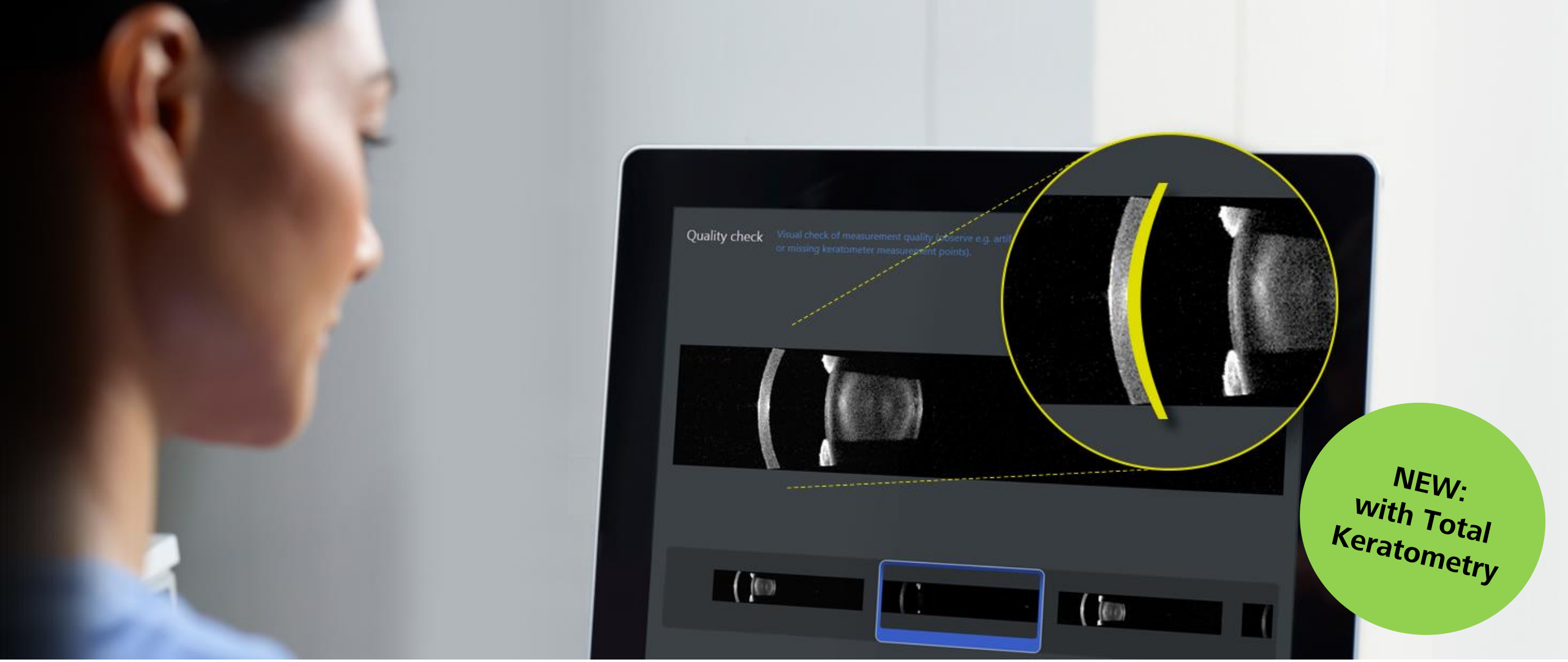


ZEISS IOLMaster 700

Replacing assumptions with measurements

Agenda

1. Introduction: SW 1.80 & Total Keratometry (TK)
2. Total Keratometry (TK)
3. GUI - Measurement, Analyze
4. GUI - IOL Calculation
5. Print & Export Options
6. Websites

Agenda

Total Keratometry (TK)
Replacing assumptions with measurements

- **Total Keratometry(TK®)** is a new measurement that combines telecentric keratometry and SWEPT Source OCT technology for the assessment of anterior and posterior corneal curvature.
- The purpose of TK is to replace standard keratometry, aiming to help to reduce outliers and improve refractive outcomes of IOL calculation in cataract surgery.
- TK is ULIB-compatible, therefore existing standard formulas and IOL constants may be applied.

Picture source: Carl Zeiss Meditec media database

Total Keratometry (TK)
Replacing assumptions with measurements

With Total Keratometry (TK)

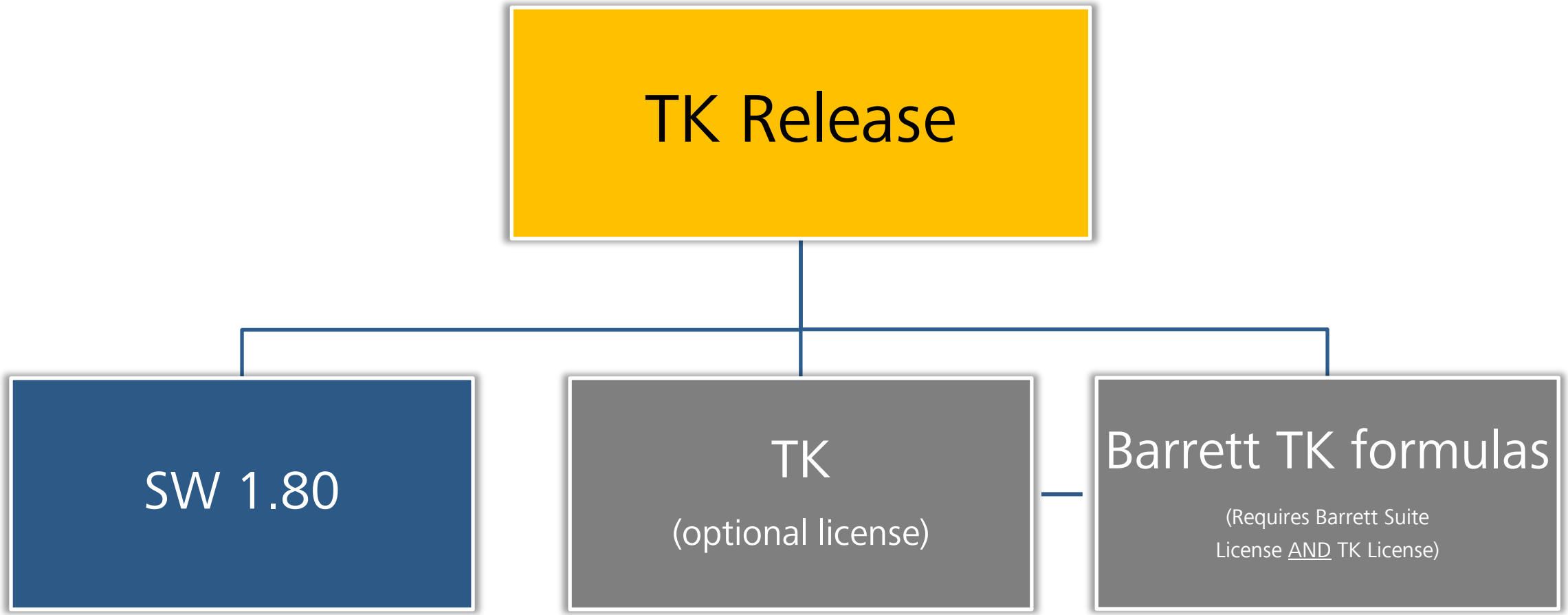
- The posterior corneal surface can now be directly measured with SS-OCT and used in formulas onboard the ZEISS IOLMaster and Z CALC, without changing your clinical workflow.
- Thus, it is no longer necessary to use assumptions or nomograms of the posterior cornea.

This improves the results of toric IOL power calculations: 14% more patients within +/– 0.5D cylinder (Haigis-T*).

Source: Total Keratometry Compendium, *Fabian and Wehner 2018*
**Retrospective post-hoc analysis of 145 normal cataract eyes implanted with aspheric IOL, 6 weeks post-op.*

Picture source: Carl Zeiss Meditec media database

ZEISS IOLMaster 700
SW 1.80 & Total Keratometry (TK) Overview



Contents of ZEISS IOLMaster Software 1.80 Update

Overview – Part 1

Picture source: Carl Zeiss Meditec media database

- **Measurement**
  - Enhanced Fixation / AL Check Scan
- **Analyse**
  - Display pupil offset (CW-Chord aka angle kappa)
- **IOL Calculation**
  - Target Refraction
  - Change of LVC Status
  - Support of non-constant toric IOL ranges
- **Settings**
  - Flexible print & export options
  - Reference Image
- **Bugfixes**
  - Minor bug fixes

Contents of Total Keratometry (optional license)
Overview – Part 2

- **Total Keratometry (TK)**
  - Added new measurement values:
    - **Total Keratometry:** TK (TK1, TK2, ΔTK, axis)
    - **Posterior Corneal Surface**: PCS (PK1, PK2, ΔPK, axis)

- **New Barrett TK formulas <u>exclusive</u> to ZEISS IOLMaster 700**
  - The **Barrett TK Universal II** and **Barrett TK Toric** formulas allows the use of actual posterior corneal surface values for IOL power calculation.
  - **Only available if Barrett Suite <u>AND</u> Total Keratometry licenses are both activated.**

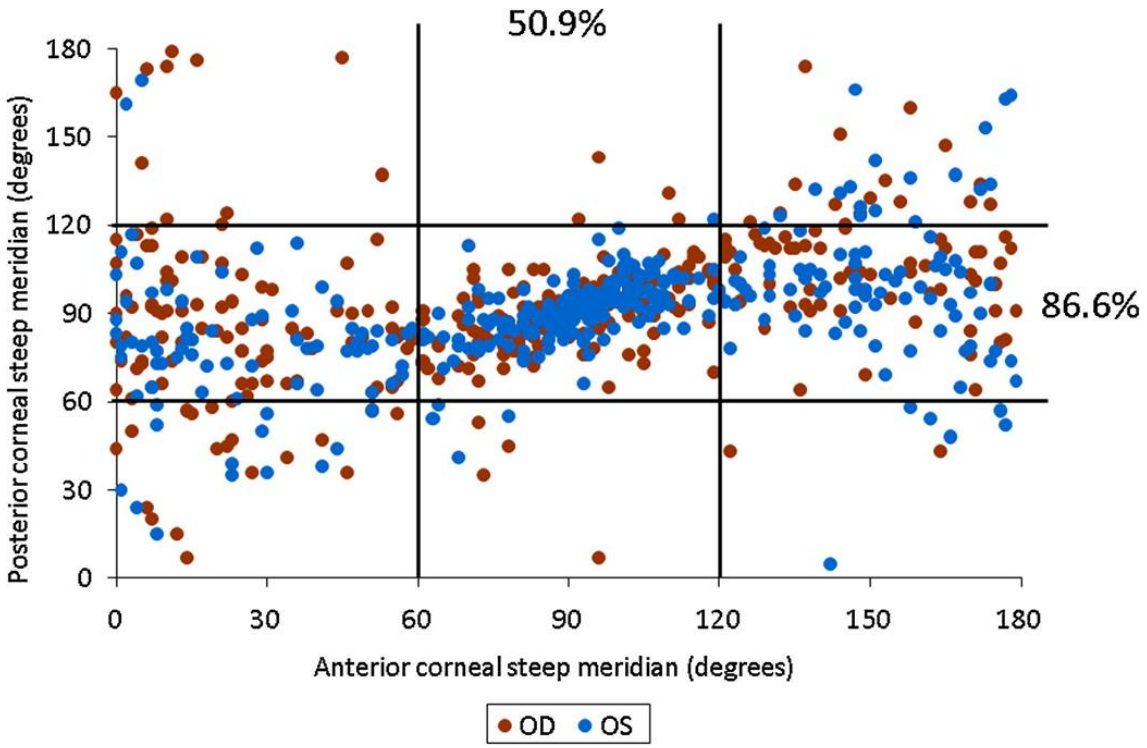
Picture source: Carl Zeiss Meditec media database

Total Keratometry (TK)
Replacing assumptions with measurements

- **ZEISS IOLMaster 700,** no hardware or operating change
- Proven **Telecentric Keratometry** and **SWEPT Source OCT**
- Use with **trusted formulas on the ZEISS IOLMaster 700** and **existing IOL constants**
- Two **new Barrett TK formulas** for non-toric and toric IOL
- **Improves toric and non-toric IOL power calculation**

Agenda

Background
Posterior corneal surface has an impact on total corneal power

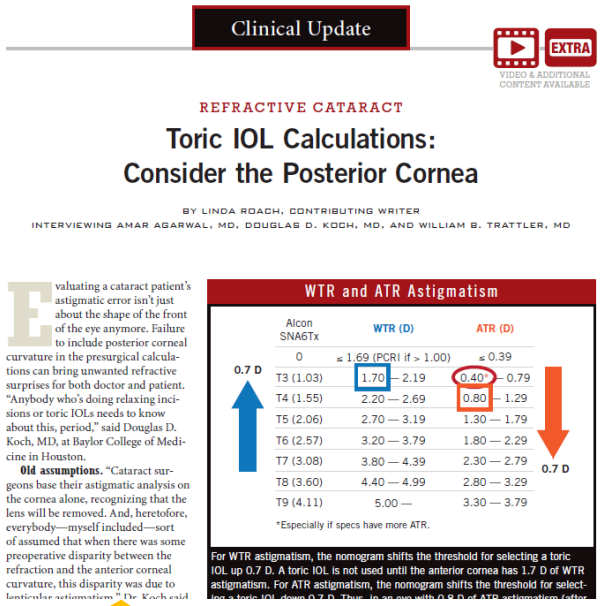


- ***EG. Koch et al.:*** The anterior cornea axis can be considerably different to the posterior cornea axis, resulting in different total corneal astigmatism.

D. D. Koch, S. F. Ali, M. P. Weikert, M. Shirayama, R. Jenkins, und L. Wang, „Contribution of posterior corneal astigmatism to total corneal astigmatism“, *J Cataract Refract Surg*, Bd. 38, Nr. 12, S. 2080–2087, Dez. 2012

How do we handle this today?
Existing methods are not entirely satisfactory

Incorporate IOL power adjustment nomograms into formulas



Clinical Update

EXTRA
VIDEO & ADDITIONAL CONTENT AVAILABLE

REFRACTIVE CATARACT

Toric IOL Calculations: Consider the Posterior Cornea

BY LINDA ROACH, CONTRIBUTING WRITER
INTERVIEWING AMAR AGARWAL, MD, DOUGLAS D. KOCH, MD, AND WILLIAM B. TRATTLER, MD

Evaluating a cataract patient's astigmatic error isn't just about the shape of the front of the eye anymore. Failure to include posterior corneal curvature in the presurgical calculations can bring unwanted refractive surprises for both doctor and patient. "Anybody who's doing relaxing incisions or toric IOLs needs to know about this, period," said Douglas D. Koch, MD, at Baylor College of Medicine in Houston.

Old assumptions. "Cataract surgeons base their astigmatic analysis on the cornea alone, recognizing that the lens will be removed. And, heretofore, everybody—myself included—sort of assumed that when there was some preoperative disparity between the refraction and the anterior corneal curvature, this disparity was due to lenticular astigmatism." Dr. Koch said

WTR and ATR Astigmatism

Alcon SNA6Tx	WTR (D)	ATR (D)
0	≤ 1.69 (PCRI if > 1.00)	≤ 0.39
T3 (1.03)	1.70 — 2.19	0.40* — 0.79
T4 (1.55)	2.20 — 2.69	0.80 — 1.29
T5 (2.06)	2.70 — 3.19	1.30 — 1.79
T6 (2.57)	3.20 — 3.79	1.80 — 2.29
T7 (3.08)	3.80 — 4.39	2.30 — 2.79
T8 (3.60)	4.40 — 4.99	2.80 — 3.29
T9 (4.11)	5.00 —	3.30 — 3.79

0.7 D ↑ ↓ 0.7 D

*Especially if specs have more ATR.

For WTR astigmatism, the nomogram shifts the threshold for selecting a toric IOL up 0.7 D. A toric IOL is not used until the anterior cornea has 1.7 D of WTR astigmatism. For ATR astigmatism, the nomogram shifts the threshold for select-

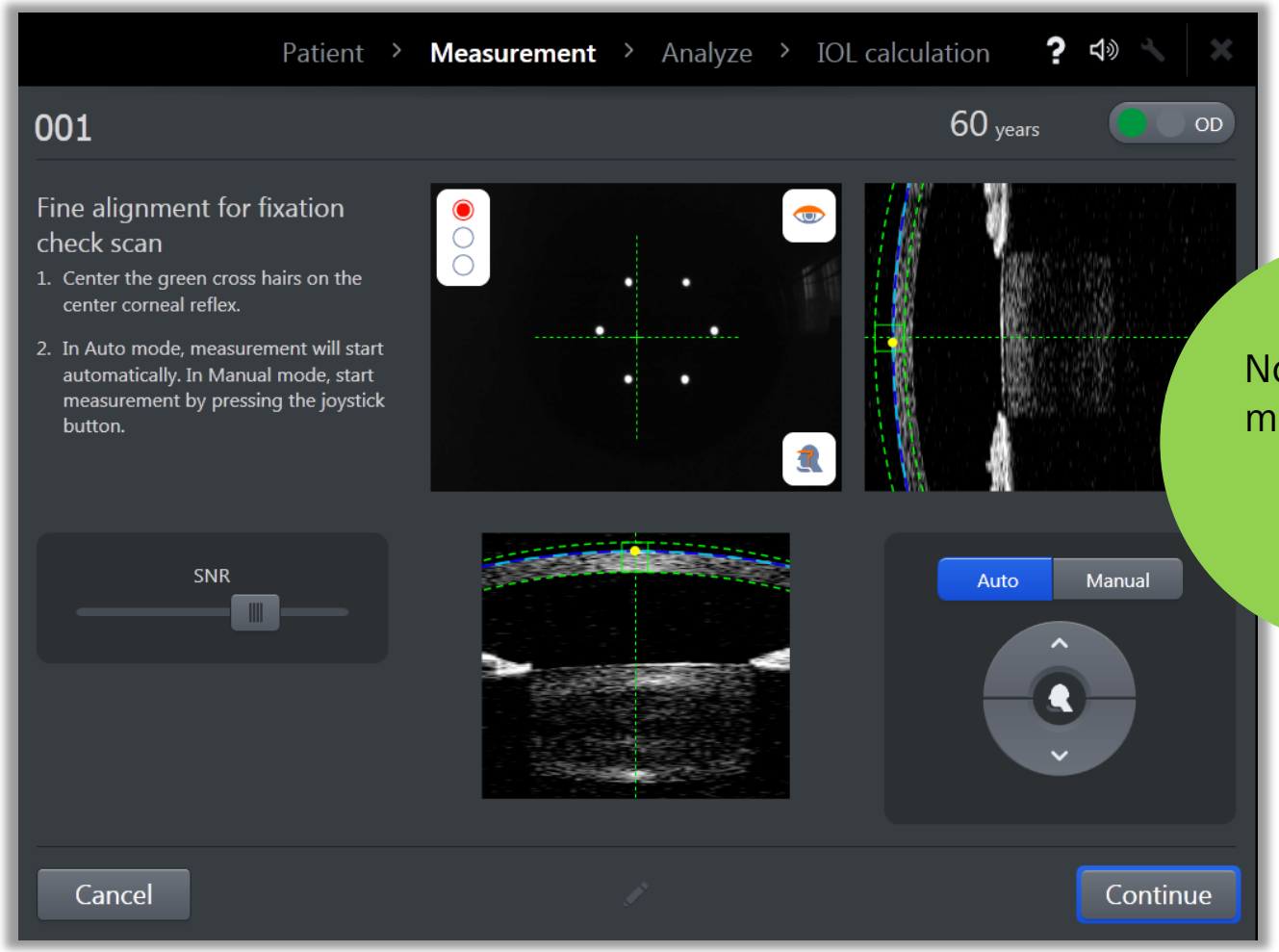
Models and nomograms are based on statistical measurements and might not compensate for outliers

Comprehensive eye scanners

Other devices provide posterior measurements, but are not always compatible with trusted formulas and constants

