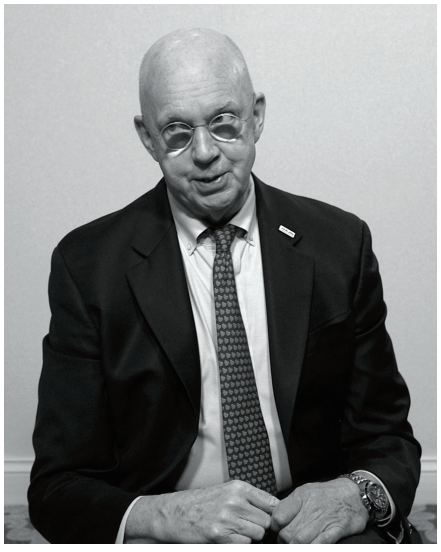
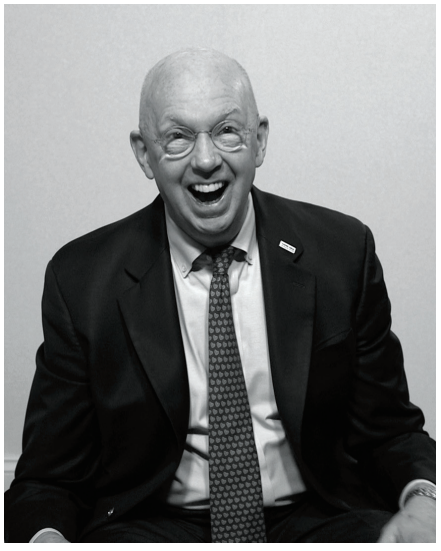
STEVE CHARLES

MD, FACS, FICS





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Nominated by the Chief Medical Editor and Associate Medical Editor of

RT
Retina Today

In addition to being an innovator in vitreoretinal surgery, Dr. Charles is the founder of MicroDexterity Systems, a company that develops robots for dexterity enhancement for minimally invasive knee and hip replacement, spine surgery, and skull base neurosurgery, and a cofounder, systems engineer, investor, stockholder, and chairman of CamPlex, a company developing advanced visualization technology for microinvasive spine surgery, neurosurgery, and transoral approaches to head and neck cancer. He is also an airline transport pilot and multiengine instrument-rated pilot with type ratings in Citation 500, 560, 650, Falcon 50, and Sabre 65 jets. In this interview, Dr. Charles reminisces about the people who influenced him early in life, and he explains why weightlifting should be a part of everyone's routine.

INTERVIEWED BY KAREN ROMAN, *RETINA TODAY* EDITOR-IN-CHIEF

BMC: You attended medical school after attending engineering school. What drew you to ophthalmology?

STEVE CHARLES, MD, FACS, FICS: I knew I wanted to be an engineer, and I never wavered from that. I pursued engineering all through medical school, internship, residency, fellowship, and throughout my career. I've never stepped back from engineering. I chose not to be a biomedical engineer because biomedical engineers are not designers; they work in the laboratory to support things like how bones break or how knee joints wear out, but they're not design guys. Companies like GE Medical Systems, Medtronic, and Alcon don't hire biomedical engineers to do design; they hire mechanical engineers and electrical engineers. I studied mechanical engineering, electrical engineering, and, more recently, photonics and optics.

I got the idea to go to medical school from simply looking at a catalog for the University of Oklahoma. So I went to medical school to find ways to apply my engineering skills and my knowledge to help lessen human suffering. Performing a high volume of complex surgeries teaches me what problems need to be solved.

When I was a freshman medical student, Edward W.D. Norton, MD, took me under his wing and gave me an indirect ophthalmoscope. Early in my sophomore year, he accepted me into residency without my even applying. So here's a past president of the Retina Society, a past president of the American Academy of Ophthalmology, and founder of the Bascom Palmer Eye Institute, who mentored me without ever being formal about it, but just being encouraging.

In those days there were no selfies, no group board pictures, no ceremonies, you just did your training and you left. The last day I was there, after 8 years—this is a wonderful story—I was walking out the door with my stuff and Dr. Norton was walking in to go to work. I stopped him and asked, "Dr. Norton, what can I ever do to repay you for all you have done for me and for the others who trained here, and of course for the patients?" He tapped me on the shoulder with this sort of almost push, and he said, "Teach." Then he turned and walked away. How cool is that?

BMC: Who were your role models growing up?

