Dale K. Heuer, MD

Dr. Heuer contemplates the value of a sense of humor, areas for future NEI-funded study, and the role of antifibrotic agents.

1. Has becoming the chairman of a department of ophthalmology changed your outlook on academic medicine?

It has brought my views into clearer focus. Many of my colleagues in the community labor under the misconception that academic departments have institutional sources of funding to underwrite their missions of teaching, research, and community service. Most have relatively little institutional support or actually subsidize their institution. Even successful basic science researchers do not receive grant funding sufficient to support 100% of their activities. Most academic ophthalmology departments generate their revenue the old-fashioned way: we earn it, one patient at a time. That clinical revenue is almost universally "taxed" by our institutions to help run their missions. Furthermore, by virtue of our practices' location and teaching environment, we are frequently at a competitive disadvantage compared with subspecialists in the community, a group that has grown largely because of ophthalmology's great success at skills transfer.

The frequent tension between town and gown now that academia no longer has an exclusive franchise on subspecialty care is understandable but detrimental to residents. I would encourage my colleagues who live within 1 hour of an academic center with an ophthalmology residency to volunteer to staff a resident clinic or surgery session at least once a month.

2. Do you still only floss a few days before dental appointments? What prompted you to incorporate humor into your scientific presentations?

I still do not floss regularly, and I recognized my experience as an example of the challenge of patients' adherence that would resonate with many ophthalmologists. With respect to keeping my lectures light, I think a danger for professionals is taking themselves too seriously. Whenever cartoons relate to some aspect of my presentation, I incorporate them, if for no other reason than to keep myself engaged during my own lectures.

The occasional song to end a talk was actually a step far outside my comfort zone. I had been assigned the "painful" topic of bleb dysesthesia for an AGS/AAO subspecialty program. I was lamenting my situation over dinner with two colleagues, Paul Lee, MD, JD, and Ronald Fellman, MD, in a restaurant where we were seated near a blues band, and the concept of the "bleb dysesthesia blues" struck me.

My goal is to help members of my audience remember one or two things that I emphasized with humor or song so that they are able to take better care of their patients.

3. How would you describe your experience helping to organize the Ocular Hypertension Treatment Study (OHTS)?

Michael Kass, MD, and Mae Gordon, PhD, invited me to participate in two 2-day planning meetings, which were held during the summers of 1989 and 1990. As an assistant professor at the time of the invitation, I was uncertain what contribution I could make to the august panel assembled. The group agreed strongly on the need

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FAST FACTS

- Professor and Chair of Ophthalmology at the Medical College of Wisconsin in Milwaukee, 1997 to present
- Named in *The Best Doctors in America*, editions 1 to 7, spanning 1992 to 2006
- Recipient of the AAO's Senior Achievement Award and of the AAO State Governmental Affairs' Academic Achievement Award, 2000 and 2001, respectively
- Principal Investigator for 5-Fluorouracil and Glaucoma Filtering Surgery (NEI grant No. 2 U10 EY06206, 1990 to 1993) and for the Collaborative Initial Glaucoma Treatment Study (NEI grant No. 1 U10 EY09100, 1993 to 1998)
- Vice Chair for the Ocular Hypertension Treatment Study (NEI grant No. 1 U10 EY09307, 1993 to 2008; NEI grant No. 2 U10 EY09307, 2003 to 2008)

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for a large, multicenter, randomized clinical trial to evaluate the safety and efficacy of the topical ocular hypotensive treatment of ocular hypertension, and members worked to develop a study design that represented a consensual compromise on (1) the ideal data to gather and (2) the practical need to gather only the information essential to the study's principal and secondary aims.

The OHTS' findings affected the way we manage and, more fundamentally, think about ocular hypertensive patients. We also now have tools to estimate an individual patient's risk of developing glaucoma in the intermediate term. I am humbled to have been able to participate in OHTS and have been consistently impressed by the dedication and integrity of the many people involved.

