

The AI Practice of the Future

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The future of artificial intelligence in ophthalmology will be shaped by several converging forces.

First, nearly every workforce study predicts a growing shortage of ophthalmologists relative to an aging and expanding patient population. This gap will continue to widen, creating an urgent need for technologies that extend the reach and effectiveness of physicians, rather than replace them.

Second, ophthalmology is uniquely positioned to benefit from AI because it is fundamentally a data-driven specialty. We generate enormous amounts of structured clinical information from imaging and diagnostics to surgical outcomes that lend themselves naturally to machine learning and predictive analytics.

Third, the gap between “domain expertise” and the delivery of that expertise has never been smaller. The computational power available today and the speed with which ideas can be translated into clinical tools are dramatically different from when I first became interested in machine learning and artificial intelligence a decade ago. What once required years of development can now be accomplished in months.

Finally, the increasing availability of real world outcome data across every subspecialty in ophthalmology will continuously improve our collective knowledge and clinical decision-making.

Rather than relying solely on published literature, future AI systems will learn from the experience of millions of patients, allowing recommendations to become increasingly personalized and evidence based. With these trends in mind, our mission becomes clear: How do we deliver continuously evolving, expert clinical decision support to physicians while simultaneously providing intelligent decision support to patients? These are fundamentally different problems, but both are essential.

Today, most AI decision-support platforms have been developed primarily by AI technologists rather than practicing physicians. Systems such as OpenEvidence largely generate recommendations by synthesizing information from the medical literature. While valuable, these systems do not represent true domain expertise built upon proprietary clinical knowledge, decades of physician experience, and continuously evolving real world outcomes data. In fact, recent studies have demonstrated that general-purpose large language models such as ChatGPT can often perform comparably to these literature-based systems.

Patient-facing AI presents a different challenge altogether. While large language models can answer questions and provide educational information, they rarely address the complexity of how patients actually make decisions. Medical decisions are rarely made in isolation. They are influenced by personal values, family circumstances, risk tolerance, financial considerations,

and competing priorities. Many decisions resemble a “trolley car dilemma”, where every available option carries tradeoffs. It is also well known that the way information is presented can significantly influence the decision itself. As physicians grounded in clinical care, we recognize that compassion is not simply an accessory to medicine, it is one of its defining characteristics. In the era of artificial intelligence, our responsibility is not merely to build systems that provide answers, but to develop systems that preserve empathy, strengthen communication, and support the deeply human process of shared decision-making.

The extraordinary interest and valuations of companies developing medical AI demonstrate that the market recognizes this opportunity, yet no existing platform fully addresses both sides of the physician-patient relationship while continuously learning from real world outcomes and becoming better over time. In his recent book on AI in medicine, *[A Giant Leap: How AI Is Transforming Healthcare and What That Means for Our Future]*, Robert Wachter argues that the solutions most likely to succeed will be comprehensive, integrated platforms rather than isolated point solutions. AI will not replace physicians or their staff. Instead, it will assume tasks that machines perform better, allowing clinicians to devote more of their time to the aspects of medicine that only humans can provide.

Ophthalmology is uniquely positioned to lead this transformation. Our specialty combines rich imaging data, measurable outcomes, standardized workflows, and a tradition of technological innovation. We are entering what I believe will be a renaissance in medicine. One that is driven by deep domain expertise, artificial intelligence, and eventually quantum computing, whose ability to analyze extraordinarily large and complex datasets may fundamentally reshape medical discovery.

Our journey at Advanced Euclidean Solutions began with early work in artificial intelligence and machine learning that resulted in multiple issued patents, some of which have been

successfully sold. Today, however, our focus is on a much larger vision. SpaceX’s mission has always been to preserve human consciousness. As physicians dedicated to patient care, our mission should be to preserve something equally precious: the deeply human relationship between doctor and patient. At its core, medicine has always been a relationship between healer and patient. Every technological advance should strengthen that relationship, not replace it.

Experienced physicians, scientists, engineers, and strategic partners are building AI solutions that advance this mission. We understand the realities of clinical medicine because we have lived them. Collectively, we have a proven track record of translating complex technologies into practical solutions that improve patient care.

Further, we already know that empathy can be measured through analysis of clinical conversations. AI systems can identify opportunities to improve communication, suggest more effective ways to explain complex medical decisions, and help physicians connect more meaningfully with their patients. We can intentionally design systems that reinforce compassion, improve communication, and promote continuous learning for both clinicians and healthcare organizations.

The result is a healthcare ecosystem in which everyone benefits.

Patients receive more personalized care, better communication, and improved access to expertise. Physicians gain intelligent tools that enhance their effectiveness without diminishing their humanity. Healthcare systems become more efficient, scalable, and sustainable.

Most importantly, the sacred relationship between physician and patient is preserved. Everyone benefits. Everyone improves. Together, we continue to get better.