

Supplementary Table1. IOLs models used in the paper, including the manufacturer and data source.

Model	Manufacturer	Data Source
Acrysof SN60W	Alcon	ROC (n=34) BCM (n=3) LVPEI (n=15)
Acrysof SN60AT y SA60AT	Alcon	LVPEI (n=8)
Acrysof MA60AC (3 pieces)	Alcon	LVPEI (n=2)
Acrysof IQ Vivity (DAT015; DAT315; DAT415)	Alcon	BCM (n=11)
Clareon CNA0T0	Alcon	ROC (n=27) FJD (n=198)
Clareon PanOptix CNWTT0 Trifocal	Alcon	LVPEI (n=2)
Tecnis (ZCB00 & DIB00 & DCB00 & PCB00 & ICB00)	J&J	BCM (n=48) LVPEI (n=29)
Sensar (AAB00)	J&J	LVPEI (n=10)
B&L enVista MX60, MX60E, MX60ET1.25	B&L	ROC (n=7) BCM (n=14)
B&L MI60. Akreos	B&L	FJD (n=2)
FH5600SQ & HP760AP	Aurolab	LVPEI (n=21)
AS- 6T	Care group	LVPEI (n=5)
Other IOL models*	---	BCM (n=39)

ROC = Flaum Eye Institute, University of Rochester, Rochester, NY, United States

BCM = Department of Ophthalmology, Baylor College of Medicine, Houston, TX, United States

FJD = Ophthalmology Department, Fundación Jiménez Díaz University Hospital, Madrid, Spain

LVPEI = LV Prasad Eye Institute, Hyderabad, India

*Other IOL models include: ZXR00, LI61AO, TFAT00, TFA40, TFAT30, TFNT00, TFNT40, ZCU150, ZXR00, DIU150, DIU225, DIU300, DIU375, SN6AT9, MA60MA, DFW300, DFW375, CCA0T0, DXR00V, DFR00V, DXW150.

Supplementary Appendix 1. Brief description of each feature and its corresponding acronym.

Clinical Features and IOLMaster 700 features

- (1) **Gender (1M2F)**: Male or Female (categorical).
- (2) **Laterality (1OD2OS)**: Right eye or left eye (categorical).
- (3) **AgeAtTimeOfOperationyear**: Age of the patient.
- (4) **IOLModel (1SN60WF2CNA0T03MX60EUS)**: IOL Model implanted (categorical).
- (5) **IOLPowerInsertedD**: IOL Power Inserted, in Diopters.
- (6) **AxialLengthmm IOLMaster (AL_{IOLMaster})**: Axial length obtained directly from the IOL Master 700 system in millimeters.
- (7) **PreopK1**: Keratometry. Highest Radius of curvature meridian in cornea, in Diopters.
- (8) **PreopK1Axis**: Keratometry. Angle of the highest Radius of curvature meridian in cornea in degrees.
- (9) **PreopK2**: Keratometry. Lowest Radius of curvature meridian in cornea, in Diopters.
- (10) **PreopK2Axis**: Keratometry. Angle of the lowest Radius of curvature meridian in cornea, in degrees.

- (11) **Sphere:** Preoperative refraction of the patient's eye, in Diopters.
- (12) **Cyl:** Preoperative astigmatism of the patient's eye, in Diopters.
- (13) **SphericalEquiv:** Preoperative spherical equivalent of the patient's eye, in Diopters.
- (14) **Number of days to post-op scan:** Num days from surgery to postoperative scan.
- (15) **Pupil size:** Preoperative pupil size, in millimeters.
- (16) **Radius of curvature of Anterior Cornea (RAC):** Mean radius of curvature of the anterior surface of the cornea, in millimeters.

Geometrical features from OCT (3-D models within the pupil):

- (1) **Corneal Thickness (CT):** Corneal thickness in millimeters.
- (2) **ACD:** Anterior chamber depth in millimeters.
- (3) **LT:** Crystalline lens thickness in millimeters.
- (4) **Vitreous chamber depth (VCD):** Vitreous chamber depth in millimeters.
- (5) **Axial Length (AL_{OCT}):** Axial length, obtained from OCT images in millimeters.
- (6) **AL_not_corrected:** Axial length, obtained from OCT images, without correction with different indices of refraction (i.e., using an equivalent index of refraction) in millimeters.
- (7) **std_AL_non_corrected_eyes:** Standard deviation of the AL_not_corrected across meridians in millimeters.
- (8) **med_RAC_eyes:** Mean Radius of curvature of the anterior surface of the cornea across 2-D meridians (i.e., best circle fitting. Fitting diameter=3mm) in millimeters.
- (9) **med_RPC_eyes:** Mean Radius of curvature of the posterior surface of the cornea across 2-D meridians (i.e., best circle fitting. Fitting diameter=3mm) in millimeters.
- (10) **med_RAL_eyes:** Mean Radius of curvature of the anterior surface of the crystalline lens across 2-D meridians (i.e., best circle fitting. Fitting diameter=3mm) in millimeters.
- (11) **med_RPL_eyes:** Mean Radius of curvature of the posterior surface of the crystalline lens across 2-D meridians (i.e., best circle fitting. Fitting diameter=3mm) in millimeters.
- (12) **med_RAC_eyes_Diam2:** Mean Radius of curvature of the anterior surface of the cornea across 2-D meridians (i.e., best circle fitting. Fitting diameter=6mm) in millimeters.
- (13) **med_RPC_eyes_Diam2:** Mean Radius of curvature of the posterior surface of the cornea across 2-D meridians (i.e., best circle fitting. Fitting diameter=6mm) in millimeters.
- (14) **med_RAL_eyes_Diam2:** Mean Radius of curvature of the anterior surface of the crystalline lens across 2-D meridians (i.e., best circle fitting. Fitting diameter=6mm) in millimeters.
- (15) **med_RPL_eyes_Diam2:** Mean Radius of curvature of the posterior surface of the crystalline lens across 2-D meridians (i.e., best circle fitting. Fitting diameter=6mm) in millimeters.
- (16) **RAC_3D:** Radius of curvature of the anterior surface of the cornea from the 3-D models (i.e., best sphere fitting. Fitting diameter=3mm) in millimeters.
- (17) **RPC_3D:** Radius of curvature of the posterior surface of the cornea from the 3-D models (i.e., best sphere fitting. Fitting diameter=3mm) in millimeters.
- (18) **RAL_3D:** Radius of curvature of the anterior surface of the crystalline lens from the 3-D models (i.e., best sphere fitting. Fitting diameter=3mm) in millimeters.

