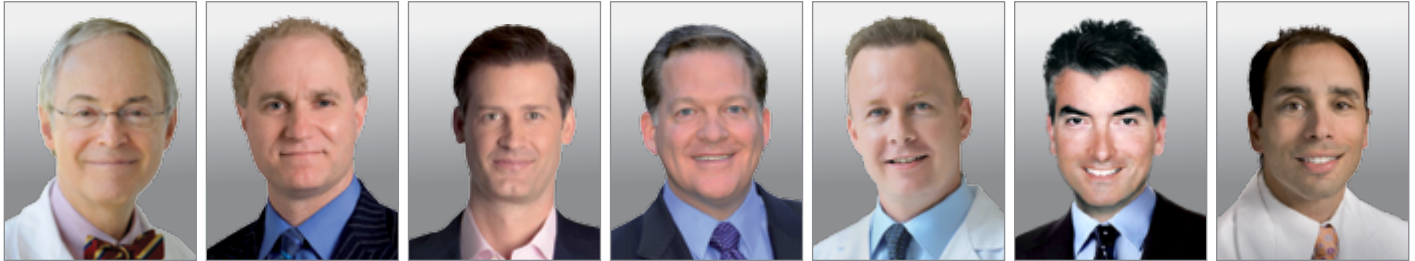# cassini Clinical Review

Summer Issue 2014

Premium treatments start with premium diagnosis

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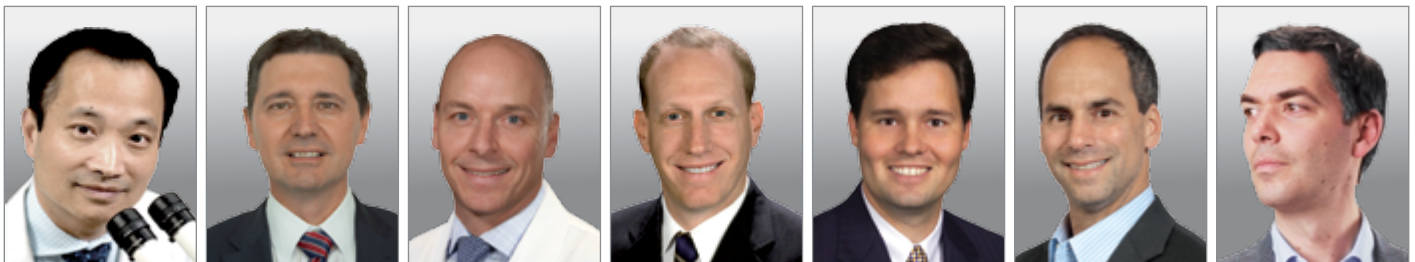Cleveland Clinic
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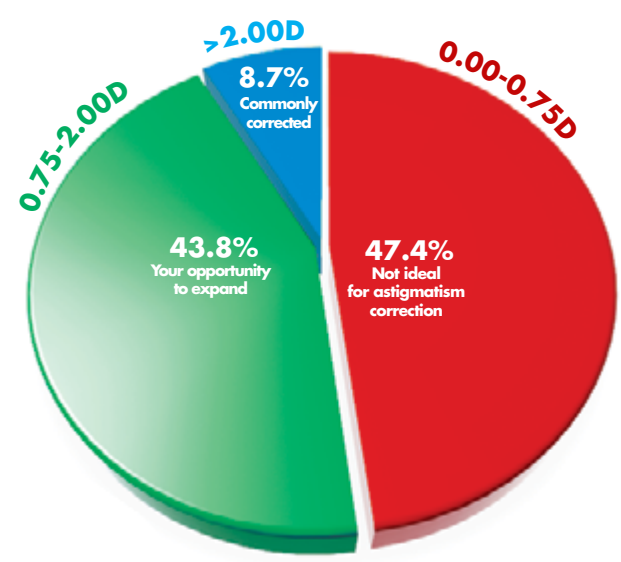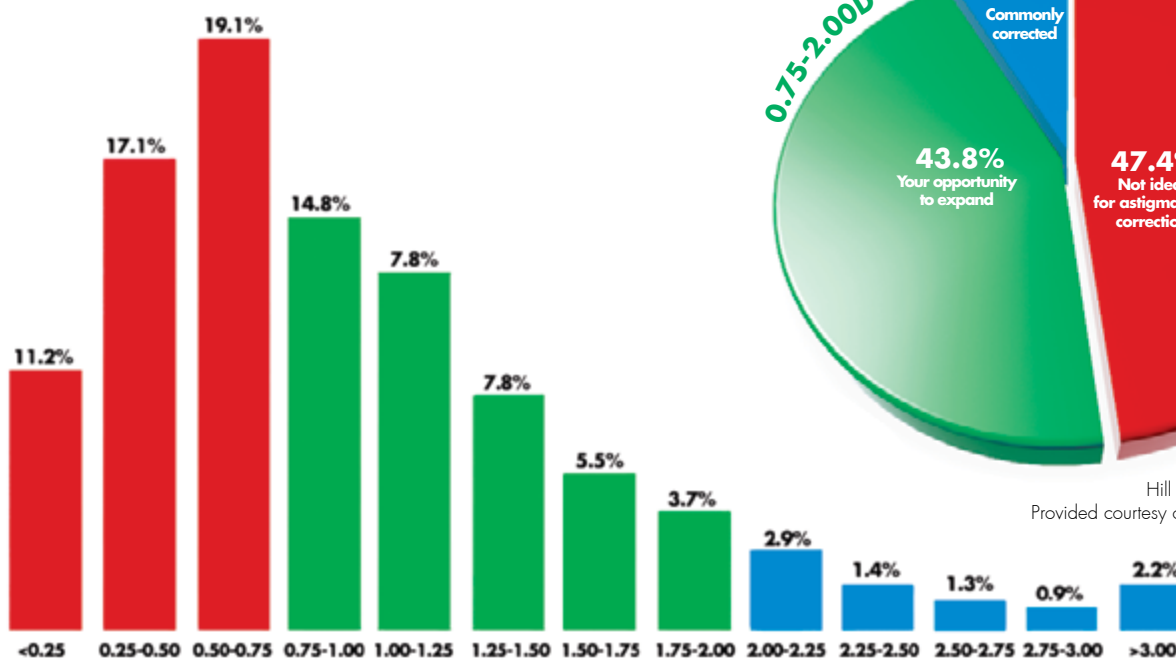Cape Coral Eye Center
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Your opportunity to expand

