

WASTE IN OPHTHALMOLOGY ORS



Can the specialty's carbon footprint be reduced?

BY JASMINE MAHAJAN, BS; MARKO OYDANICH, MD, MS; AND ALBERT S. KHOURI, MD

The United Nations established strategies to reduce greenhouse gas (GHG) emissions, but human-induced global warming continues to threaten global health.¹ The health care sector accounts for 4.4% of global emissions.² In the United States, the health care sector's climate footprint amounts to about 10% of total GHG emissions.³

As surgical technique and instrumentation evolve to become more efficient, the environmental burden may grow.⁴ The carbon footprint from the OR alone is an estimated 3,000 to 5,000 tons of CO₂ per year.⁵ The amount of medical waste, moreover, increased dramatically during the COVID-19 pandemic owing to the increased use of personal protective equipment.⁶

Ophthalmology is no exception to these trends.⁷ The popularity of single-use equipment and devices as a means of lowering the risk of infection and reducing postoperative complications has produced an explosion of medical waste. Growing awareness of the problem is spurring initiatives to reuse or resterilize as much equipment and medication as possible.⁸

SURGICAL WASTE TODAY

Surgical waste can accumulate quickly and is often collected before the surgical day concludes (Figure A).

Some medical equipment, including syringes, needles, tips, and empty IOL cartridges, is designed for single use. Gonioscopy lenses and applanation tonometer prisms used to be reusable, but nearly all of those currently

manufactured are disposable, increasing plastic waste and health care costs.⁹ Some disposable gonioscopy lenses have been investigated to see if they cause any deleterious effects or influence patient outcomes when compared to those that are reusable.¹⁰ It was concluded that there are no differences in efficacy in reducing IOP when disposable or reusable lenses are used, suggesting that reusable lenses may be an environmentally friendly option.

Many commonly used tools can be reused but are not. For example, marking pens may be used repeatedly but are often disposed of after making a single mark (Figure B). Needle containers can hold up to 20 needles but are disposed of after each surgical case, as are partially filled containers

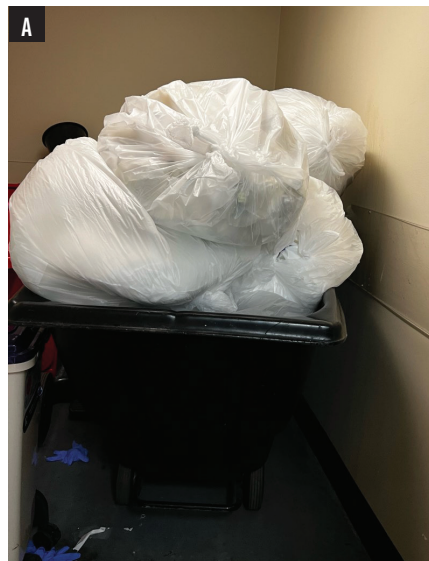


Figure. Surgical waste accruing before noon on a routine surgery day (A). Marking pens, bottles of balanced salt solution, needle containers, and unfinished drug bottles are common objects in ophthalmology ORs (B, C).



EYESUSTAIN

BY DAVID F. CHANG, MD, AND CASSANDRA L. THIEL, PHD

In 2020, we published the results of the first large survey of ophthalmologists on OR waste.¹ The survey was conducted by the Ophthalmic Instrument Cleaning and Sterilization (OICS) Task Force, which has representatives from the ASCRS, AAO, Outpatient Ophthalmic Surgery Society (OOSS), and Canadian Ophthalmological Society. Of the more than 1,000 ophthalmologists who responded, 98% believed that OR waste is excessive, 78% believed that more surgical supplies should be reused, 91% were concerned about climate change, and 87% wanted their medical societies to advocate for reducing the carbon footprint of ophthalmic surgery.

The strong consensus of opinions captured by the survey inspired EyeSustain.org, a web- and app-based resource center for sustainability in ophthalmology. Its development addressed the need to centralize information and resources related to sustainability in ophthalmology. The website was launched on Earth Day during the 2022 ASCRS Annual Meeting.

FIVE OBJECTIVES

The mission of EyeSustain includes five objectives:

- **No. 1:** Engage, network with, and educate the global ophthalmic community about more sustainable practices;
- **No. 2:** Collaborate with industry to reduce ophthalmology's carbon footprint and surgical waste;
- **No. 3:** Support research and innovative solutions for reducing ophthalmology's environmental impact;
- **No. 4:** Collaborate with other medical specialties on reducing the carbon footprint of the health care system; and
- **No. 5:** Support advocacy and education about the effects of climate change on public health.

