FIVE KEY STRATEGIES FOR A GREENER PRACTICE



A detailed examination of the strategies and collaborative efforts needed to minimize waste, enhance energy efficiency, and promote sustainable practices in ophthalmology.

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In any high-volume OR, the extensive waste produced by just one surgery is unmistakable. This month, in the Fundamentals in Five *column, Drs. Mehta, Nuyen, and Thiel offer an in-depth analysis of steering ophthalmology toward an eco-friendlier path. They insightfully highlight the need to reassess traditional, wasteful practices and be mindful of the environmental impact of our supply chain. It is incumbent upon every stakeholder in our field to contribute actively to a future marked by enhanced sustainability.*

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Ophthalmology holds a unique position as the medical specialty with the highest volume of procedures, granting it a pivotal role in steering the medical field toward improved sustainability. Within the practice of ophthalmology itself, there are many opportunities to pursue this vital goal of sustainability.

FUNDAMENTAL 1 MINIMIZING WASTE IN THE CLINIC AND OR

In the medical field, especially within the United States, physical or solid waste is a prevalent concern. Studies have revealed that as much as 15% of products brought into US ORs and clinical spaces may be discarded without ever being used.[1,2] For example, a single cataract surgery in the United States may generate two or more large bags of trash.

Unnecessary waste also occurs when partially used pharmaceutical bottles are discarded instead of being dispensed to a patient or reused among multiple patients.[3-6] Although there may be firm policy barriers in some states—such as the requirement to label a bottle with patient information before dispensing it from the OR—most of these wasteful practices are the result of local policies, product selection and procurement, and stocking methods. All of these areas warrant careful evaluation to reduce what's brought into clinical spaces.[7]

Additional sources of OR and clinic waste often stem from product packaging, including protocols or instructions that are seldom used. Engaging with product representatives and manufacturers about electronic instructions and reusable, reprocessable, or recyclable products can encourage the industry to enhance its sustainability efforts. Many waste reduction efforts also offer the potential for significant cost savings.

FUNDAMENTAL 2 GOING FULL CIRCLE

A significant challenge in the pursuit of sustainability today lies in the prevailing make-take-toss product life cycle. This linear approach stands in stark contrast to the more sustainable circular economy model, which emphasizes maintaining the value of material resources through practices such as reuse, remanufacturing, and recycling.[8]

Generally, reusable items tend to be more environmentally friendly, with fewer emissions and a lower total cost throughout their lifespan. These items should be prioritized within the medical practice. Where constraints such as physical space or other factors prevent the use of reusable items, ophthalmologists should explore alternative disposable options.

One option is single-use device reprocessing, an FDA-approved process where third-party companies sterilize and resell single-use devices back to health systems. This approach has limited availability in ophthalmology but offers a path toward sustainability. Another strategy involves procuring supplies made with recycled content or from renewable resources such as biomaterials or biopolymers.

Recycling remains an essential aspect of sustainability, especially for materials such as paper products,

aluminum, and glass that are easily recyclable.[9] Although the recycling of plastics is important, it may not be as reliable a market as anticipated,[10] and the aforementioned methods will likely prove more effective in reducing emissions than recycling alone.[11]

The move toward a circular model within ophthalmology will necessitate collaboration among physicians, industry leaders, and legislative bodies. By working together, these stakeholders can create meaningful changes and further the efforts to increase circularity within the field of ophthalmology.

FUNDAMENTAL 3 MAXIMIZING ENERGY AND WATER EFFICIENCY

Hospitals rank as the second most energy-intensive commercial buildings in the United States, surpassed only by food service establishments.[12,13] The energy demands of ORs are particularly notable, consuming three to six times more energy than hospital wards or office clinics.[14]

Transitioning to renewable energy sources is a vital step in reducing emissions, but equally critical is the implementation of energy efficiency initiatives. These may include using EnergyStar-rated appliances, employing LED lighting, and integrating timers and motion sensors to curtail lighting, ventilation, or plug loads from computers when spaces are unoccupied. Remarkably, one study found that ORs were unoccupied up to 40% of the time.[15]

A noteworthy example is the Providence St. Peter Hospital in Washington, which achieved a reduction in energy consumption by diminishing its ventilation system output by 60% during unoccupied periods.[16] Instituting a shutdown checklist for staff can facilitate the process of turning down a room when it is not in use. Not only do these energy-reducing measures contribute to sustainability, but they also correlate with significant cost savings over time.

Water efficiency is another key consideration in the OR setting, leading to further cost reductions. An illustrative practice is the formalizing of alcohol-based surgical scrubs, rather than water-based solutions. Javitt et al documented remarkable savings in terms of cost, water, and scrub time by adopting waterless scrub methods.[17,18]

FUNDAMENTAL 4 PROMOTING SUSTAINABLE TRANSPORTATION AND ACCESSIBILITY

To diminish transport-related carbon emissions, more localized delivery of care and the appropriate implementation of teleophthalmology should be championed.[19,20] Rather than depend solely on expansive tertiary-care institutions that serve a wide catchment area, the development of smaller treatment centers or screening hubs specifically for patients with chronic ophthalmic conditions could minimize emissions and enhance accessibility in more remote locations.

Teleophthalmology can further this effort. Although it's not a solution for every situation, its judicious use can reduce emissions,[21]save money,[22] and uphold the accuracy of diagnoses, thus extending accessibility to ophthalmic specialists.[23] The advancement in technology for various home devices to monitor visual acuity, IOP, and visual fields may result in fewer clinic visits, subsequently reducing transportation needs and emissions.[24-28]

FUNDAMENTAL 5 IMPLEMENTING SUSTAINABLE PROCUREMENT AND SUPPLY CHAIN MANAGEMENT

A significant portion of emissions within the global health sector, accounting for 71%, is attributable to the supply chain,[29] with the majority stemming from disposable medical supplies and equipment. Sustainable procurement is not merely a trend but a necessity. It involves a comprehensive examination of the environmental, social, and economic impacts over the life cycle of an item—ranging from raw material extraction and the working conditions of laborers to transportation and end-of-life disposal.

Supply chain emissions can be dramatically reduced by embracing the principles of a circular economy[30] and opting for materials designed with longevity and reusability in mind. Regular maintenance of equipment can not only prolong the life of costly devices but also minimize the need for continual replacements.

Purchasing items made from recycled content might be a more straightforward strategy than attempting to manage end-of-life processing for those items. When possible, choosing reusable equipment over single-use items can contribute to both cost savings and sustainability. Investing in sanitation and sterilization to permit reusability of devices can ease the transition away from single-use products. Moreover, purchasing from local companies and distribution facilities may invigorate the local economy and simultaneously reduce transport-associated emissions.

CONCLUSION

The field of ophthalmology stands at a crossroads of technological advancement and environmental responsibility. The pressing need to steer the industry toward sustainability must be met with a comprehensive approach that encompasses minimizing waste, embracing a circular economy model, maximizing energy and water efficiency, promoting sustainable transportation and accessibility, and implementing sustainable

procurement and supply chain management. ■

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