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Ophthalmic Innovation for Everyone

Innovation in ophthalmology has gotten complicated. Molecular, chemical, and preclinical work often begins in academic departments with NEI or angel investor funding. Early-stage development is driven by entrepreneurs in small start-up companies who hope to commercialize a product. Because the path to FDA approval can be protracted and expensive, capital needs are impressive.

But FDA approval is only one step, and companies must develop a reimbursement model, negotiate with payers, and demonstrate value to ophthalmologists and their patients. Bringing a product from bench to the patient requires good science, good technology, good management, lots of capital, and persistence. What propels this work?

“The main driver of innovation is unmet patient need,” said Sophie Bakri, retina specialist and ophthalmology department chair at the Mayo Clinic. For retinal diseases, the largest needs are for sustained-release devices and gene therapy for exudative age-related macular degeneration (AMD) and treatments for dry AMD and inherited retinal degenerations. In glaucoma, Thomas Samuelson points to the long-term risks of bleb-forming procedures. “For much of my career, the surgical options for glaucoma patients were simply not safe enough for routine use in those who had lower- or medium-risk glaucoma. This unmet need is what drives the transformational MIGS procedures and devices.” We also need innovation to increase efficiencies in caring for a growing number of patients with eye disease.

Innovation also requires a revenue model. Due to the aging demographic in many countries, ophthalmology now presents a substantial market. For example, the size of the global ophthalmic devices market is projected to reach \$66.7 billion by 2027,¹ and the ophthalmology therapeutics market is projected to increase by \$12.34 billion from 2021 to 2025.² Unsurprisingly, there’s a correspondingly dramatic increase in interest from funding partners.³

Does this capital investment in health care innovation create the wrong incentives? Tom doesn’t think so. “First, new technology requires funding to survive the rigors of the innovation process. Second, due to the combination of the FDA process and the professionalism of the vast majority of physicians, only the safer or more efficacious treatments

become a long-term treatment option for our patients.” He suggested that even though new technologies add short-term expense, they can save money over time. Modern cataract surgery is a great example of this.

Ultimately, it is the payers who decide which technologies are available to patients, and this presents another hurdle for innovators to overcome. As proposed, the 2022 CMS physician fee schedule would reduce reimbursement for inserting an iStent during cataract surgery to less than \$50. But there’s a potential way to address such challenges. As Sophie noted, capital partners and large companies can “have a portfolio of drugs and devices to spread the risk.”

Finally, although innovation has always been central to the culture of ophthalmology, the undertaking increasingly requires collaboration with other stakeholders. Several meetings now bring these partners together. I attended Eyecelerator, and what impressed me most was the thrumming energy from smart people who think about challenges from a different, nonphysician perspective. In recognition of these partnerships, Byers Eye Institute at Stanford University offers a project-based fellowship for bringing innovations in ophthalmic technology to market.

There’s no question that the pace of innovation, along with the complexity and interest, is increasing. And more than ever, the role of the ophthalmologist is central in defining unmet needs and in determining which treatments truly increase safety, efficacy, and efficiency.



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1 www.alliedmarketresearch.com/ophthalmic-devices-market.

2 www.alliedmarketresearch.com/ophthalmic-drugs-market.

3 www2.deloitte.com/content/dam/insights/us/articles/6459_Health-tech-investment-trends/DI_Health-tech-investment-trends.pdf.