A Multi-site Field Study Evaluating the Effectiveness of Manual Cleaning of Flexible Endoscopes with an ATP Detection System

Category: Antisepsis/Disinfection/Sterilization   **Type:** Oral Abstract

Marco Bommarito, PhD - Lead Research Specialist, 3M Infection Prevention Division; **Grace A. Thornhill, PhD** - Technical Service Specialist, 3M Infection Prevention; **Dan J. Morse** - Senior Biostatistical Specialist, 3M Infection Prevention Division
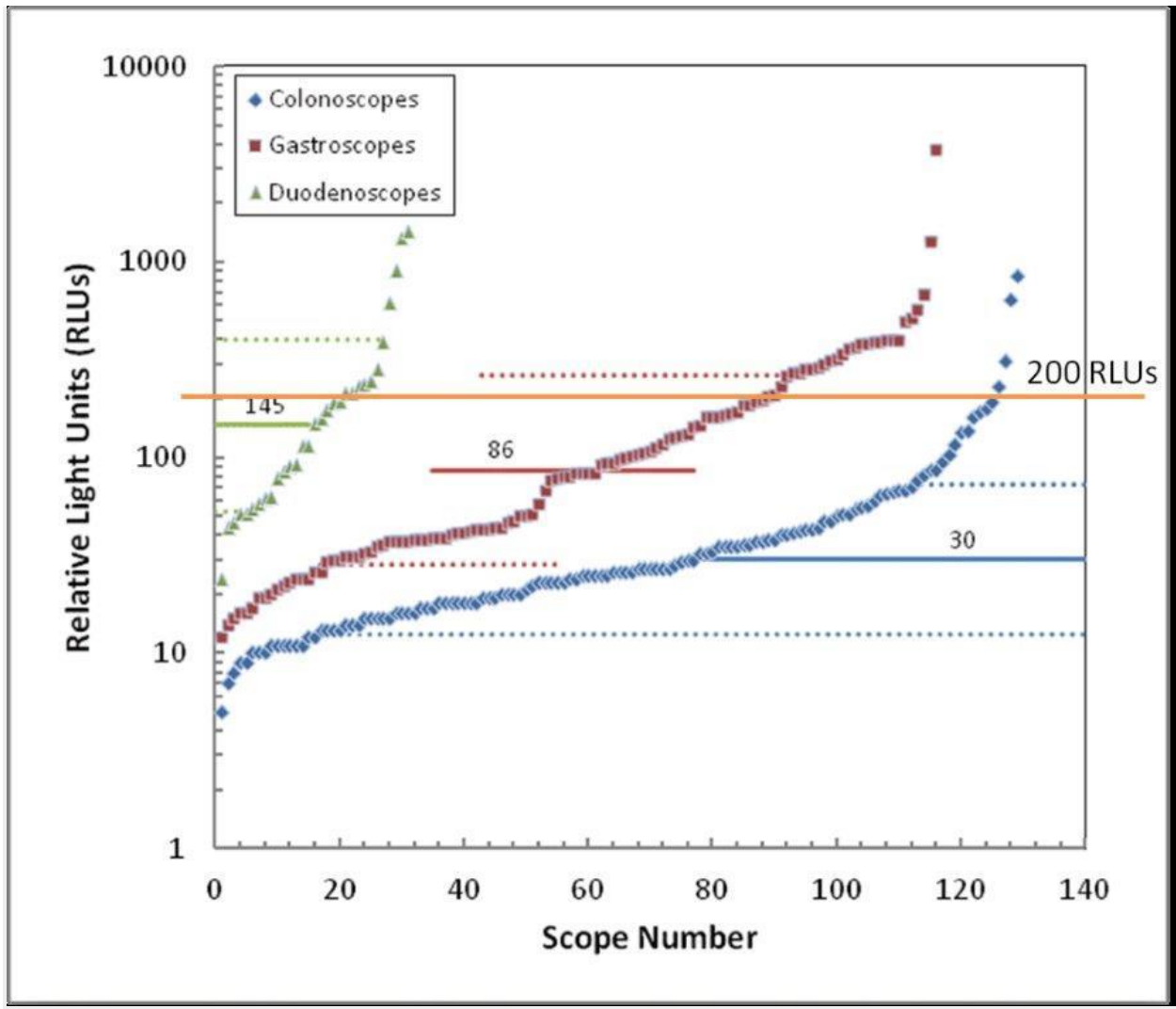
Background/Objectives
An ATP bioluminescent assay was used to monitor the cleanliness of flexible endoscopes after the manual cleaning step of the decontamination and disinfection process, for five hospitals across the US.

Methods
Three types of flexible endoscopes were tested after manual cleaning at five different hospital sites using an ATP Water assay. The method entailed collecting and testing a water sample harvested from the suction/biopsy lumen using an ATP Water Test. The amount of ATP, in relative light units (RLUs), was measured with a hand-held luminometer. The number of cleaning failures was determined.

Results
The figure shows the results of this field study displayed on a semi-logarithmic plot of RLUs versus scope number, by the type of scope measured. For each type of endoscope the data is ordered from low to high values. Also shown with a solid line across the entire figure is a proposed pass-fail RLU threshold value reported in the clinical literature [M.J. Alfa, I. Fatima, N. Olson; The adenosine triphosphate test is a rapid and reliable audit tool to assess manual cleaning adequacy of flexible endoscope channels; Am. J. Infect. Control and M.J. Alfa, I. Fatima, N. Olson; Validation of adenosine triphosphate to audit manual cleaning of flexible endoscope channels; Am. J. Infect. Control (Both articles in press, available online)]. The log transformed data was analyzed to determine the mean for each scope (solid lines) and the standard deviation (dashed lines). We observed the lowest mean for colonoscopes (30 RLUs), followed by gastroscopes (86 RLUs), and finally duodenoscopes (145 RLUs). The standard deviation was also smaller for colonoscopes (0.38 log[RLUs]) in comparison to gastroscopes (0.48 log[RLUs]) and duodenoscopes (0.44 log[RLUs]). Using the 200 RLUs pass-fail value proposed in the literature, we observed failure rates in the manual cleaning step to be highest for duodenoscopes (30% failure rate, 10/30) and gastroscopes (24%, 28/116) and lowest for colonoscopes (3%, 4/129).

Conclusions

245 endoscopes, for five different US hospitals were measured for ATP contamination after the manual cleaning step of the disinfection process. Surprisingly, we observed considerably higher levels of ATP contamination in duodenoscopes and gastroscopes as compared to colonoscopes. As a result, a significant number of cleaning failures were observed for these types of endoscopes. Given the importance of the manual cleaning step to ultimately achieve proper high level disinfection, these results suggests that a different protocol or more attention may need to be placed on manually cleaning upper GI endoscopes.