

Opinion

Selfie-Refraction— Really?

“Self-refraction is coming!” is best shouted repetitively, à la Chicken Little, intending to alarm anyone who is listening. But just as the sky didn’t fall, it’s likely that the self-refraction alarm will soon fade to ennui. Like most disruptive technologies, self-refraction will change its industry irrevocably but mostly will not disrupt our professional position as ophthalmologists.

I have some personal experience with self-refraction. As a pre-presbyopic ophthalmology resident, I sat myself in the examining chair, eye chart illuminated and phoropter in place. One eye at a time, I carefully did the “one or two step” dance, including the Jackson cross-cylinder, to come up with the best refraction. I could see 20/10 with my correction, so it must be right. Right? I added the appropriate add (1.25) that was not only what my age deserved but also what I saw best at near. I prescribed myself the resultant bifocals and engaged the local optician, who was happy to provide the new glasses. Trouble was, when I put them on I felt nauseated, and I never could get used to them. The science of optics was overflowing my head, but I had yet to master the art of refraction.

Innovators who dream of promoting low-cost access to clearer vision are looking at self-refraction as a tool that could be useful for millions of schoolchildren in parts of the world where eye care resources are profoundly lim-

ited. In one such project, Joshua Silver, an atomic physicist at Oxford University, developed self-adjusting spectacles with two thin membranes separated by silicone oil. The user adjusts the amount of oil to achieve the greatest clarity, one eye at a time, then clamps the inflow tube and discards the oil reservoir. The glasses are available at retail for about \$30 (Adaptive Eye-care). With support from the World Bank and Dow Corning, the hope is to mass produce them at \$2 or less. Several published studies have demonstrated that users (even schoolchildren¹) are capable of self-adjustment with results comparable to autorefractors or cycloplegic manual refraction. The big drawbacks are that the glasses are not capable of cylindrical or high myopic correction, and they are ugly, with thick frames and round lenses.

Next-generation, higher-tech products that are now in the pipeline will allow users to check vision online and help determine their own prescription. Before long, these new products will collide with state laws requiring a prescription by a licensed eye care professional to enable manufacture and fitting of ophthalmic lenses. So what is the position of the American Academy of Ophthalmology? Bring it on—the science will lead the way: “The Academy recognizes the potential of information technology, including Internet-based screening, refraction, and other diagnostic tests, in increasing access to

health care services, enhancing patient involvement in their health care decision making, improving efficiency, and reducing overall health care costs.”²

That may be good guidance for the future, but for now, I like to recall the advice given to all medical students: “The physician who treats himself has a fool for a patient.” And modify it to “The patient who refracts himself has a fool for a doctor.”

1 He M et al. *Ophthalmology*. 2011;118(6):1162-1169.

2 American Academy of Ophthalmology. Information statement: Use of innovative technologies in diagnosing eye diseases and conditions. September 2014.



RICHARD P. MILLS, MD, MPH
CHIEF MEDICAL EDITOR, EYENET