Challenging Considerations Regarding Waste and Potential Environmental Effects in Cataract Surgery

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Previous authors have posed questions about the economic and environmental effects of health care.1 In this issue of JAMA Ophthalmology, Tauber et al2 continue to illuminate the economic and environmental costs of pharmaceutical waste associated with cataract surgery at 4 different settings in the northeastern United States, complementing work on the carbon footprint of cataract surgery.1 By using analytical concepts and techniques from environmental approaches (eg, the economic input-output life cycle assessment [EIO-LCA] method), the authors have enlarged our perspectives and our understanding of the true costs of our care by encompassing more of the societal externalities associated with our ophthalmic surgeries.

The study results show that pharmaceutical waste conservatively ranged from 21.3% to 65.8% across the 4 sites (a federal medical center, a private ambulatory surgical center, a private tertiary care center, and a private outpatient center) included in this study. This wide variation in pharmaceutical waste across the sites suggests that opportunities for substantial increases in efficiency—and financial and environmental savings—may exist in many, if not all, settings. Although these findings are exciting and appear to indicate a major opportunity, at least 3 additional factors bear consideration.

First, confirmation of these findings in different geographic regions and different settings is vital, given well-known variation in medical practice, such as preoperative ophthalmic testing before cataract surgery across physicians3 and the findings of the study by Nambur et al4 on surgical supply variance comparing cataract surgical procedures in India with those in the United States. Related to concerns about the generalizability of the 4 study sites, the annualized number of cataract procedures performed at the study sites may be less than that performed at many higher-volume ambulatory care surgery centers that may account for the bulk of cataract surgery in this country. Would these sites be more (or less) efficient than the study sites? The 2 sites with the highest waste percentages in the study were the outpatient and ambulatory surgery centers, locations where the bulk of cataract procedures in the United States are likely performed.

Second, if we look deeper into the results, the largest component of pharmaceutical waste in the study was the use of antibiotic drops. As noted by the authors in their discussion,2 given the lower rate of endophthalmitis after cataract surgery with the use of intracameral antibiotics at the end of the case compared with postoperative use of antibiotic drops,5 the use of antibiotic drops with cataract surgery likely has decreased and will continue to further decrease. As an alternative, level 1 evidence supports the use of preoperative instillation of povidone-iodine to reduce the incidence of endophthalmitis. As such, we would expect to see a major decrease in the use and thus subsequent waste of at least some of the pharmaceuticals noted in this study with changing practices in the United States and elsewhere.

Third, although the methods used represent standard practice in the environmental economics field, data for the EIO-LCA approach were back-adjusted for more than 15 years (to 2002), when the model was last updated. Given the substantial changes in health care inflation compared with general inflation, as well as additional understanding of economic calculations in environmental waste during this period, we are uncertain as to the appropriate weighting for such adjustments. However, one might consider this model to be an underestimate of effect, given the historical rate of health care inflation, especially in pharmaceuticals, during this time period.

As noted by the authors,2 the findings make clear the opportunity we have to reassess our current practices in the United States regarding the use of medications for cataract surgery. What is the risk increase with the multiuse of preoperative drops? What would the effect be with the use of smaller, single-use vials, if we were to include the effect of packaging? Based on reports from the Aravind Eye Hospitals on the high quality and safety of cataract surgery6 using far fewer resources per case4 referenced in this report—and the findings of this report—we now have an evidence base on which to assess in other settings how we might deliver similar care that is less wasteful of resources (and thus lower cost) and less harmful to our environment and world. Additional similar analyses, together with more safety and outcomes studies, may create an evidence base to reassess standards regarding the multipatient use of supplies and other surgical approaches in Western countries.
ARTICLE INFORMATION

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REFERENCES