(19) **RPL_3D**: Radius of curvature of the posterior surface of the crystalline lens from the 3-D models (i.e., best sphere fitting. Fitting diameter=3mm) in millimeters.

(20) **RAC_3D_Diam2**: Radius of curvature of the anterior surface of the cornea from the 3-D models (i.e., best sphere fitting. Fitting diameter=6mm) in millimeters.

(21) **RPC_3D_Diam2**: Radius of curvature of the posterior surface of the cornea from the 3-D models (i.e., best sphere fitting. Fitting diameter=6mm) in millimeters.

(22) **RAL_3D_Diam2**: Radius of curvature of the anterior surface of the crystalline lens from the 3-D models (i.e., best sphere fitting. Fitting diameter=6mm) in millimeters.

(23) **RPL_3D_Diam2**: Radius of curvature of the posterior surface of the crystalline lens from the 3-D models (i.e., best sphere fitting. Fitting diameter=6mm) in millimeters.

(24) **magnitude tilt pre**: Tilt magnitude of the natural crystalline lens (preoperative).

(25) **direction tilt pre**: Tilt direction of the natural crystalline lens (preoperative).

Crystalline lens full shape features obtained from OCT (see [1-3] for details)

(1) **VOL_eigen_lenses**: Volume of the crystalline lens, from the full shape estimated using eigenlenses method in cubic millimeters.

(2) **LSA_eigen_lenses**: Surface area of the crystalline lens, from the full shape estimated using eigenlenses method in square millimeters.

(3) **DIA_eigen_lenses**: Equatorial diameter of the crystalline lens, from the full shape estimated using eigenlenses method in millimeters.

(4) **EPP_eigen_lenses**: Equatorial plane position of the crystalline lens, from the full shape estimated using eigenlenses method in millimeters.

(5) **LT_eigen_lenses**: Crystalline lens thickness, from the full shape estimated using eigenlenses method in millimeters.

(6) **Coef_eigenlenses, a1**: First eigenlens coefficient.

(7) **Coef_eigenlenses, a2**: Second eigenlens coefficient.

(8) **Coef_eigenlenses, a3**: Third eigenlens coefficient.

(9) **Coef_eigenlenses, a4**: Fourth eigenlens coefficient.

(10) **Coef_eigenlenses, a5**: Fifth eigenlens coefficient.

(11) **Coef_eigenlenses, a6**: Sixth eigenlens coefficient.

(12) **Coef_eigencenters, c1**: First eigencenter coefficient.

(13) **Coef_eigencenters, c2**: Second eigencenter coefficient.

(14) **Coef_eigencenters, c3**: Third eigencenter coefficient.

(15) **Coef_eigencenters, c4**: Fourth eigencenter coefficient.

(16) **Coef_eigencenters, c5**: Fifth eigencenter coefficient.

(17) **Coef_eigencenters, c6**: Sixth eigencenter coefficient.

(18) **EPP_eigen_lenses2**: Equatorial plane position of the crystalline lens, calculated in a different way, from the full shape estimated using eigenlenses method in millimeters.

(19) **LT_IOVS**: Crystalline lens thickness, from the full shape estimated using IOVS method in millimeters.

(20) **VOL_{iovs}**: Volume of the crystalline lens, from the full shape estimated using IOVS method in cubic millimeters.

(21) **LSA_{iovs}**: Surface area of the crystalline lens, from the full shape estimated using IOVS method in square millimeters.

(22) **DIA_{iovs}**: Equatorial diameter of the crystalline lens, from the full shape estimated using IOVS method in millimeters.

(23) **EPP_{iovs}**: Equatorial plane position of the crystalline lens, from the full shape estimated using IOVS method in millimeters.

(24) **EPP_{int_app}**: EPP using intersection approach.

References

- [1] E. Martinez-Enriquez, A. de Castro, and S. Marcos, "Eigenlenses: a new model for full crystalline lens shape representation and its applications," *Biomed Opt Express*, vol. 11, no. 10, pp. 5633-5649, Oct 1 2020, doi: 10.1364/BOE.397695.
- [2] E. Martinez-Enriquez, P. Perez-Merino, M. Velasco-Ocana, and S. Marcos, "OCT-based full crystalline lens shape change during accommodation in vivo," *Biomed Opt Express*, vol. 8, no. 2, pp. 918-933, Feb 01 2017, doi: 10.1364/BOE.8.000918.
- [3] E. Martinez-Enriquez, M. Sun, M. Velasco-Ocana, J. Birkenfeld, P. Perez-Merino, and S. Marcos, "Optical Coherence Tomography Based Estimates of Crystalline Lens Volume, Equatorial Diameter, and Plane Position," *Invest Ophthalmol Vis Sci*, vol. 57, no. 9, pp. OCT600-10, Jul 1 2016, doi: 10.1167/iovs.15-18933.