

Utilizing a Two-step Terminal Cleaning Protocol in the Operating Room: A Quantitative Analysis in an Acute Care Hospital



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Learning Objectives

- Distinguish between cleaning and disinfection in operating rooms.
- Evaluate the effectiveness of two-step cleaning protocols.
- Interpret adenosine triphosphate (ATP) bioluminescence test results.

Background

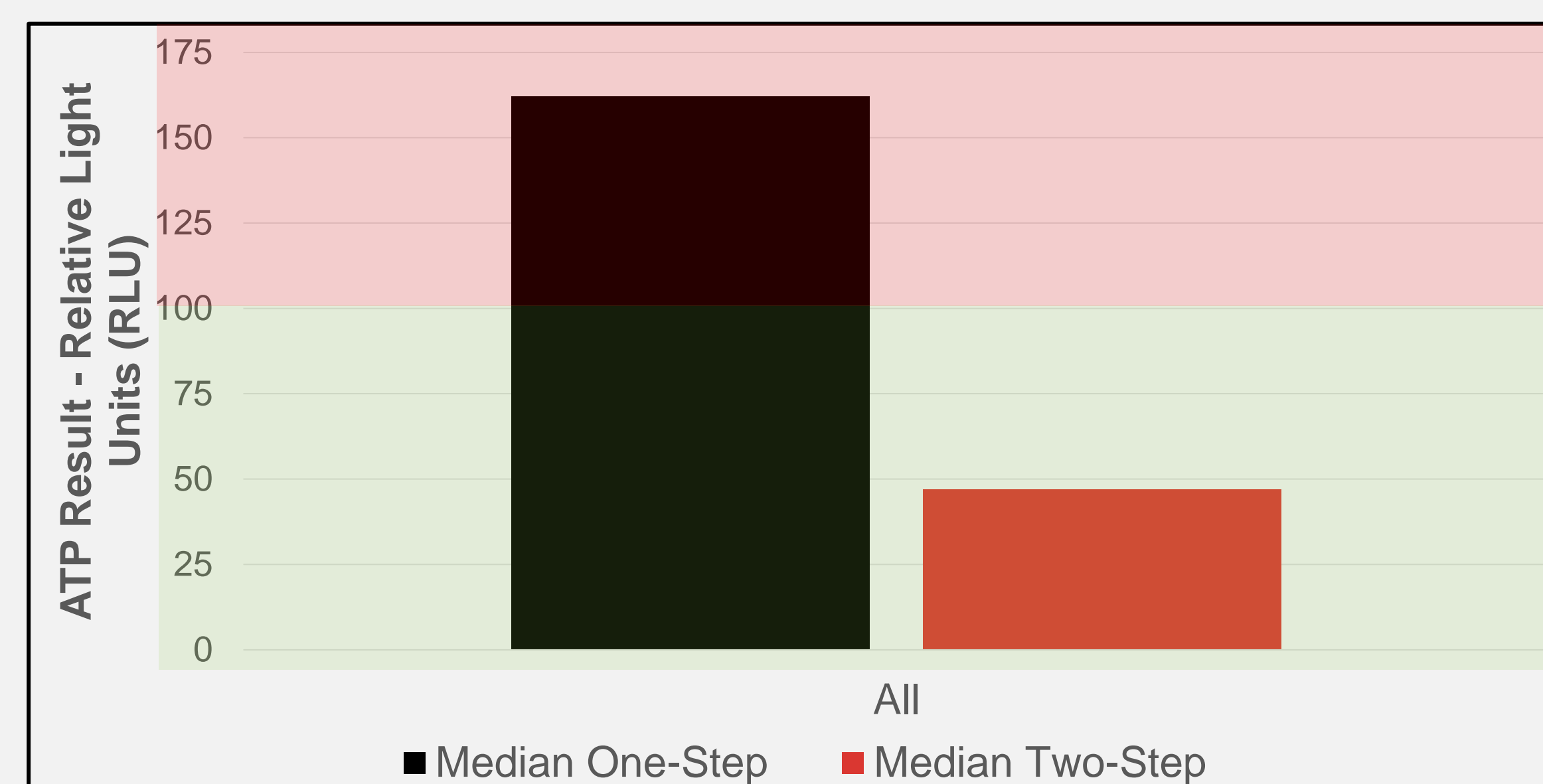
Infection control in operating rooms (OR) is a pivotal aspect of patient care, with environmental disinfection playing a crucial role in preventing healthcare-associated infections. A notable gap was found in acknowledging the distinct roles of cleaning versus disinfection. Cleaning refers to the process of removing pathogens, dirt, and impurities from surfaces whereas disinfection kills pathogens on surfaces but may not remove them. This lack of understanding poses a challenge in ensuring optimal cleaning and disinfection practices. Understanding these differences is essential for effective terminal cleaning of ORs.

