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A Survey of Laryngoscope Contamination at a University and a Community Hospital

To the Editor:—The cleaning and disinfection of laryngoscope handles and blades is becoming more controversial. The potential for blood exposure and contamination during routine anesthetics and airway management has been documented.¹⁻³ Several companies are marketing and developing disposable covers for this equipment. Rigorous guidelines generally exist for the decontamination of laryngoscope blades, while handles may not even be cleaned between patients. Although the infectious risk of equipment contaminated with residual blood is unknown, quality assurance is necessary to evaluate the effectiveness of cleaning and decontamination.

Methods: To detect the presence of occult blood contamination of laryngoscope handles and blades, we conducted a study at a university hospital (25 anesthetizing sites) and at a community hospital (13 anesthetizing sites). At each site, one clean, decontaminated laryngoscope blade and one handle were tested for the presence of occult blood contamination using hemoccult testing. This guaiac-based assay can detect blood in concentrations as low as 1:10,000.^{4*} All sites were "set up" and ready for the anesthetic induction of the next patient. Laryngoscope blades had been processed with a chlorhexidine gluconate or a dimethylammonium chloride detergent scrub, a 20-min glutaraldehyde soak, and a final water rinse. Neither institution had a protocol for handle cleaning; however, the anesthesia technicians wiped the handles if they appeared grossly dirty. Each handle or blade was rinsed with a spray of 10 ml of saline. A two-drop aliquot of the rinse was tested for occult blood using a fresh Hemoccult Sensa card and developer (SmithKline Diagnostics, San Jose, CA). The appearance of any blue color was considered a positive result. All cleaning solutions were tested for their ability to produce a false-positive result.

Results: At the university hospital, 12 of the 25 handles (48%) and 1 of the 25 blades (4%) tested positive for occult blood contamination. At the community hospital, 7 of the 13 handles (54%) and 3 of the 13 blades (23%) tested positive. Cochran-Mantel-Haenszel statistics for combined data, stratified by location were used to analyze the combined frequency of handle contamination (19/38, *i.e.*, 50%) compared to the combined frequency of blade contamination (4/38, *i.e.*, 10.5%). This difference in frequency of occult blood contamination was significant at the $P < 0.001$ level. None of the cleaning solutions produced a false-positive result.

Discussion: Our results indicate that 50% of our handles may be contaminated with occult blood. Laryngoscope handles generally do

not contact patient mucosa, and the infectious risk, although not known, probably is small. Laryngoscope handles should not, however, be considered clean. Surprisingly, 10.5% of laryngoscope blades were found to be contaminated with occult blood. This equipment does contact mucous membranes. Roberts has cultured numerous organisms from laryngoscopes that had been washed and cleaned.⁵ As a quality-improvement monitor, these results indicate that reevaluation of our cleaning protocols may be necessary. The surfaces of laryngoscope handles and blades are irregular and contain potential repositories for infectious material. If our ideal is to provide clean equipment free of infectious potential, then we fall short of the mark. The use of more rigorous decontamination protocols, disposable equipment, or disposable blade and handle covers may help us reach that goal.

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