THE WEBSITE

Funded initially by the ASCRS Foundation and developed by an advisory board with expertise on sustainability in health care, the EyeSustain.org website has several major sections. One focuses

on reducing OR waste and has an online carbon footprint calculator. Relevant studies and position papers from the OICS task force are archived here. Other sections focus on reducing ophthalmic drug waste, making clinics more sustainable, and sharing global best practices in ophthalmology. Each section has a resource library with references to the peer-reviewed literature that can be used to advocate for change within institutions and facilities.

Surgical manufacturers have been invited to share their waste-reducing initiatives in a section dedicated to industry collaboration on making surgery more sustainable. Another section provides pertinent information on the effects of climate change on public health.

COLLABORATION

The European Society of Cataract and Refractive Surgery (ESCRS) and AAO joined ASCRS as cosponsors of EyeSustain.org after its launch. The goal of this partnership is to develop a global coalition of ophthalmic organizations, societies, and their members who are committed to promoting the sustainability of eye care through advocacy, collaboration, and education. Each member society will incorporate sustainability into its educational programs, designate representatives to a global EyeSustain council, and establish a committee on sustainability to engage interested members. For instance, these efforts were on display at the 40th Congress of the ESCRS in September 2022 (congress.2022.escrs.org/sustainability).

An example of the power of collaboration is the OICS task force position paper on topical drug waste in ophthalmic surgery.² Endorsed by the ASCRS, AAO, OOSS, and American Glaucoma Society, the document was released and posted on EyeSustain.org in April 2022. The evidence-based paper documents the policies of multiple regulatory and accreditation agencies and clarifies that multidose bottles may be used on multiple patients and until the labeled date of expiration.

In our OICS survey, 98% of respondents expressed a willingness to use multidose bottles on multiple patients, but less than half of them were currently doing so.¹ The respondents who were

practicing in hospitals were far less likely to reuse the bottles than those operating in ambulatory surgery centers.³ A separate unpublished OOSS survey, however, found that 88% of ambulatory surgery centers discarded multidose topical drug bottles at the end of the day, week, or month.

After meeting with the OICS task force, the CMS issued a clarification to its surveyors that topical drops are not subject to the 28-day expiration policy that applies to injectable medications. The OICS position paper also recommends that surgical patients requiring a topical medication not used for other patients be allowed to bring that partially used medication home for postoperative use.²

CONCLUSION

EyeSustain.org makes it easy to locate and share resources such as multisociety position papers with the global community. The aim is to help ophthalmologists around the world effect policy change within their own institutions.

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of dilating drops and balanced salt solution (Figure C).

The amount of surgical waste is greater in the United States than in some other countries. In one study, approximately 1 kg more waste was generated per trabeculectomy at an eye care facility in Baltimore compared to one in India.¹¹ This is interesting because India has far fewer regulations governing the use and disposability of surgical equipment. Moreover, the rate of endophthalmitis reported following phacoemulsification was lower in India than in the United States (0.01% vs 0.04%).¹²

STRATEGIES AND RECOMMENDATIONS

No. 1: Analyze the waste. One strategy for reducing OR waste and ophthalmology's carbon footprint is to separate waste from recyclable material.¹³

No. 2: Reconsider regulations. Eye care providers, health care administrators, and manufacturers can also reevaluate the benefits and drawbacks of strict regulations on products for which the risks of contamination are not well studied. The theoretical adverse effects of reusing eye drops, gonioscopy lenses, and tonometer prisms are not equivalent to the measurable financial and environmental burden of the waste produced.¹⁴ Efforts at reducing environmental costs without sacrificing surgical technique and increasing postoperative

complications have shown great promise in several countries, creating an opportunity for a shift in others, including the United States.¹¹

No. 3: Improve education. Studies have found that trainee surgeons generate almost 25% more waste than experienced surgeons. Efforts to reduce GHG emissions could be augmented through waste reduction education starting at the trainee level.¹⁵

No. 4: Conduct research to inform action. There is a dearth of research on the environmental impact of surgical waste in ophthalmology. Studies should be designed to trial different approaches to waste reduction. ■

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