



PREVENT DEFENSE

Over the past several decades, we have developed clever and effective surgical remedies for many of the ills that befall the eye. The art of removing the cataractous lens and replacing it with an artificial one could arguably be the most successful procedure in all of medicine. Impressive strides in surgical treatment of the various pressure-related optic neuropathies we call *glaucoma* have revolutionized our management of this disease. Also, our retina colleagues continue to find new ways to slow the progression of diabetic microvascular disease and age-related macular degeneration. In short, ophthalmologists have become quite adept at fixing the eye when it is broken. But how much of our collective effort has been directed toward preventing these problems from developing in the first place?

Many eye care physicians dismiss the notion of prevention of ocular pathology as an exercise in futility. Cataracts appear in our systemically sickest patients but also in our most healthy yogis, joggers, and vegans. Indeed, some degree of cataract formation seems to inexorably accompany aging. Most forms of glaucoma also seem to be elusive targets for prevention. Although some studies suggest that physical activity may decrease the risk of glaucoma,¹⁻³ other studies are inconclusive or even suggest that static, dynamic, or aerobic exercise might exacerbate glaucoma.⁴⁻⁶

The incidence of myopia is increasing at an alarming rate, and the trend seems linked to increasing performance of near work and lack of outdoor play in children.^{7,8} It is estimated that, by 2050, more than half of the world's population will be myopic, and 10% will be highly myopic.⁹ When we see most humans beginning to exhibit a myopic phenotype that would essentially have been a death sentence a few thousand years ago, we can surmise that there is something very powerful at work. That *something* is a biological adaptation of axial length and keratometry to allow prolonged viewing of a smartphone at a working distance of 5 inches.

Many risk factors for common ocular pathologies are difficult or impossible to mitigate, but some targets for preventive efforts stand out. As of 2017, approximately 100 million Americans were diabetic or prediabetic.¹⁰ The looming societal costs of diabetes are staggering to contemplate. Retinal vascular disease and cataract are the most obvious diabetes-associated ocular pathologies, but glaucoma is probably indirectly linked as well through the associated conditions of obesity and sleep apnea.^{11,12}

A trip to any big-box retailer reveals stacks and stacks of over-the-counter nasal steroid sprays for the treatment of allergic rhinitis. In 2018, more than \$700 million worth

of over-the-counter nasal steroid sprays were sold in the United States.¹³ Prescription steroids add to this astonishing total. Intranasal and inhaled corticosteroids are well-known causes of cataract and glaucoma, and, although newer steroid preparations are touted as being safer in this regard, every experienced cataract surgeon has seen patients with very early-onset cataracts whose sole risk factor was use of a so-called safe steroid. Similarly, reversible elevations in IOP have been reported with the use of these drugs, despite studies claiming that this does not occur.¹⁴

The looming myopia epidemic may represent the toughest challenge of all for eye care physicians. The dramatic shift toward the use of handheld devices has spurred the development of better near vision solutions in our cataract and refractive surgery patients, but this same phenomenon is creating more myopia in our children. Getting these children to put down their screens and go outside and play may make eradicating diabetes and allergic rhinitis look easy. Although our tendency as surgeons is to imagine new ways to correct these varied problems, some of our attention should be directed toward preventing them in the first place. ■

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STEVEN J. DELL, MD | CHIEF MEDICAL EDITOR