Total Keratometry Measurement

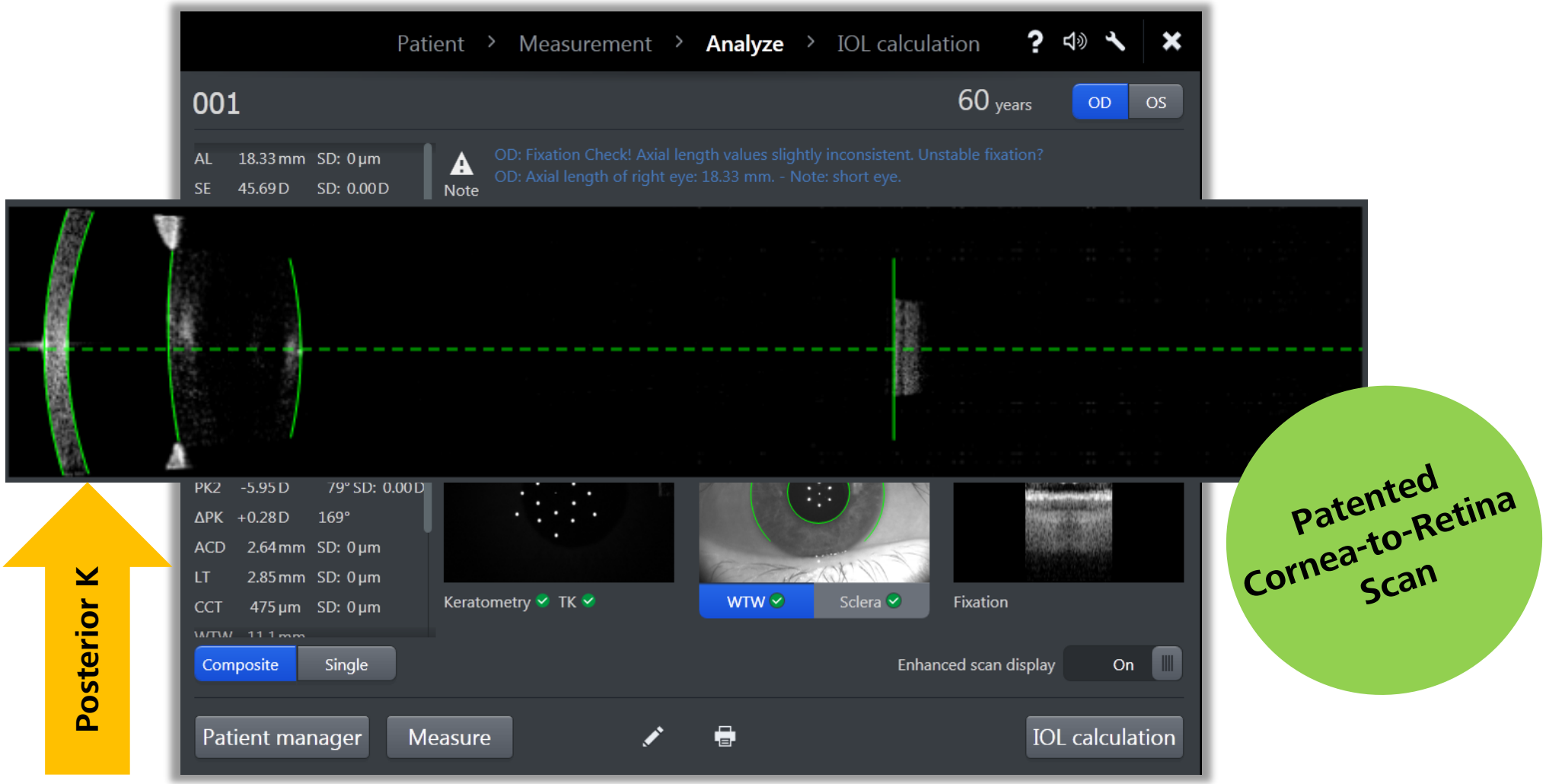
No change to existing workflow



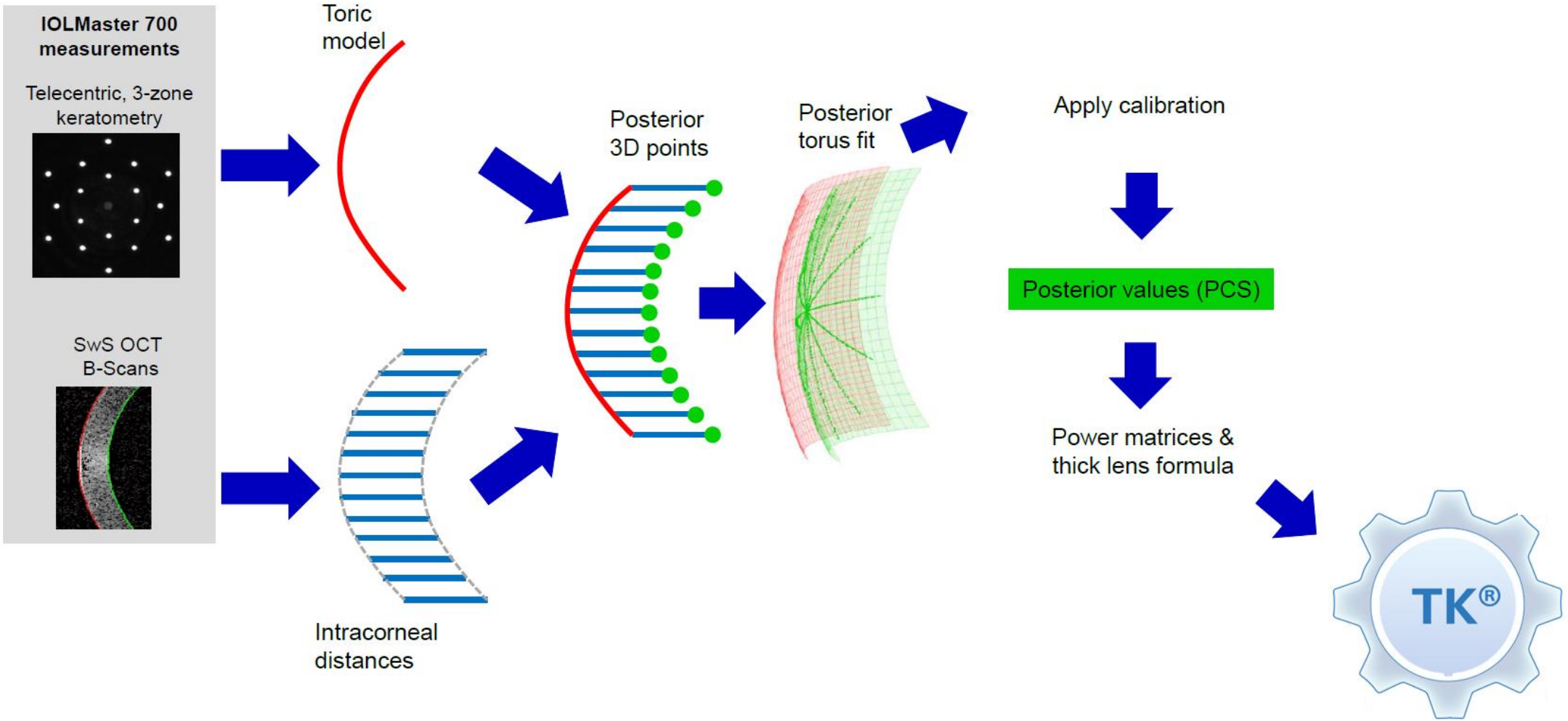
No change to measurement workflow **< 45 sec!**

Total Keratometry Measurement

Enabled by patented Cornea-to-Retina Scan based on SS-OCT

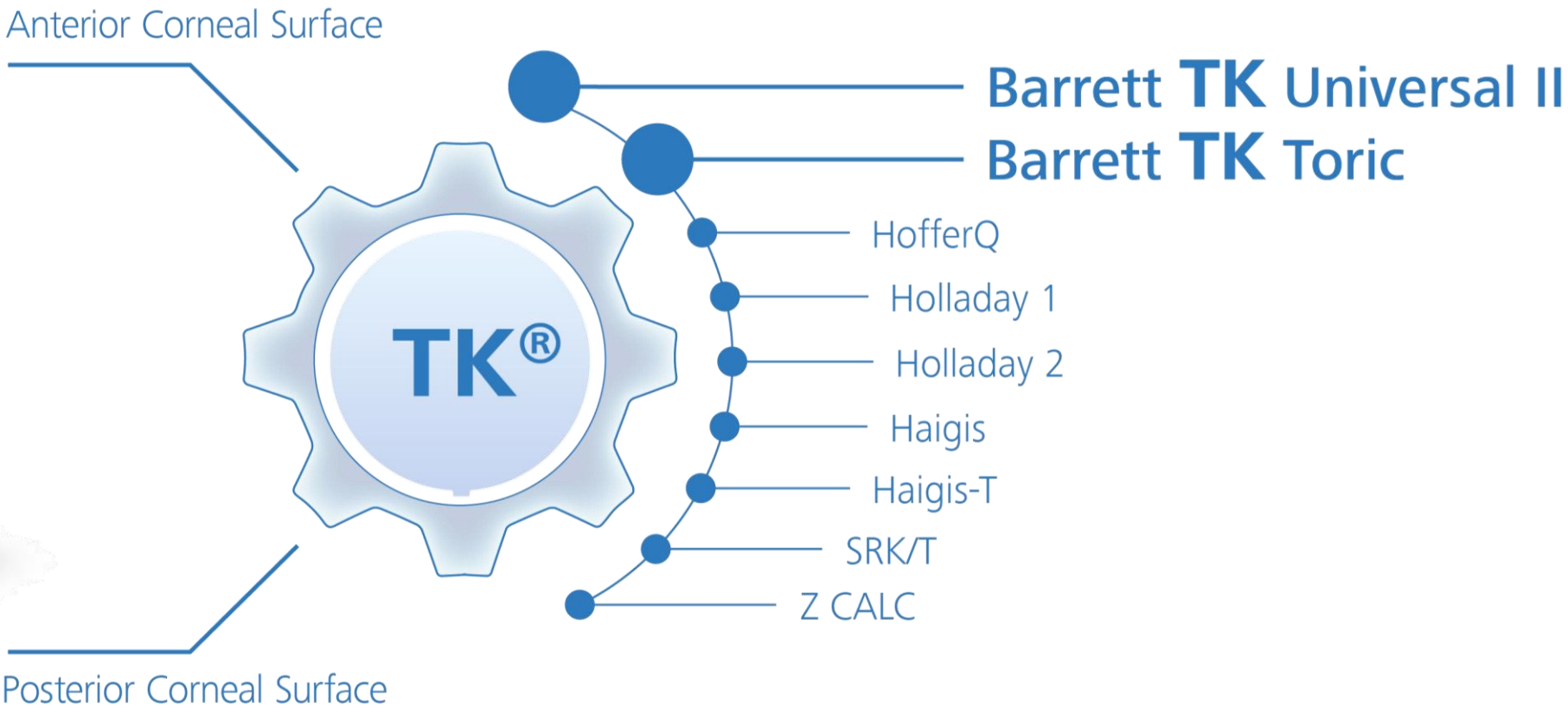


Total Keratometry Measurement
Measurement principle



Total Keratometry Measurement

Measuring total corneal power



Measuring the Posterior Corneal Surface with the ZEISS IOLMaster 700

Enhanced biometric measurement for individualized surgical planning

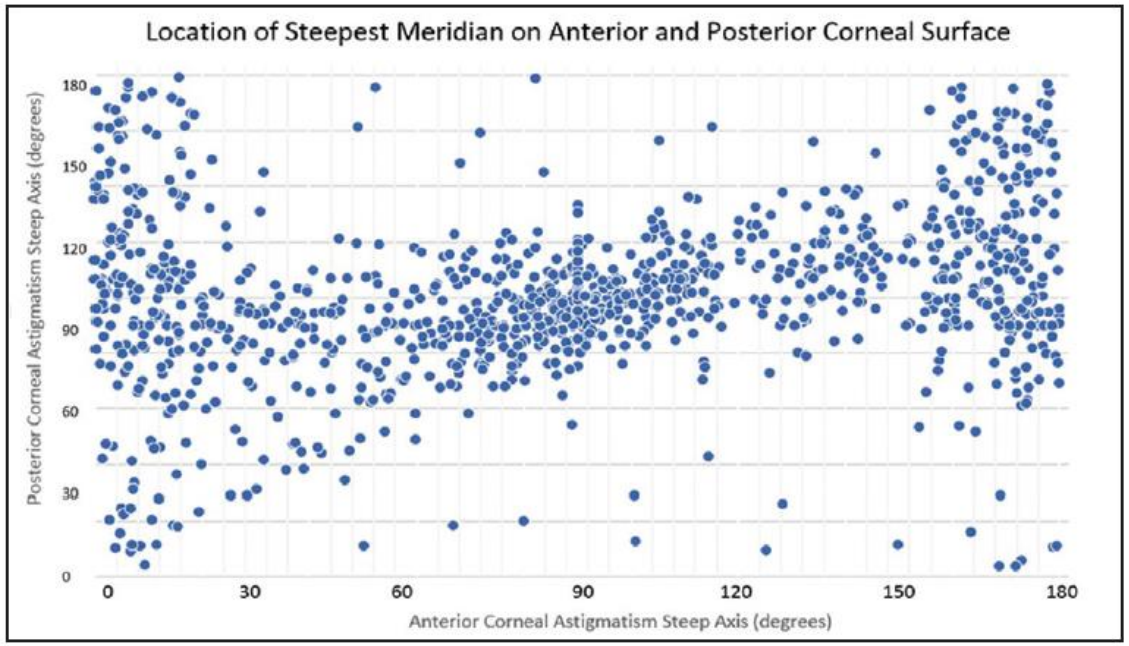


Figure 1. Distribution of orientation of the steep axis of astigmatism on the anterior and posterior corneal surfaces.

- This first description of posterior corneal astigmatism measurement by the ZEISS IOLMaster 700
  - Found the average magnitude of posterior corneal astigmatism and proportion of vertical orientation of steep axis was lower than previous estimates.
  - **The ZEISS IOLMaster 700 appears capable of providing enhanced biometric measurement for individualized surgical planning.**

LaHood BR, Goggin M. Measurement of Posterior Corneal Astigmatism by the IOLMaster 700. *J Refract Surg* 2018;34(5):331–36.

Remarkable IOL Calculation Results Observed

Improve toric IOL calculation

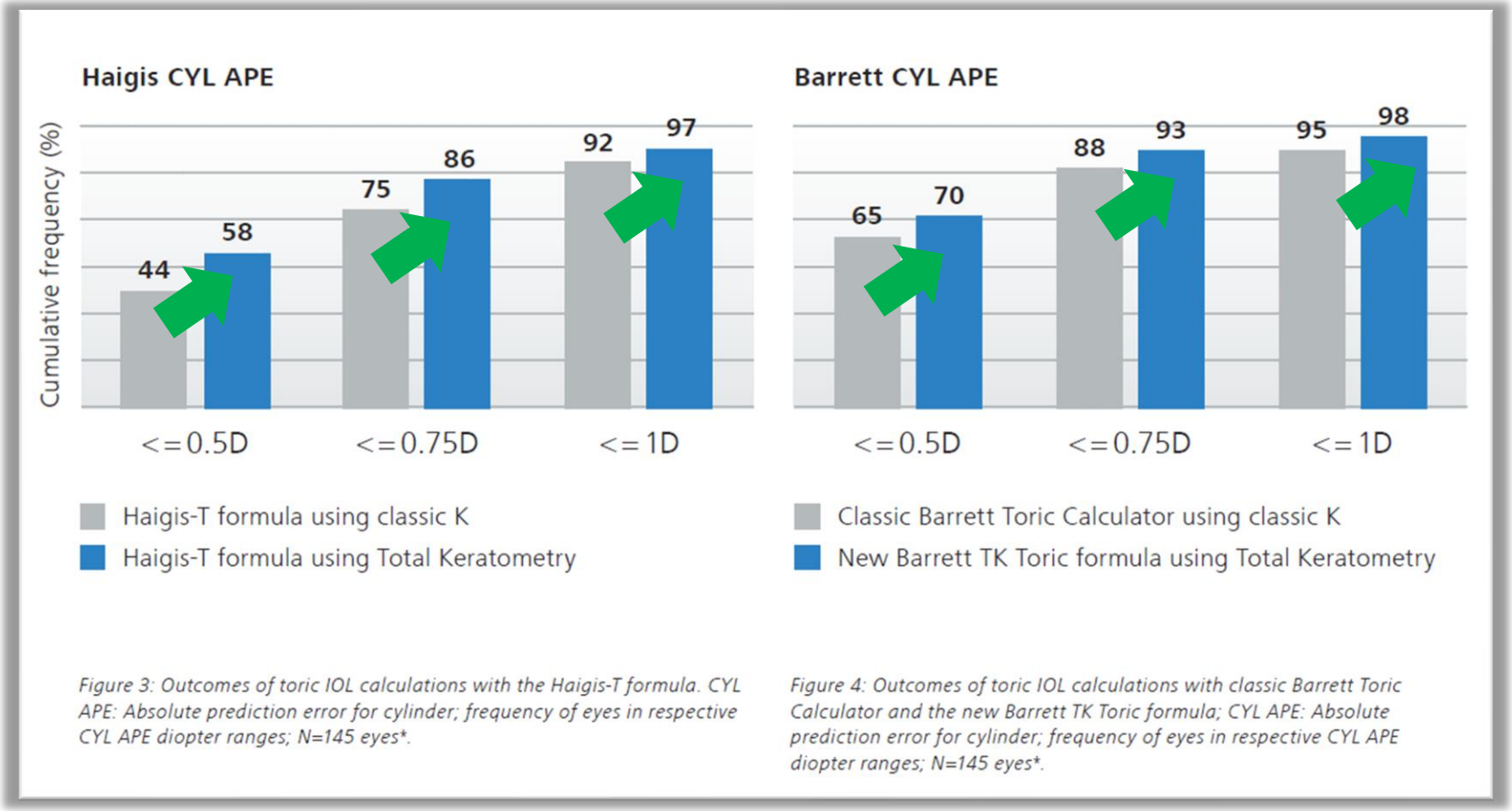


Figure 3: Outcomes of toric IOL calculations with the Haigis-T formula. CYL APE: Absolute prediction error for cylinder; frequency of eyes in respective CYL APE diopter ranges; N=145 eyes.*

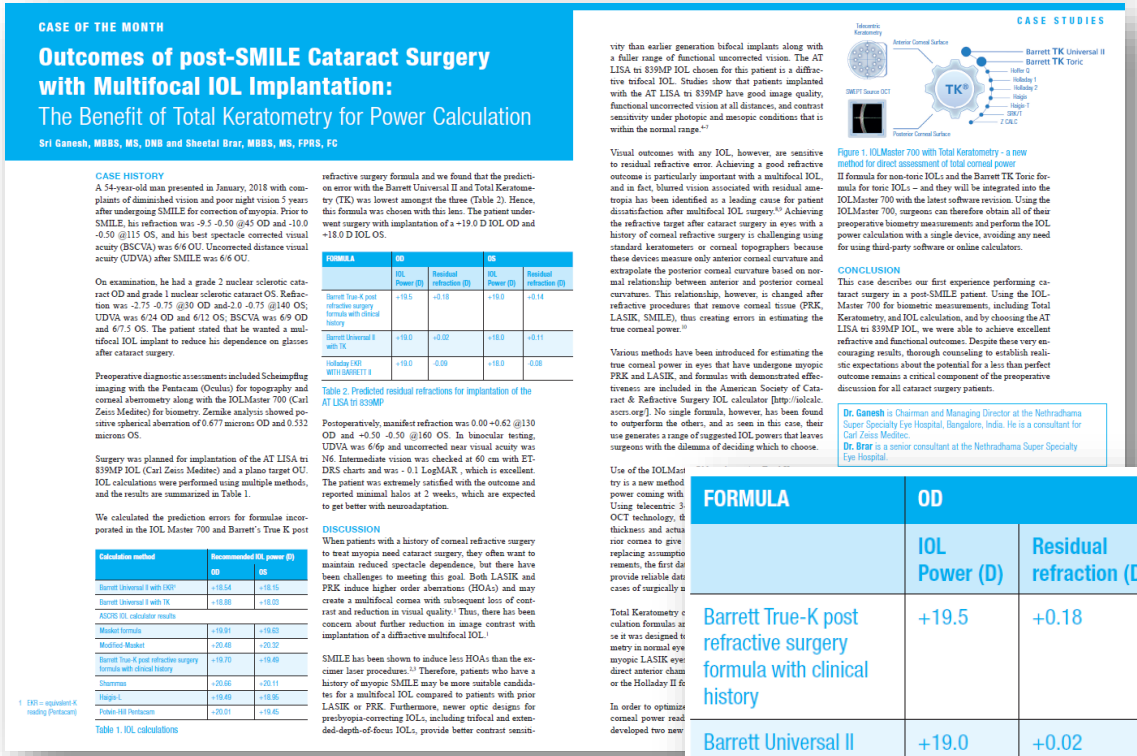
Figure 4: Outcomes of toric IOL calculations with classic Barrett Toric Calculator and the new Barrett TK Toric formula; CYL APE: Absolute prediction error for cylinder; frequency of eyes in respective CYL APE diopter ranges; N=145 eyes.*

Improve toric IOL calculation.

Source: Total Keratometry Compendium
Fabian and Wehner 2018
** *Retrospective post-hoc analysis of 145 normal cataract eyes implanted with aspheric IOL, 6 weeks post-op.*

Total Keratometry Post-Laser Vision Correction?

First post-SMILE cases promising



CASE OF THE MONTH

Outcomes of post-SMILE Cataract Surgery with Multifocal IOL Implantation:

The Benefit of Total Keratometry for Power Calculation

Sri Ganesh, MBBS, MS, DNB and Sheetal Brar, MBBS, MS, FPRS, FC

CASE HISTORY

A 54-year-old man presented in January, 2018 with complaints of diminished vision and poor night vision 5 years after undergoing SMILE for correction of myopia. Prior to SMILE, his refraction was -9.5 -0.50 @45 OD and -10.0 -0.50 @115 OS, and his best spectacle corrected visual acuity (BSCVA) was 6/6 OU. Uncorrected distance visual acuity (UDVA) after SMILE was 6/6 OU.

On examination, he had a grade 2 nuclear sclerotic cataract OD and grade 1 nuclear sclerotic cataract OS. Refraction was -2.75 -0.75 @30 OD and-2.0 -0.75 @140 OS; UDVA was 6/24 OD and 6/12 OS; BSCVA was 6/9 OD and 6/7.5 OS. The patient stated that he wanted a multifocal IOL implant to reduce his dependence on glasses after cataract surgery.

Preoperative diagnostic assessments included Scheimpflug imaging with the Pentacam (Oculus) for topography and corneal aberrometry along with the IOLMaster 700 (Carl Zeiss Meditec) for biometry. Zernike analysis showed positive spherical aberration of 0.677 microns OD and 0.532 microns OS.

Surgery was planned for implantation of the AT LISA tri 839MP IOL (Carl Zeiss Meditec) and a plano target OU. IOL calculations were performed using multiple methods, and the results are summarized in Table 1.

We calculated the prediction errors for formulae incorporated in the IOL Master 700 and Barrett's True K post refractive surgery formula and we found that the prediction error with the Barrett Universal II and Total Keratometry (TK) was lowest amongst the three (Table 2). Hence, this formula was chosen with this lens. The patient underwent surgery with implantation of a +19.0 D IOL OD and +18.0 D IOL OS.

Calculation method	Recommended IOL power (D)	
	OD	OS
Barrett Universal II with EKR[1]	+18.54	+18.15
Barrett Universal II with TK	+18.86	+18.03
ASCRS IOL calculator results		
Masket formula	+19.91	+19.63
Modified-Masket	+20.48	+20.32
Barrett True-K post refractive surgery formula with clinical history	+19.70	+19.49
Shammas	+20.66	+20.11
Haigis-L	+19.49	+18.96
Potvin-Hill Pentacam	+20.01	+19.45

1 EKR = equivalent-K reading (Pentacam)

Table 1. IOL calculations

FORMULA	OD		OS	
	IOL Power (D)	Residual refraction (D)	IOL Power (D)	Residual refraction (D)
Barrett True-K post refractive surgery formula with clinical history	+19.5	+0.18	+19.0	+0.14
Barrett Universal II with TK	+19.0	+0.02	+18.0	+0.11
Holladay EKR WITH BARRETT II	+19.0	-0.09	+18.0	-0.08

Table 2. Predicted residual refractions for implantation of the AT LISA tri 839MP

SMILE has been shown to induce less HOAs than the excimer laser procedures.[3,5] Therefore, patients who have a history of myopic SMILE may be more suitable candidates for a multifocal IOL compared to patients with prior LASIK or PRK. Furthermore, newer optic designs for presbyopia-correcting IOLs, including trifocal and extended-depth-of-focus IOLs, provide better contrast sensitivity than earlier generation bifocal implants along with a fuller range of functional uncorrected vision. The AT LISA tri 839MP IOL chosen for this patient is a diffractive trifocal IOL. Studies show that patients implanted with the AT LISA tri 839MP have good image quality, functional uncorrected vision at all distances, and contrast sensitivity under photopic and mesopic conditions that is within the normal range.[4-7]

Visual outcomes with any IOL, however, are sensitive to residual refractive error. Achieving a good refractive outcome is particularly important with a multifocal IOL, and in fact, blurred vision associated with residual ametropia has been identified as a leading cause for patient dissatisfaction after multifocal IOL surgery.[8,9] Achieving the refractive target after cataract surgery in eyes with a history of corneal refractive surgery is challenging using standard keratometers or corneal topographers because these devices measure only anterior corneal curvature and extrapolate the posterior corneal curvature based on normal relationship between anterior and posterior corneal curvatures. This relationship, however, is changed after refractive procedures that remove corneal tissue (PRK, LASIK, SMILE), thus creating errors in estimating the true corneal power.[10]

Various methods have been introduced for estimating the true corneal power in eyes that have undergone myopic PRK and LASIK, and formulas with demonstrated effectiveness are included in the American Society of Cataract & Refractive Surgery IOL calculator [http://iolcalc.ascrs.org/]. No single formula, however, has been found to outperform the others, and as seen in this case, their use generates a range of suggested IOL powers that leaves surgeons with the dilemma of deciding which to choose.

Use of the IOLMast
try is a new method
power coming with
Using telecentric 3-
OCT technology, t
thickness and actua
rior cornea to give
replacing assumptio
rements, the first da
provide reliable dat
cases of surgically

Total Keratometry
culation formulas a
se it was designed t
metry in normal eye
myopic LASIK eye
direct anterior cham
or the Holladay II fo

In order to optimiz
corneal power read
developed two new

CASE STUDIES

Figure 1. IOLMaster 700 with Total Keratometry - a new method for direct assessment of total corneal power

II formula for non-toric IOLs and the Barrett TK Toric formula for toric IOLs – and they will be integrated into the IOLMaster 700 with the latest software revision. Using the IOLMaster 700, surgeons can therefore obtain all of their preoperative biometry measurements and perform the IOL power calculation with a single device, avoiding any need for using third-party software or online calculators.

