

Legacy of leadership: Training the next generation of ophthalmic surgeons

Abstract

The rapid evolution of ophthalmic surgery, driven by technological breakthroughs in artificial intelligence, robotics, and advanced microsurgical techniques, has fundamentally transformed the landscape of vision restoration. However, this clinical renaissance presents a profound pedagogical challenge: how to effectively and ethically train the next generation of ophthalmic surgeons. The traditional “see one, do one, teach one” apprenticeship model is increasingly inadequate in an era demanding zero-error tolerance and flawless psychomotor precision. This article explores the imperative of establishing a modern legacy of leadership in ophthalmic education, moving beyond the mere transfer of surgical skills to encompass the holistic development of the surgeon. We examine the critical integration of virtual reality simulators, structured wet-lab curricula, and dedicated fellowship programs to ensure patient safety while accelerating the learning curve. Furthermore, we address the often-overlooked dimensions of mentorship, including ethical decision-making, compassionate patient communication, practice management, and surgeon resilience. By cultivating an environment of psychological safety and fostering a culture of continuous learning, established ophthalmologists can leave a legacy that transcends their own clinical achievements. Ultimately, the future of ophthalmology relies on mentors who are as dedicated to sculpting exceptional surgeons as they are to restoring sight, ensuring that the highest standards of competency and compassion are carried forward.

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Introduction

The paradigm of ophthalmic surgery has undergone a radical transformation over the past three decades, transitioning from broad manual techniques to procedures demanding sub-millimeter precision, such as micro-incision cataract surgery, femtosecond laser-assisted procedures, and minimally invasive glaucoma surgeries.¹ As the boundaries of what is clinically possible continue to expand, propelled by artificial intelligence and robotic integration, the ophthalmic community faces a critical inflection point in surgical education. The mastery of these advanced techniques requires a sophisticated amalgamation of spatial awareness, bimanual dexterity, and rapid microscopic decision-making. Consequently, the traditional apprenticeship model of surgical training—often summarized by the historical adage “see one, do one, teach one”—is no longer sufficient, nor is it ethically defensible in a modern healthcare environment that demands pristine outcomes and absolute patient safety.² The contemporary ophthalmic mentor must, therefore, embrace a new pedagogical philosophy, one that recognizes training the next generation not as an obligatory adjunct to clinical practice, but as the most enduring legacy a leader can leave. This requires a comprehensive approach that systematically deconstructs complex surgical maneuvers, leverages advanced simulation technology, and instills a profound sense of ethical responsibility and communicative empathy.

The foundation of modern surgical leadership begins with reimagining the initial stages of psychomotor skill acquisition. In the past, novices often gained their foundational experience directly in the operating room, a high-stress environment where the dual imperatives of patient safety and surgical education inevitably collided. Today, visionary leadership in training necessitates the mandatory integration of structured simulation before a trainee ever touches a human eye. Virtual reality (VR) surgical simulators,

equipped with high-fidelity haptic feedback, allow trainees to develop critical muscle memory, understand intraocular tissue dynamics, and practice crisis management in a risk-free environment. Studies have consistently demonstrated that trainees who achieve proficiency on VR simulators experience significantly lower complication rates, such as posterior capsule rupture, during their initial live surgeries.³ When simulation is seamlessly integrated with rigorous, progressive wet-lab training using animal or synthetic eyes, the learning curve is flattened, and the trainee enters the live operating theater with a foundational competence that honors the patient’s trust. The true legacy of a teaching institute is often reflected in the robustness of its wet-lab and simulation curriculum, serving as the bridge between theoretical knowledge and surgical execution.

However, the acquisition of technical dexterity is merely the baseline of ophthalmic training; the true essence of leadership lies in the real-time mentorship provided within the operating room. The transition from the simulator to the human eye remains a uniquely vulnerable period for a young surgeon. Effective surgical teaching requires the mentor to possess extraordinary patience, emotional intelligence, and the ability to articulate intuitive, subconscious maneuvers. It involves the delicate art of knowing exactly when to intervene to prevent a complication and when to allow the trainee to struggle just enough to facilitate profound learning.⁴ This requires establishing an environment of psychological safety, where trainees feel empowered to vocalize uncertainty or admit an error without fear of humiliation. When a mentor reacts to an intraoperative complication with calm, methodical problem-solving rather than frustration, they impart a lesson in surgical resilience that is far more valuable than the successful execution of an uncomplicated procedure. By narrating their own cognitive processes during complex cases and openly discussing their past surgical missteps, established leaders demystify the aura of the “infallible surgeon,” fostering a culture of transparency and continuous, lifelong learning.

Beyond the confines of the operating theater, the legacy of ophthalmic leadership must aggressively address the holistic development of the physician, particularly in the realm of ethical clinical judgment. The modern trainee is bombarded with an array of premium intraocular lenses, cutting-edge diagnostic modalities, and intense industry marketing.⁵ Mentors have a profound obligation to teach young surgeons how to navigate this commercialized landscape with unwavering integrity. This involves training the next generation to critically evaluate peer-reviewed literature, separate evidence-based medicine from industry hype, and prioritize the patient's actual clinical needs over financial incentives or the allure of novel, yet unproven, technologies. The true test of a surgeon's character often occurs not when they are performing a complex maneuver, but when they are advising a patient against an unnecessary, albeit profitable, intervention. By consistently modeling ethical decision-making, prioritizing the doctrine of informed consent, and demonstrating how to manage the inherent conflicts of interest in modern medical practice, leaders construct an ethical scaffolding that will support their trainees throughout their careers.