Most people have astigmatism to some extent. A study of more than 6,000 cataract patients confirms that over 50% of cataract patients have a level of astigmatism that falls within the range correctable by a Toric IOL[1]. That means that a premium IOL is an excellent option for a significant number of your cataract patients.

More than 50% of cataract patients are eligible for astigmatic correction

>2.00D
8.7%
Commonly corrected

0.75-2.00D

0.00-0.75D

43.8%
Your opportunity to expand

47.4%
Not ideal for astigmatism correction

Hill Distribution Data.
Provided courtesy of Dr. Warren Hill

11.2%
17.1%
19.1%
14.8%
7.8%
7.8%
5.5%
3.7%
2.9%
1.4%
1.3%
0.9%
2.2%

<0.25 0.25-0.50 0.50-0.75 0.75-1.00 1.00-1.25 1.25-1.50 1.50-1.75 1.75-2.00 2.00-2.25 2.25-2.50 2.50-2.75 2.75-3.00 >3.00

Dioptric intervals

Distribution Data. Provided courtesy of Dr. Warren Hill

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Cassini for Astigmatism Correction

With Cassini preoperative planning, you can confidently treat your patient's cataract with Toric IOLs and provide precise astigmatism correction in a single procedure.

A total of 30 patients with age range between 43-85 years old and astigmatism between 0.5D to 3.5D underwent cataract surgery with Toric IOLs and Cassini planning performed by one experienced surgeon.