CONCLUSION

This case describes our first experience performing cataract surgery in a post-SMILE patient. Using the IOLMaster 700 for biometric measurements, including Total Keratometry, and IOL calculation, and by choosing the AT LISA tri 839MP IOL, we were able to achieve excellent refractive and functional outcomes. Despite these very encouraging results, thorough counseling to establish realistic expectations about the potential for a less than perfect outcome remains a critical component of the preoperative discussion for all cataract surgery patients.

Dr. Ganesh is Chairman and Managing Director at the Nethradhama Super Specialty Eye Hospital, Bangalore, India. He is a consultant for Carl Zeiss Meditec.

Dr. Brar is a senior consultant at the Nethradhama Super Specialty Eye Hospital.

DISCUSSION

When patients with a history of corneal refractive surgery to treat myopia need cataract surgery, they often want to maintain reduced spectacle dependence, but there have been challenges to meeting this goal. Both LASIK and PRK induce higher order aberrations (HOAs) and may create a multifocal cornea with subsequent loss of contrast and reduction in visual quality.[1] Thus, there has been concern about further reduction in image contrast with implantation of a diffractive multifocal IOL.[1]

"Using the IOLMaster 700 for biometric measurements, including Total Keratometry and IOL calculation, and by choosing the AT LISA tri 839MP IOL, we were able to achieve **excellent refractive and functional outcomes**."

Ganesh, Sri. Outcomes of post-SMILE Cataract Surgery with multifocal IOL implantation. CRSTE 2018.

What Do Doctors Say?

Graham Barrett, MD, Perth, Australia

"I am very impressed with the results I have obtained with the IOLMaster 700."

"TK has the potential to reduce refractive surprises to a minimum."

Han Bor Fam, MD, Singapore

"For toric and non-toric, The TK value improves the overall outcome."

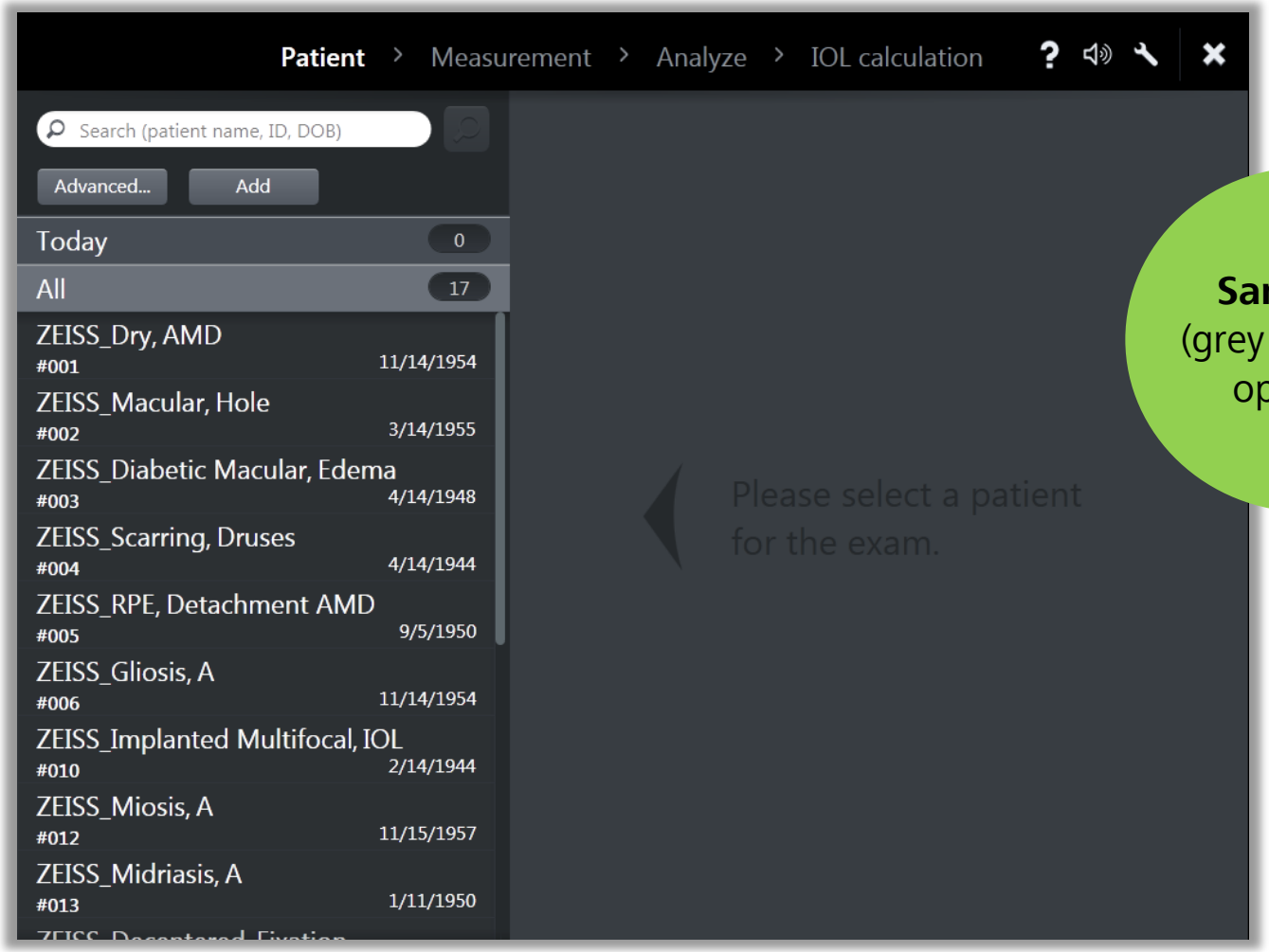
"It tightens consistency, it reduces the outliers and enhances the overall outcome."

Agenda

1	Introduction: SW 1.80 & Total Keratometry (TK)
2	Total Keratometry (TK)
3	GUI - Measurement, Analyze
4	GUI - IOL Calculation
5	Print & Export Options
6	Websites

ZEISS IOLMaster 700 SW 1.80

Customized user Interface for your personal preference



Same GUI
(grey interface optional)

ZEISS IOLMaster 700 SW 1.80

Enhanced Fixation / AL Check Scan throughout the entire measurement process

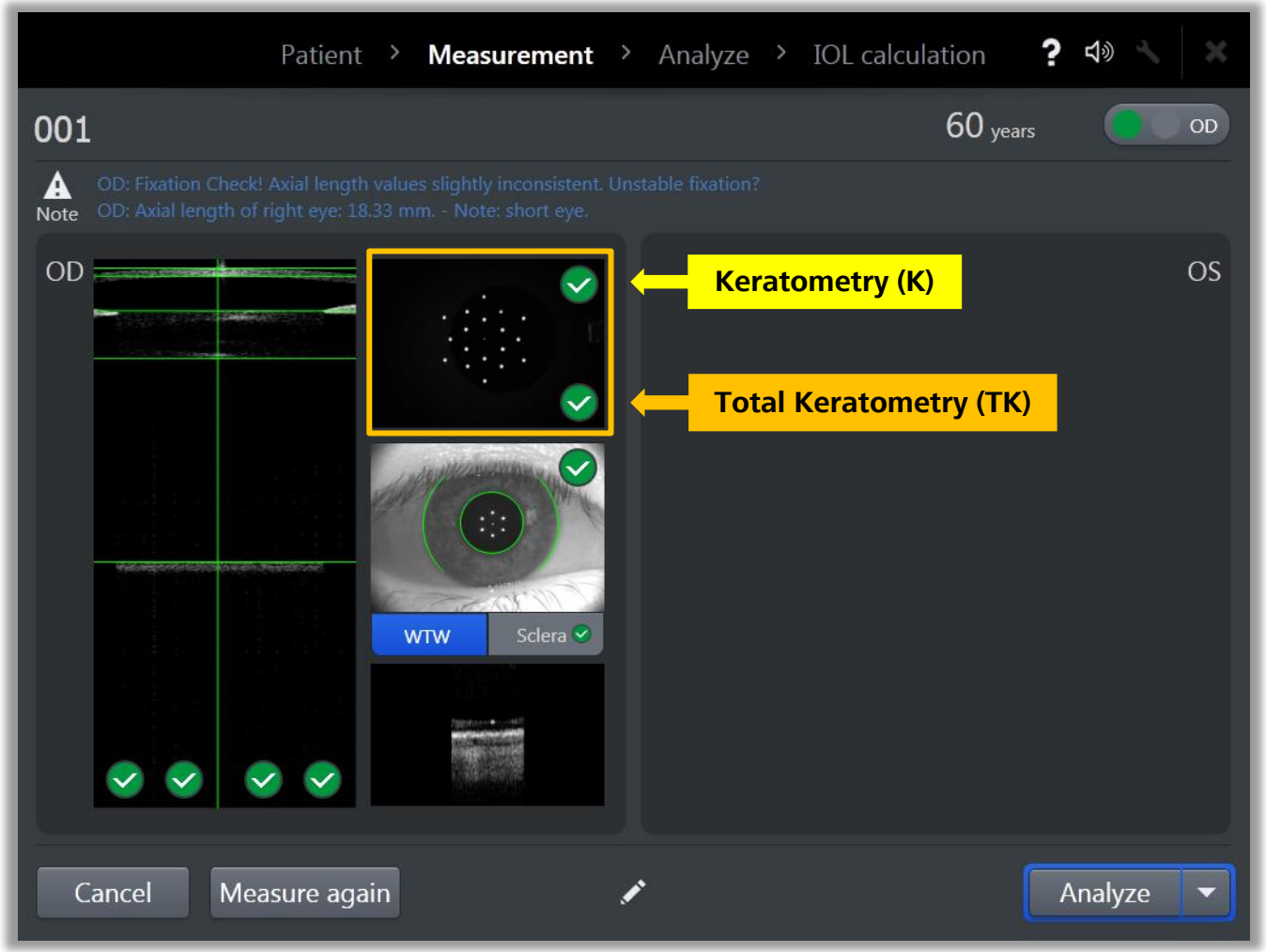
- Axial length measurement is taken from **different time points** in the measurement process and will be compared to further ensure the patient was fixating.

1. Anterior segment OCT scan (ie. during fine alignment scan)
    - Axial length measurement **#1 taken**

2. Retina OCT scan (ie. during fixation check scan)
    - Axial length measurement **#2 taken**

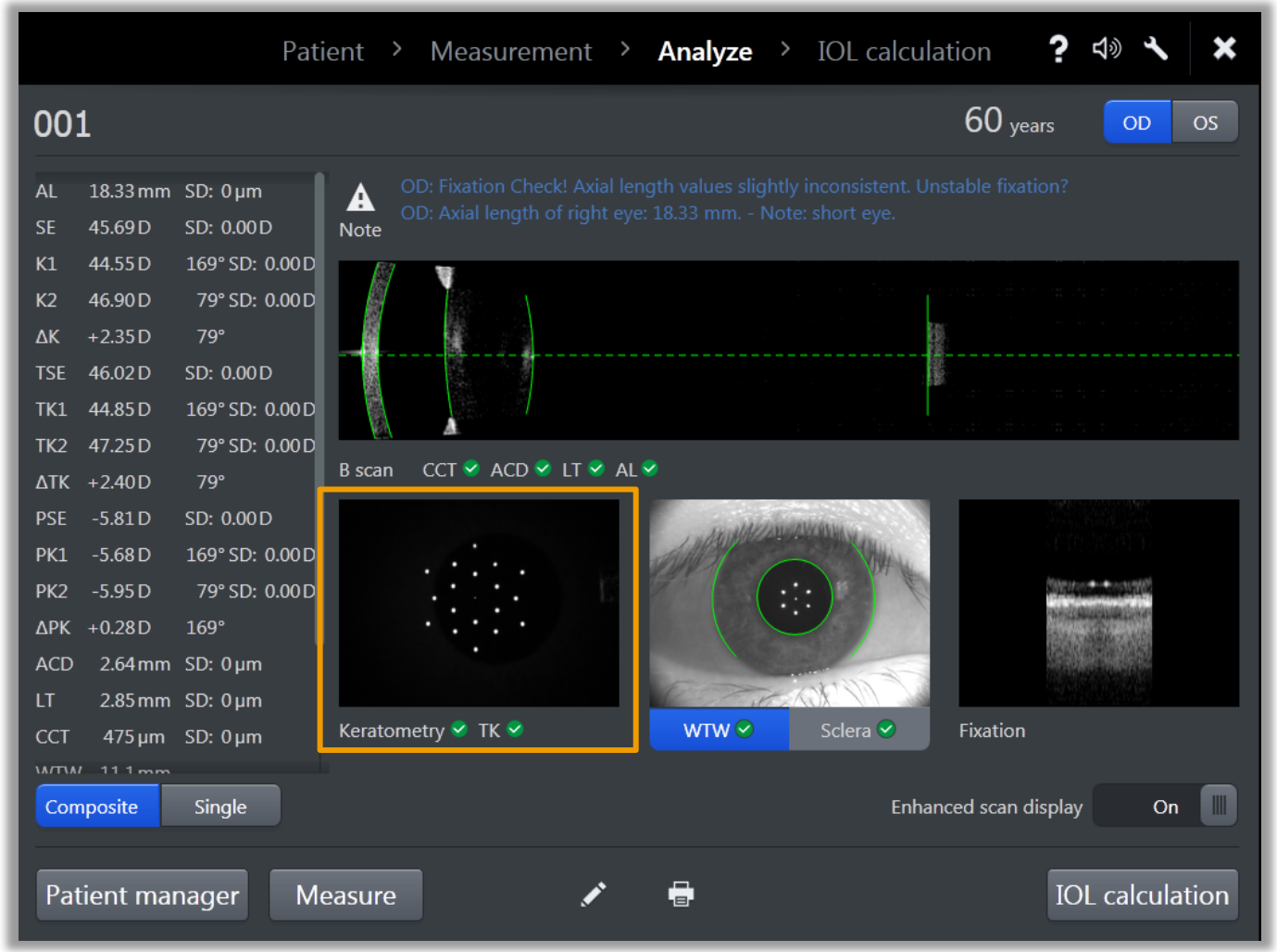
ZEISS IOLMaster 700 SW 1.80 & TK

Evaluate your measurements with intuitive quality checks



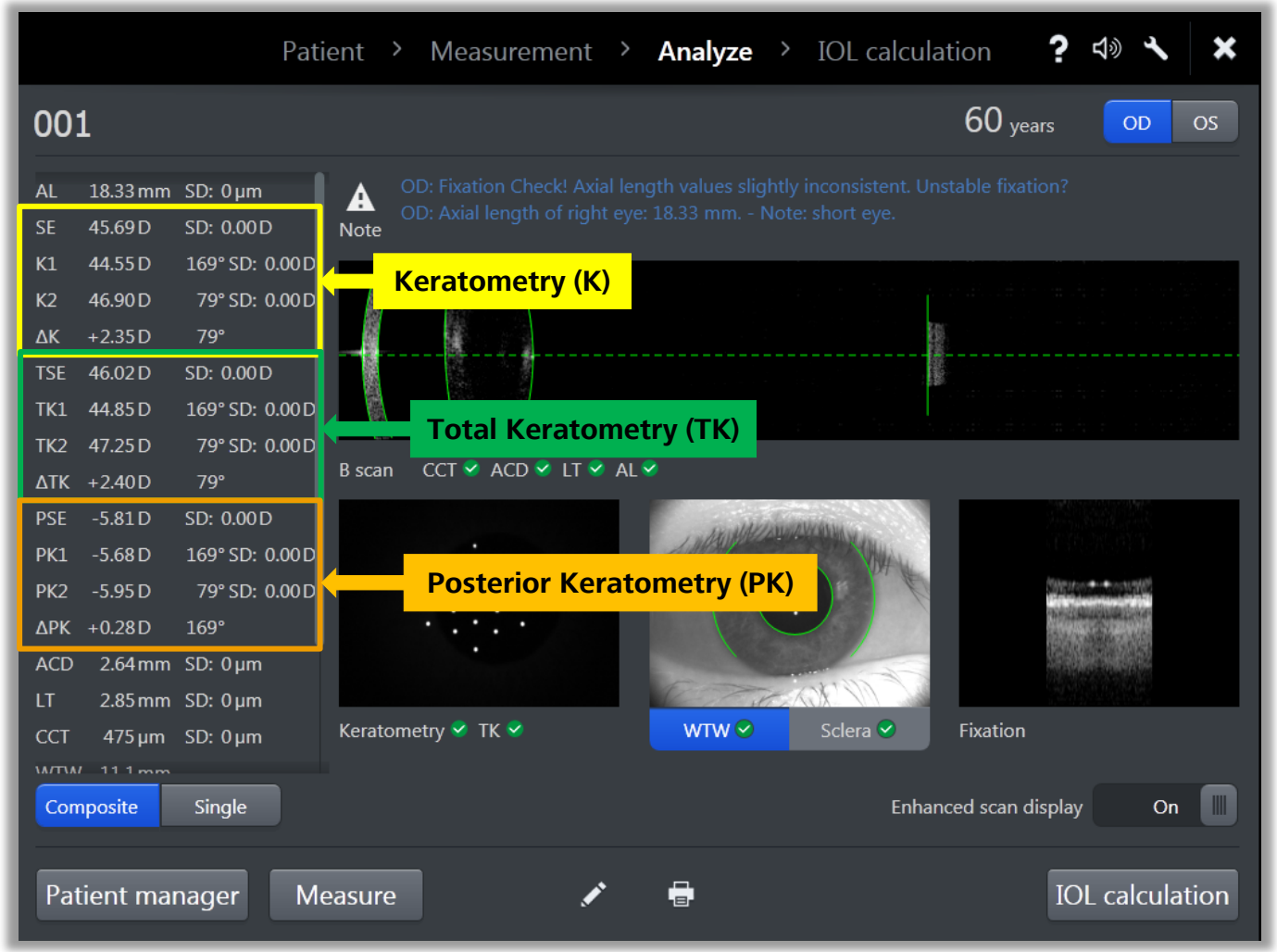
ZEISS IOLMaster 700 SW 1.80 & TK

Easily evaluate quality of your measurements



ZEISS IOLMaster 700 SW 1.80 & TK

Conveniently view all keratometry data on one screen – K, TK & PK



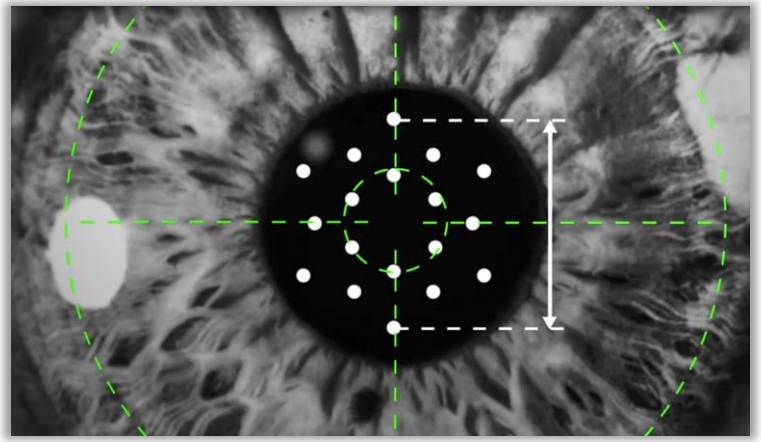
ZEISS IOLMaster 700 SW 1.80 & TK

Conveniently view all keratometry data on one screen – K, TK & PK

Telecentric Keratometry
Unique optical system to the ZEISS IOLMaster

- The IOLMaster is the only optical biometer on the market that uses a smart optical configuration that allows telecentric and thus **distance-independent** keratometry.

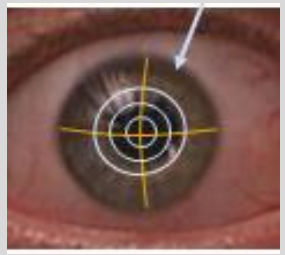
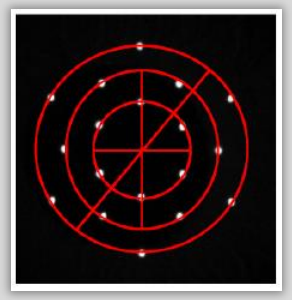
  - **'Motion independent'** keratometry
  - **Independent of focus** (easy & comfortable to use)
  - **Direct radius measurement** (constant spot distance)
  - **Visual assessment** of dots for tear film integrity



- Robust, precise and repeatable keratometry measurements

- NOW, the IOLM combines unique telecentric keratometry measurement of the anterior corneal surface with measurement of the posterior corneal surface in order to calculate **Total Keratometry (TK)**.

