

the **Ophthalmologist**TM

DOUBLING DOWN ON VIRTUAL SURGERY

Digital twin technology is enabling patient-specific surgery planning for optimal refractive outcomes

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As biomechanical expertise continues to grow in ophthalmology, it has become clear that no two eyes are the same – not even those of the same individual. But with the advent of digital technologies across healthcare, including advances in artificial intelligence and the digital twin, whole new levels of personalization are now achievable in ophthalmic surgery. Harald P. Studer, CEO of Optimo Medical AG, tells us how combining these advances with sophisticated software solutions is enabling patient-specific eye surgery that ensures optimal outcomes for patients.

How are advances in digital technologies shaping the landscape of ophthalmology?

Standard-of-care cataract and corneal surgery relies on high-tech diagnostic and therapeutic devices, yet the planning of treatments is often still done with old-fashioned, statistically based, and non-personalized methods. Because it becomes increasingly apparent that every eye is unique, personalization emerges as the key to successful cataract surgery. In silico digital models, such as our Optimeyes™ software, are enabling clinicians to more accurately predict the outcomes of surgical procedures and minimize risk for the patient.

How is Optimo Medical AG using these advanced tools and what benefits can they offer to ophthalmologists?

At Optimo Medical AG, we are building on current digital twin technology, combining our extensive knowledge of corneal biomechanics with a wealth of expertise in mathematics and computational modeling to create Optimeyes™. This software offers surgeons a safe, precise, and low-cost method for patient-specific surgery planning, replacing the

traditional statistical evaluation of nomograms. The state-of-the-art technology is able to produce a virtual clone of the interior segment of the patient's eye, meaning a surgeon can perform a “dry-run” to establish the optimal surgery parameters. First, a patient's individual corneal topography measurements are imported into the software, based on biomechanical simulations. Then, the surgical parameters are modeled and optimized, including values for optical zone, incision length, incision depth, and orientation.

Patients are often left with treatable astigmatism after cataract surgery; by using the software for preoperative arcuate keratotomy planning, surgeons can ensure any residual astigmatism from cataract surgery is minimized – this is a key benefit.

How do you see technologies such as yours developing in the near and longer-term future?

With both the FDA and the European Council recommending the use of virtual surgery to create digital models of patient outcomes and modernize the evaluation of patient benefit and risk, it is clear that digital technologies, such as Optimeyes™, will significantly advance the field of ophthalmology and healthcare as a whole. The ability to conduct in silico patient-specific surgery planning will enable truly personalized procedures that will drastically improve refractive outcomes for patients. We believe artificial intelligence, in combination with digital twin technologies, will become the standard of care in surgery planning across ophthalmology and will help improve surgical outcomes exponentially.

Optimeyes™ is CE marked and available for sale in Europe only.

