Published in final edited form as:

J Cataract Refract Surg. 2010 May ; 36(5): 705–706. doi:10.1016/j.jcrs.2010.03.011.

Redefining health, disease, and surgical success

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The ability to measure success is critical in any attempt to evaluate a surgical outcome. Medicine has witnessed the development of increasingly sophisticated tools for assessing the disease state and its response to treatment. The visual system is an excellent example of such advances, with molecular diagnosis, optical coherence tomography, contrast sensitivity testing, and wavefront sensing serving as just a few examples. Such tools can add important information to the ingenious but understandably coarse diagnostic modalities of antiquity. At the same time, they provide new perspectives on a disease, illuminating normal and abnormal processes that could not be observed or measured before and thus open our thinking to new pathomechanisms and modes of treatment.

As a result of these sophisticated tools, medicine has undertaken a “deep dive” into the finest micro details of disease mechanisms. A preponderance of United States National Institutes of Health funding is invested in basic research, and such work is inarguably essential for any real progress in developing more effective treatments, preventions, and cures. Only more recently has the broader dimension of the patient experience received concerted scientific attention. As with all science, appropriate tools are required for capturing these data.

One byproduct of the development and refinement of patient experience metrics is a struggle with the fundamental definitions of health and disease. If we ask a patient, his or her definition of health might include concepts such as independence; freedom from pain; and the functional capacity to work, play, worship, and otherwise participate in all aspects of daily life without physical or emotional hindrance.¹ As clinicians, we tend to define health and disease in terms of the metrics we have available in our offices: corrected visual acuity, corneal transparency at the slitlamp microscope, or a flat macula on fundoscopic examination. It is therefore not surprising that a disconnect often arises between the clinical examination and patient satisfaction. In an example from pulmonary medicine, an internist will frequently measure the success of bronchodilator therapy with pulmonary function tests such as the forced expiratory volume (FEV₁), which shows a roughly linear improvement as treatment is increased from 1 to 2 to 3 puffs. However, patient-reported quality of life may decrease with a third puff because of the unpleasant side effects of excessive beta-adrenergic activity such as tremulousness and hyperactivity.¹ In our field, assessment of only the lower-

order refractive status of the eye after laser in situ keratomileusis or only the transparency of the ocular media after cataract surgery can lead to important shortcomings in our understanding of the patient experience. Our metrics of success even give rise to tensions between ophthalmic subspecialties, as refractive surgeons frequently encounter criticism from colleagues who define health only in terms of corrected visual acuity.

It is clear that more holistic measures of the patient experience are essential to better understanding of our patients and the impact our interventions are having on them. In some cases, a more careful look at simple but frequently overlooked outcomes measures can reveal differences between treatments that can affect the patient experience. For example, in this issue, Alfonso et al. (pages) report a secondary outcome measure in multifocal intraocular lens (IOL) surgery, intermediate vision, that highlights significant differences in distance-corrected intermediate acuity between multifocal IOL designs. More complex outcome measures such as reading speed,² simulated driving performance, and behind-the-wheel driving testing capture higher-level elements of the patient experience and involve aspects of neuromotor performance that influence a patient's ability to use and experience vision. Perhaps the broadest and most challenging category of outcomes assessment is the patient-reported outcome. Pesudovs et al. (pages ...) present a thoughtful validity analysis of the most commonly used patient-reported outcome measure in clinical vision research, the NEI Visual Function Questionnaire (VFQ). They also provide reworked versions of the questionnaire to differentiate 2 very different dimensions measured with the tool—the visual function dimension and the socioemotional dimension. (Electronic versions of full- and short-form questionnaires are available at www.jcrsjournal.org.) The work represents an impressive effort to critically assess a valuable patient-reported outcome metric, to suggest improvements to it, and to translate these improvements into open-source tools that other scientists can scrutinize and any clinician or clinical trialist can access.

With continued work in this area, we are more likely to understand what makes a patient more functional and more satisfied. Such data will become increasingly central to the regulatory approval process for new devices and drugs and, if used properly without ignoring the mechanistic data provided by basic research, can be used to evaluate and even direct our surgical efforts to satisfy a holistic multiscale model of success that matches well with the patient experience.

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