3-zone Telecentric Keratometry
For improved repeatability & reproducibility

IOLM700			• **3-zone** Telecentric Keratometry • **18 points**	• *1.5mm • *2.5mm • *3.5mm	• SE, K1, K2, ΔK, axis • TSE, TK1, TK2, ΔTK, axis • PSE, PK1, PK2, ΔPK, axis

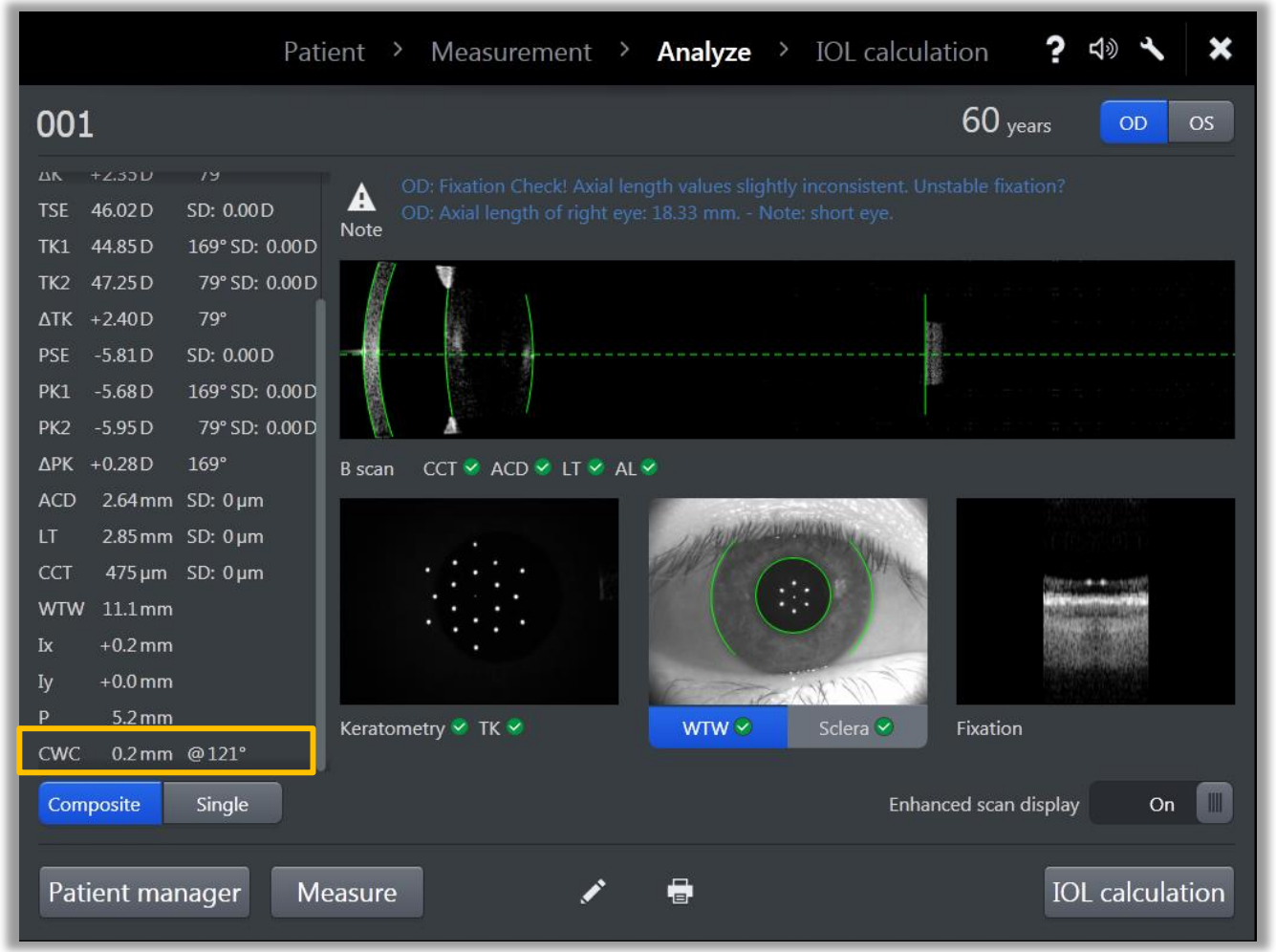
** Approximate values, depending on corneal radii*

- **Average of all 18 points are used**
  - "3-zone consistency" (Improved repeatability and reproducibility due to improved consistency checks – less outliers)
  - "3 zone correlation" (additional correlation in 3 zones for improved repeatability)

Chang-Waring Chord (Angle Kappa)

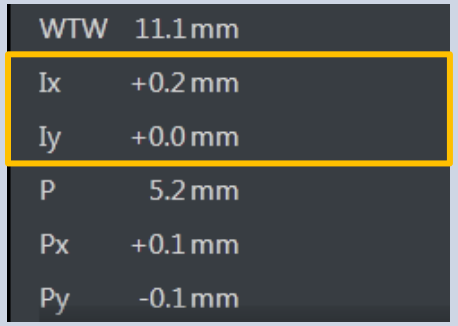
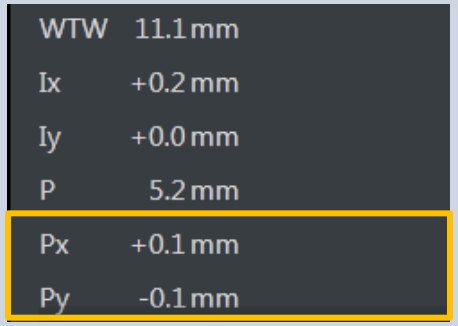
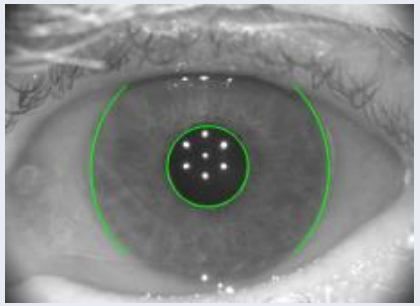
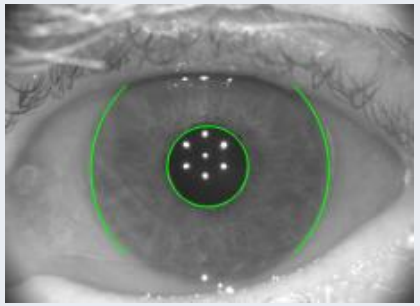
Evaluate the axis symmetry of the eye

- The IOLMaster offers the option to view the pupil offset in:
  - Cartesian coordinates (x,y) **or**
  - Polar coordinates (CW-Chord)
- Easily set preference in *Advanced settings > Parameters, units > Chang-Waring Chord*



Angle Alpha and Angle Kappa

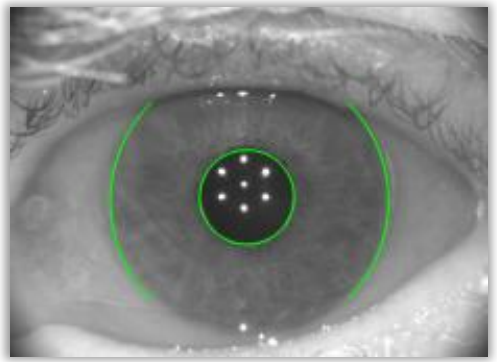
Evaluate the axis symmetry of the eye

Angle alpha	Angle kappa (CW-Chord)
	
	
• **Angle alpha** is the difference between the center of the limbus and the visual axis.	• **Angle kappa** is the difference between the center of the pupil and the visual axis.

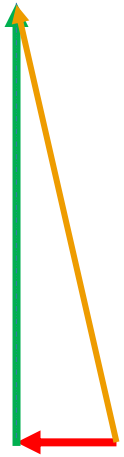
Chang-Waring Chord (Angle Kappa)

Evaluate pre-op for MIOL implantation – Optimize IOL centration

WTW	11.2 mm
Ix	-0.2 mm
Iy	+0.7 mm
P	3.8 mm
Px	-0.1 mm
Py	+0.5 mm

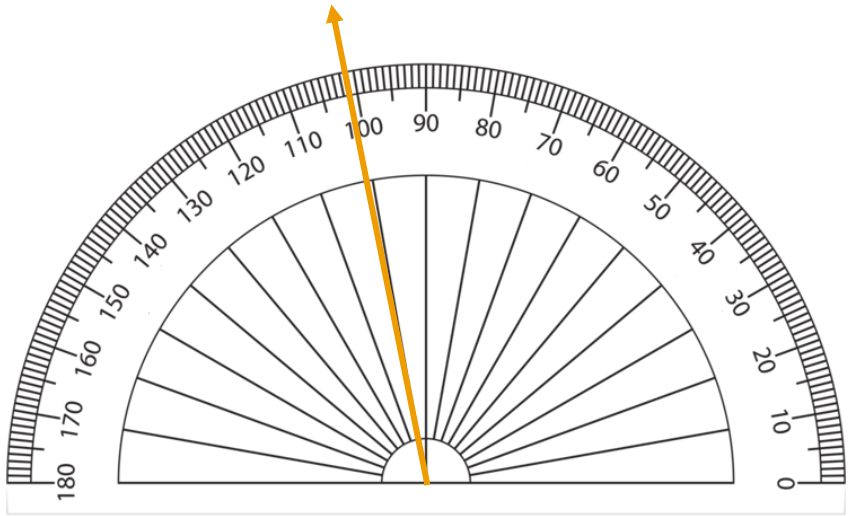


Py = + 0,5 mm



Px = -0,1 mm

CWC = 0,5 mm @ 101°



Chang-Waring Chord (Angle Kappa)

Evaluate pre-op for MIOL implantation – Screen patients suitability

- **Jack Holladay – „Pay attention to the Angla Kappa!“**

  - The dimension between the visual axis and the pupil is called the angla kappa (or chord mu / CWC).
  - The proper place to center a diffractive, premium aspheric, or toric IOL is halfway between the visual axis and the center of the pupil.
  - If that **value is greater than 0.6mm**, patients with diffractive lenses will have halos and glare.

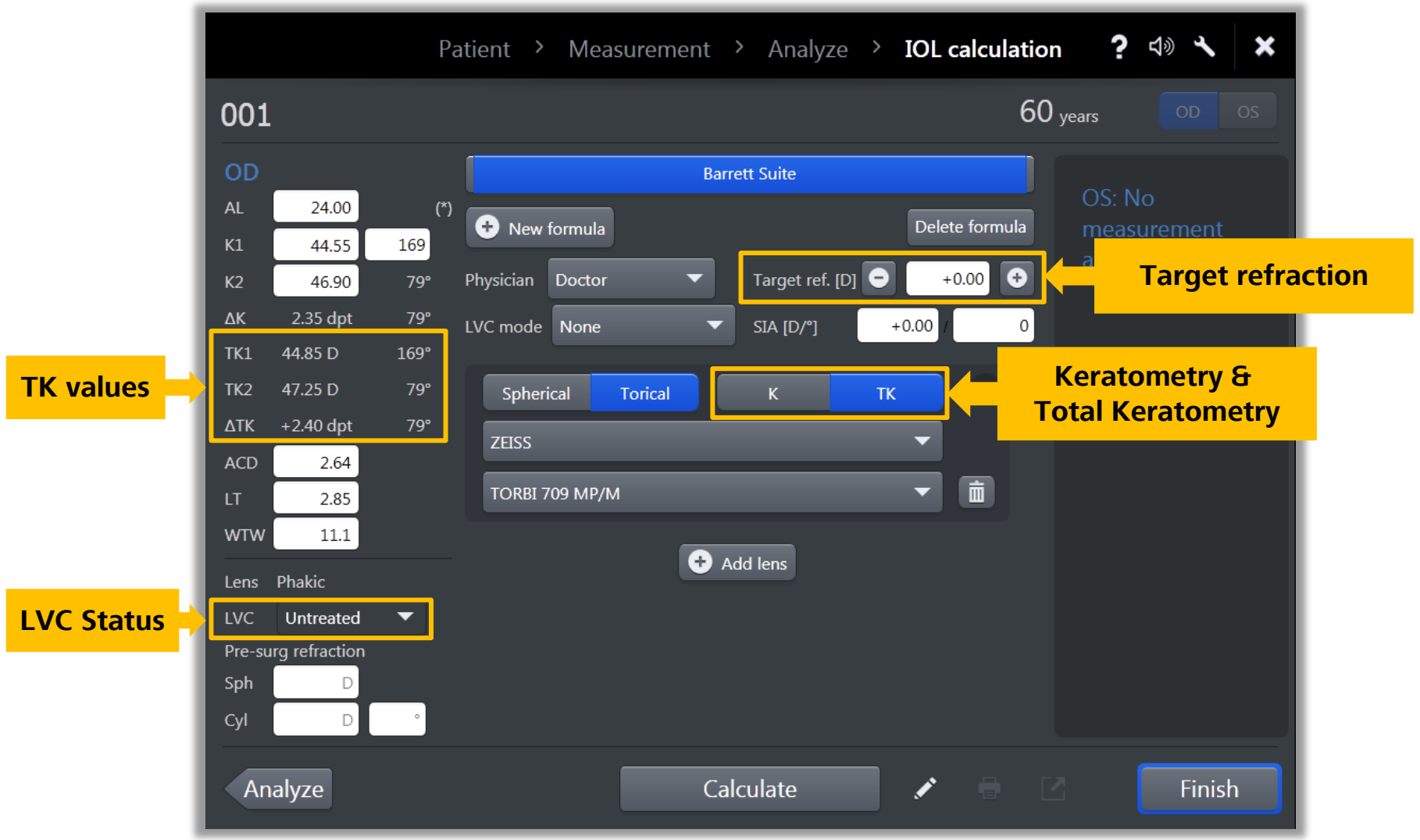
Jack T. Holladay, MD, Hidden Figures, Cataract & Refractive Surgery Today Europe, April 2018, pg 78-80

Agenda

1	Introduction: SW 1.80 & Total Keratometry (TK)
2	Total Keratometry (TK)
3	GUI - Measurement, Analyze
4	GUI - IOL Calculation
5	Print & Export Options
6	Websites

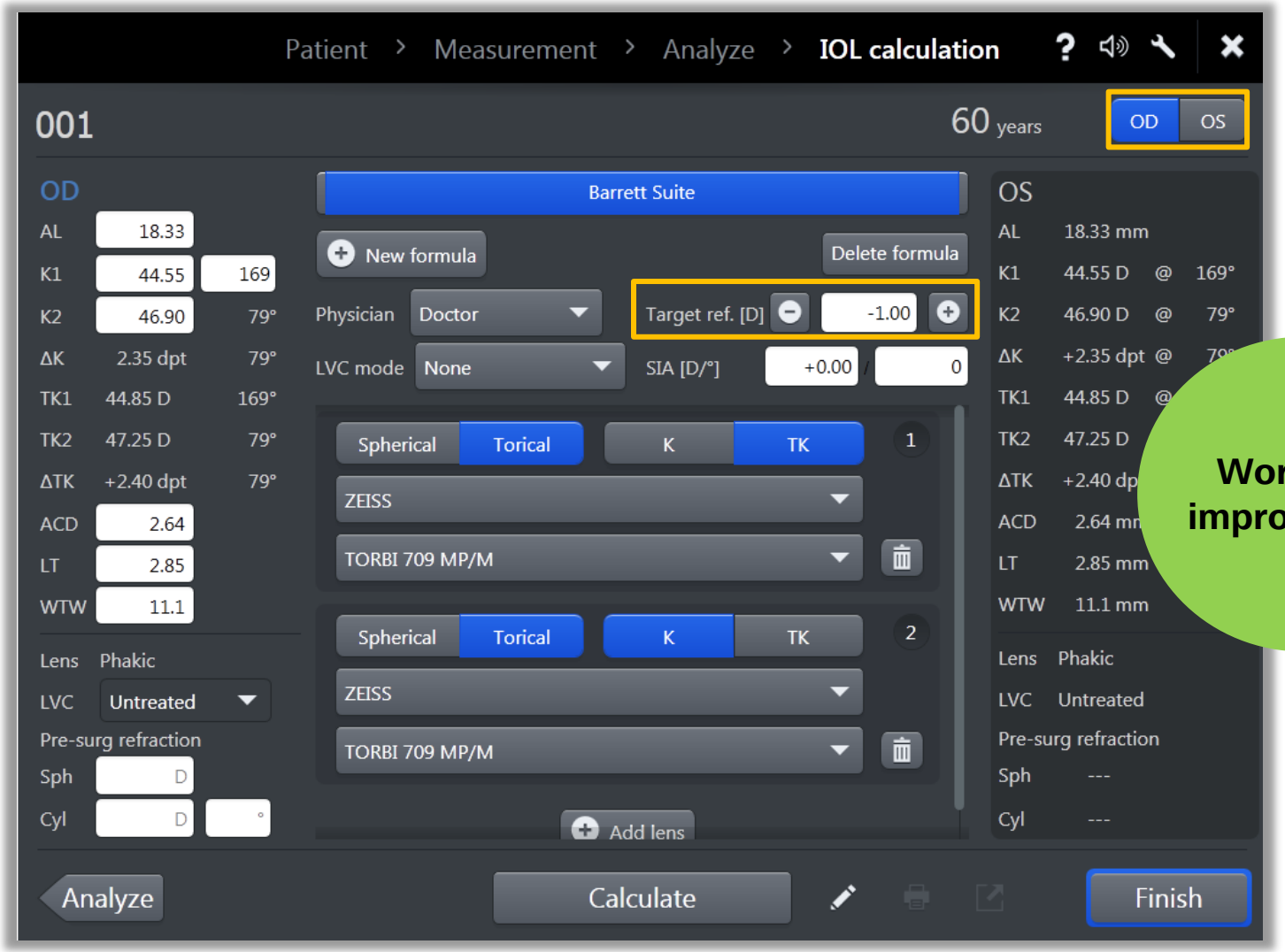
ZEISS IOLMaster 700 - IOL Calculation screen

New features to improve workflow efficiency



Target refraction

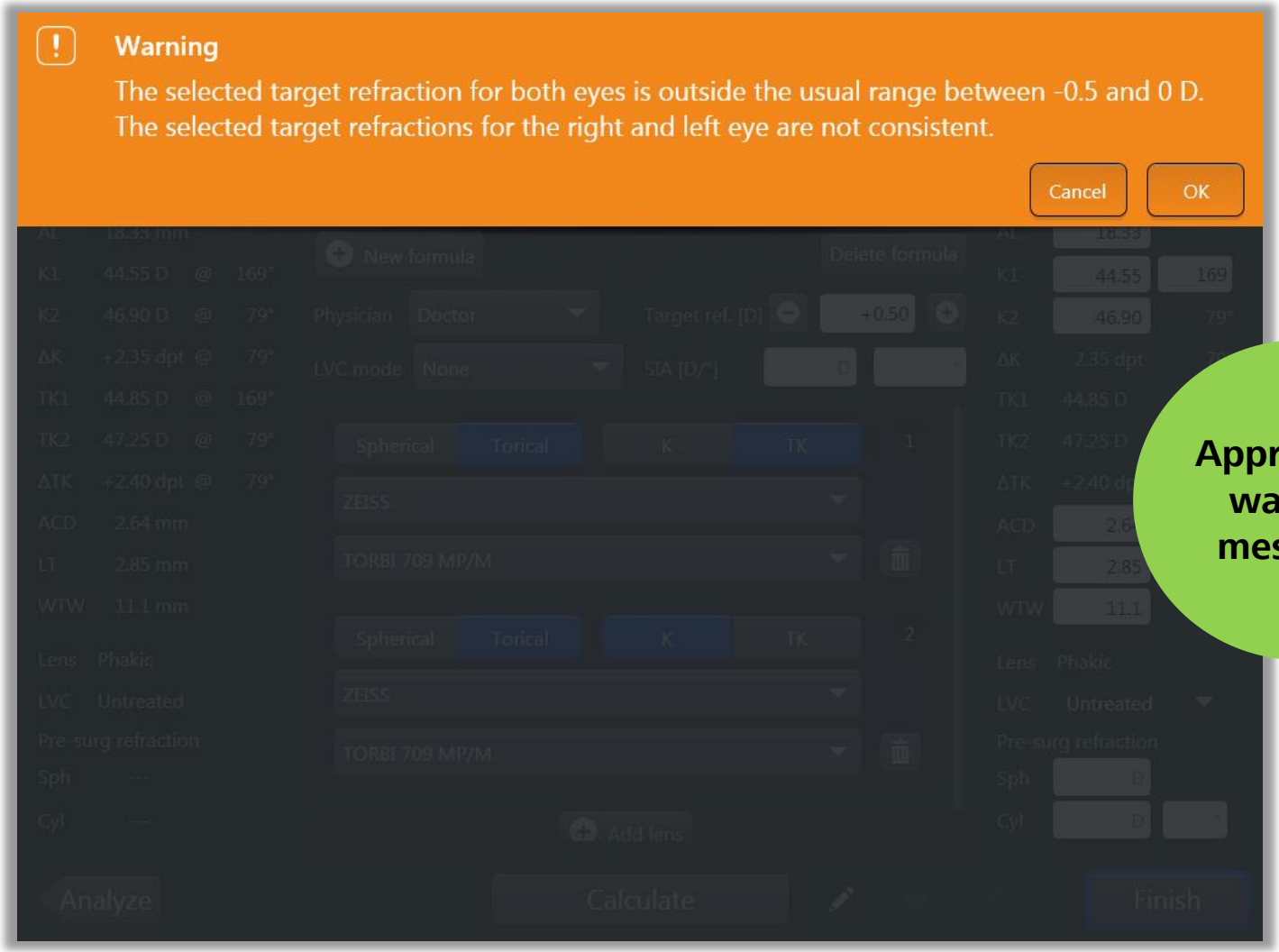
Setting target refraction individually for OD & OS to improve workflow



Workflow improvement

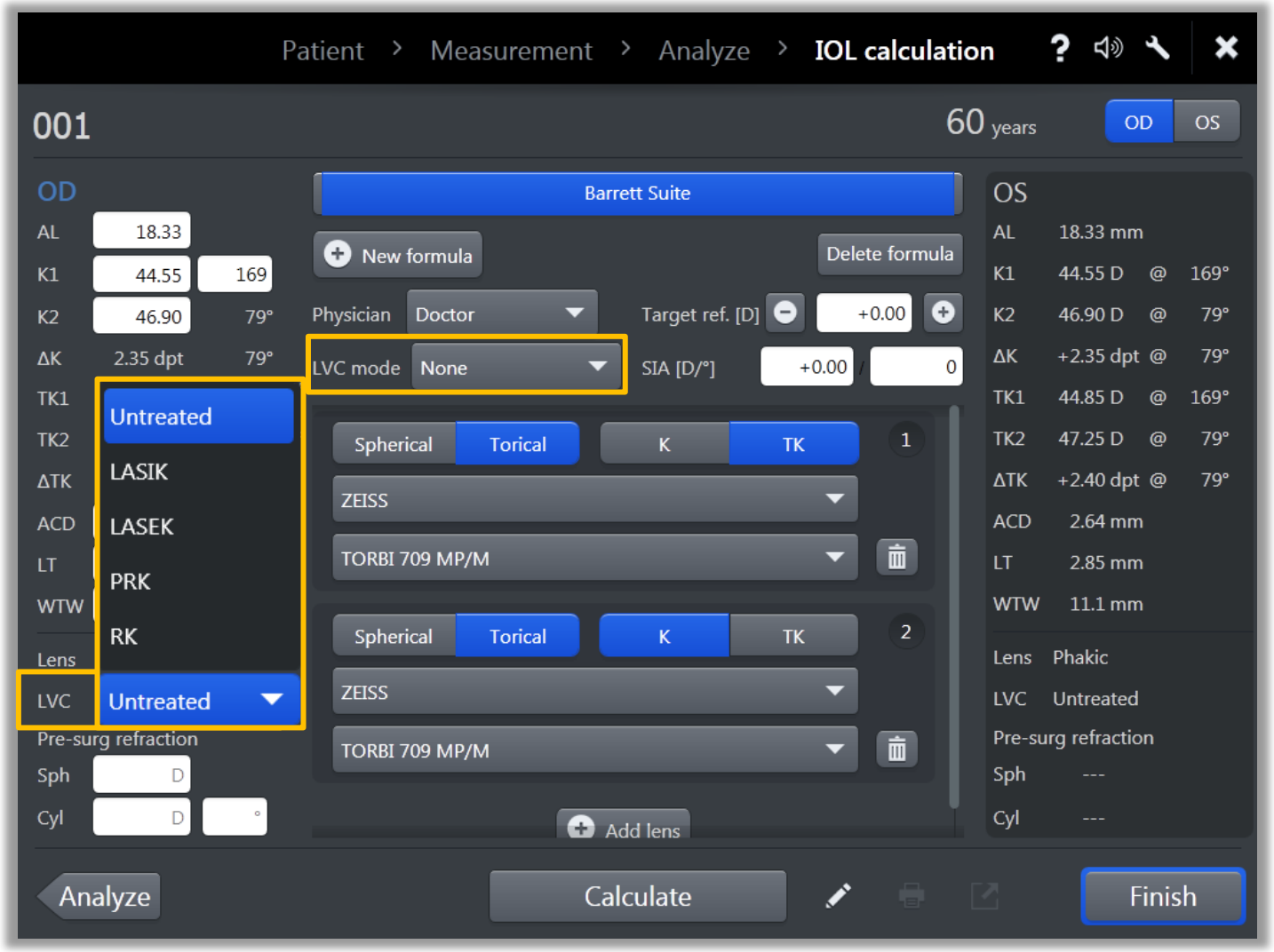
Target refraction

Identify changes in target refraction with appropriate warning messages



Change of LVC status

No need to re-measure the patient!

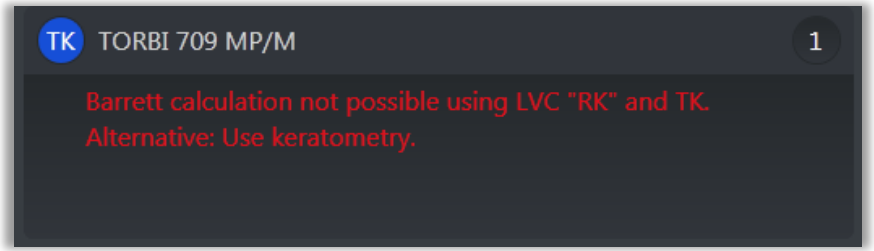


- Ability to change LVC status **post-acquisiton**.
  - Only Barrett Suite (ie. Barrett True-K) will calculate for post-RK patients (with standard Ks).