Jonathan Solomon, MD
Solomon Eye Associates
Bowie, MD, USA

Pre and post-op cycinder for 30 toric IOL patients

☐ Preoperative refractive cylinder ☐ Postoperative refractive cylinder
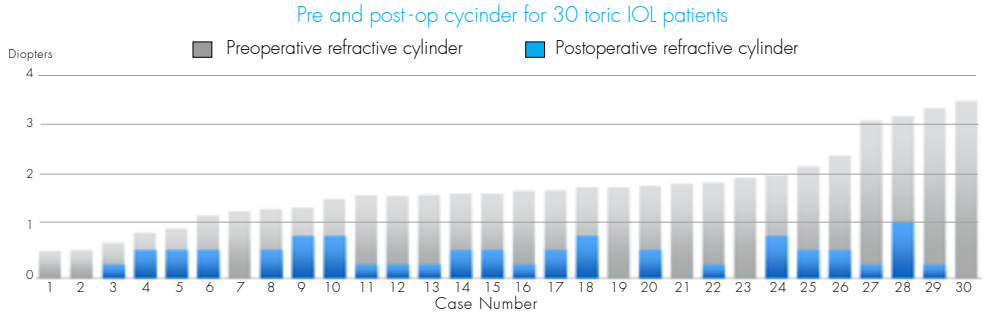
Compared to data published in literature, the 30d postoperative data demonstrates an excellent reduction of the postoperative cylinder and therefore creates exciting opportunities for astigmatism correction in cataract patients.
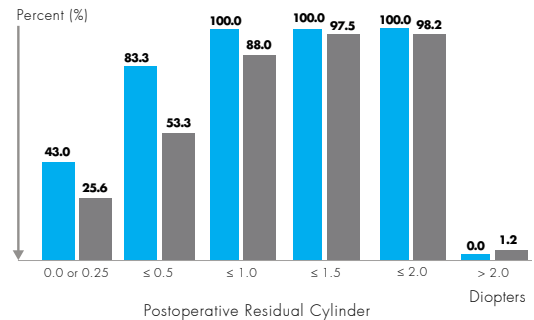
Improved uncorrected distance visual acuity (UDVA)

☐ Uncorrected distance visual acuity 30d postoperatively with Cassini preoperatively planning.
☐ Cumulative uncorrected distance visual acuity 1year postoperatively. E. Holland et. al., Ophthalmology.2010
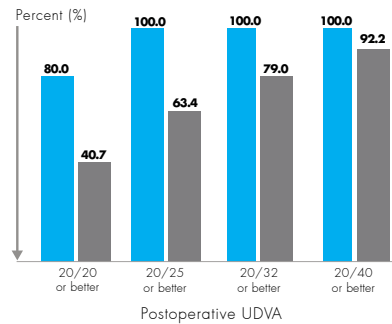
More reduction of residual cylinder

☐ Absolute residual refractive cylinder 30d postoperatively with Cassini preoperatively planning
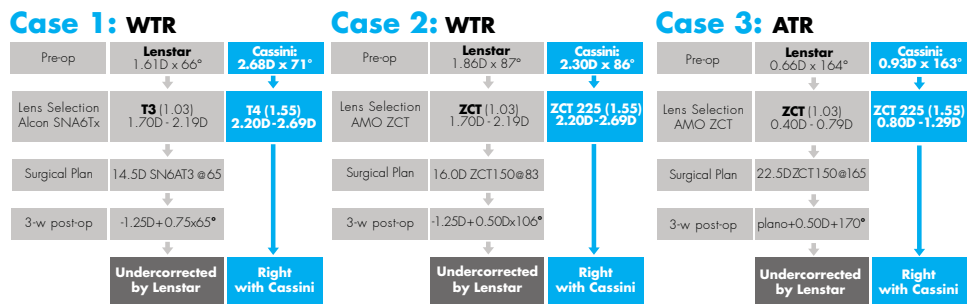☐ Cumulative absolute residual refractive cylinder 1 year postoperatively. E. Holland et. al., Ophthalmology.2010

Reducing Refractive Surprises

Cassini takes the guesswork out of the equation

In a case series comparing the use of an optical biometer (Lenstar) to Cassini calculations for Toric IOL cases, the objective was to determine inter-device error in cases planned using the Baylor nomogram V2 adjustment. These example cases demonstrated an undercorrection using biometry K readings compared to the more accurate Cassini predicted outcomes.

