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Review Article

The "VFFIOL e.V. Biometry Academy" - An Online Continuing Education Initiative in Ocular Biometry for Ukrainian Ophthalmologists

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Abstract

Accurate ocular biometry and appropriate intraocular lens (IOL) power calculation are prerequisites for achieving the target refraction after cataract surgery. Their reliable application requires an understanding of measurement quality, calculation methods, formula constants and the sources of refractive prediction error.

The "VFFIOL e.V. Biometry Academy" is an online continuing education initiative established by Prof. Oksana Vitovska and Dr. Sibylle Scholtz within the framework of VFFIOL e.V. (Verein zur Förderung der Forschung auf dem Gebiet der Intraokularlinsenberechnung e.V,) with a particular focus on continuing professional development for Ukrainian ophthalmologists. Its recorded lectures connect scientific foundations with clinical practice and allow participants to study independently of scheduled teaching sessions. The website is available in German, English and Ukrainian, providing multilingual access to information about the initiative.

This article describes the "VFFIOL e.V. Biometry Academy's" educational rationale and concept and identifies priorities for its further development. Meta-analytic evidence indicates that internet-based education is clearly superior to no intervention but broadly equivalent to conventional formats; the effectiveness of an individual program therefore has to be demonstrated rather than assumed. The Academy's contribution to knowledge acquisition, changes in clinical practice and patient outcomes should therefore be assessed prospectively.

Keywords: *Biometry; Lens Implantation; Intraocular; Education; Medical; Continuing; Computer-Assisted Instruction*

Introduction

Cataract surgery planning combines anatomical measurements with optical prediction. The selected IOL power depends on the quality of the biometric data, the calculation method and the constants used within that method. A comprehensive review by Kane and Chang illustrates the close relationship between measurement technology and formula performance. For example, it is described here that, with the use of modern biometry technology and modern formulas, the proportion of eyes falling within ±0.50 D of the target refraction post-operatively [1]. Continuing education in this field is therefore relevant both to clinicians performing cataract surgery and to colleagues responsible for acquiring and reviewing biometric measurements.

A central objective of the "VFFIOL e.V. Biometry Academy" is to ensure that Ukrainian ophthalmologists retain access to professional continuing education, even amidst the ongoing war, a situation characterized by limited in-person instruction and compromised infrastructure [2]. The "VFFIOL e.V. Biometry Academy", initiated by Prof. Oksana Vitovska and Dr. Sibylle Scholtz under the auspices of the VFFIOL e.V. (Verein zur Förderung der Forschung auf dem Gebiet der Intraokularlinsenberechnung e.V, https://www.vffiol.org/), provides recorded online lectures on ocular biometry and IOL power calculation via the VFFIOL e.V. website. The initial concept for this series of educational sessions emerged as early as the beginning of 2026. The initiative officially launched on May 21, 2026, with the first lecture: "Measure twice, implant once! Biometry mistakes we've all made - and some ideas on how to avoid them". To date, 10 lectures have been made available on the website, released at irregular intervals of approximately 2 to 3 weeks. The individual lectures range in length from 7 to 39 minutes, with a total combined duration of approximately 188 minutes (as of November 1, 2026). The 9 current speakers hail from Ukraine, Spain, Egypt, and Germany (Table 1). The lectures are available to stream free of charge and do not require registration.

Aim of the Study

The aim of this descriptive report is to present the scientific rationale and educational concept of the initiative. It does not report an evaluation of learner performance or clinical outcomes.

Scientific rationale for education in ocular biometry

Reliable IOL power calculation requires more than obtaining a numerical result from a device or calculator. Clinicians must assess whether the measurements are plausible, understand the assumptions of the selected method and recognize situations in which standard approaches may be insufficient. In a theoretical error analysis, Norrby identified the preoperative estimation of the postoperative IOL position (35%), the determination of the postoperative refraction (27%) and the preoperative axial length measurement (17%) as the largest contributors to the refractive prediction error [3]. These findings provide an educational basis for discussing the full measurement and calculation pathway rather than considering formula selection in isolation.

Corneal measurement quality deserves particular attention. In a prospective multicentre study with two keratometry measurements taken approximately three weeks apart, Epitropoulos and colleagues found greater test-retest variability of keratometry and a higher proportion of eyes with a difference in calculated IOL power of more than 0.50 D among patients with hyperosmolar tears than among those with normal tear osmolarity [4]. The study illustrates how ocular surface abnormalities can influence cataract surgery planning. Teaching should therefore address the assessment of the ocular surface, the interpretation of inconsistent measurements and the circumstances in which reassessment is appropriate.

