.7761
TECNIS v TECNIS II	0.0400
TECNIS v enVista	0.7320
TECNIS II v enVista	0.1154

Rotation Direction



Limitations:

- website was not created with intention for research
- misalignment isn't synonymous with post-operative rotation
- not a controlled setting (measuring toric axis, manifest refractions, etc.)

Conclusion:

According to the *astigmatismfix* database, the newly designed TECNIS Toric II platform is as rotationally stable as the AcrySof toric platform and more rotationally stable than the original TECNIS toric and enVista toric platforms

Thank You!

Questions?

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