On What Information Do Ophthalmologists Base Their Clinical Practice?

George O. Waring III, MD, FACS, FRCOphth

This issue of the *Journal of Refractive Surgery* presents a spectrum of categories of information that ophthalmologists may use to build their knowledge and design their patient care: peer reviewed articles (100 pages of 'em), proceedings of two scientific meetings: 5th International Congress of Wavefront Sensing and Optimized Refractive Corrections (in a special section) and the 9th Nidek International Refractive Surgery Symposium (in a free-standing supplement), and a commercially-sponsored section by Alcon about its LADARVision and CustomCornea platforms.

In this editorial, I briefly survey the different sources, categories, and qualities of ophthalmic print information available to us, with the specific goal of encouraging ophthalmologists to distinguish information that qualifies as evidence-based, and therefore as a solid foundation on which to build clinical practice.

**PEER-REVIEWED LITERATURE**

The most likely source of substantive information are articles that have undergone the rigors of critical review by two or three qualified colleagues (who remain anonymous, always seem to find something wrong, and often have astounding differences of opinion among themselves) as well as the rough battering by unfeeling editors. Of course, authors who submit articles to peer-reviewed journals are more likely to labor intensively over them ahead of time, which increases their quality.

Prospective randomized trials are the gold standard of this genre. Expensive, time-consuming, complex, years in the planning-execution-publication cycle, and sometimes frustratingly difficult to interpret, these studies, which often appear as a series of articles, provide the firmest basis for drawing reliable scientific and clinical conclusions. Randomized clinical trials are the microscope of clinical science, revealing information that cannot be seen with the “naked eye” of clinical experience, case series, and accepted wisdom. In ophthalmology, the vast majority of substantive randomized clinical trials have been funded by the National Eye Institute. In this issue of the Journal, Mastropasqua and colleagues in a randomized study design, compare wavefront-guided and conventional PRK. Kim and colleagues use an investigational design peculiar to ophthalmology: the ability to perform one procedure in one eye and a comparison procedure in the other eye of the same patient in this study wavefront-guided vs. conventional LASIK—a design that gives additional control of biological variability as well as subjective assessment by the patient.

Readers who wish to find the highest quality randomized clinical trials in ophthalmology can consult the Cochrane Database, which can be accessed at <www.cochrane.org>. The curious will be amazed at the paucity of such trials in ophthalmology.

Without the rigor of prospective design, randomization, and masked or controlled interpretation of results, other types of peer-reviewed articles become the silver standard, or in some cases the bronze standard—they place, but they don’t win. Nevertheless, they can provide valuable and trustworthy information for the scientist and clinician—it just takes a more critical reading to see if the authors, reviewers, and editors have done their job. Excellent prospective trials by Shemesh and colleagues comparing microkeratomes and by Serrao and Lombardo comparing PRK with and without surface smoothing grace this issue of the Journal.

**PROCEEDINGS OF MEETINGS**

In this issue, the Proceedings of the 5th International Congress of Wavefront Sensing and Optimized Refractive Corrections and the 9th Nidek International Refractive Surgery Symposium provide a different type of information. The papers have been screened by peers in order to get on the
program, have been editorially reviewed by the guest editors, who compiled the special section and supplement, and have been generally reviewed by the editor-in-chief of the Journal, but none has been subject to formal peer review. Thus, there have been multiple filters, but the content still amounts to a summary of a presentation at a meeting—a set-up that may allow erroneous or unsupported conclusions to emerge, conclusions that might not be unusual in a scientific meeting where the purpose is to foment discussion and analysis of new and emerging technologies and practices.

Do proceedings have a place in a peer-reviewed journal like the *Journal of Refractive Surgery*? The answer is yes, because these more informally reviewed papers present information that may be more current and more rapidly evolving than that percolating through the peer review process and information that may indeed never be published as a peer-reviewed paper, in spite of admirable content. One of the goals of the *Journal of Refractive Surgery* is to make available to its readership new and emerging aspects of refractive surgery. Proceedings of meetings provide this forum. However, the Journal is careful to distinguish these proceedings by separate pagination (S-pagination) and full disclosure of the nature of the content of these sections.

I express the appreciation of readers of the Journal by acknowledging the meeting organizers and guest editors of the Wavefront Congress proceedings and the Nidek Symposium supplement.

Interestingly, similar types of information are available in publications of abstracts—most notably the 1000+ abstracts presented at the Association for Research in Vision and Ophthalmology (ARVO) annual meeting and published as part of *Investigative Ophthalmology and Visual Science*, and the abstract book that accompanies the International Society of Refractive Surgery and American Academy of Ophthalmology annual programs. These abstracts have been screened by committees established to select the best papers for the program—but only on the basis of a summary with a conclusion, not on the basis of thorough peer review of the study design, methods, results, and conclusions. Nevertheless, these are useful sources of information.

