

# Current Perspective

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## Where the Health Care Investors Are Going

**W**hen envisioning the future of medicine, it helps to remember the adage “follow the money.” Early-stage investors are now making bets as to where health care innovation will lead us. While not 100% prescient, they devote a lot of sophisticated talent, mental energy, money, and complex data analytics trying to predict the next big thing. And billions of dollars follow those analytics.

HealthCare Ventures, Kleiner Perkins Caufield & Byers, Polaris Venture Partners, and InterWest Partners (all top venture capital firms that invest in the life sciences space) don’t use magic. But they are intently, dispassionately focused on their goal. They and their money go to the trends and disruptive forces that they believe will generate high returns.

How big is this pool of early-investor money and how much goes to life sciences/biotechnology? Over the past decade, about 20% of the total pool of U.S. venture capital has been invested in life sciences each year—a range of about \$6.5 to \$9.0 billion annually. Historically, the largest pool of money goes into oncology and neurology companies. Ophthalmology investments fluctuate a lot—from about \$200 to \$500 million per year. So what are the big trends that the venture capital industry sees as likely to shape the future of health care—and, in some cases, to “rock our world”?

The most substantial is the increasing use of patient-facing digital technology in health care—smart devices that will sense, analyze, and upload inputs from everything from glucose monitors to wearable cardiac rhythm-sensing devices to complex diagnostic imaging. Propeller Health, for example, has developed a Bluetooth-enabled inhaler sensor to improve medication adherence in patients with asthma. Livongo is a cell phone-connected glucose meter that provides personalized diabetes coaching for better glucose control and health-cost savings. In ophthalmology, sensors may upload intraocular pressure, cup-to-disc ratios, digital imaging, and visual function (such as Opternative). Altogether, the wearable digital device industry grew over 400% between 2014 and 2016.

In addition to digital input devices, investors are focusing on the development of consumer downloadable health-related applications. In 2016, such apps were downloaded more than 1 billion times—including over 200 million

times in the United States. One-quarter of them dealt with disease detection, monitoring, and treatment. Many currently offer visual function testing, ocular anatomy and physiology tutorials, and disease information.

Investors are also betting on the impact of genomics and personalized therapy. Fifteen years ago, diagnostic tests were available for fewer than 1,000 genetic disorders. Today, that number is over 5,000. Numerous big data platforms are now “crowd-sourcing” a combination of genetics and phenotypic information with predictive analytics to enable personalized treatments. Only 5 personalized medicines existed in 2008; now we are approaching 150. Gene testing has entered the consumer space with 23andMe, Helix, Color, and even Ancestry.com.

The digital revolution in health care also holds promise for clinical trials. The average duration from phases 0 through 3 is about 12 years. Use of clinical data registries to facilitate clinical trial enrollment is already shortening the process by months to years, bringing innovations to physicians and patients that much quicker.

Envision a tomorrow when physiologic data come not only from episodic office visits but also from digitally enabled home monitoring systems with both patient- and physician-facing analytics. Physiologic and genomic information supported by predictive analytics will enable more-personalized care and better outcomes—with the outcomes further enriching and improving the analytic architecture.

This is not a vision of the distant future; investors believe that returns both on capital and for patients are just around the corner. Fortunately, ophthalmology attracts its fair share of attention, in part reflecting both the unsolved burden of eye disease and the potential inherent in digital innovation.



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