Methods

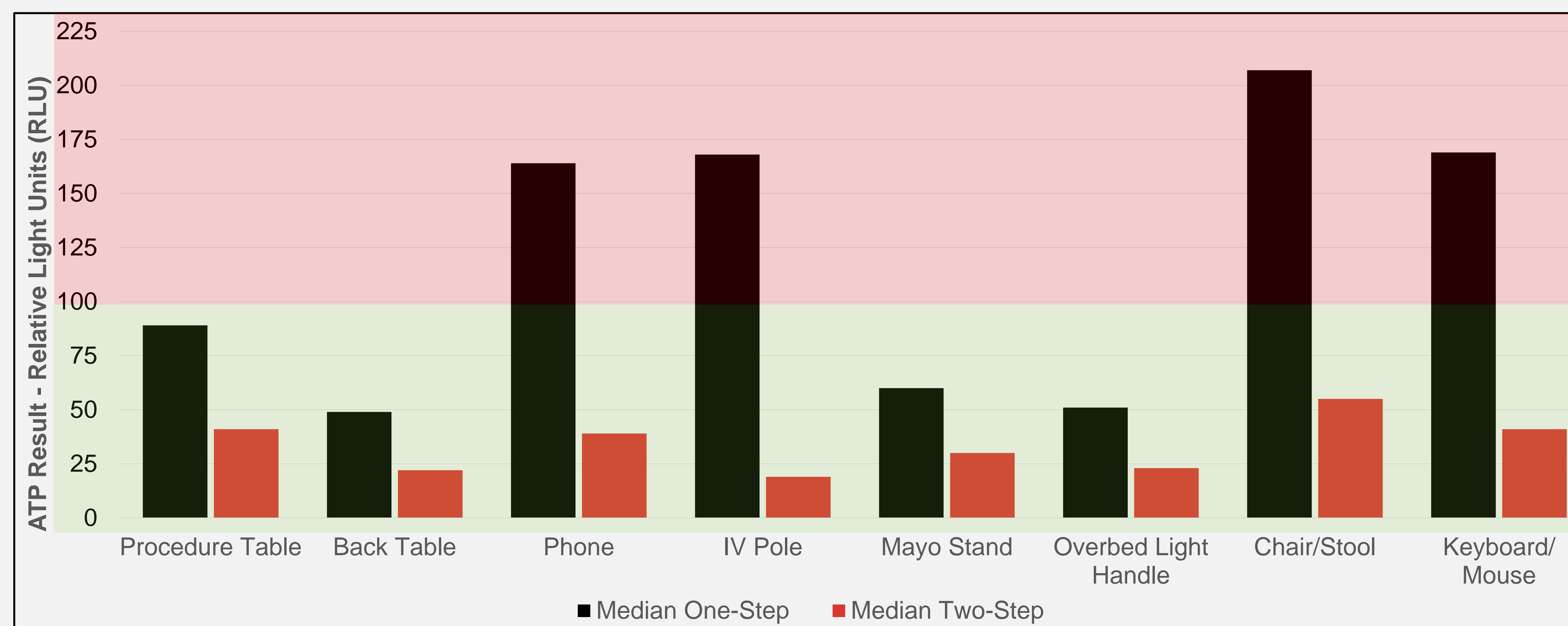
To address this gap, a two-step terminal cleaning protocol was piloted in an acute care hospital with 29 ORs. This protocol transitioned from a single-step disinfectant only approach to a method combining multi-surface cleaner and disinfectant. A total of 25 ORs underwent adenosine triphosphate (ATP) bioluminescence testing on high touch surfaces, assessing 471 ATP testing points. ATP results were compared before and after implementation. Median ATP counts were analyzed using the Mann-Whitney U test due to non-normative distribution.

Results

The two-step cleaning protocol resulted in a pronounced decrease in ATP readings, indicating a higher level of surface cleanliness. Median ATP count reduced from 162 to 47 relative light units (RLU) ($P=.001$). This general trend of improved cleanliness was consistent across various high-touch surfaces. Notable median ATP count decreases were found on computer keyboard/mouse surfaces, decreasing from 169 to 41 RLU ($P<.001$) and intravenous (IV) pole surfaces from 169 to 19 RLU ($P=.002$) Back tables also decreased significantly from 49 to 22 RLU ($P=.009$).



	Median One-Step ATP Result (RLU)	Median Two-Step ATP Result (RLU)
Procedure Table	89	41
Back Table	49	22
Phone	164	39
IV Pole	168	19
Mayo Stand	60	30
Overbed Light Handle	51	23
Chair/Stool	207	55
Keyboard/ Mouse	169	41
All	162	47



Statistical significance for all data has been determined using the Mann-Whitney U test.

Conclusions

Findings highlight the effectiveness of a two-step terminal cleaning and disinfection protocol in ORs. By reducing organic contaminants on high-touch surfaces, as evidenced by lower ATP results, the revised protocol demonstrates improved environmental cleanliness over traditional single-step disinfection. The findings advocate for the adoption of such protocols to improve environmental cleanliness.

Implications for Practice

Training and Education: Continuous training for cleaning staff is crucial to differentiate cleaning from disinfection, enhancing protocol compliance and effectiveness.

Protocol Revision and Implementation: Healthcare facilities should consider adopting a standardized two-step cleaning protocol to significantly boost OR cleanliness and patient safety.

Monitoring and Evaluation: Routine ATP bioluminescence testing is essential for maintaining high cleanliness standards in ORs through regular audits and immediate corrections.

References

- Cook, D. (2021, October 14). A smarter way to clean ORs. Outpatient Surgery Magazine. <https://www.aorn.org/outpatient-surgery/article/2021-October-smarter-way>
- Centers for Disease Control and Prevention. (2021). The Difference Between Cleaning, Sanitizing, & Disinfecting [PDF file]. Retrieved from https://www.cdc.gov/hygiene/pdf/331782-a_cleaning_sanitizing_disinfecting_508.pdf

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