

## Improving quality of care and reducing topical medication operating room waste



Operating room (OR) medication and other waste comprise a significant proportion of the total U.S. healthcare system waste.<sup>1</sup> Many ophthalmologists perform surgical procedures, especially cataract surgery, applying topical medications preoperatively and intraoperatively. Often, these medications obtained and charged from a stock supply or an electronic dispenser and used in the OR cannot be provided to patients after discharge and are discarded. Tauber et al. analyzed the economic and carbon footprint impact of ophthalmic medication OR waste at 4 northeast-region surgical facilities.<sup>2</sup> Discarded topical drops were the most costly unused or partly used of the OR medications with a total cost averaging \$148 per case, partly because facility policies prevented patients from taking their topically applied medications home. With 3.8 million cataract procedures performed annually in the United States, medications potentially totaling \$560 million are discarded, excluding the costs of upstream processing, packaging, shipping, disposal, and regional purchase-price differences.

Our discussions with ophthalmology colleagues, peers in other subspecialties, and pharmacists suggested that OR medication waste is a local, state, and national problem. Attempting to identify the etiology of OR medication waste and the impact on patients, cost, and the environment, the Illinois Society of Eye Physicians and Surgeons (ISEPS) emailed 14 voluntary questions to 700 Illinois ophthalmic surgeons statewide between September and October 2019. Seventy-three physicians (10.3%) completed the anonymous questionnaire. **Table 1** outlines the respondent demographics. Percentages are calculated based on the number of respondents who answered each question.

Where medications were dispensed onsite, 31 respondents (58.5%) noted that a pharmacy label was not attached. In settings where medications were brought from an outside pharmacy, only 13 (30%) reported that medications could be taken home postoperatively. Reasons cited included “Lack of pharmacist time or logistical problem to counsel patients” (n = 14 [35.9%]), “Medications are discarded” (n = 15 [38%]), “State or facility regulations” (n = 9 [23.1%]), “Pharmacy not equipped to print labels” (n = 11 [28.2%]), “Hospital, ASC, and ER protocols” (n = 19 [48.7%]), and “Insufficient pharmacy staffing” (n = 9 [23.1%]). Mydriatic drops were the most commonly discarded medications (n = 47 [79.7%]), followed by antibiotic drops (n = 36 [61.0%]) and ointments (n = 31 [42.5%]). Thirty (41.7%) indicated that at least 1 of their patients experienced an adverse event

postoperatively because medications were not offered (**Table 2**). Of the 29 who elaborated on adverse outcomes, 19 (65.5%) reported increased postoperative inflammation and 6 (20.7%) reported postoperative infection, suggesting prioritization of antibiotic and antiinflammatory drop labeling.

The results indicate that the lack of counseling and medication labeling, facility policies, and noncompliance with burdensome state requirements are the main factors causing such waste. Our findings reflect 2 of the 6 waste domains in healthcare identified by Shrank et al.: failure of healthcare delivery and administrative complexity.<sup>3</sup>

One approach to waste reduction would be to promote institutional and state policies allowing patients to use topical OR medications after discharge. In addition, hospital systems could maximize efficiency, cost-effectiveness, and economies of scale while ensuring patient safety by incorporating the same perioperative dilation, antibiotic, and antiinflammatory drop order sets and multidose medication applications across the network.<sup>2,4,5</sup> Cost savings could be applied toward care for underserved patients and other meaningful endeavors.

In April 2019, the ISMS adopted a resolution to help resolve topical OR and emergency department medication waste statewide.<sup>6</sup> The ISMS also sent Senate Bill 3266 to the Illinois legislature in February 2020, concurrently negotiating with regulatory stakeholders and eliciting the support of other surgical and nonsurgical specialties.

**Table 1. Respondent demographics.**

Characteristic	n	%
Specialty (n = 73)		
Cataract/anterior segment	12	16.4
Comprehensive	30	41.1
Cornea	2	2.7
Pediatrics	5	6.8
Glaucoma	7	9.6
Retina	13	17.8
Orbital and/or oculoplastics	4	5.5
Years in practice (n = 72)		
≤5	6	8.3
6 to 10	7	9.7
11 to 25	25	34.7
>25	34	47.2
Primary operative setting (n = 72)		
Ambulatory surgical center	22	30.6
Academic hospital outpatient department	11	15.3
Private or community hospital outpatient department	35	48.6
Veterans Affairs hospital	2	2.8
Office	2	2.8

**Table 2. Adverse events for patients who were not able to receive medications directly from the operating room.**

Event	n = 29	%
Logistical		
Finances prevented patients repurchasing same agents	26	89.7
Transportation and support issues	20	68.9
Quality of care issues if postoperative acquisition of medications is not possible	18	62.0
Caregiver support problems	11	37.9
Medical		
Increased postoperative inflammation	19	65.5
Postoperative infection	6	20.7

The ISMS is also proposing a similar resolution to the American Medical Association on topical OR and emergency department medication waste, including the use of multidose eyedrops for multiple patients.<sup>7</sup> This resolution is endorsed by the American Society of Cataract and Refractive Surgery, the American Academy of Ophthalmology, and the American Glaucoma Society. With a coalition of other similarly impacted national subspecialty organizations, we hope these steps will improve patient care, reduce overall healthcare cost and waste, provide educational resources, mitigate drug shortages, lead to regulatory and facility policy reforms, and aid in preserving our environment.

Medication cost and waste is a component of the life cycle assessment analyzing methods to reduce, reuse, and recycle OR equipment and products in which the American Society of Cataract and Refractive Surgery is involved.<sup>1</sup> We await

future research on the impact of intracameral antibiotics on the costs of discarded medications regionally and modification of existing facility policies to allow the reuse of topical drugs.<sup>4,8</sup>

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