



Technology Ushers in a New Era of Dramatic Improvements in the Diagnosis and Treatment of Glaucoma

The goal is to prevent blindness in the more than 60 million people affected by glaucoma worldwide.

Glaucoma describes a range of disorders in which the final common pathway is rapid, progressive ganglion cell death with resultant nerve fiber layer loss and increasing neuroretinal rim thinning leading to optic nerve dysfunction. Diagnosis is typically based on characteristic optic nerve head appearance in combination with class visual field defects often with elevated IOP. Medications, laser, and surgery may be used to lower IOP, currently the main modifiable risk factor. The greatest unmet needs are two-fold: 1) detecting the disease earlier, because patients experience symptoms only when the disease is advanced and current treatments cannot reverse ganglion cell loss, and 2) identifying patients at highest risk for rapid progression of the disease, so treatment interventions with various risk profiles can be tailored to the rate of vision loss with the goal of avoiding functional blindness.

Applications of New Technology to the Field of Glaucoma

The time is ripe for technological advances because diagnostic and treatment tools are increasingly available. These include portable screening tools such as optical coherence tomography (OCT) and OCT angiography (OCT-A); new medications; lasers; and microinvasive glaucoma surgeries (MIGS). Advances in machine learning and artificial intelligence are making it possible to aggregate various sources of clinical data and to apply algorithms to develop patient

risk stratification models. Fast and compact imaging tools and mobile solutions are enabling more rapid, convenient screening and detection of glaucoma. Monitoring is progressing, but slowly, because it requires changes in how glaucoma progression is measured, which need to be validated with longitudinal studies. Biomarkers and new drug delivery technologies offer the promise of improving treatment outcomes. Telemedicine and mobile health can be used for remote detection, diagnosis, and management.

Investments in Innovative Technologies

Santen, a global specialty ophthalmology company, is dedicated to improving the eyesight and health of people around the globe. Santen not only creates tangible products but also innovative services and processes. Santen encourages the development of innovations through actively learning and applying best practices in the world. As part of this effort, Santen established the Global Innovation Office (IO) in 2015 headed by technology veteran Elo Kent. IO's mission is to forge partnerships within both life sciences and technology ecosystems, including inventors, digital health startups, venture capitalists, and incubators, with a common goal to develop novel early stage technologies that solve patients' unmet needs. Kent believes that new technologies can have the biggest impact on earlier disease detection, better monitoring of disease progression, improved treatment outcomes, and enhanced



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