Formula constants are another key educational topic, as they are specific to the formula and the IOL model. Their optimization requires suitable biometric and postoperative refractive data, an appropriate optimization strategy and validation. Langenbucher and colleagues demonstrated that different optimization approaches can produce different results and emphasized the importance of cross-validation [5]. Resources such as IOLCon (https://iolcon.org/) provide access to IOL specifications and updated or optimized constants [5]. Training can help clinicians interpret these resources and understand why the origin and applicability of a constant matter.

Biometry education should also prepare learners for eyes that fall outside routine assumptions, including very short or long eyes, eyes after corneal refractive surgery and eyes with keratoconus. The published literature shows that formula performance and the interpretation of corneal measurements depend on the clinical setting [1,6,7]. The overarching educational goal is to develop informed judgement about data quality and method selection.

Educational concept of the biometry academy

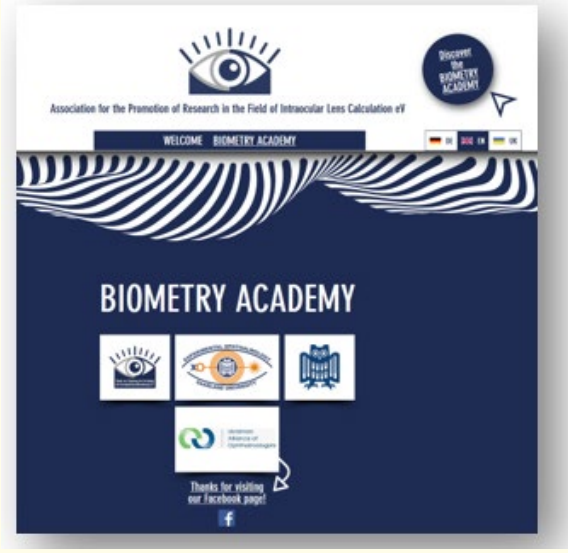


Figure 1: *Welcome page of the “VFFIOL e.V. Biometry Academy” (https://www.vffiol.org/biometryacademy).*

The “VFFIOL e.V. Biometry Academy´s” (Figure 1) core format consists of recorded lectures on ocular biometry and IOL power calculation. Participants can access the teaching at a time that suits their circumstances and revisit explanations when necessary. This format reduces dependence on attendance at a single scheduled event and allows specialist content to remain available beyond the original presentation (Table 1).

Title	Speaker	Length	Language	Subtitles	Recording date
Measure twice, implant once! Biometry mistake we´ve all made – and some ideas how to avoid them	Sibylle Scholtz, Achim Langenbucher	18 min	English, optionally German	Ukrainian	21. May 2026
Biometrie aus der Praxis. Was will uns das Auge damit sagen? (Biometry in practice. What is the eye trying to tell us?)	Daniela Riedmaier	25 min	German, optionally English	Ukrainian	11. June 2026
Messfehler und Outtakes. Was sieht man, wenn man genau hinsieht? (Measurement errors and outtakes. What do you see when you look closely?)	Daniela Riedmaier	17 min	German, optionally English	Ukrainian	18. June 2026
IOLCon: An IOL Power Calculation Platform for Optimizing Outcomes	Sibylle Scholtz, Oksana Vitovska, Achim Langenbucher	13 min	English, optionally German	Ukrainian	2, July 2026

IOLCon Updated: Enhanced Support for Calculating Toric and Non-toric IOLs	Sibylle Scholtz, Oksana Vitovska, Achim Langenbucher	17 min	English, optionally German	Ukrainian	24. July 2026
IOL Calculation Mishaps – The Toric Surprise	Patrick Peschke	7 min	English, optionally German	Ukrainian	12. August 2026
Calculating the Human Eye – The Evolution of Biometry for Cataract Surgery	Ahmed Assaf	11 min	English, optionally German	Ukrainian	26. August 2026
Astigmatism and its correction	Jose-Manuel Diez-del Corral Belda	39 min	English, optionally German	Ukrainian	6. September 2026
Spectacle Prescription after IOL Implantation	Yuliia Malovana	18 min	Ukranian	Englisch	3. Oktober 2026
Optical Biometer: Step-by-Step IOL & Toric Calculation Guide	Tomey	8 min	English, optionally German	Ukrainian, Englisch	18. October 2026
Dry Eye and Biometry	Oksana Vitovska	15 min	Ukrainian	Englisch	27. October 2026

Table 1: *Currently available recorded lectures (https://www.vffiol.org/uk/biometryacademy (as of November 1, 2026)).*

The initiative aims to connect the scientific principles of measurement and calculation with their application in everyday clinical practice. Its particular emphasis on Ukrainian ophthalmologists reflects the founders' intention to support continuing education where flexible access is especially valuable. The project also offers a basis for international exchange through contributions from speakers with expertise in the subject.

The website is available in German, English and Ukrainian. This multilingual presentation can make information about the Academy easier to navigate and improve its visibility among different professional audiences. The availability of the website in three languages should be distinguished from the language of individual lectures. Clear identification of lecture languages and any available subtitles or translated materials would help participants choose suitable resources.

