Opinion

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What Will We Do With Our Garbage?

The Mariana Trench is the deepest known place on planet Earth. The southern end of the trench, named Challenger Deep, is its lowest point. When Victor Vescovo, the American explorer and private equity investor, explored Challenger Deep in his submarine, he set the world record for the deepest dive and identified three new species of marine animals. He also found a plastic bag.

Some 150 metric tons of plastic circulates in marine ecosystems, and we add 8 million metric tons of plastic waste every year,[1] but plastic in the ocean is only one aspect of the global waste problem. Our health systems contribute an estimated 8% to 10% of the greenhouse gas emissions in the United States,[2] and much of the waste is generated from surgery. Think of the gloves and gowns, device packaging, single-use medications, tubing, and sheets that are thrown out after every ophthalmic procedure. Because cataract surgery is the most commonly performed medical procedure worldwide, addressing its waste is a great place to start.

The good news: Among ophthalmologists, the interest in tackling this challenge is growing. In a survey of 1,200 ophthalmologists, 93% expressed concern about the amount of waste produced by cataract surgery and supported action to reduce the garbage.[3] In a *Baltimore Sun* editorial, published on Earth Day, Sathvik Namburar and glaucoma specialist Alan Robin argued that even those who are not convinced by the environmental argument should be concerned about the economic implications of surgical waste.[4] For instance: In one study, staff at one site threw out nearly $200,000 per year of unused eyedrops after cataract surgery.[5]

If ophthalmologists agree that the mountain of physical waste is a problem, what can we do? The Ophthalmic Instrument Cleaning and Sterilization (OICS) Task Force, chaired by David Chang and Cathleen McCabe and comprising representatives from several ophthalmology organizations, is developing multipronged pragmatic strategies to decrease ophthalmic surgical waste.

We've all taken the oath *primum non nocere* ("First, do no harm"), and to promote safety, we've developed sterilization and single-use standards that are not always evidence-based. The OICS Task Force is developing evidence that endophthalmitis rates are not increased when resource-efficient protocols are implemented, a step that is necessary to convince regulatory agencies, health systems, and industry partners. The group is looking at three categories: single-use pharmaceuticals, reusable surgical supplies, and disposables.

Waste is so embedded in our surgical culture that change requires work at nearly every step. David Palmer, an ophthalmologist in Illinois, became increasingly frustrated that medications used at the end of surgery are discarded. He pushed for the introduction of SB0579, which would allow patients to take home topically applied medications from surgery if needed for post-op care. The bill passed in the Illinois Senate and House and is now on the governor's desk. Other ophthalmologists are interested in cellulose biodegradable surgical drapes, multidose labeling of pharmaceuticals, and decreasing our dependence on single-use surgical supplies.

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The shift to green surgery should be anchored in evidence, driven by environmental concerns, and motivated by economic efficiencies. Each of us can become more aware of—and more uncomfortable with—the level of waste generated by cataract surgery. Jeff Pettey, a member of the Academy's Young Ophthalmologist Committee, observes: "I'm witnessing a refreshing level of awareness and concern among young physicians. As they become the leaders of tomorrow, I predict green medicine will become a core value for all of ophthalmology." Let's start now.

1 www.worldwildlife.org/initiatives/oceans. Accessed May 11, 2021.
2 Chung JW, Meltzer DO. *JAMA.* 2009;302(18):1970-1972.
3 Chang DF et al. *J Cataract Refract Surg.* 2020;46(7):933-940.
4 Namburar S, Robin A. U.S. health care sector combatting one crisis, but contributing to another: climate change. *Baltimore Sun.* April 23, 2021.
5 Tauber J et al. *JAMA Ophthalmol.* 2019;137(10):1156-1163.