

The sensitivity of the three-stage phenolphthalein blood indicator test at 60 seconds was 1:10,000 parts blood to normal saline. Collected data were analyzed and percentages were computed based on the relative rate of occurrence. None of the blades or handles observed had visible blood. Of the 65 blades tested for occult blood, 13 (20%) tested positive. Of the 65 handles tested for occult blood, 26 (40%) tested positive. There were more PM blades and handles positive for occult blood than AM blades and handles.

These findings are consistent with a similar study done by Morell, Ririe, James, Crews, and Huffstetler in 1994. Using the guaiac-based test for occult blood, they found blade contamination with occult blood to be 10.5% and handle contamination to be 50%. The presence of blood is suggestive of poor compliance with established cleaning and sterilization protocols and an indicator of potential cross-infection, since biological fluids such as blood and saliva are known to transmit infectious diseases. More rigorous decontamination protocols must be instituted to ensure complete removal of blood prior to sterilization, since the laryngoscope blade and handle have irregular surfaces with repositories for infectious material. The routine use of disposable equipment or blade/handle covers are also possible solutions.

The views expressed in this abstract are those of the author and do not reflect the official policy of the Uniformed Services.

42. Incidence of visible and occult blood on laryngoscope blades and handles

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Anesthesia providers must take appropriate precautions to reduce the potential for transmission of infectious agents to the patients under their care. The devastating spread of human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) over the past decade has resulted in the development of specific guidelines for the cleaning, disinfection, and sterilization of medical equipment and instruments. Contamination of laryngoscope blades and handles with visible and occult blood frequently occurs during routine airway management. Several studies suggest sterilization procedures may be ineffective, or there may be poor compliance with the established protocols. The degree to which contaminated anesthesia equipment plays in the overall nosocomial rate is difficult to determine. The purpose of this study was to determine the incidence of visible and occult blood on laryngoscope blades and handles that were identified as ready for patient use.

A modified version of the three-stage phenolphthalein blood indicator test, which is used in forensic medicine, was employed to determine the presence of occult blood. A preliminary study was conducted in vitro to determine the sensitivity of the phenolphthalein test kit. Following institutional approval, laryngoscope blades and handles identified as ready for patient use were observed for visible blood and tested for occult blood at a local medical facility that has five or more operating rooms in daily use. AM and PM testing continued until a total of 65 laryngoscope blades and handles had been tested. Data collected were recorded daily on a data collection tool.

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TITLE: A SURVEY OF LARYNGOSCOPE CONTAMINATION AT A UNIVERSITY AND A COMMUNITY HOSPITAL

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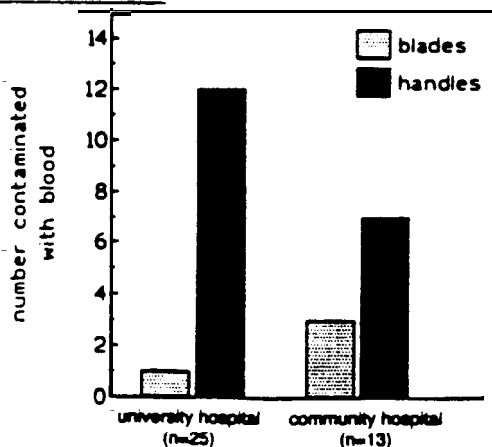
Introduction. Laryngoscope blades are routinely cleaned after use; however, handles are repeatedly used without decontamination. we hypothesized that handles may be contaminated with blood, which could transmit infection.^{1,2}

Methods. One laryngoscope handle and 1 blade were tested for occult blood contamination from each of 25 anesthesia locations at a university hospital and 13 locations at a large community hospital. All blades had been washed and decontaminated by a Hibiclenz or Broadspec 128 detergent/Cidex/water protocol. Each blade and handle was rinsed with 10 cc of 0.9% saline. Two drops of the rinse were placed on a Hemocult Sensa occult blood slide and developed. A blue color was considered positive for occult blood. Detergents and cidex were also tested for falsely positive results. Cochran-Mantel-Haenszel statistics for combined data stratified by location were performed on the data.

Results. Nineteen handles and 4 blades tested positive for occult blood contamination ($P < 0.001$). The results per institution are summarized in the Fig. Cidex, Hibiclenz and Broadspec 128 all tested negative.