CHARLES: A mechanical engineer, a surgeon, and a college professor were the three most important people in my life. My maternal grandfather, Harry Johnson, was a hard-working mechanical engineer who received an award in World War II for designing the diesel generator sets that were used at Iwo Jima and Normandy Beach for field hospitals, field kitchens, and the like. He didn't build technology to kill people, he built technology to save people. As a little kid, I wanted to be an engineer who designed things, just like him.

My godfather, John D. Charles, MD, who was my dad's oldest brother, was a world-class cancer surgeon. He was president of the American Society of Colon and Rectal Surgeons. If you were the President of the United States and you had colon cancer, you'd go see my uncle. I was his favorite of the nieces and nephews because I chose medicine. What I learned from him, both on the podium and in person, was his incredible focus on what's best for the patient; on being dignified, polite, and pleasant to everybody; and how to be a true gentleman. He's the kind of guy who could never have yelled at a nurse or a scrub tech in the OR or walked around acting like a big-shot doctor.

My dad was an art historian, a painter, a sculptor, and an art history

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professor. From him I learned how to be a good lecturer. Without any notes, he was just good. I've done a lot of speaking—more than 2000 speaking trips in 50 countries—and I learned my style of speaking from him.

BMC: Surely your engineering background played a role in your contributions to the design and development of Alcon's Accurus and Constellation Vision Systems. What were the seeds of inspiration that led to these technological advances?

CHARLES: System integration, fluidics control law, human-machine interface, high-performance pneumatics, better illumination, tool identification, and dual actuation.

BMC: You are continually listed in Best Doctors in America, you have received medals and honors, written hundreds of articles, authored textbooks and chapters, and lectured around the world. Steve Charles is a rolling stone that never gathers moss. What do you do to unwind, relax, have fun?

CHARLES: I don't recreate. I only do surgery, engineering, teaching, writing, studying technology and regenerative medicine, and I work out intensely 5 days a week and fly a business jet.

BMC: What's your favorite form of exercise?

CHARLES: I do two things: lift weights and stationary bike. Three days a week, I lift heavy. Men and women alike should really include weight training in their lives. It releases human growth hormone and it obviously builds muscle, which consumes calories, even at rest. Weightlifting gives me stamina. I work 12 hours a day, 70 to 80 hours a week, and I never get tired. On the other 2 days a week, I do cardio on a recumbent bike.

BMC: You have three grown daughters, all of whom are successful in their chosen career paths. What advice did you offer them as they were growing up?

CHARLES: Work hard, play hard, be the best you can be; learning, loving, and laughing are key.

BMC: What makes Steve Charles laugh?

CHARLES: I like to think that I have a great sense of humor. My dad was very much a punster. I like the British-style plays on words. I don't stand up and tell jokes, but funny stuff seems to roll out of my mouth when I'm talking at the podium or to patients. I appreciate people who have a sense of humor, and I really enjoy subtle wordplay.

On a separate but related note, what makes me smile is to see my grandkids or my daughters doing well, or to see a happy patient. Also when I'm teaching someone something, and they hit that moment when they say, "Oh, now I get it. *That's* why you do that."

BMC: What are you most proud of?

CHARLES: Being a dad and a grandad are the most important titles, or privileges, I have ever had.

BMC: What five words best describe you?

CHARLES: Learning, working, improving, caring, humane.

BMC: What keeps you up at night?

CHARLES: Outside of ophthalmic circles, I worry about our country. I'm embarrassed that we're ranked 23rd in the world in science, technology, engineering, and mathematics graduates.

In health care in general, not just in ophthalmology, I'm concerned about the incredible emphasis many doctors place on revenue. So many are focused on efficiency or, in other words, on making more money. I'm focused on my patients. If the money comes, it comes. I don't make medical decisions based on whether a patient has money; if someone doesn't have money, he or she still receives care and treatment. I've empowered my entire practice to adopt this attitude. The idea is simple: Just take care of people; the money will come. Be organized, but play by the rules. Don't try to game the Medicare system.

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

CHARLES: Napoleone Ferrara, MD. He was a gynecologist from Italy who worked as a clinical researcher at Genentech and identified VEGF, and he then developed both bevacizumab (Avastin; Genentech) and ranibizumab (Lucentis; Genentech), which have revolutionized medical retina. These drugs are the treatments for wet macular degeneration, diabetic macular edema, retinal vein occlusions, retinopathy of prematurity, myriad blinding diseases for which we had poor treatment or no treatment at all, with total safety and incredibly high effectiveness. He's made the biggest contribution to retina in 100 years, in my opinion. ■

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