

Advances in biometry and IOL calculation

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Abstract

The subject of this report is the review of new advances in biometry and iol calculation in the field of cataract surgery. Starting from the biometric examination with contact ultrasound (less precise) to immersion (more precise), we move on to optical biometry, preferably swept-source OCT, which also pass through even very dense cataracts, is operator-independent, gives greater comfort for the patient, and allow control of the accuracy of fixation. Currently 70% of the results are as expected, but in eyes with too short or too long axial length, the margin of error grows exponentially, as well as in the presence of previous operations, the result is less precise: in particular in previous operations, of refractive surgery. The third generation formulas (Holladay 1, SRKT, Hoffer-Q) are now obsolete. The formulas to use are Barrett Universal II, TK Yeo Evo formula, Haigis, Kane iol formula, Olsen. In particular the work of Kane J, a 25-year-old Australian ophthalmologist, is changing our biometrics culture. In fact, in a work of 2016, examining the data of 3500 patients, he highlighted that the most precise formula is to be considered the Barrett formula, in almost all axial lengths, except in very short eyes, where almost all the formulas they are wrong more frequently. In a subsequent work of 2019 Kane analyzed with his own program, using the so-called artificial intelligence, a large series of patients and was able to establish that Kane's formula ranks as the first formula, with more than 50% of patients between 0 and 0.25, and then follows the Olsen. These data were confirmed in a subsequent work on a series of 11 thousand patients.



We can summarize the take-home message as follows:

- 1) All formulas generate at least 50% of cases between ± 0.50 D
- 2) SS OCT optical biometers allow better results with all formulas
- 3) The best results are obtained with KANE, BARRETT, OLSEN and EVO formulas
- 4) Many scientific papers on small numbers of patients: they do not offer irrefutable results

Biography:

Dr. Alfonso Anania Currently working on surgery of the anterior segment and refractive surgery in a private practice (Diagnostic Center: Studio Cemes via Siria, 24 00179 Roma; Studio Oculistico via 4 Novembre, 154 Filadelfia (VV), and in private Hospitals operating within the National Health Service (Clinica S.Marco viale XXI Aprile, 2 Latina; Clinica Oculistica Santa Lucia viale Trieste, 71 Cosenza).

Speaker Publications:

1. "The aging of the human lens"
2. "Critical analysis of incisional corneal surgery for myopic refractive defects"
3. "Epidemiological study on 227 patients suffering from systemic diseases: relationships with the ocular manifestations"
4. "Morning Glory disc anomaly : two cases description"
5. "Dark room test in the normal eye, in glaucomatous with and sine-hypertension and in the ocular hypertension"

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