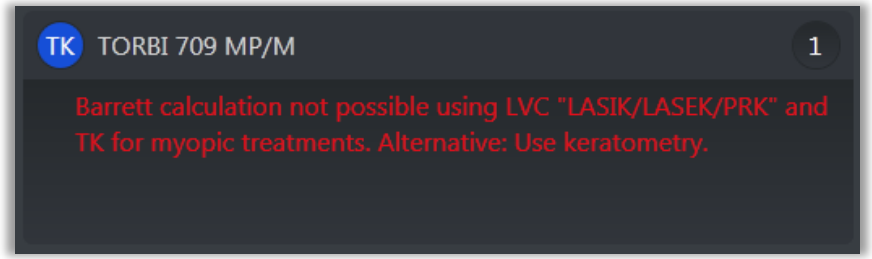
Total Keratometry & Post-LVC Formulas

Expand IOL calculation for your post-LVC patients

- TK measurement values can be used to calculate **post myopic LASIK and PRK with Haigis and Holladay II formulas** (ie. formulas that do not consider Ks for the ELP prediction).
- TK measurement values cannot be used with LVC formulas such as Haigis-L and Barrett True-K.
- ZEISS IOLMaster 700 will block any calculations that are not yet available.
    - EG. Barrett TK calculation is not possible using LVC ‘RK’.

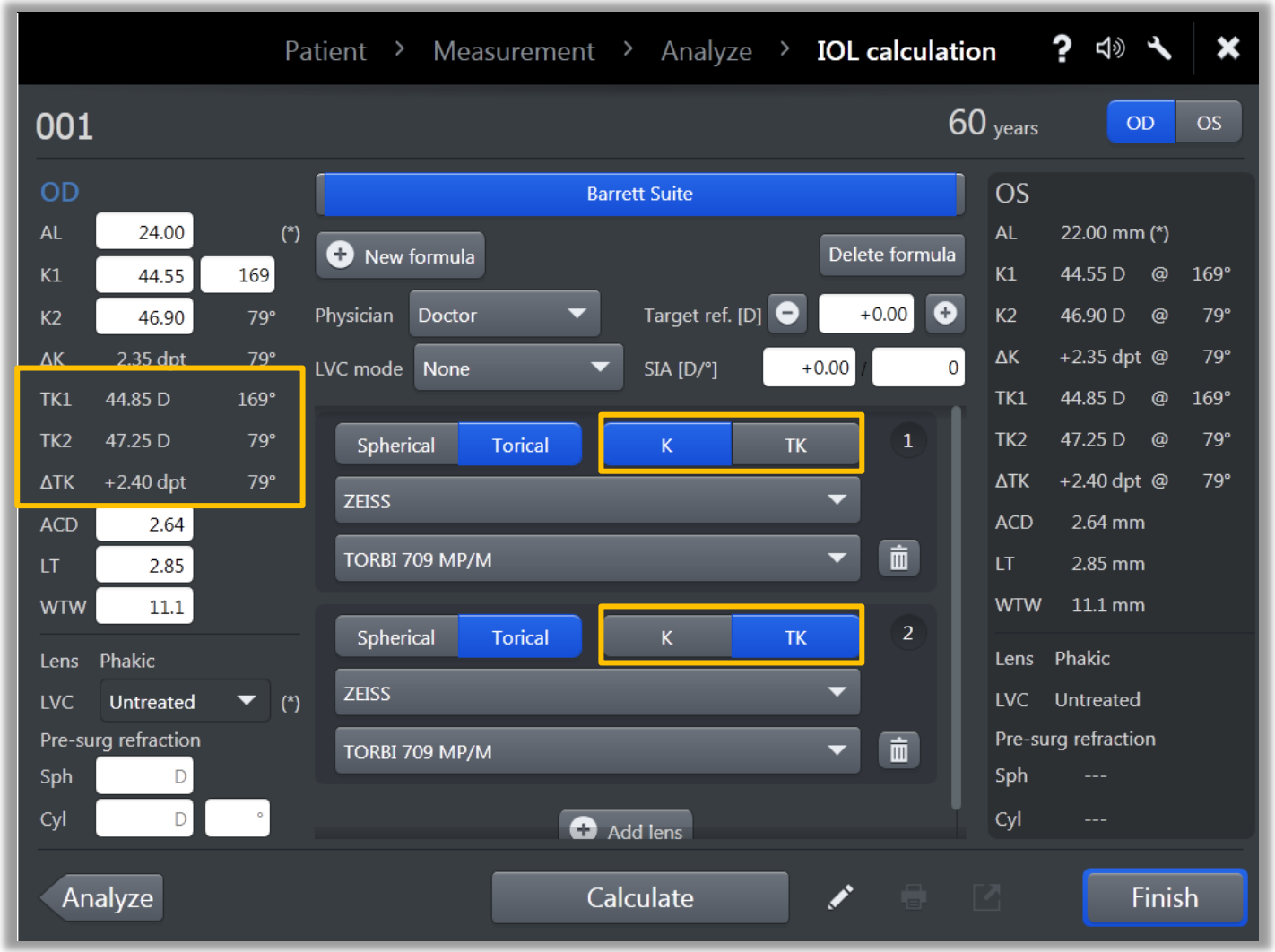


    - EG. Barrett TK Toric calculation is not possible using LVC ‘LASIK/LASEK/PRK’.



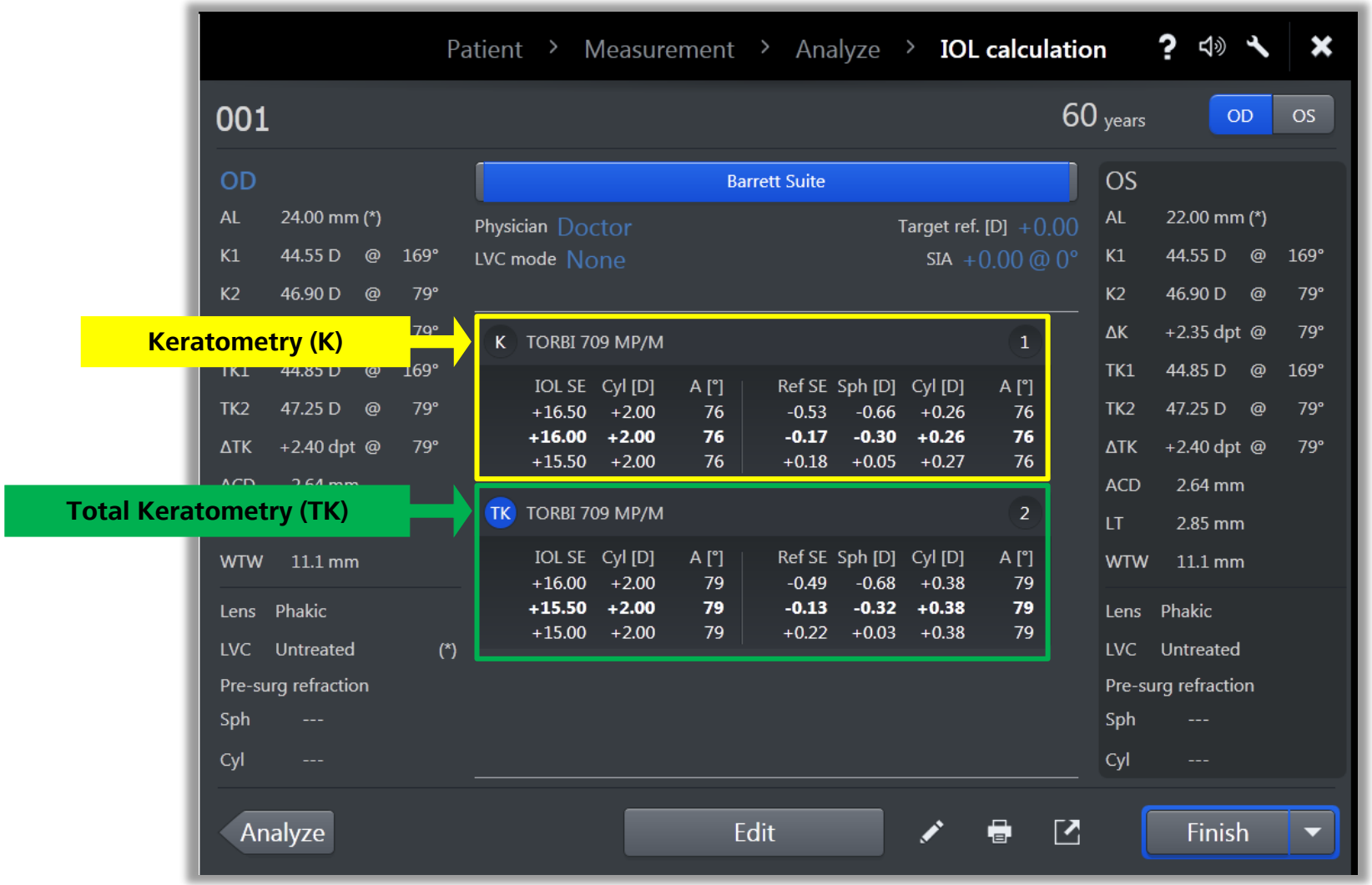
ZEISS IOLMaster 700 - IOL Calculation screen

View and compare TK & K measurement values on one screen



ZEISS IOLMaster 700 - IOL Calculation screen

View and compare TK & K measurement values on one screen



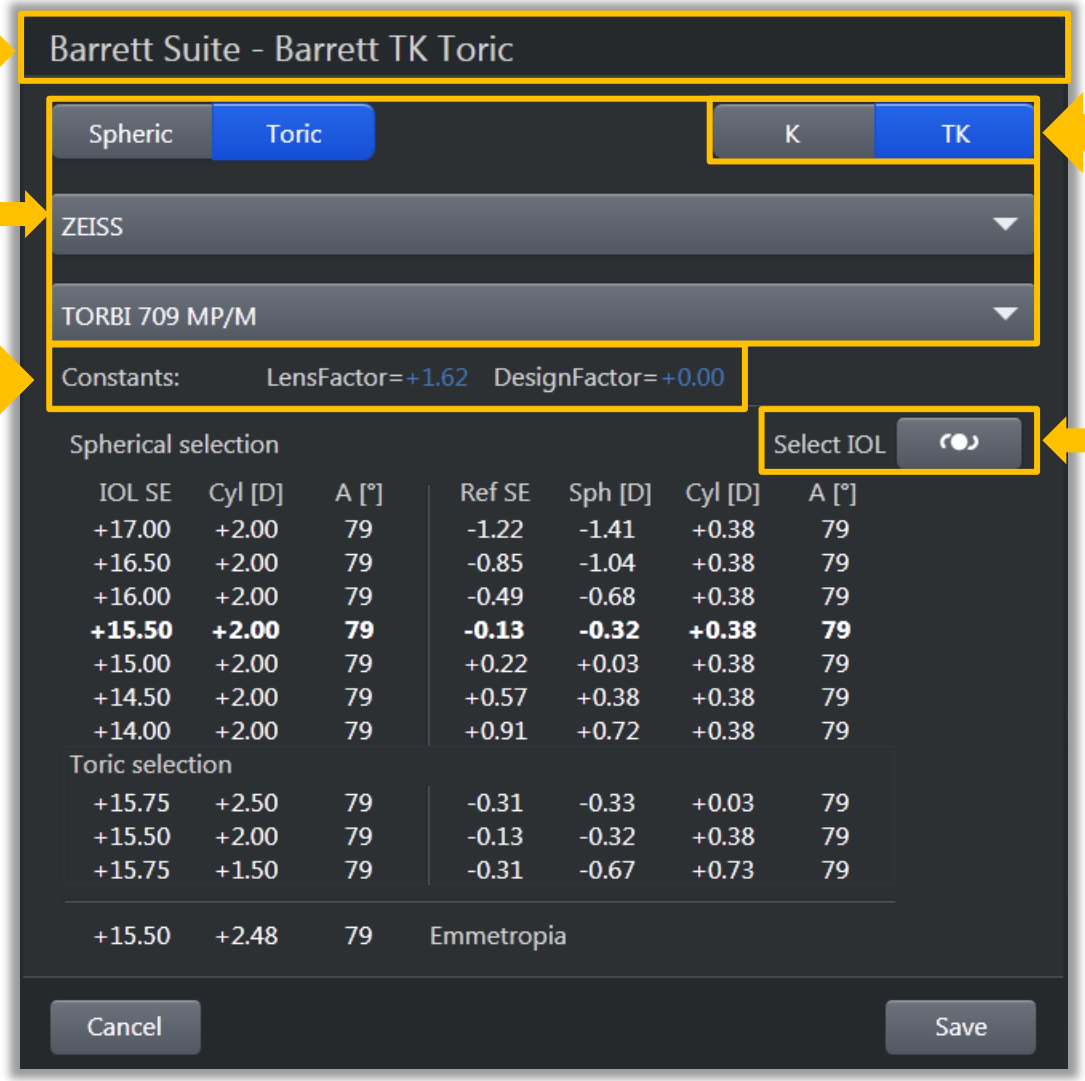
Detailed IOL information screen

Quickly view and change IOL selection

Formula used for IOL calculation

Change IOL

View formula constants

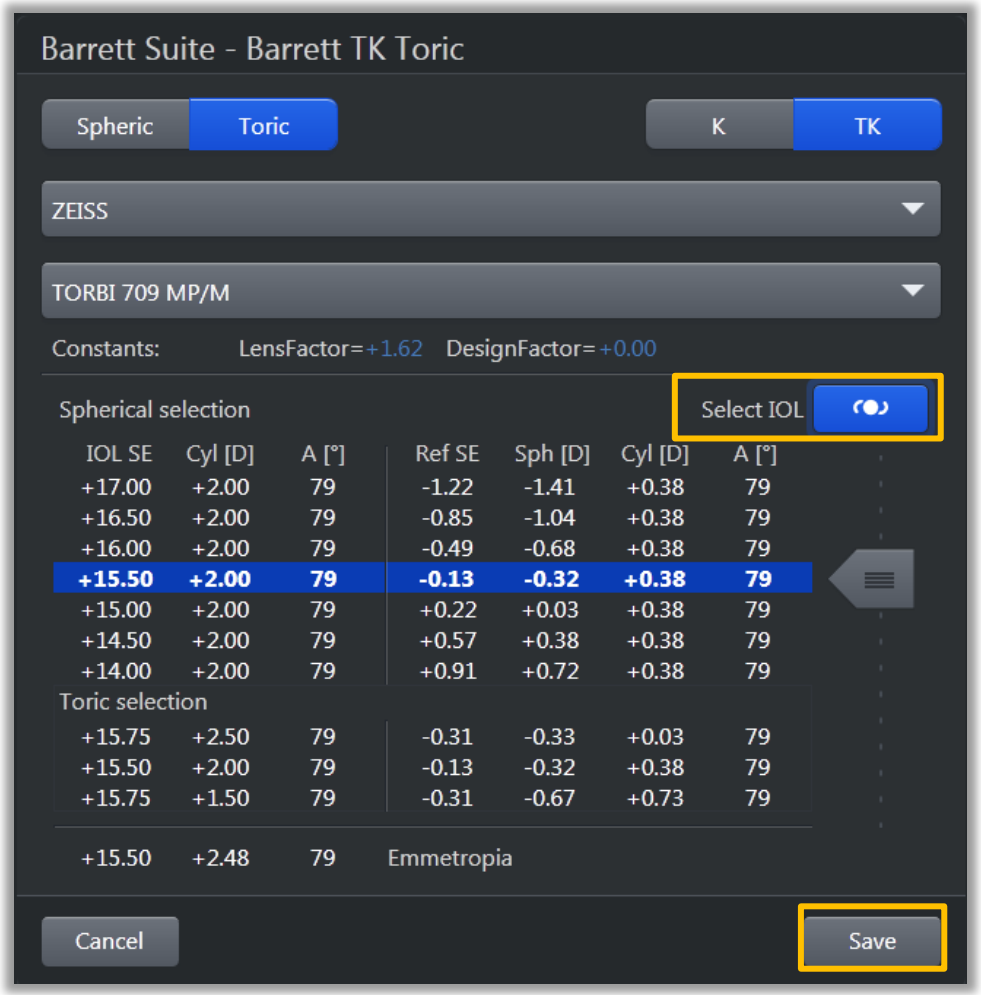


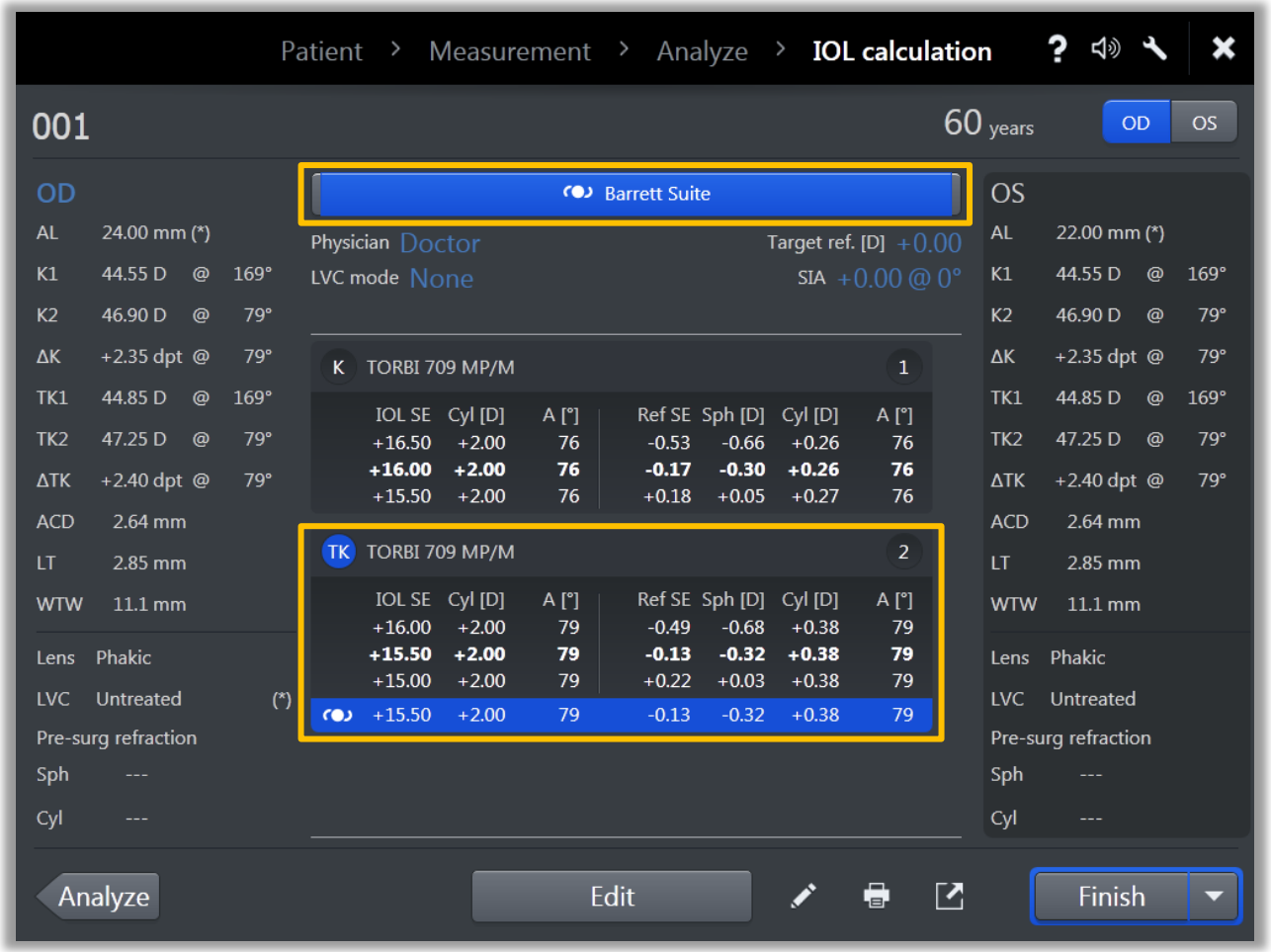
Easily toggle between standard K & TK for IOL calculation