Discussion. The absence of a protocol for cleaning laryngoscope handles resulted in 50% contamination with blood.

Metal laryngoscope handles are not waterproof, nor designed for immersion. The surface is checkered to improve grip and may be a repository for blood or saliva. Gloves may protect the provider but offer no protection to patients if the equipment or gloves are dirty. 10% of the blades also tested positive. Disposable covers, redesigned laryngoscopes or improved cleaning protocols may decrease cross-contamination.



References.

1. Anaesthesia 45:831-833, 1990.
2. Surg Gynecol Obstet 172:480-483, 1991.

Patient Safety Highlighted at ASA

“ASA Meeting,” Continued from Pg. 37

Taiwan and the University of Chicago reported on a remarkably clever combination of fiberoptic bronchoscope and a disposable laryngoscope blade used to provide instructor monitoring of endotracheal intubation by novices. Either by direct vision through the bronchoscope or use of a videocamera and monitor, the instructors were able to guide the intubation attempts and increase the success of the learners' attempts.

Dr. P. **Craig** and colleagues from the University of Chicago surveyed anesthesia residency programs to determine the provisions they made for failed intubations outside the operating rooms. Most often mentioned was needle cryothyrotomy by anesthesia personnel, followed by surgical cryothyrotomy by surgical personnel. Disturbingly, the plan for ventilation after needle cryothyrotomy was with bag ventilation in 51% of those who mentioned that needle cryothyrotomy was their plan. **Fifty-six** percent chose jet ventilation and one person chose passive oxygen insufflation (the respondents were able to choose more than one option). It was suggested that contingency **plans** are not well thought out in some programs that send residents out into the hospital for **intubations**.

Using a videocamera and microphone to analyze verbal interchange and compare it to the ability of expert systems to work with humans, Dr. **RJ Cook** and colleagues from the University of Chicago and Ohio State University investigated communication between problem solvers in neurosurgical procedures. Expert systems are unable to communicate effectively with humans because of the lack of a common ground (a base of knowledge of dynamic situations that is shared by humans but unprogrammable in expert systems at present).

Dr. S. **McNulty** and associates from Jefferson Medical College explored the incidence of dysrhythmia caused by electrocautery in patients with right ventricular ejection fraction pulmonary artery catheters in place during surgery. They found that grounding the reference electrode **resulted** in a significant reduction of current through the catheter electrode and suggest that microshock hazard with

patient motion between the Masimo SET prototype and the **Nellcor** N-3000 and N-200 pulse **oximeters**. The **Masimo** SET prototype was much more accurate during patient motion. The Masimo is not yet **commercially** available.

Dr. B. **Inman** and associates of The Medical College of Virginia found that EEG monitoring during carotid endarterectomy did not affect the incidence of **post-op** neurological defects nor the **frequency** of reintubation in the PACU.

In an effort to decrease decision-to-delivery times for **C-sections**, Dr. M. Souders and others of the **Albert Einstein** Medical Center in Philadelphia are conducting C-section **drills** involving persons from the nursing, anesthesia and obstetrical services. Performance evaluations are conducted after the **drill**. They hope to optimize outcomes in **difficult situations**.

Dr. E. **Sia-Kho** and colleagues from the New York Hospital-Cornell Medical Center cultured laryngoscope handles and blades. Even though the blades had been washed and soaked in Cidex, there was **16%-18%** contamination **The handles** which were not **disinfected** showed **60% contamination**. The authors suggest that disposable handles and blades would eliminate the problem of cross contamination.

Pre- and Postoperative Visits

Drs. C. Klopfenstein, A. **Villiger**, J. Bolle, A. Forster, University Hospital, Geneva, Switzerland, compared a group of patients scheduled for elective surgery who received a preanesthetic visit in an outpatient setting two weeks prior to hospitalization followed by a second visit on the evening before surgery (Group A — two visits) with a second group of patients who received only the preoperative visit on the evening before surgery (Group B). Using two different subjective measures of anxiety, the group that was seen twice (Group A) had significantly less anxiety about their impending surgery ($P < 0.01$) when interviewed on the night before surgery (after the second preanesthetic visit) than did Group B (one visit).

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