**TEXTBOOKS**

What a wide array of quality of information one can find in textbooks: from gems to dross. Most modern textbooks are compendia of individual chapters by individual authors, with the single-authored textbook a reportable rarity. Essentially, each chapter is an essay, usually surveying some literature, propounding the author’s techniques and experience, and expressing the author’s particular point of view. Peer review is almost nonexistent, except for that effort exerted by one or two editor/authors whose responsibility is to compile and screen the material. Such editorial control is usually lax, and authors are given enormous latitude to express their opinions. Sometimes the books with the slickest color covers, the largest number of pages, and the coolest illustrations are the most vacuous in terms of substantive content. Nevertheless, textbooks are the best place for the demonstration of individual surgical techniques and expressions of individual clinical experience. They are also an invaluable source as “review articles” when self-sacrificing, ambitious authors mount a thorough and major review of the literature in a single chapter. Such review information will never be published in the original peer-reviewed literature, unless it is in the form of a true metaanalysis—a formal method of pooling together results of clinical trials that meet strict criteria in order to divine conclusions that result from “the weight of the evidence.”

Under the able editorship of David Miller, the Journal has sustained a book review section since its inception—but let’s admit it, it is extremely difficult to find people who will give an incisive, critical, and sometimes destructive review of a book written by a colleague—often a professional acquaintance or personal friend! Too many book reviews turn out to be adulatory pabulum.

**COMMERCIALLY-SPONSORED SPECIAL SECTIONS**

In recent years, the Journal has allowed both Nidek and Alcon to purchase extra pages (pages that do not replace the publication of original peer-reviewed material) for the purpose of publishing articles that usually pertain to their products. Is this a legitimate role for a peer-reviewed journal? I think it is. In the field of refractive surgery, as in many other medical endeavors, manufacturers possess enormous amounts of information that can be valuable to clinicians, but that commonly remain buried “on file” or in the oppressively thick binders submitted to the FDA. Although assembled with commercial motivation, this information can be useful because it indeed forms the basis for the design of products that will be used by physicians on patients, the basis for products that must undergo the rigorous scrutiny of regulatory bodies, and the basis for products that must stand up in the
Editorial/Waring

The combative venue of modern competitive markets. Thus, this information is not simply “advertising.” Making it available in the context of a peer-reviewed journal has advantages. Companies are more likely to release information they consider proprietary if they feel they have some control over it. Of course, such a mode of publication yields mostly “good news,” as companies are unlikely to publish negative findings that would decrease the splendor of their products. Thus, there is no balance; there is decreased objectivity, especially when the articles are authored by those who consult for or those who are employed by the sponsor. The articles are editorially reviewed by individuals either on the Journal’s editorial board or selected by the section editors as outside reviewers, but such informal review falls short of classic peer review. The articles are finally read by the editor-in-chief in an attempt to identify unsupported claims and crass commercialism—both of which are expunged prior to publication.

Commerically-sponsored sections have another practical advantage: they allow SLACK, Incorporated, the publisher and owner of the Journal, to provide more pages for original peer reviewed articles by allocating some of the monies paid by commercial sponsors for more pages for original articles—thus expanding the fundamental scientific contributions of the Journal.

NEWS PUBLICATIONS

I imagine that every ophthalmologist has a corner in the office with a large stack of attractive news publications—in full color on slick paper. The vast majority of these are distributed free and are supported by advertising revenues. They include weekly news publications, monthly reviews, topical special publications—readers know all too well what I mean. In the past, these periodicals sported the derogatory appellation of “throw-aways.” That is no longer true. Just as the New York Times and other classical news publications provide valuable information (yes, and we throw them away), so these ophthalmic periodicals do as well. It’s just that they do it with minimal editorial control and are subject to commercial influence and author conflicts of interest, and the reporters may be brilliant, or poorly informed. I have been interviewed by reporters whose first question is, “How do you spell keratomileusis?” Such stringers are unlikely to dig out falsehoods and highlight true breakthroughs in their articles. Thus, they challenge the reader more than any of the aforementioned categories to beware: the clinical pearls offered may be white—or black!

But let’s admit it: these news publications are read by most ophthalmologists—even if they are only scanned and are commonly addressed in a quiet, tile-lined room where there is discrete privacy.

In its earlier volumes, the Journal of Refractive Surgery had a News Section, but since the Journal is published bimonthly and since there is a profusion of ophthalmic news publications, the News Section became obsolete and was terminated.

CONCLUSION

The Journal of Refractive Surgery holds steadfastly to its foundation: a peer-reviewed journal devoted to assisting refractive surgeons and their colleagues in acquiring the most reliable and up-to-date information on refractive surgery and related fields—including lens implant surgery. As demonstrated by the present issue, the Journal does so by employing a variety of categories and sections—always with appropriate internal and external editorial control, always fully disclosed as to their nature, and (hopefully) always providing information on which ophthalmologists can base their clinical practice.