Select IOL

Detailed IOL information screen

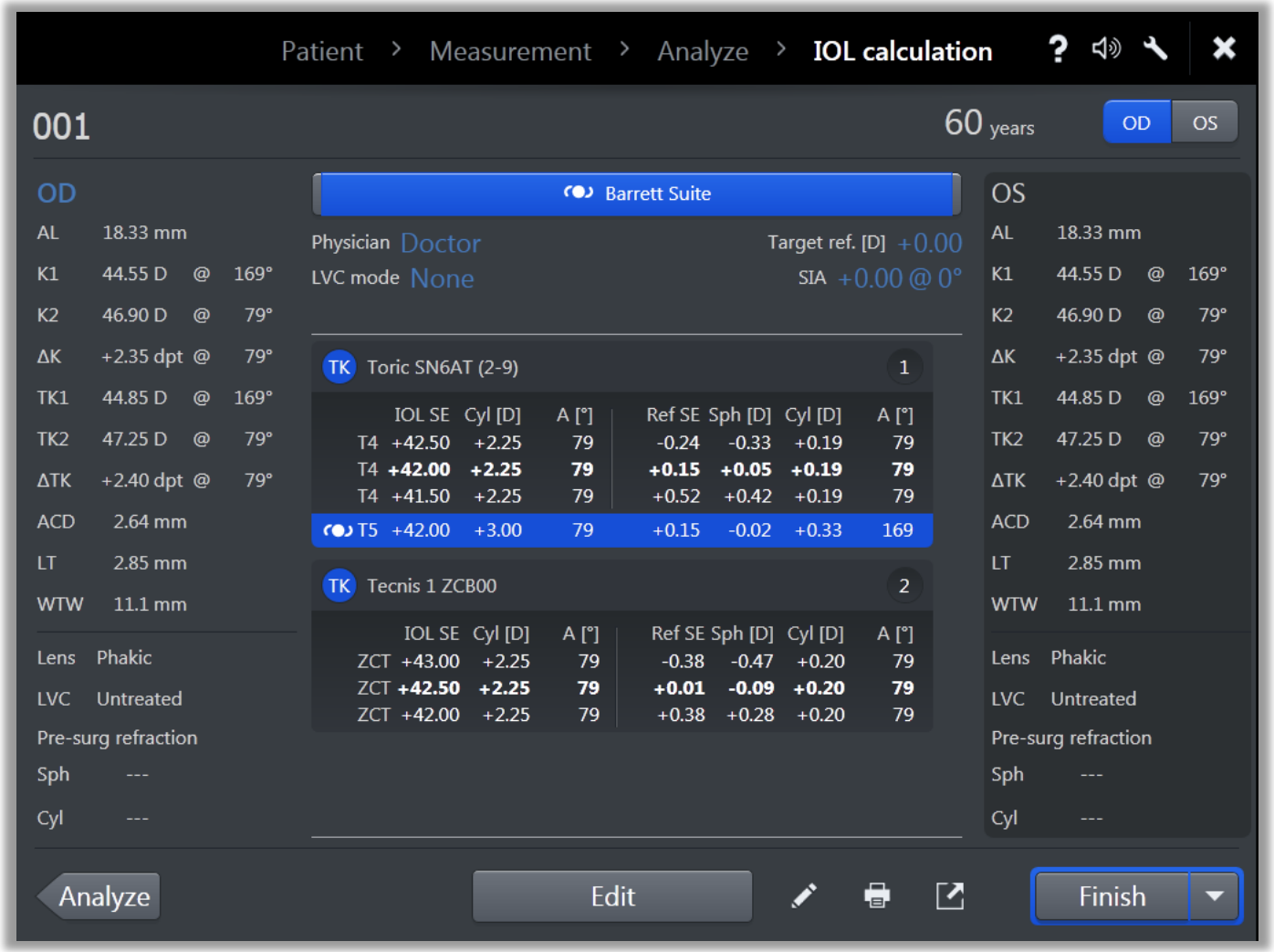
Identify selected IOL and formula

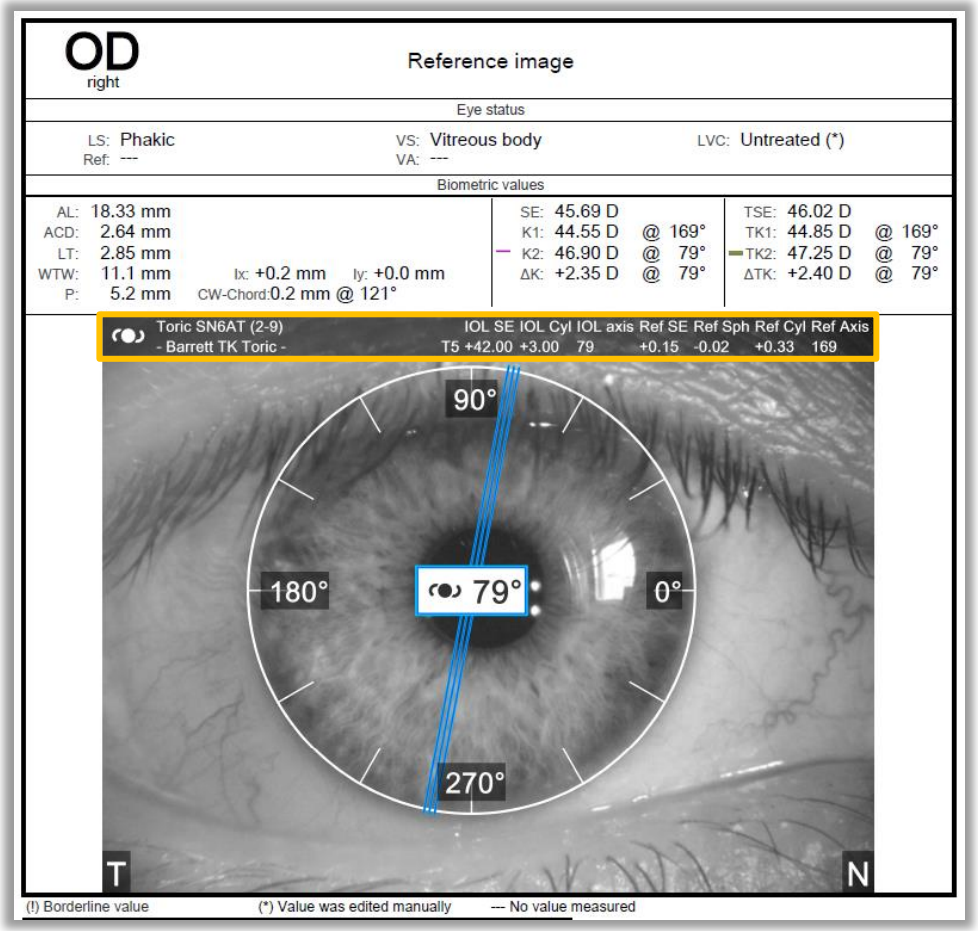




Preselection of an IOL and export to ZEISS CALLISTO eye

Automatic transfer target axis and detailed printout

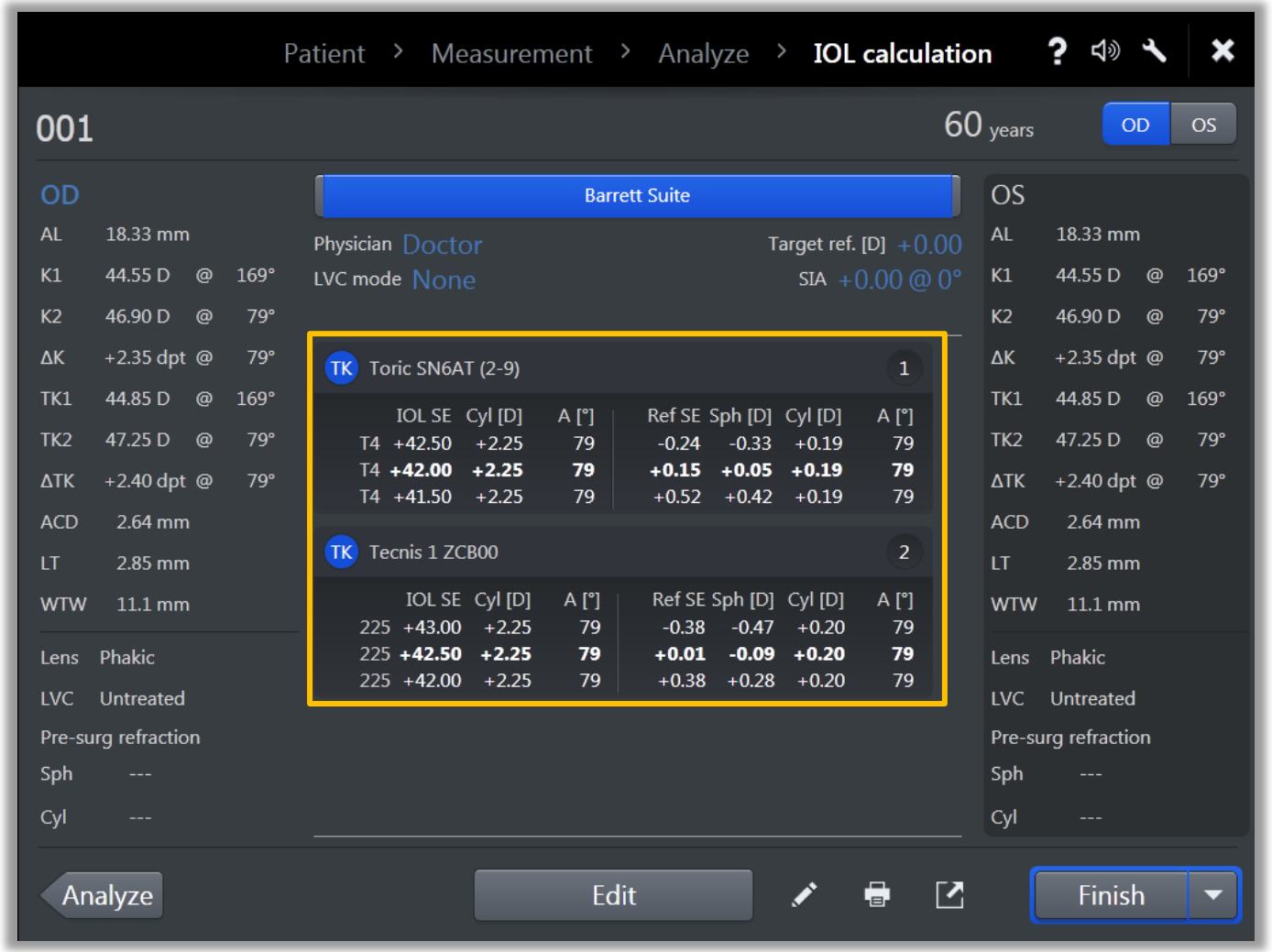




ZEISS IOLMaster 700 - IOL Calculation screen

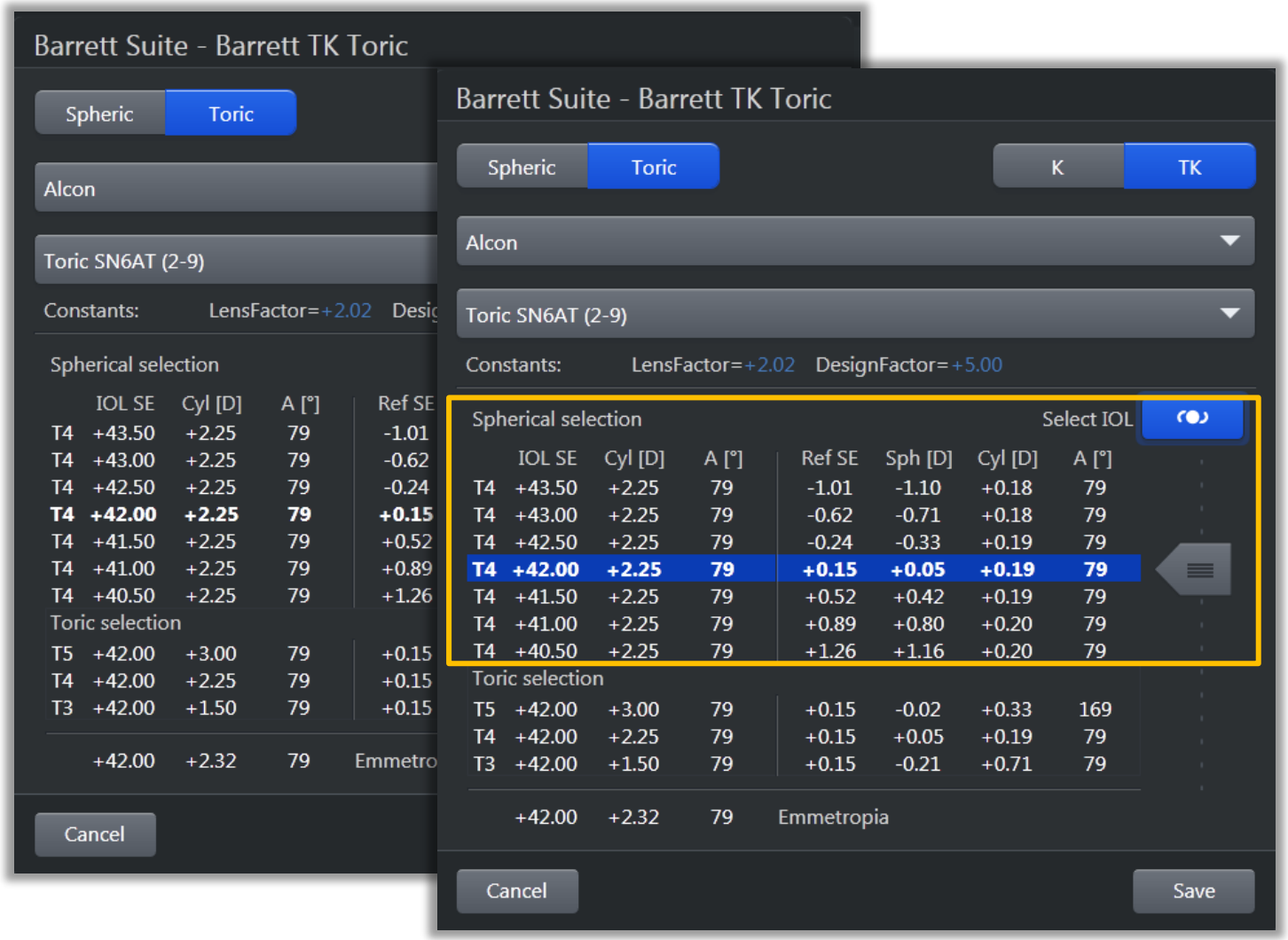
No need to manually enter data to online calculators

- **Support of non-constant toric IOL ranges**
- EG. Alcon toric IOLs
  - Cylinder step sizes
  - Naming convention (eg. T2, T3, T4, etc)



ZEISS IOLMaster 700 - IOL Calculation screen

No need to manually enter data to online calculators

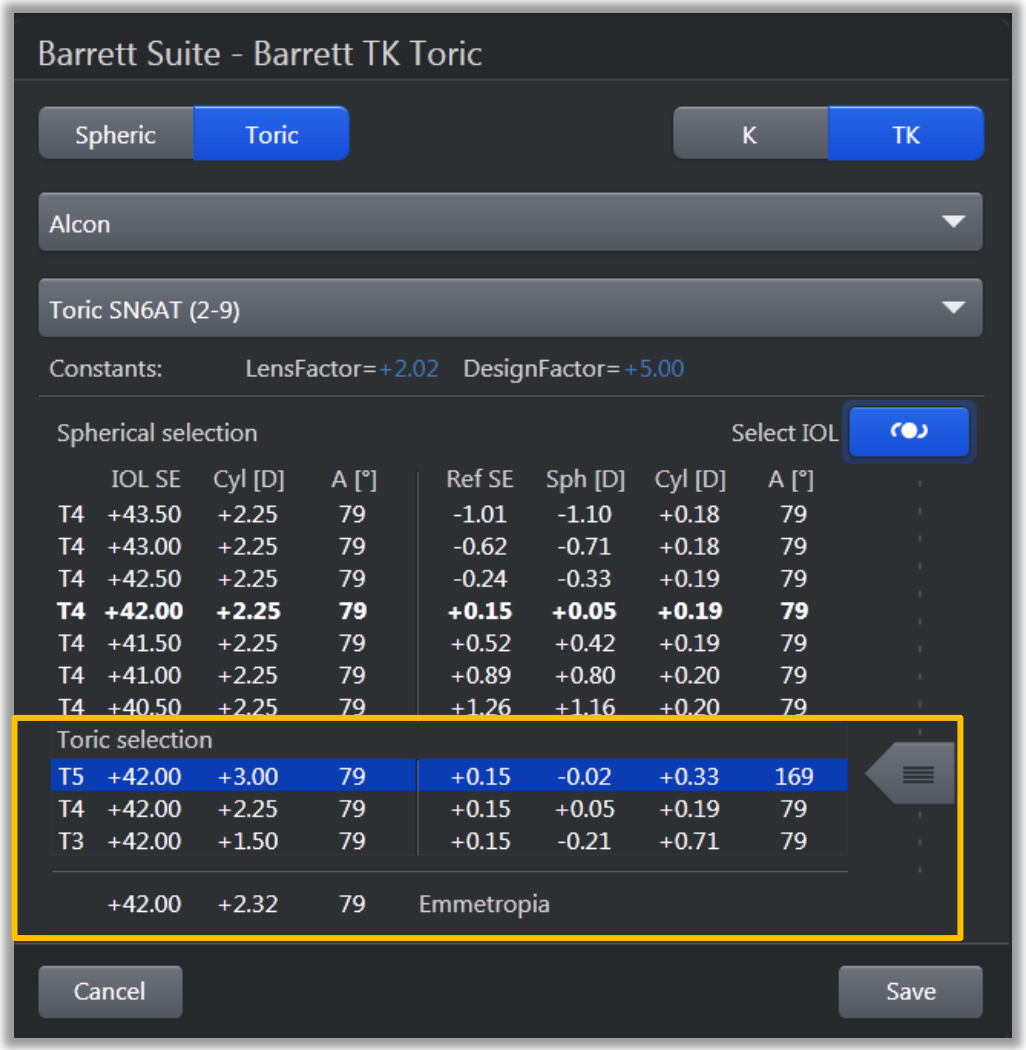


Select IOL

- Spherical selection (IOL SE)

ZEISS IOLMaster 700 - IOL Calculation screen

No need to manually enter data to online calculators



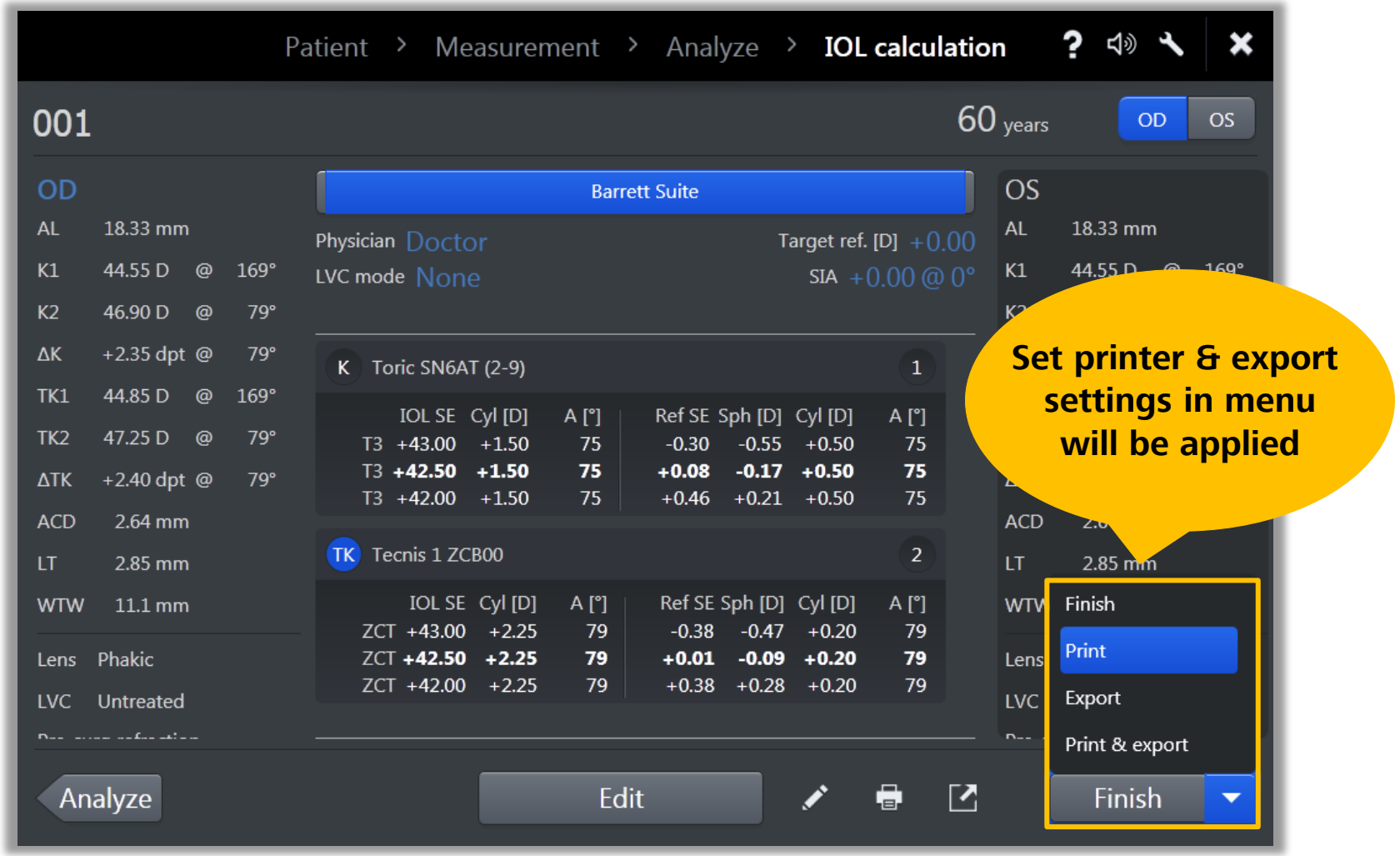
Select IOL

- Toric selection (Cyl & Axis)
  - 1 overcorrection (axis flip)
  - 2 undercorrection (no axis flip)

Agenda

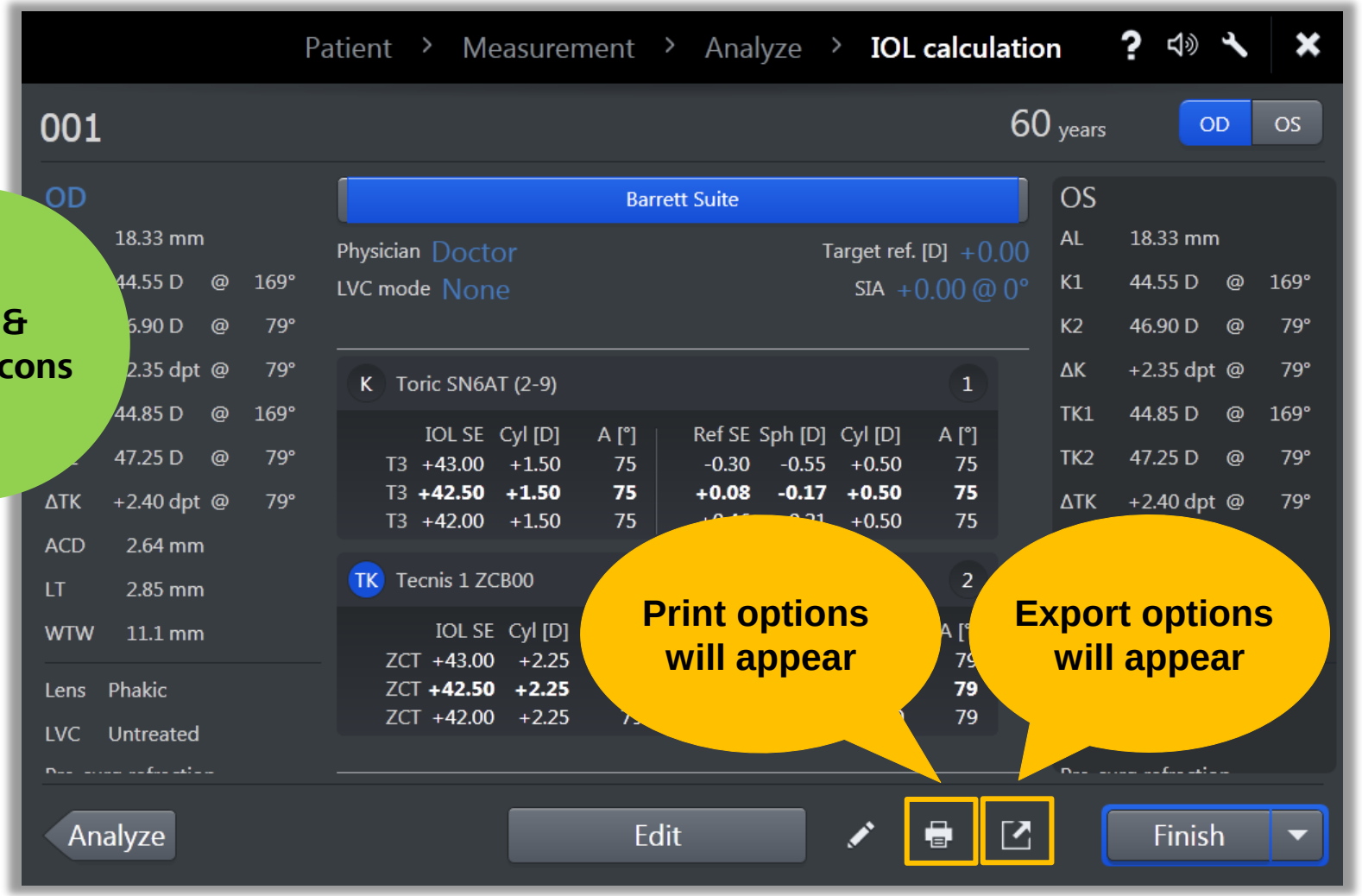
Print and Export Options

Customizable and flexible options to improve workflow efficiency



Print and Export Options

Customizable and flexible options to improve workflow efficiency

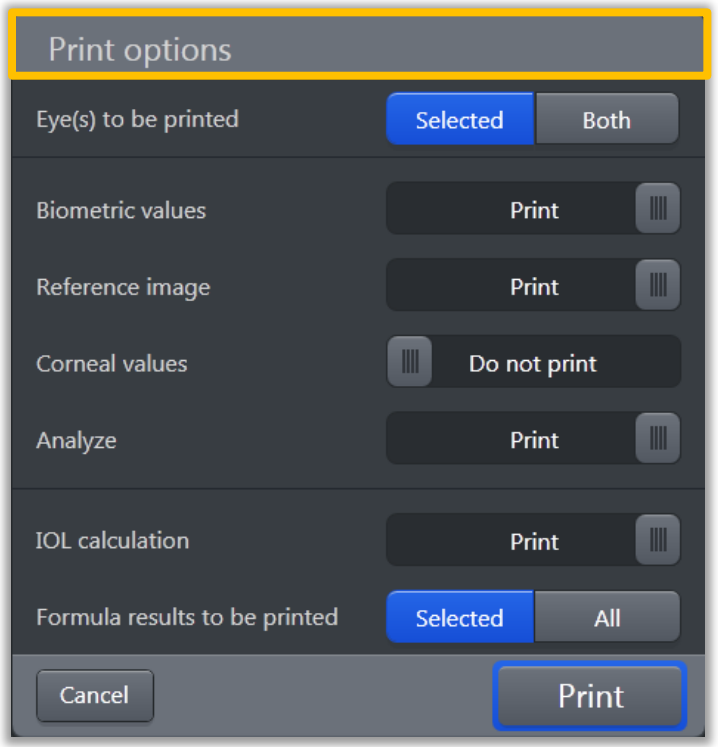


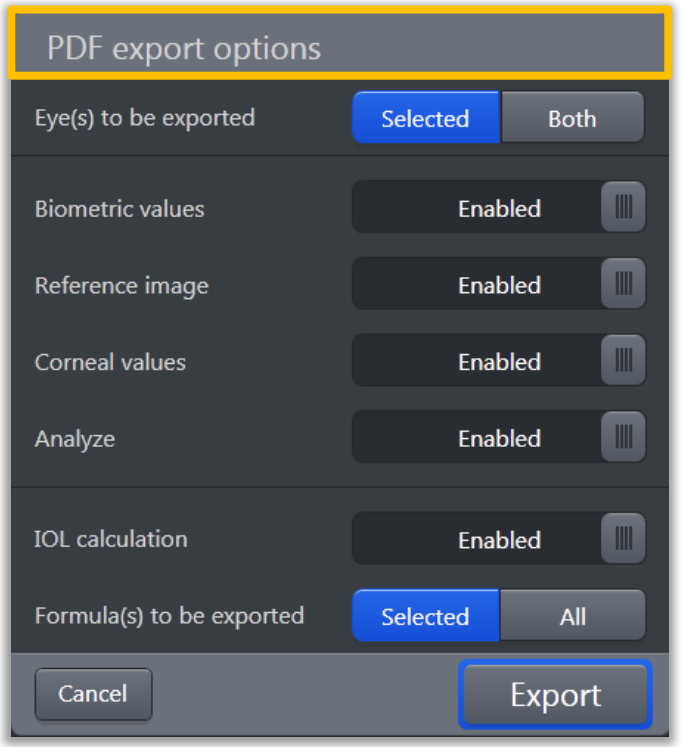
Print and Export Options

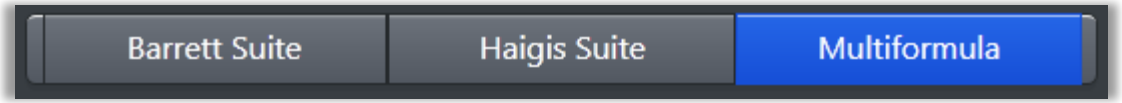
Customizable and flexible options to improve workflow efficiency

