

Henry F. Edelhauser, PhD

Dr. Edelhauser comments on the importance of properly cleaning ophthalmic instruments and why new techniques of ocular delivery will be the next big advance in ophthalmology.



1. Why did you choose ophthalmology as a profession?

When I was in graduate school at Michigan State University, I had a professor who had a grant to study why fish get keratoconus. At that time, no one knew much about the fish cornea, so I started

studying it in terms of its permeability, what makes the cornea swell or become cloudy, and what is important about its structure, including the epithelium and endothelium. That experience led to a career of studying the cornea and the structure and function of the corneal endothelium. These studies led to an interest in why the human cornea becomes edematous after cataract surgery and the role of the corneal endothelial barrier and metabolic pump function.

2. As cochair of the 2006-2007 Toxic Anterior Segment Syndrome Task Force, you helped establish "Recommended Practices for Cleaning and Sterilizing Intraocular Surgical Instruments." How did you become involved in this effort?

I was in Holland in 1988, and Adrian Breebaart, MD, the chairman of the Department of Ophthalmology at the Academic Medical Center of the University of Amsterdam, called me into his office. He had noticed that an increasing number of his patients developed corneal edema after cataract surgery. We discovered that the staff of the institution's central sterilization unit was neither trained nor aware of how to clean ophthalmic instruments. We conducted laboratory studies that found that the detergent used to clean the instruments was toxic to corneal endothelium, and we labeled the cases *toxic endothelial cell destruction*.¹ We then realized that viscoelastic is very sticky and can be left behind in some of the cannulas. The viscoelastic was absorbing the detergent, and when the cannulas were used to reform the anterior chamber, the detergent was infused into the eye. Additionally, the surgeons using advanced phaco machines had increased the speed of surgery and shortened the time taken to clean the instruments, which can cause toxic anterior segment syndrome.

Nick Mamalis, MD, and I collaborated with the major ophthalmic companies, the Centers for Disease Control, the FDA, and the AAO, along with a group of five nurses and an epidemiologist, to develop a series of guidelines for cleaning ophthalmic instruments. Because ophthalmic instruments are tiny and have small orifices, one

must take the time to clean them properly. The guidelines can be viewed at www.ascrs.org/tass.

3. What is the current focus of your research?

Emory Eye Center in Atlanta recently received a grant from the National Eye Institute to develop new techniques for delivering therapeutic agents to the back of the eye. It is a multicenter grant between Emory, Georgia Institute of Technology, the University of Pennsylvania, and the University of Colorado. My coinvestigators and I are developing drug delivery techniques that can penetrate the sclera or possibly use a microneedle to inject drugs into the suprachoroidal space, where they can then diffuse to the back of the eye. Thirty years ago, the advances in ophthalmology were surgical, like the development of phacoemulsification and vitreoretinal surgery. Now that we are able to treat diseases at an early stage, the major advances in this specialty are going to be therapeutic and will focus on the development of new therapeutic treatments and ocular delivery techniques.

4. Considering that you gave the ASCRS, Charles Kelman, MD, Innovator's Lecture on the evolution of surgical pharmacology this year, could you provide some advice on how a surgeon makes his or her way to the podium?

Develop an expertise in a specific area. Once you are recognized by your peers, you may be asked to speak at a professional meeting. Ophthalmologists are always looking for new techniques and treatments, so you should be at the forefront of new developments. You should also collaborate with your peers, because advances are not made by a single person. Once you have the opportunity to share your ideas, they will develop into a new therapeutic treatment or a new surgical technique.

5. What do you like to do in your leisure time?

My wife and I have a condominium in Lake Geneva, Wisconsin, and we go there to relax away from the hustle and bustle of Atlanta. Lake Geneva is also close to our grandchildren in Chicago, so we get to spend time with them as well. It is a much more relaxed way of life, and it gives us a chance to enjoy the beauty of the Midwest outdoors. ■

1. Breebaart AC, Nuyts RM, Pels E, et al. Toxic endothelial cell destruction of the cornea after routine extracapsular cataract surgery. *Arch Ophthalmol*. 1990;108(8):1121-1125.