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Case 1: WTR

	Lenstar	Cassini:
Pre-op	1.61D x 66°	2.68D x 71°
Lens Selection Alcon SNA6Tx	T3 (1.03) 1.70D - 2.19D	T4 (1.55) 2.20D-2.69D
Surgical Plan	14.5D SN6AT3 @65	
3-w post-op	-1.25D+0.75x65°	
	Undercorrected by Lenstar	Right with Cassini

Case 2: WTR

	Lenstar	Cassini:
Pre-op	1.86D x 87°	2.30D x 86°
Lens Selection AMO ZCT	ZCT (1.03) 1.70D - 2.19D	ZCT 225 (1.55) 2.20D-2.69D
Surgical Plan	16.0D ZCT150@83	
3-w post-op	-1.25D+0.50Dx106°	
	Undercorrected by Lenstar	Right with Cassini

Case 3: ATR

	Lenstar	Cassini:
Pre-op	0.66D x 164°	0.93D x 163°
Lens Selection AMO ZCT	ZCT (1.03) 0.40D - 0.79D	ZCT 225 (1.55) 0.80D - 1.29D
Surgical Plan	22.5DZCT150@165	
3-w post-op	plano+0.50D+170°	
	Undercorrected by Lenstar	Right with Cassini

**A. John
Kanellopoulos, MD**
Laservision Eye Institute
Athens, Greece

Accurate Central Cornea Measurement

Superior in central corneal measurement to Placido and to Scheimpflug if opacity, haze or high irregularity is present.

Case 1

42 year old Keratoconus patient, surprisingly has additional posterior polymorphous corneal dystrophy which shows clearly in slit lamp **(1A)** and anterior segment OCT **(1B)**.

For corneal topographies: Both Placido **(1C)** and Scheimpflug **(1D)** showed the inferior temple cone but no sign of anything special in the central cornea part. The axial curvature image of Cassini **(1E)** shows clearly the influence of the posterior polymorphous corneal dystrophy part to the anterior cornea curvature.

1A

1B

1C

1D

1E
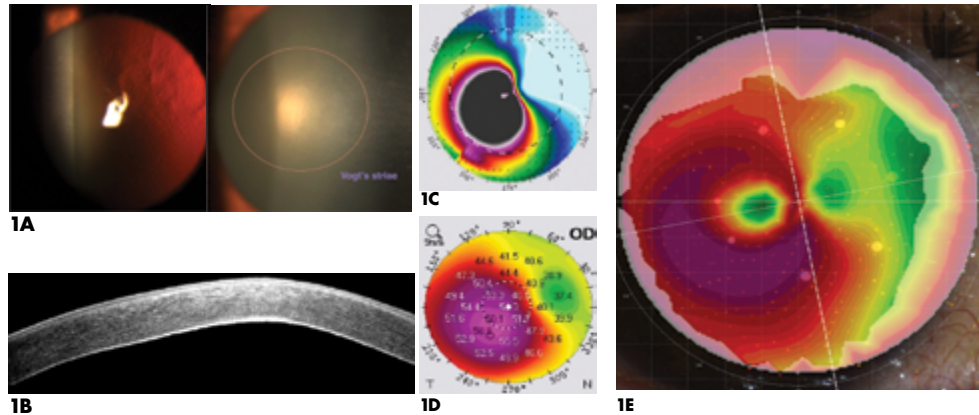
Case 2

38 year old severe Keratoconus patient, in Placido **(2A)** shows a unreasonable 45.6D and 61.8D along the meridian of the inferior temporal cone in the central 3mm zone. The overall astigmatism was only 1.4D and the flat meridian at 103.8° along the cone direction.

While the flat meridian from Pentacam **(2B)** was 27.8° and Cassini **(2C)** was 20°. Furthermore, Pentacam generates 62.9D and 52.3D along the cone meridian with more than 10D difference in the central 3mm zone which is not reliable as well.