Optional pop-up menu

- Pop-up print/export menu will appear when clicking on icon (default settings)
- User can easily change as required
- Eyes to be printed (Selected/Both)
- Formula results to be printed (same as IOLM500)



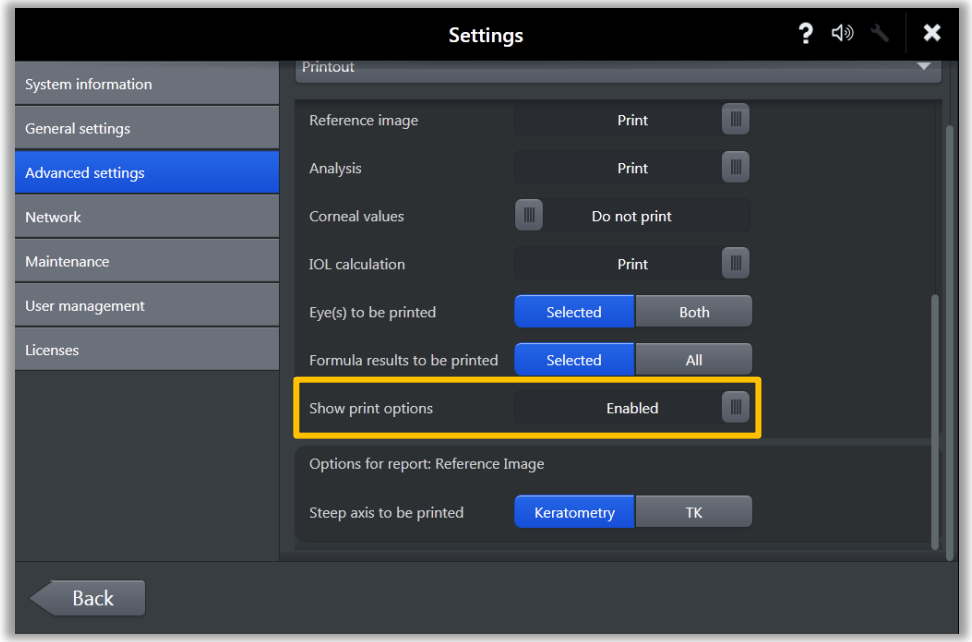


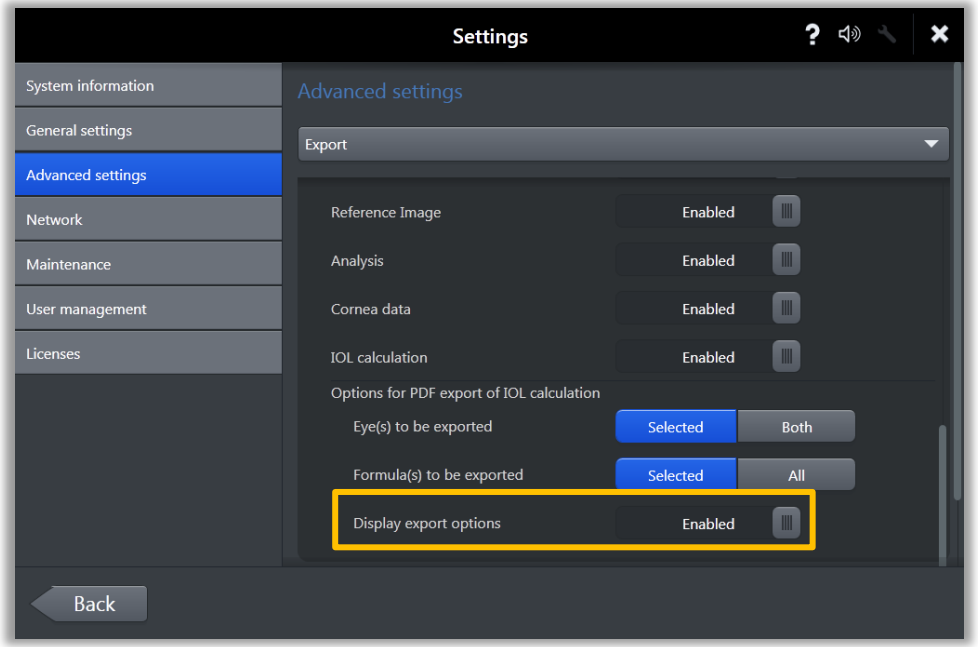


Print and Export Options

Customizable and flexible options to improve workflow efficiency

- **Optional pop-up menu**
  - Enable in *Advanced settings > Printout > Show print options*
  - Enable in *Advanced settings > Export > Enable PDF export > Display export options*



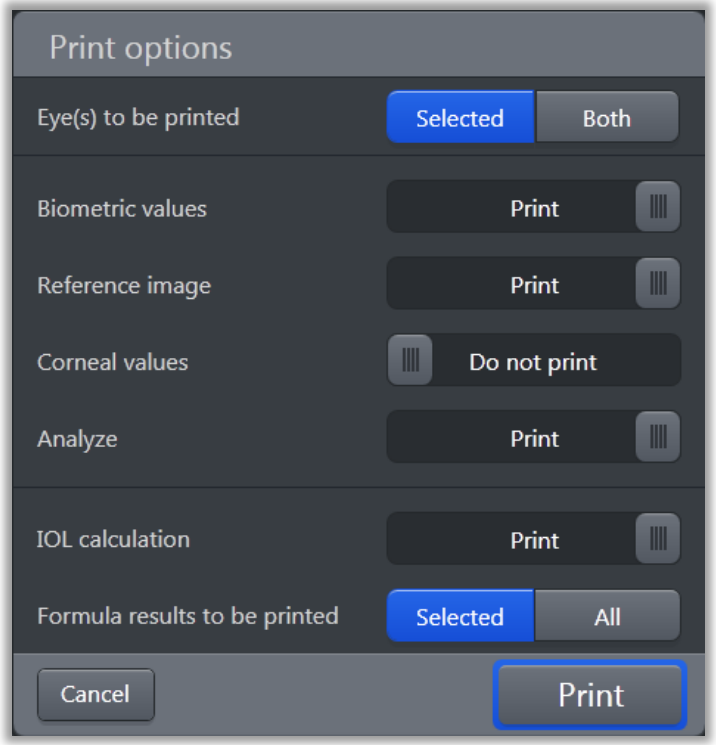


ZEISS IOLMaster 700 Printouts

Intuitive and detailed printouts

- **Printouts available:**
  - IOL Calculation (OD/OS)
  - Analyze (OD)
  - Analyze (OS)
  - Biometric values (OD/OS)
  - **Corneal values (OD/OS)**
  - Reference image (OD)
  - Reference image (OS)

NEW!



Picture source: Carl Zeiss Meditec Media Database

IOL Calculation (OU)

Picture source: Carl Zeiss Meditec Media Database

Patient: TEST TEST

Date of birth: 3/9/1968 | Gender: Female
Patient ID: 001

Physician: Doctor | Operator: Doctor

Carl Zeiss Meditec AG
Goeschwitzer Strasse 51-52
www.meditec.zeiss.de

Date of calibration test: 3/16/2018 | by: Doctor | Result: Failed
Date of measurement: 4/24/2018 | n: 1.3375 | CVD: 12.00 mm

This IOL calculation contains values that were edited manually.
Please note the information on the following page.

OD right — IOL calculation — OS left

Toric SN6AT (2-9) - Barrett TK Toric - T5

Eye status

OD	OS
LS: Phakic	VS: Vitreous body
Ref: ---	VA: ---
LVC: Untreated	LVC mode: -
Target ref.: plano	SIA: +0.00 D @ 0°

Biometric values

OD	OS
AL: 22.00 mm (*)	AL: 22.10 mm (*)
ACD: 2.64 mm SD: 0 µm	ACD: 2.64 mm SD: 0 µm
LT: 2.86 mm SD: 0 µm	LT: 2.86 mm SD: 0 µm
WTW: 11.1 mm	WTW: 11.1 mm
SE: 45.69 D SD: 0.00 D K1: 44.65 D @ 169°	SE: 45.69 D SD: 0.00 D K1: 44.65 D @ 169°
ΔK: +2.36 D @ 79° K2: 46.90 D @ 79°	ΔK: +2.36 D @ 79° K2: 46.90 D @ 79°
TSE: 46.02 D SD: 0.00 D TK1: 44.85 D @ 169°	TSE: 46.02 D SD: 0.00 D TK1: 44.85 D @ 169°
ΔTK: +2.40 D @ 79° TK2: 47.25 D @ 79°	ΔTK: +2.40 D @ 79° TK2: 47.25 D @ 79°

TK ZEISS TORBI 709 MPM — OD

- Barrett TK Toric - (LF: +1.62 DF: +0.0)

IOL SE	IOL Cyl	IOL axis	Ref SE	Ref Sph	Ref Cyl	Ref Axis
+23.00	+2.00	79°	-0.80	-0.96	+0.31	79°
+22.60	+2.00	79°	-0.41	-0.57	+0.31	79°
+22.00	**+2.00**	**79°**	**-0.04**	**-0.19**	**+0.31**	**79°**
+21.60	+2.00	79°	+0.34	+0.18	+0.31	79°
+21.00	+2.00	79°	+0.71	+0.55	+0.32	79°
+22.00	+2.34	79°	Emmetropia			

TK ZEISS TORBI 709 MPM — OS

- Barrett TK Toric - (LF: +1.62 DF: +0.0)

IOL SE	IOL Cyl	IOL axis	Ref SE	Ref Sph	Ref Cyl	Ref Axis
+22.60	+2.00	79°	-0.70	-0.86	+0.31	79°
+22.00	+2.00	79°	-0.32	-0.48	+0.31	79°
+21.60	**+2.00**	**79°**	**+0.06**	**-0.10**	**+0.32**	**79°**
+21.00	+2.00	79°	+0.43	+0.27	+0.32	79°
+20.60	+2.00	79°	+0.79	+0.63	+0.32	79°
+21.60	+2.36	79°	Emmetropia			

TK Alcon Toric SN6AT (2-9) — OD

- Barrett TK Toric - (LF: +2.02 DF: +5.0)

IOL SE	IOL Cyl	IOL axis	Ref SE	Ref Sph	Ref Cyl	Ref Axis
T4 +24.00	+2.25	79°	-0.89	-0.98	+0.18	79°
T4 +23.60	+2.25	79°	-0.51	-0.60	+0.18	79°
T4 +23.00	**+2.25**	**79°**	**-0.15**	**-0.24**	**+0.18**	**79°**
T4 +22.60	+2.25	79°	+0.22	+0.12	+0.19	79°
T4 +22.00	+2.25	79°	+0.58	+0.48	+0.19	79°
+23.00	+2.41	79°	Emmetropia			

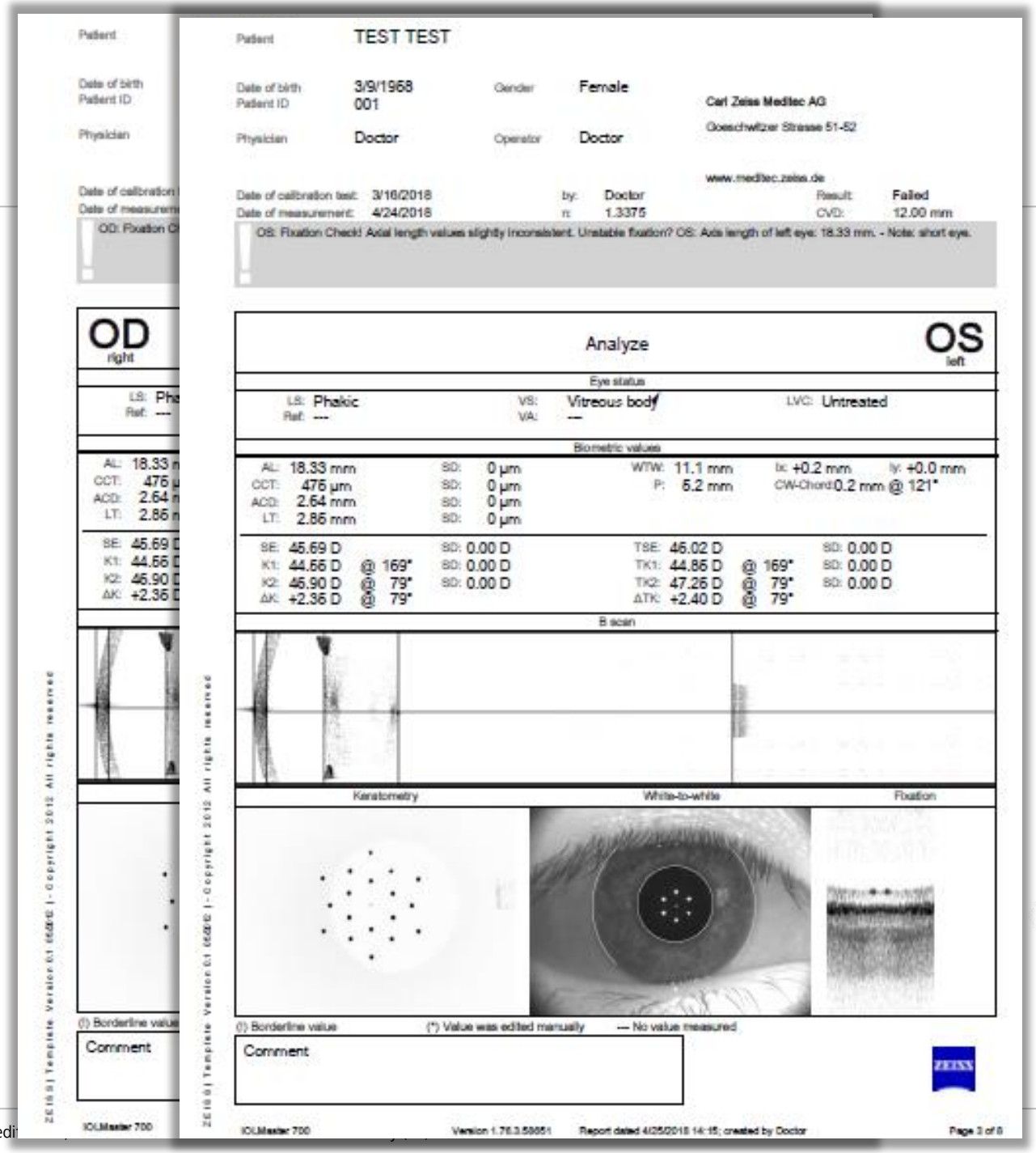
TK Alcon Toric SN6AT (2-9) — OS

- Barrett TK Toric - (LF: +2.02 DF: +5.0)

IOL SE	IOL Cyl	IOL axis	Ref SE	Ref Sph	Ref Cyl	Ref Axis
T4 +23.60	+2.25	79°	-0.81	-0.90	+0.18	79°
T4 +23.00	+2.25	79°	-0.44	-0.53	+0.18	79°
T4 +22.60	**+2.25**	**79°**	**-0.07**	**-0.16**	**+0.19**	**79°**
T4 +22.00	+2.25	79°	+0.29	+0.20	+0.19	79°
T4 +21.60	+2.25	79°	+0.66	+0.55	+0.19	79°
+22.60	+2.42	79°	Emmetropia			
T5 +22.60	**+3.00**	**79°**	**-0.07**	**-0.24**	**+0.34**	**169°**

(!) Borderline value (*) Value was edited manually --- No value measured

Comment



Analyze (OD/OS)

Picture source: Carl Zeiss Meditec Media Database

Patient	TEST TEST		
Date of birth	3/9/1968	Gender	Female
Patient ID	001		
Physician	Doctor	Operator	Doctor

Carl Zeiss Meditec AG
Goeschwitzer Strasse 51-52
www.meditec.zeiss.de

Date of calibration test:	3/16/2018	by:	Doctor	Result:	Failed
Date of measurement:	4/24/2018	n:	1.3375	CVD:	12.00 mm

OD: Fixation Check! Axial length values slightly inconsistent. Unstable fixation? OD: Axial length of right eye: 18.33 mm. - Note: short eye.
OS: Fixation Check! Axial length values slightly inconsistent. Unstable fixation? OS: Axis length of left eye: 18.33 mm. - Note: short eye.

OD right — Biometric values — **OS** left

Eye status

OD				OS			
LS:	Phakic	VS:	Vitreous body	LS:	Phakic	VS:	Vitreous body
Ref:	---	VA:	---	Ref:	---	VA:	---
LVC:	Untreated			LVC:	Untreated		

Biometric values

OD				OS			
AL:	18.33 mm	SD:	0 µm	AL:	18.33 mm	SD:	0 µm
CCT:	475 µm	SD:	0 µm	CCT:	475 µm	SD:	0 µm
ACD:	2.64 mm	SD:	0 µm	ACD:	2.64 mm	SD:	0 µm
LT:	2.85 mm	SD:	0 µm	LT:	2.85 mm	SD:	0 µm

AL	CCT	ACD	LT	AL	CCT	ACD	LT
18.33 mm	475 µm	2.64 mm	2.85 mm	18.33 mm	475 µm	2.64 mm	2.85 mm
18.33 mm	475 µm	2.64 mm	2.85 mm	18.33 mm	475 µm	2.64 mm	2.85 mm
18.33 mm	475 µm	2.64 mm	2.85 mm	18.33 mm	475 µm	2.64 mm	2.85 mm
18.33 mm	475 µm	2.64 mm	2.85 mm	18.33 mm	475 µm	2.64 mm	2.85 mm
18.33 mm	475 µm	2.64 mm	2.85 mm	18.33 mm	475 µm	2.64 mm	2.85 mm
18.33 mm	475 µm	2.64 mm	2.85 mm	18.33 mm	475 µm	2.64 mm	2.85 mm

Central corneal thickness

OD				OS			
SE:	45.69 D		SD: 0.00 D	SE:	45.69 D		SD: 0.00 D
K1:	44.55 D	@ 169°	SD: 0.00 D	K1:	44.55 D	@ 169°	SD: 0.00 D
K2:	46.90 D	@ 79°	SD: 0.00 D	K2:	46.90 D	@ 79°	SD: 0.00 D
ΔK:	+2.35 D	@ 79°		ΔK:	+2.35 D	@ 79°	
SE:	45.69 D	ΔK: +2.35 D	@ 79°	SE:	45.69 D	ΔK: +2.35 D	@ 79°
SE:	45.69 D	ΔK: +2.35 D	@ 79°	SE:	45.69 D	ΔK: +2.35 D	@ 79°
SE:	45.69 D	ΔK: +2.35 D	@ 79°	SE:	45.69 D	ΔK: +2.35 D	@ 79°
TSE:	46.02 D		SD: 0.00 D	TSE:	46.02 D		SD: 0.00 D
TK1:	44.86 D	@ 169°	SD: 0.00 D	TK1:	44.86 D	@ 169°	SD: 0.00 D
TK2:	47.26 D	@ 79°	SD: 0.00 D	TK2:	47.26 D	@ 79°	SD: 0.00 D
ΔTK:	+2.40 D	@ 79°		ΔTK:	+2.40 D	@ 79°	
TSE:	46.02 D	ΔTK: +2.40 D	@ 79°	TSE:	46.02 D	ΔTK: +2.40 D	@ 79°
TSE:	46.02 D	ΔTK: +2.40 D	@ 79°	TSE:	46.02 D	ΔTK: +2.40 D	@ 79°
TSE:	46.02 D	ΔTK: +2.40 D	@ 79°	TSE:	46.02 D	ΔTK: +2.40 D	@ 79°

White-to-white and pupil values (Chang-Waring Chord)

OD				OS			
WTW:	11.1 mm	Ix: +0.2 mm	Iy: +0.0 mm	WTW:	11.1 mm	Ix: +0.2 mm	Iy: +0.0 mm
P:	5.2 mm	CW-Chord: 0.2 mm @ 121°		P:	5.2 mm	CW-Chord: 0.2 mm @ 121°	

Image stored — Reference image — Image stored

(!) Borderline value (*) Value was edited manually --- No value measured

Comment

ZEISS

IOLMaster 700 Version 1.78.3.58851 Report dated 4/25/2018 14:15; created by Doctor Page 4 of 8

ZEISS

Biometric Values (OD/OS)

Picture source: Carl Zeiss Meditec Media Database

Patient TEST TEST

Date of birth 3/9/1968 Gender Female
Patient ID 001

Physician Doctor Operator Doctor

Carl Zeiss Meditec AG
Goeschwitzer Strasse 51-52
www.meditec.zeiss.de

Date of calibration test: 3/16/2018 by: Doctor Result: Failed
Date of measurement: 4/24/2018 n: 1.3375 CVD: 12.00 mm

OD: Fixation Check! Axial length values slightly inconsistent. Unstable fixation? OD: Axial length of right eye: 18.33 mm. - Note: short eye.
OS: Fixation Check! Axial length values slightly inconsistent. Unstable fixation? OS: Axis length of left eye: 18.33 mm. - Note: short eye.