4. What area(s) do you think particularly merit NEI-funded study in the next 5 to 10 years?

At least one multicenter, prospective study of diagnostic modalities is already underway, and I hope it provides a better understanding of their role in the management of chronic glaucoma. Research is also needed to correlate the findings of structural and functional diagnostic tests when glaucoma patients begin to experience functional impairment that affects their daily activities and/or quality of life.

If a clear consensus develops on a blebless surgical procedure with fewer complications (even if perhaps yielding a slightly lesser IOP reduction) compared with trabeculectomy, I would think a clinical trial of initial medications versus that procedure should be considered.

When a noninvasive means of continuously monitoring IOP is developed, a study of whether a targeted IOP in the low versus midteens really achieves better long-term preservation of visual function in patients with manifest glaucoma will be essential, given the higher costs in terms of additional medications and/or surgical complications often needed to achieve a pressure in the low teens.

Finally, the two biggest challenges for which NEI-funded studies are critically needed are (1) developing the public health strategies to identify the individuals who have undiagnosed glaucoma or are at moderately high risk for the disease and (2) developing the behavioral and practical approaches that will increase our patients' abilities to use their medications consistently and adhere to their follow-up regimens.

5. How has your attitude about the role of antifibrotics in glaucoma surgery changed?

The inhibitory effect of 5-fluorouracil (5-FU) on fibroblast proliferation and its in vivo safety in rabbit eyes found by Mark Blumenkranz, MD,[1] led Richard Parrish, MD, to investigate its potential to inhibit bleb scarring after trabeculectomy. In May 1982, the first patient at high risk for trabeculectomy failure received postoperative, subconjunctival 5-FU injections. My fellowship at the Bascom Palmer Eye Institute in Miami began approximately 7 weeks later, when Rich and my other fellowship mentors—Douglas Anderson, MD, Paul Palmberg, MD, and Elizabeth Hodapp, MD—were all intrigued by this approach.

As an aside, participating in the initial human 5-FU pilot study, helping in the design and conduct of the Fluorouracil Filtering Surgery Study, and later participating in the early US experience with aqueous shunts (with my colleagues/mentors at the Doheny Eye Institute in Los Angeles, Donald Minckler, MD, and George Baerveldt, MD) were a great way to start my academic career. I would encourage young ophthalmologists interested in or starting an academic career to identify an emerging diagnostic approach, therapeutic intervention, or basic science hypothesis about which they can be passionate and then to participate actively in the scientific process of evaluating that issue.

With the introduction of intraoperative mitomycin C (MMC) during trabeculectomy, wound-healing modulation became more popular. Attendant with the higher success rates and lower IOPs afforded by 5-FU and MMC, however, were more frequent complications. Technical changes, primarily the broad intraoperative application of MMC (or 5-FU) and possibly a conversion to fornix-based conjunctival flaps, have reduced the frequency of these complications.[2] Ophthalmologists including myself hoped that a more selective and incremental modulation of wound healing might provide a better therapeutic margin, but this remains an elusive dream. Many innovative surgical approaches thus now center on Schlemm's canal or uveoscleral outflow. The 1-year results of the Tube Versus Trabeculectomy Study[3,4] have re-energized the debate about the potential role for aqueous shunts earlier in the surgical management of glaucoma.

Whichever surgical procedures gain favor over the ensuing years, wound-healing modulation will undoubtedly play a role in their successes.

This article describes the off-label use of 5-FU and MMC.

1. Blumenkranz M, Hernandez E, Ophir A, et al. 5-fluorouracil: new applications in complicated retinal detachment for an established antimetabolite. *Ophthalmology.* 1984;91:122-129.
2. Khaw PT. Advances in glaucoma surgery: evolution of antimetabolite adjunctive therapy. *J Glaucoma.* 2001;10(5 suppl 1):S81-S84.
3. Gedde SJ. Treatment outcomes in the Tube Versus Trabeculectomy (TVT) Study after one year of follow-up. Paper presented at: The 16th Annual Meeting of the AGS; March 3, 2006; Charleston, SC.
4. Herndon LW. Surgical complications in the Tube Versus Trabeculectomy (TVT) Study during the first year of follow-up. Paper presented at: The 16th Annual Meeting of the AGS; March 3, 2006; Charleston, SC.