



# Comparing Costs of Water Consumption for Cataract Surgery Hand Antisepsis in US Ambulatory Surgery Centers (ASCs)

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None.



# Background and Purpose

- Water used in hospitals and other health care facilities comprises 7 percent of the total water use in commercial and institutional facilities in the US.<sup>1</sup>
- Current CDC guidelines for surgical hand hygiene require use of an antimicrobial soap and water for 2-6 minutes, or use of a non-antimicrobial soap and alcohol-based rub.<sup>2</sup> WHO guidelines state that if hands are not visibly soiled, an alcohol-based hand scrub is sufficient.<sup>3</sup>
- In a large ophthalmic surgical hospital, replacing a water-based surgical hand scrub with an alcohol-based hand rub was projected to save nearly 62,000 liters of water per operating room per year (based on an average of 12,921 cases per year), and \$280,000 to \$348,000 per operating room per year.<sup>4</sup>
- **Study Aims:**
  - To report the scrub techniques for cataract procedures in ophthalmic operating rooms across the United States.
  - To compare projected cost savings of an alcohol-based scrub technique and fully water-based scrub technique.

# Methods

- Cross-sectional, retrospective, multicenter study including 4 academic centers and 1 private ambulatory surgery center
- Self-report data from each site on scrub protocol, automaticity and flow rate of scrub sinks, cataract procedure volume, personnel per case, and local cost of water in ORs from June 1, 2022 to May 31, 2023.
- Surveys were sent to 15 surgery centers

# Results

- 5 surgery centers responded with completed surveys
  - 4 were affiliated with academic institutions and 1 was a private practice surgery center.
- **Type of Scrub Protocol**
  - 3 centers followed a mixed water- and alcohol-based scrub protocol, with water-based scrub for the first case of the day, and alcohol-based for each subsequent case
  - 1 center followed an alcohol-based scrub protocol only, for each case
  - 1 center reported a surgeon or staff dependent scrub protocol, with water-based for the first case of the day, and varied scrub practices for each subsequent case
- **Scrub Duration**
  - Duration of scrub time for water-based scrub ranged from 3-5 minutes
- **Scrub Personnel**
  - Number of scrubbed personnel ranged from 2-6 people, with the private practice having the least number of personnel in each case

State	Average Cost of Water (\$/gallon) <sup>9, 10, 11, 12, 13</sup>	Projected Total Cost of Water-Based Scrub
CA	\$0.009	\$37,892
OR	\$0.017	\$38,840
FL	\$0.001	\$36,875
IL	\$0.005	\$37,346
MD	\$0.010	\$38,000

**Table 1.** Projections for an ASC doing 5000 cataracts/year with only water-based scrubs with BD EZ Scrub 107 Surgical scrub brush, sponge, nail pick.<sup>5</sup> Assuming sink flow rate of 2 gallons/min, 3 min scrub time, 4 personnel scrubbed per case

Alcohol Scrub Type	Manufacturer Instructions	Price of Scrub Per Manufacturer Use Instructions <sup>6, 7, 8</sup>	Projected Cost of Alcohol Scrubbing
Avagard (Chlorhexidine Gluconate 1% Solution and Ethyl Alcohol 61%)	3 pumps (6ml) per use	\$0.68	\$13,600
Medline Sterillium® Rub Fragrance-Free Surgical Scrub	3 pumps (6.6 ml) per use	\$0.45	\$9,000.00

**Table 2.** Projections for an ASC doing 5000 cataracts/year with only alcohol-based scrubs. Assuming 4 personnel scrubbed per case.

# Conclusions and Future Directions

- Hand scrub practices vary amongst ambulatory surgery centers, with much variability due to individual surgeon/staff preferences
- Using an entirely water-based scrub protocol is projected to be 2.79 times more expensive than using an entirely alcohol-based scrub protocol
- Implementing an alcohol-based scrub protocol has the potential to decrease both water consumption and costs, as well as staff and OR turnover time
- Future directions include:
  - Surveying more academic institutions as well as private practice ambulatory care centers
  - Performing cost-comparison with international eye surgery centers, including Aravind Eye Hospitals in India
  - Investigating infection rates at institutions with different scrub protocols

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