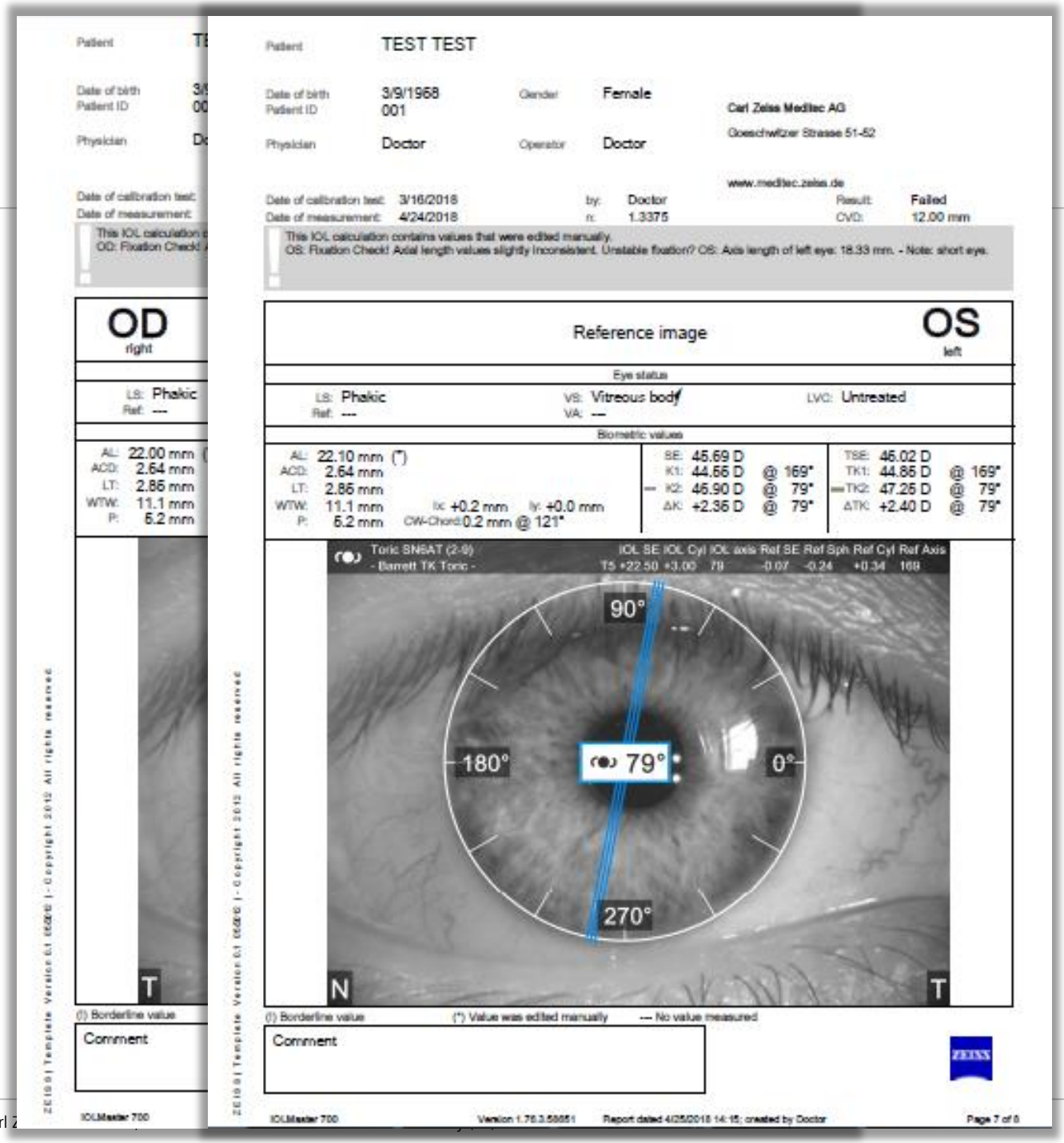
OD right	Corneal values	OS left
Eye status		
LS: Phakic Ref: --- LVC: Untreated VS: Vitreous body VA: ---		LS: Phakic Ref: --- LVC: Untreated VS: Vitreous body VA: ---
Corneal values		
SE: 45.69 D K1: 44.55 D @ 169° K2: 46.90 D @ 79° ΔK: +2.35 D @ 79° SD: 0.00 D SD: 0.00 D SD: 0.00 D		SE: 45.69 D K1: 44.55 D @ 169° K2: 46.90 D @ 79° ΔK: +2.35 D @ 79° SD: 0.00 D SD: 0.00 D SD: 0.00 D
SE: 45.69 D ΔK: +2.35 D @ 79° SE: 45.69 D ΔK: +2.35 D @ 79° SE: 45.69 D ΔK: +2.35 D @ 79°		SE: 45.69 D ΔK: +2.35 D @ 79° SE: 45.69 D ΔK: +2.35 D @ 79° SE: 45.69 D ΔK: +2.35 D @ 79°
True keratomic power		
TSE: 46.02 D TK1: 44.86 D @ 169° TK2: 47.26 D @ 79° ΔTK: +2.40 D @ 79° SD: 0.00 D SD: 0.00 D SD: 0.00 D		TSE: 46.02 D TK1: 44.86 D @ 169° TK2: 47.26 D @ 79° ΔTK: +2.40 D @ 79° SD: 0.00 D SD: 0.00 D SD: 0.00 D
TSE: 46.02 D ΔTK: +2.40 D @ 79° TSE: 46.02 D ΔTK: +2.40 D @ 79° TSE: 46.02 D ΔTK: +2.40 D @ 79°		TSE: 46.02 D ΔTK: +2.40 D @ 79° TSE: 46.02 D ΔTK: +2.40 D @ 79° TSE: 46.02 D ΔTK: +2.40 D @ 79°
Corneal back surface values		
PSE: -5.81 D PK1: -5.68 D @ 169° PK2: -5.95 D @ 79° ΔPK: +0.28 D @ 169° SD: 0.00 D SD: 0.00 D SD: 0.00 D		PSE: -5.81 D PK1: -5.68 D @ 169° PK2: -5.95 D @ 79° ΔPK: +0.28 D @ 169° SD: 0.00 D SD: 0.00 D SD: 0.00 D
PSE: -5.81 D ΔPK: +0.28 D @ 169° PSE: -5.81 D ΔPK: +0.28 D @ 169° PSE: -5.81 D ΔPK: +0.28 D @ 169°		PSE: -5.81 D ΔPK: +0.28 D @ 169° PSE: -5.81 D ΔPK: +0.28 D @ 169° PSE: -5.81 D ΔPK: +0.28 D @ 169°
Other values		
CCT: 475 µm WTW: 11.1 mm P: 5.2 mm SD: 0 µm lx: +0.2 mm ly: +0.0 mm CW-Chord: 0.2 mm @ 121°		CCT: 475 µm WTW: 11.1 mm P: 5.2 mm SD: 0 µm lx: +0.2 mm ly: +0.0 mm CW-Chord: 0.2 mm @ 121°

(!) Borderline value (*) Value was edited manually --- No value measured

Comment

NEW! Corneal Values (OU)

Picture source: Carl Zeiss Meditec Media Database



Patient TEST TEST

Date of birth 3/9/1968 Gender Female
Patient ID 001

Physician Doctor Operator Doctor

Carl Zeiss Meditec AG
Goeschwitzer Strasse 51-52
www.meditec.zeiss.de

Date of calibration test: 3/16/2018 by: Doctor Result: Failed
Date of measurement: 4/24/2018 n: 1.3375 CVD: 12.00 mm

This IOL calculation contains values that were edited manually.
OS: Fixation Check! Axial length values slightly inconsistent. Unstable fixation? OS: Axis length of left eye: 18.33 mm. - Note: short eye.

OD right | Reference image | OS left

Eye status

OD	OS
LS: Phakic	LS: Phakic
Ref: ---	Ref: ---
	VS: Vitreous body
	VA: ---
	LVC: Untreated

Biometric values

OD			OS		
AL: 22.10 mm (*)					
ACD: 2.64 mm					
LT: 2.86 mm					
WTW: 11.1 mm	lx: +0.2 mm	ly: +0.0 mm			
P: 5.2 mm	CW-Chord: 0.2 mm @ 121°				
SE: 45.69 D			TSE: 46.02 D		
K1: 44.66 D	@	169°	TK1: 44.85 D	@	169°
K2: 46.90 D	@	79°	TK2: 47.25 D	@	79°
ΔK: +2.36 D	@	79°	ΔTK: +2.40 D	@	79°

(!) Borderline value (*) Value was edited manually --- No value measured

Comment

Reference Image (OD/OS)

Picture source: Carl Zeiss Meditec Media Database

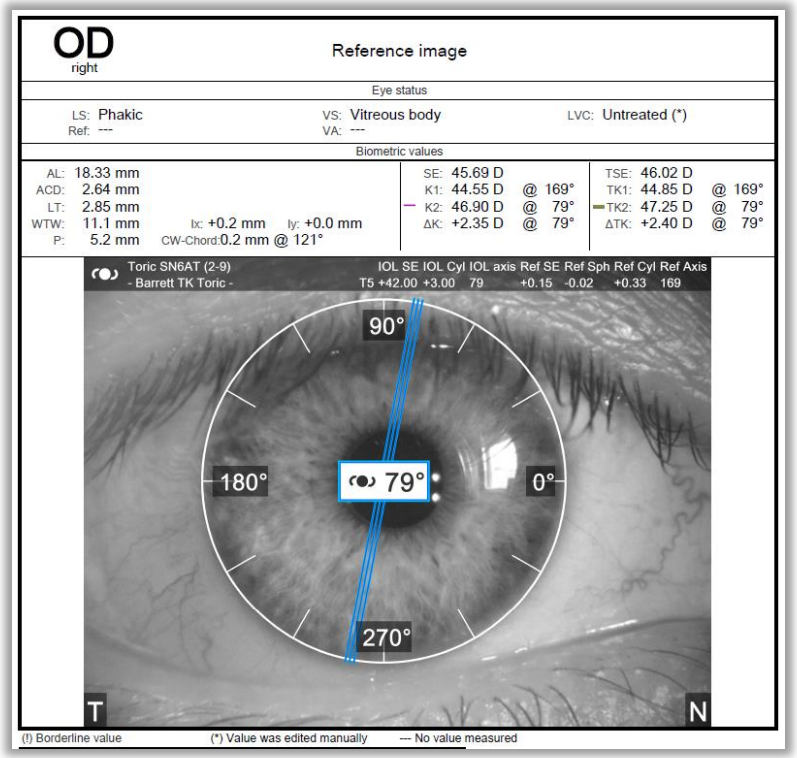
Reference Image

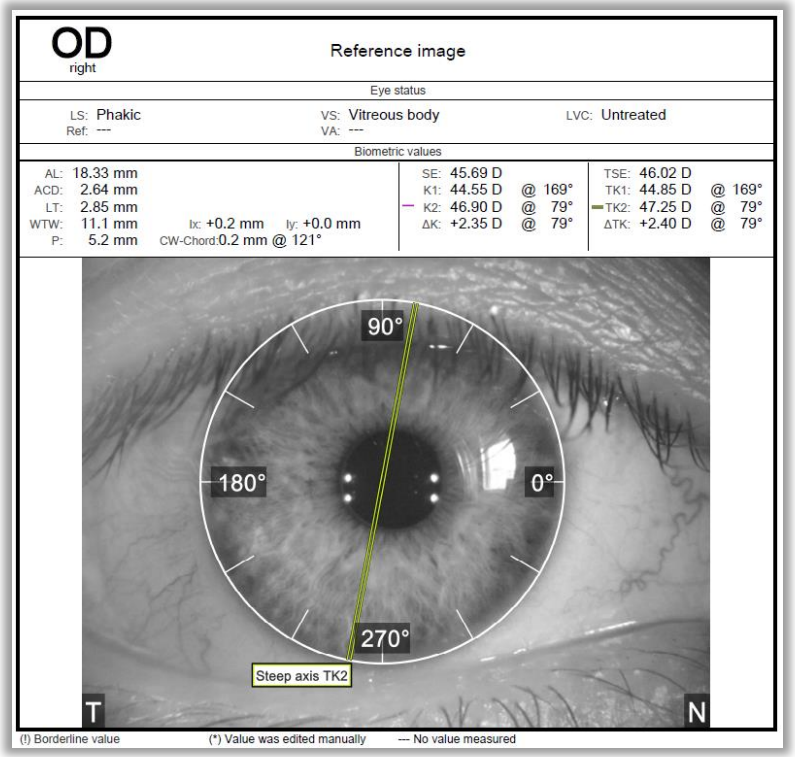
Options for report – Implantation axis or steep axis to be printed

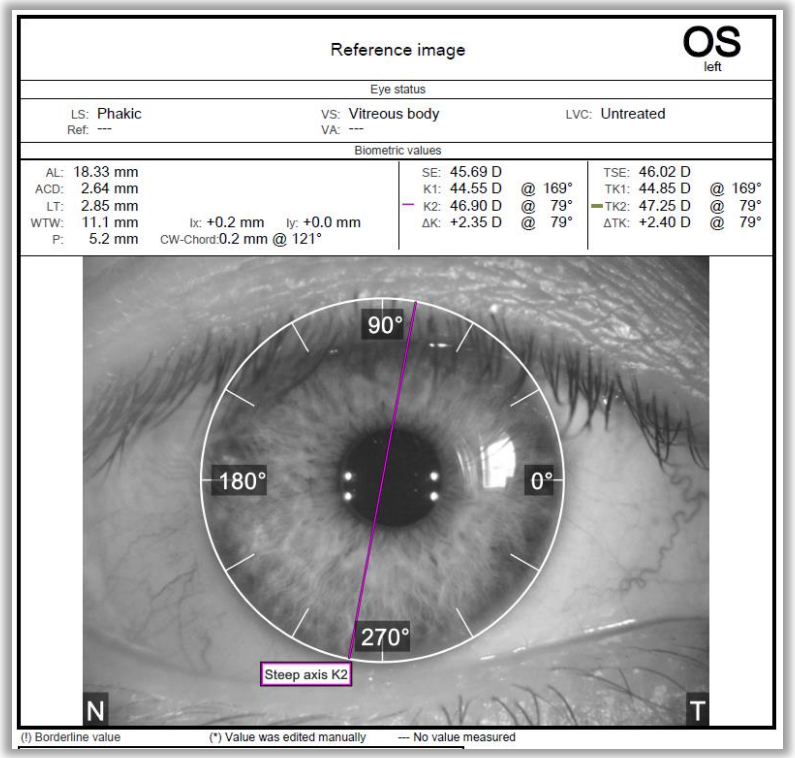
Chosen IOL

Total Keratometry

Keratometry







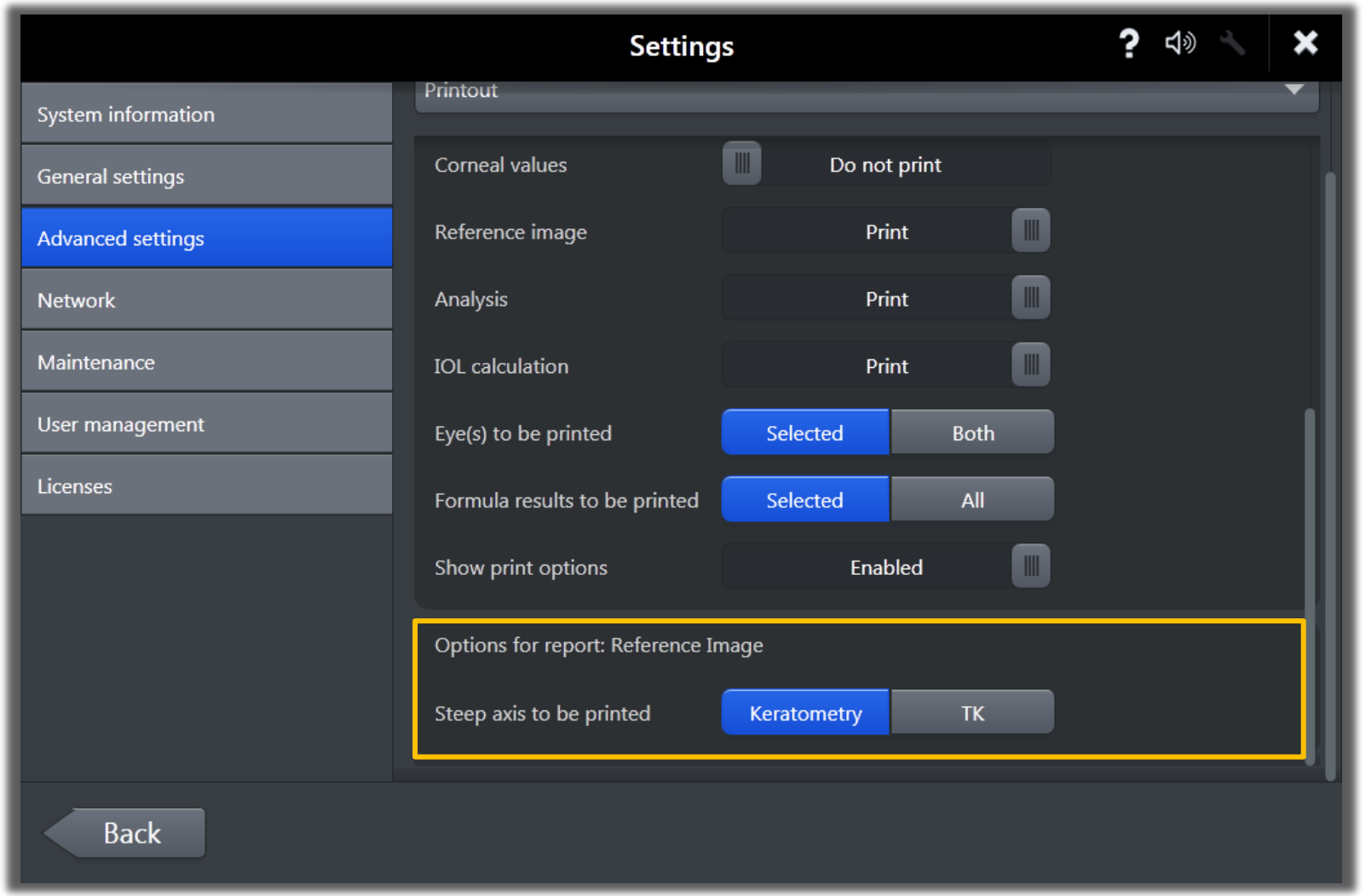
3 Blue Lines
CALLISTO implantation axis

2 Green Lines
Total Keratometry steep axis
(2 surfaces - anterior & posterior)

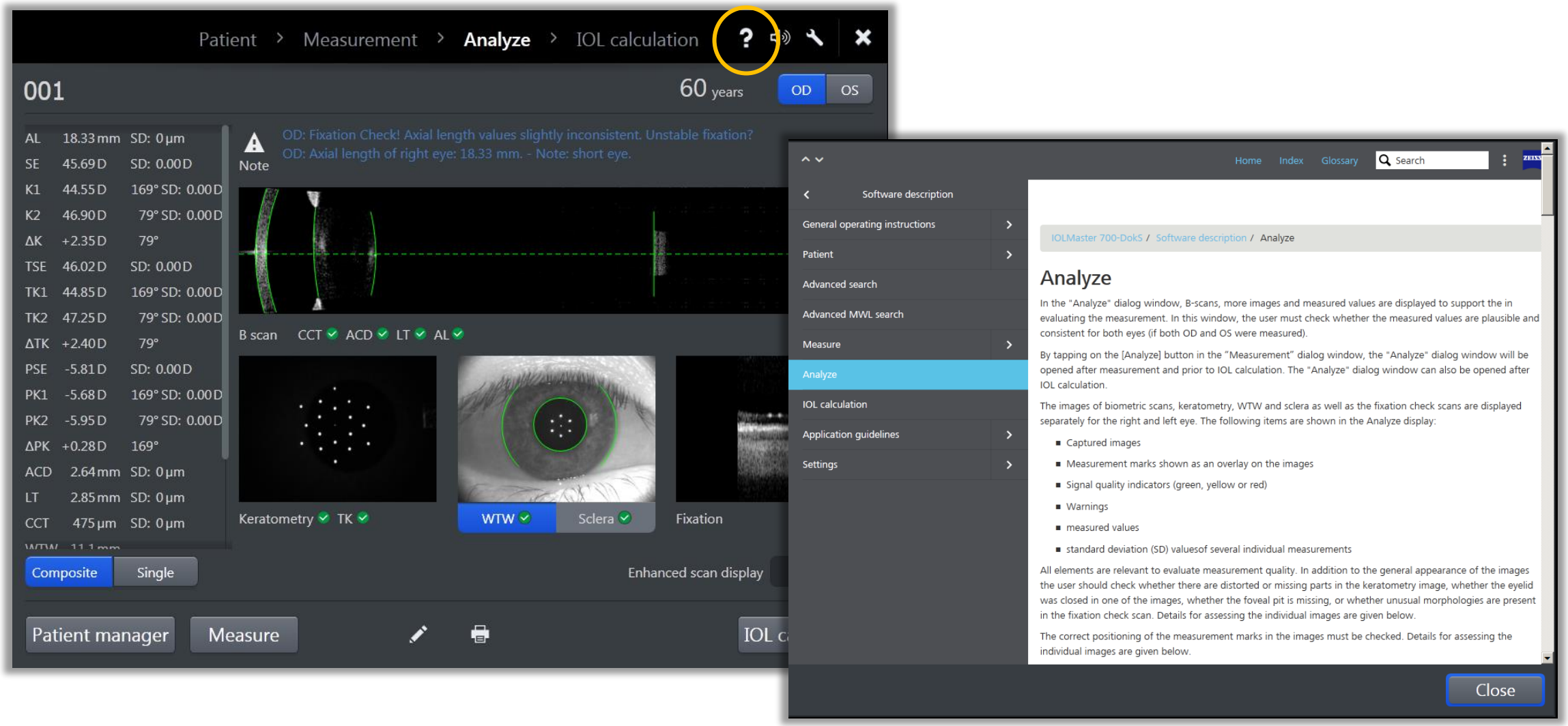
1 Purple Line
Keratometry steep axis
(1 surface - anterior)

Reference Image

Options for report – Implantation axis or steep axis to be printed



Online User Help
Context Sensitive Help Menu



Agenda

Total Keratometry (TK)
Websites

- **IOLMaster 700 website** www.zeiss.com/IOLMaster
- **Total Keratometry website** www.zeiss.com/tk
- **ZEISS Cataract Community** https://cataract-community.zeiss.com/
- **IOL Constants** ULIB http://ocusoft.de.ulib/c1.htm
  IOLCon http://iolcon.org/

Picture source: Carl Zeiss Meditec Media Database

Seeing beyond

EN_32_150_0064I