Equally paramount to surgical and ethical competence is the mastery of patient communication, an often-underemphasized component of formal medical education that can dictate the trajectory of a surgeon's career. The modern ophthalmic patient is highly informed, holds immense expectations for perfect refractive outcomes, and can quickly become the "unhappy 20/20 patient" if their subjective experience does not match their preoperative assumptions.⁶ Therefore, training the next generation requires a dedicated focus on the art of human connection. Mentors must teach trainees how to actively listen, establish rapport, and translate complex optical concepts into accessible language. Furthermore, trainees must learn the delicate skill of managing expectations, explicitly outlining the limitations and potential risks of a procedure to ensure the patient's psychological readiness. When a complication inevitably arises, the surgeon's ability to communicate the issue with honesty, empathy, and a clear plan for remediation is what prevents a clinical setback from escalating into a profound breach of trust or a medicolegal crisis. Integrating principles of effective communication and media literacy into residency and fellowship programs ensures that young surgeons are equipped to navigate the complex interpersonal dynamics of the consultation room just as adeptly as they navigate the anterior chamber.⁷

The critical need for comprehensive training is particularly pronounced in high-volume settings, such as those found in India, where the burden of cataract blindness demands both exceptional efficiency and uncompromising quality. In these environments, dedicated, short-term and long-term fellowship programs serve as the vital crucible for refining surgical skills and developing leadership capacity.⁸ A well-structured fellowship does more than simply increase surgical volume; it provides the nuanced, specialized mentorship required to transition a competent resident into an authoritative, independent consultant. During these intensive periods, fellows learn the intricacies of organizing a high-volume surgical day, managing a diverse surgical team, and optimizing clinic workflow without sacrificing the individual patient experience. When established institutions commit the time and resources to host these fellowships, they actively participate in a multiplier effect, seeding communities with highly capable surgeons who will, in turn, elevate the standard of care in their respective regions. The impact of a single dedicated mentor in a fellowship program can resonate through thousands of restored eyes over the subsequent decades.

Furthermore, a comprehensive training legacy must prepare the young ophthalmologist for the realities of practice management and medical entrepreneurship. The transition from the sheltered environment of an academic training center to the competitive landscape of private practice is notoriously fraught with challenges. Young surgeons frequently find themselves entirely unprepared for the business of medicine, struggling with issues of human resources, healthcare economics, regulatory compliance, and clinic marketing.⁹ Leaders in ophthalmology must recognize that a surgeon who cannot sustain a viable practice cannot serve their community effectively. Therefore, integrating foundational concepts of medical entrepreneurship into the training curriculum is essential. Mentors should openly share insights into clinic administration, strategic planning, and the cultivation of a patient-centric organizational culture. By equipping trainees with the basic tenets of practice management, mentors empower them to build resilient, sustainable institutions that can weather economic fluctuations and continue to provide high-quality care.

Finally, the modern legacy of leadership must directly address the growing crisis of physician burnout and the vital importance of psychological resilience. Ophthalmic surgeons operate under immense pressure, carrying the profound responsibility of preserving humanity's most valued sense. The compounding stressors of high patient volumes, administrative burdens, and the emotional weight of managing surgical complications can lead to profound professional exhaustion.¹⁰ Mentors must proactively model healthy boundaries, self-care, and the ability to compartmentalize clinical stress. By fostering open dialogues about the emotional toll of surgical practice and normalizing the utilization of mental health resources, leaders can help dismantle the toxic culture of invulnerability that has historically plagued the medical profession. Teaching a young surgeon how to forgive themselves after a surgical complication, how to derive sustained joy from their daily practice, and how to maintain a fulfilling life outside of medicine is perhaps the most profound act of mentorship possible.

In conclusion, the title of "surgeon" is earned through rigorous examination and clinical credentialing, but the title of "leader" is forged through the selfless dedication to elevating others. The future of ophthalmology does not solely depend on the next iteration of artificial intelligence or robotic platforms; it depends fundamentally on the character, competence, and compassion of the individuals wielding those tools. Therefore, the legacy of leadership in ophthalmic education demands a holistic commitment to the trainee. It requires the seamless integration of advanced simulation, the patient transfer of surgical wisdom, the modeling of uncompromising ethics, and the cultivation of profound communicative empathy. As established practitioners look toward the horizon of their careers, they must realize that their most enduring contributions will not be recorded in surgical logs or financial ledgers, but in the hands, minds, and hearts of the surgeons they have trained. By intentionally designing curricula that address the multifaceted realities of modern practice, from the intricacies of medical retina fellowships to the nuances of patient communication, today's leaders ensure that the torch of ethical, high-quality ophthalmic care is passed forward, burning brighter than ever before.

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Conflicts of interest

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