Cassini **(2C)** on the other hand, performs well on this kind of irregular cornea especially in central cornea part. Within 3mm zone the data showed 65.3D/60.2D and 57.2D/54.6D parallel the cone meridian and vertical the cone meridian, respectively. Overall general keratometric was 61.74D@110° and 54.32D@20° in this case.
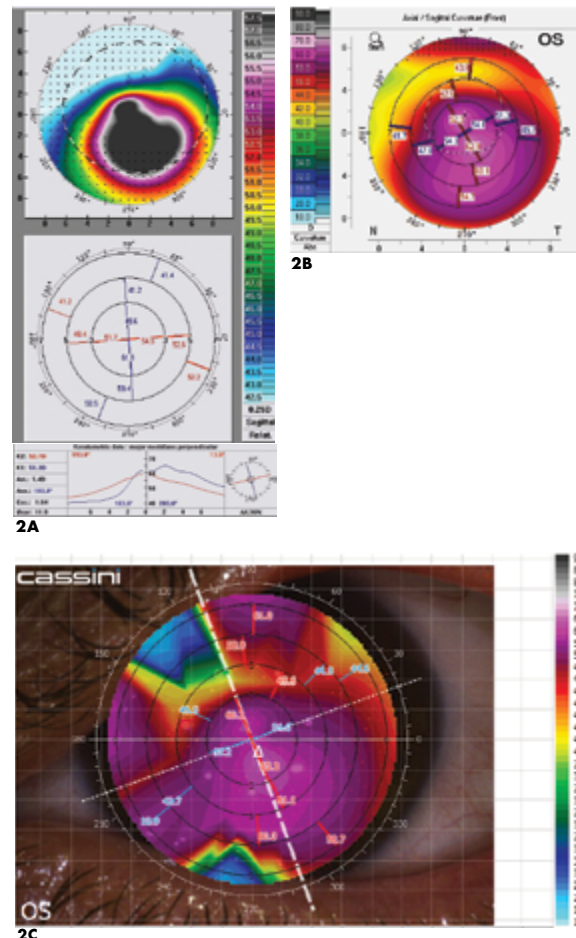
2B

2A

2C

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Case 3

72 year old monocular female cataract candidate with old scar (flying injury) shows clearly in slit lamp **(3A)** and anterior segment OCT **(3B)**. The measurements were inconsistent among Placido, Lenstar and Cassini **(3C)**. Cassini keratometry was selected as the best fit for the Toric IOL calculation and postoperative UCVA was 20/20.

3B

3A

old childhood fly-eye corneal scar
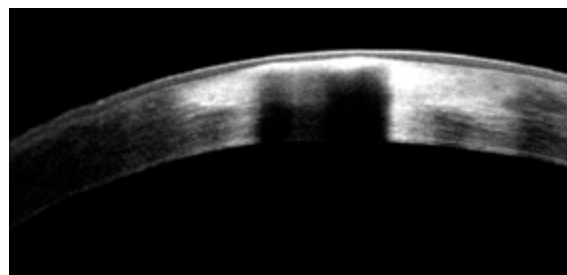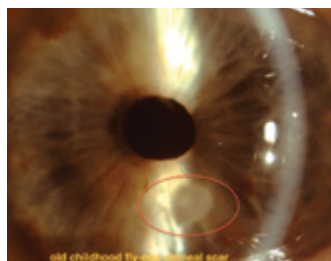
	K1 (D)	K2 (D)	Astigmatism (D)	Axis°
Placido	47.8	44.1	2.9	9.2
Optical Biometer	49.0	43.8	5.2	97
Cassini	**45.0**	**40.7**	**4.3**	**2.5**

3C

Cassini Specifications

True Axis
- Multicolor LED imaging technology combined with 2nd Purkinje imaging technology
- Axis repeatability within 3 degrees

True Magnitude
- Diopter range 4.00D – 171.00D
- Display K-values per zone 3/5/7/9mm
- Keratometric indices display in D (diopters) or mm (millimeters)

True Capture
- Auto Capture with joystick positioning
- Measurement Quality Factor parameter
- Auto pupil detection
- Topographic indices - E (shape factor), e (eccentricity), Q (asphericity), p (form factor)
- Keratoconus indices - SAI (Surface Asymmetry Index), SRI (Surface Regularity Index)

True Accuracy
- Submicron accuracy due to color LED triangulation technology < 0.8µm

True Technology
- External Ocular Photography
- Topographic maps - Axial, Refractive, Tangential, Elevation, Corneal Aberrations, Recorded color HD external ocular   photography
- Multiple color spectrum options
- Incorporated patient management program
- USB, Direct print, PDF, JPG, 3rd party output connectivity
- Mesopic and photopic pupillometry

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