

MALIK Y.



Dr. Kahook, Professor of Ophthalmology, Vice Chairman, and the Slater Family Endowed Chair in Ophthalmology at the University of Colorado School of Medicine, has filed for more than 60 patents, several of which have been licensed by companies for development and commercialization. In this interview, Dr. Kahook discusses the qualities he values in industry partners, what he is currently researching, and his predictions for future innovations.

INTERVIEWED BY CALLAN NAVITSKY, *MILLENNIAL EYE* AND *GLAUCOMA TODAY*
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KAHOOK MD



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BMC: Who or what drew you to ophthalmology?

MALIK Y. KAHOOK, MD: When I started medical school, I knew I wanted to work with my hands in some surgical specialty. I was drawn to medicine because of the fact that physicians can be presented with a problem and do something tangible to solve that problem. Going through the rotations in medical school, it became obvious to me that ophthalmology was the best example of that. It is one of the few specialties in which a patient can present with a problem and the physician can supply an immediate solution that offers a major improvement in quality of life, such as taking out a cataract that is limiting his or her vision.

BMC: Once you were in training, what about glaucoma and cataract attracted you to those subspecialties?

KAHOOK: Once I started performing anterior segment surgery, glaucoma specifically felt like an area with a huge unmet need for innovation.

When I was training, we were learning surgeries that surgeons had been doing for decades—trabeculectomy, glaucoma drainage device implantation. Because of my interest in medical devices and innovation, glaucoma and cataract surgery were a natural fit for me. I realized that not only could I help patients immediately with the technology we had available, but I could also use my skill set to improve upon those devices and advance patient care.

BMC: Did you always foresee innovation being a big part of your career?

KAHOOK: I did. I have always been interested in figuring out how to make things better. My mother says that comes from being an obstinate child. It is hard for me to just accept something at face value and say, “It is this way because it has always been this way.” For a long time, glaucoma was one of the specialties in which that was often said: “We do trabeculectomy because that’s what we’ve always done.”

Even before medical school, I was interested in working with medical

devices. I had previously attended nursing school and worked as a nurse, so I was always around medical devices and thinking of ways to improve patient care from a nursing standpoint. I found myself wondering, why do patients get decubitus ulcers when they don’t move around in bed; how can we improve their beds; and how can we improve the care of a diabetic patient through adherence aids and reminders?

For me, part of the draw to ophthalmology was that ophthalmologists use a variety of medical and surgical devices. I knew that would play a major role in my career. After my fellowship in Pittsburgh, when I started my position at the University of Colorado, I was provided startup funding for a device lab, so innovation was a part of my career trajectory from the beginning.

BMC: When you take an idea from bench to bedside, which are the most challenging steps?

KAHOOK: The most challenging part for me is to prioritize from a project standpoint. I have to ask, “Where is this

going to fit into my life for the next 5 to 8 years?" and "Do I want to pursue this at the cost of leaving other projects behind?" We only have so much time during the day, and I'm always going through the cost-benefit analysis of how my bandwidth is split. The next step is protecting the idea from a patent standpoint, as that provides most of the value in the early phase. That leads to the next most difficult point, which is financing—working to get enough dollars in place so that the idea can be fully vetted.

From there, the focus shifts to creating a team around the idea. Most of the value built after the initial point of patenting comes from having the right team. I've been lucky throughout my career to have a few good people who have worked on several projects with me. If I had a recommendation for people who are thinking about pursuing innovation, it would be to insert yourself in a circle of like-minded people who are focused on the patient, and with whom you can travel from one project to the next.

BMC: What characteristics do you look for in an industry partner?

KAHOOK: It depends on the specific project. It could be as simple as looking for a partner that could finance and commercialize an idea. In some circumstances, specific companies can add a skill set to the team that is not present on the outside of that company—say we had a drug delivery device and a company had a specific drug that would team up well with that device. There are some circumstances in which you don't seek out the biggest commercial partner but a strategic partner that specifically applies to the device being developed.

BMC: In addition to innovation, research is a big part of your career. What is the focus of your current research efforts?

KAHOOK: We have some work in the posterior segment, but most of

our efforts center on dry eye, cataract, and glaucoma. Some of the questions we strive to answer include how can innovations in the device space change the way we think about flow in the OR and how can we access technology that can bring a meaningful change in our patient outcomes?

A lot of innovation today involves small steps to improve the efficiency or economics of a device. We are focused on completely disrupting the way we do things. We think more about grand ideas than small iterative processes now, and much of our lab meetings center around completely turning things upside down and addressing problems as if nobody has ever thought of them before. That has been our focus for the past 3 to 4 years, just wiping the slate clean and starting over. I'm lucky that the University of Colorado allows me the time to ask these questions and seek answers in a protected environment.

BMC: Where do you see the focus of innovation heading in the next 5 to 10 years?

KAHOOK: From a cataract standpoint, I think innovation moving forward will focus on how we can make cataract surgery more economically viable despite reimbursement cuts in health care. I think we'll also focus on the potential of moving the procedure from the OR into an office setting and continue to move away from ultrasound as the standard technique. I believe there will be a game-changing technology in the coming years that will allow us to make cataract surgery more efficient, and this technology will be accessible not just in the developed areas of the world but in developing countries as well. We have to start asking ourselves how surgical care can be delivered efficiently in areas where trained surgeons are few in number. These can be uncomfortable questions for surgeons to contemplate, but we are obligated to think about all aspects of health care delivery and to do what is best for the patient.

In the glaucoma space, I think surgically we're moving into a different phase of ab interno and angle-based surgery and implants that will need to be more robust from an intraocular pressure (IOP)-lowering standpoint. Microinvasive glaucoma surgery (MIGS) has introduced a new way of thinking, and I believe most ophthalmologists would agree that IOP lowering with early devices in this space has so far not been very robust. Newer devices on the market now are achieving more robust IOP lowering, and I see this trend continuing. Next-generation devices currently in development will likely leverage the same level of safety while also achieving more robust IOP lowering.

BMC: If you had to nominate one creative mind in ophthalmology, whom would it be and why?

KAHOOK: Joel Schuman, MD, who is the Chair of Ophthalmology at New York University and a mentor and friend. I find his creativity to be at the top of our field, and his range of innovation is unmatched. Joel has patents that range from imaging the eye (he is an original inventor of optical coherence tomography for ophthalmic use) to modulating wound healing and drug delivery. What is perhaps more important is that Joel has immense integrity and always strives to do the right thing. He's an example that aspiring innovators can look up to and emulate. ■

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