

# Refractive Accuracy of a Novel IOL Calculator (J-CALC) Compared to 7 Existing IOL Formulae using 3 Different Keratometric Devices

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## PURPOSE

To evaluate the refractive accuracy of a new IOL calculator (J-CALC) compared to seven different IOL formulae when using keratometric (K) values from three different diagnostic devices.

## METHOD

Single-center, retrospective, non-interventional study of 1267 eyes that previously underwent cataract surgery and had preoperative biometry with both 2nd and 3rd generation LED topography (Ambient and Cassini, Cassini Technologies, B.V.), and optical biometry (Lenstar 900; Haag-Streit) or SS-OCT (Argos, Alcon Vision LLC). J-CALC is based on the theoretical model of the eye and only uses 3 variables to perform IOL calculation. Mean prediction error (MPE) within  $\pm 0.50$ D and  $\pm 1.00$ D and standard deviations were analyzed using data from 1M post op visit.

## RESULTS

In 976 eyes (Group A) data were obtained from optical biometer (Lenstar 900); in 291 eyes (Group B) data was collected from SS-OCT (Argos). In Group A, MPE within  $\pm 0.50$ D was as follows: J-CALC 87.6%, Barrett (modified) 73.2%, H1 72.5%, Haigis 73.4%, HofferQ 68.6%, SRK/T 68.1% ( $p<0.0001$ ). In Group B, MPE within  $\pm 0.50$ D was as follows: J-CALC 75.9%, Barrett 71.8%, H1 67.4%, Haigis 63.9%, HofferQ 60.8%, SRK/T 61.2% ( $p=0.016$ ). Within Group B, Argos K values were also substituted with K values from 2nd and 3rd generation LED topography (Cassini). Using J-CALC, MPE within  $\pm 0.50$ D was 70.8% for 2nd generation Cassini and 74.2% for 3rd generation Ambient, a significant improvement of +3.4% ( $p<0.0001$ ).

3rd GEN Cassini Ambient (TCA)							
MPE	0.04	0.14	0.05	0.12	0.17	0.14	0.11
SD	0.59	0.57	0.70	0.74	0.73	0.70	0.70
	J-CALC	Hazen	H1	Haigis	HofferQ	T2	SRK/T
+/-0.25	46.74%	41.92%	38.14%	42.61%	37.46%	39.52%	37.11%
+/-0.50	74.23%	71.82%	64.26%	64.60%	63.23%	64.60%	60.82%
+/-1.00	92.10%	94.16%	88.66%	87.63%	88.66%	88.66%	90.38%
+/-1.50	97.25%	98.97%	95.53%	94.50%	94.16%	95.19%	94.85%
+/-2.00	98.63%	99.31%	98.28%	97.94%	97.94%	98.28%	97.59%
+/-2.50	99.31%	99.31%	98.63%	98.28%	98.63%	98.63%	99.31%
+/-3.00	99.66%	99.66%	99.31%	99.31%	98.97%	98.97%	99.66%
+/-3.50	100.00%	99.66%	100.00%	99.66%	99.66%	99.31%	99.66%

## CONCLUSION

J-CALC provided the highest percentage of predictive accuracy when compared to other IOL formulae, while outperforming them across all 3 keratometric device measurements. The Ambient Total K is more accurate than its predecessor and is comparable to Lenstar 900 and Argos biometers.