The Academy depends on the expertise and commitment of its contributing speakers. Their educational contribution provides an opportunity to make specialist knowledge available to colleagues beyond the geographical and scheduling limits of conventional meetings. Currently, the definition of clear learning objectives is being planned, as is a process for reviewing and updating the content in line with scientific developments. Regular review of the scientific content is essential to ensure that the materials remain useful in the long term.

Evidence supporting digital continuing education

Digital education offers a practical means of distributing specialist teaching, but access and educational effectiveness are separate questions. In a meta-analysis of 201 studies, Cook and colleagues found a large pooled effect of internet-based instruction on knowledge outcomes compared with no intervention (effect size 1.00), whereas the effect compared with non-internet instruction was small (0.12) and heterogeneous [9]. These findings support the use of online teaching as an educational option without establishing that it is superior in every setting.

A Cochrane review of 16 randomized trials including 5,679 licensed health professionals found that e-learning may make little or no difference compared with traditional learning with respect to patient outcomes, professional behaviour and knowledge (low-certainty evidence), whereas the effect on skills was uncertain (very low certainty) [10]. For the Academy, this implies that its value should be assessed through the quality and relevance of its content, its accessibility and demonstrable learning, rather than inferred solely from the use of an online format.

Recorded lectures can provide a useful foundation for learning, particularly when participants need flexibility. Applying that knowledge in practice also requires opportunities for reflection and feedback. Case-based questions, worked calculation examples and optional discussion sessions would be reasonable additions to consider as the program develops. These are proposed educational enhancements, not reported features or evaluated outcomes of the present initiative.

Priorities for further development and evaluation

A coherent educational pathway could begin with the principles of ocular biometry and progress to measurement validation, formula selection and the interpretation of prediction error. Further modules could address ocular surface assessment, formula constants and challenging clinical cases. Such a structure would allow learners with different levels of experience to identify relevant starting points and recognize how individual topics relate to the complete preoperative workflow.

Evaluation should distinguish program reach from educational achievement, for example along the four levels of the Kirkpatrick model (reaction, learning, behaviour, results) [11]. To date, there have been approximately 2900 views across all presentations; the breakdown of views by individual presentation can be found in table 2. Unfortunately, YouTube does not provide precise statistics regarding the regional distribution of these views. It is estimated that more than 90 percent of the views originate from Ukraine.

Title	Number of views
Measure twice, implant once! Biometry mistake we´ve all made – and some ideas how to avoid them	208
Biometrie aus der Praxis. Was will uns das Auge damit sagen? (Biometry in practice. What is the eye trying to tell us?))	147
Messfehler und Outtakes. Was sieht man, wenn man genau hinsieht? (Measurement errors and outtakes. What do you see when you look closely?)	84
IOLCon: An IOL Power Calculation Platform for Optimizing Outcomes	103
IOLCon Updated: Enhanced Support for Calculating Toric and Non-toric IOLs	262
IOL Calculation Mishaps – The Toric Surprise	182
Calculating the Human Eye – The Evolution of Biometry for Cataract Surgery	227
Astigmatism and its correction	365
Spectacle Prescription after IOL Implantation	515
Optical Biometer: Step-by-Step IOL & Toric Calculation Guide	493
Dry Eye and Biometry	292

Table 2: *Presentation-related accesses (As of November 1, 2026).*

Website visits and lecture views can indicate interest, while participation and completion data can describe engagement. They do not establish knowledge acquisition. Brief assessments before and after selected modules, followed by delayed reassessment where feasible, could examine learning and retention. Participant feedback could identify unmet needs, language barriers and topics requiring further explanation.

Any subsequent investigation of clinical benefit would require a separate study design. Changes in refractive outcomes are influenced by measurement devices, case mix, surgical factors and calculation methods, as well as by education. A clinical evaluation would therefore need to document these factors and avoid attributing improvement to the Academy on the basis of participation alone [12]. No such outcome data are presented in this article.

Accessibility remains an implementation priority. Recorded teaching allows flexible timing but still depends on electricity, internet connectivity and suitable devices. Where technically and contractually feasible, lower-bandwidth formats, transcripts or downloadable supporting materials could make participation easier. The feasibility of these options should be considered alongside content review, speaker permissions and the resources available to sustain the program.

Conclusion

The "VFFIOL e.V. Biometry Academy" provides a framework for online continuing education in ocular biometry and IOL power calculation, with a particular commitment to Ukrainian ophthalmologists. Its recorded lectures and multilingual website are intended to make specialist teaching easier to access and integrate into individual learning schedules. The initiative addresses a clinically relevant educational need: understanding how measurement quality and calculation choices affect refractive outcomes after cataract surgery. Its further development should combine accessible teaching with clear learning objectives and prospective evaluation of educational outcomes.

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