Dhamee and Jablonski[1] designed a "light box" that rests on the abdomen or chest and thus makes any movement more obvious to the eye. Saunders and Humphrey[2] suggested amplifying the movements of the anesthesia bag by attaching a stick made of tongue depressors (and having a "flag" at the end of it) to the bag.

These monitoring devices are helpful but limited: although they identify chest movement, they provide no information regarding patency of the airway in the patient whose trachea is not intubated. Because of our concern that airway obstruction rapidly leads to hypoxemia in infants (a result of the high ratio of oxygen consumption to functional residual capacity), we monitor these patients using a pulse oximeter (Nellcor Pulse Oximeter Model N-100). Regardless of the anesthetic technique (we usually administer halothane and oxygen via insufflation), the sensor is applied to an extremity (either a finger or toe or across the foot) after the induction of anesthesia. While the patient is being positioned by the radiation therapists, we position the airway until respirations are unobstructed. At that time, the oximeter should report an oxyhemoglobin saturation of at least 96%; if saturation is less than 96%, the position of the airway is adjusted until saturation improves. The oximeter is placed near the head of the patient, and the television camera is adjusted to permit simultaneous viewing of the head and chest as well as the oximeter. At this time, all personnel leave the room and radiation is administered. As long as saturation remains stable, we believe that the airway is patent; a decrease in saturation suggests airway obstruction and the need for immediate interruption of the procedure and repositioning of the patient.

Because the pulse oximeter also reports pulse rate, it has become our most important monitor for these patients. We believe that this device provides clinical information of greater importance than that provided by monitors of chest excursion.

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Anesthesiology
63:124–125, 1985

Failure to Withdraw Flexible Fiberoptic Laryngoscope after Nasotracheal Intubation

To the Editor:—A 55-year-old man was scheduled for an open reduction and internal fixation of a fractured right mandible. He was sedated with diazepam and fentanyl. The nasal mucosa was anesthetized topically with 4% cocaine, while the laryngotracheal mucosa was anesthetized by injecting 3 ml 4% xylocaine through the cricothyroid membrane. Following this, an 8 mm ID Shiley® endotracheal tube was placed inside the nasal passage. A well-lubricated Machida flexible intubation scope FLS-6-50®* (fiberscope) was advanced through the endotracheal tube and into the pharynx and after visualizing the vocal cords into the trachea. The endotracheal tube then was threaded over the fiberscope and into the trachea. After successful completion of the intubation, the fiberscope could not be withdrawn from inside the endotracheal tube. The cause was unknown, and after a few gentle attempts to withdraw the fiberscope failed, the nasotracheal tube and the fiberscope were removed together. It was then discovered that the fiberscope had been passed through the lateral opening (Murphy eye) of the endotracheal tube. The size of this particular opening is just large enough to accept the insertion cord of the Machida FLS-6-50® fiberscope, which has an external diameter of 6.0 mm. Passage and advancement of the fiberscope through the lateral opening of the endotracheal tube is possible, but withdrawal is difficult because of the acute angle that the insertion cord takes and its tight fit in this small opening. This complication was encountered on two other occasions, and each time the cause of the problem was predicted and the fiberscope and endotracheal tube were removed together. In all three instances the fiberscope was easily

* Machida America Inc., 65 Oak Street, Norwood, New Jersey 07648.

withdrawn after a second attempt at intubation was completed using the same endotracheal tube through the same nostril but being certain that the fiberscope was advanced through the distal opening of the tube. To prevent this complication, one must make sure to identify both the side and distal openings of the endotracheal tube and take care to pass the fiberscope through the distal one.

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Simple Charcoal Filter for Closed Circuit Anesthesia

To the Editor:—Activated charcoal avidly adsorbs the potent fluorocarbon agents. A modificaton of the Engstrom* EDITH™ provides a simple way to introduce charcoal in the inspiratory limb without permanent modification of the anesthesia machine.[1]

The opinions or assertions contained herein are the private views of the author and are not to be construed as reflecting the views of the Department of the Army or the Department of Defense.

* Manufactured by Gambro-Engstrom AB, Box 20109, S-16120 Bromma, Sweden. U. S. Distributor: GAMBRO, Inc., 600 Knightbridge Parkway, Lincolnshire, Illinois 60069.

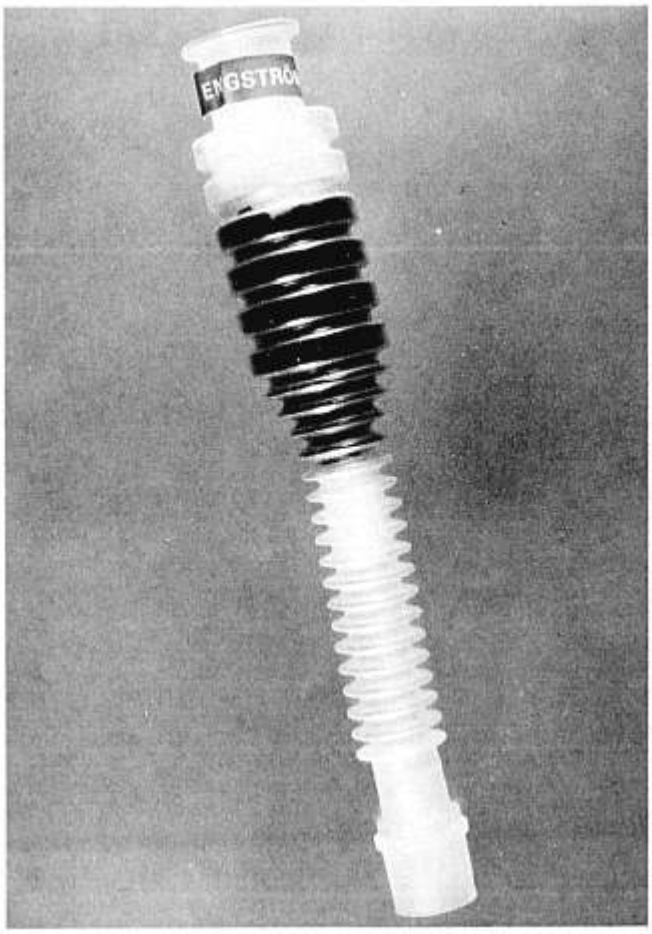

FIG. 1. Charcoal filter. Top of figure is proximal end, which connects to the anesthesia machine.

The filter is shown in the figure. The sponge is removed from the EDITH™. A small piece of sponge (about 0.3 cm) is cut off and placed in the narrowed part of the EDITH™. The EDITH™ is then filled with charcoal (Fisher Scientific, 6–14 mesh) to within 2.0 cm of the top. A 1.5–2.0 cm section of sponge is then inserted to contain the charcoal. The filter has little resistance. However, if an excessive quantity of sponge is compressed into the narrow portion, high resistance can result. A 15–22 mm adapter is placed on the distal end. To use the filter, the inspiratory limb of the circuit is momentarily disconnected and the filter interposed between the machine and the circuit. The filter is not connected directly to the endotracheal tube.

The filter holds 30–45 ml of charcoal and will adsorb approximately 1,500 ml of vapor. The filter will reliably awaken two adult patients. The filter does not pose an infection hazard, since it is placed proximal to the bacterial filter. The filter is easily recharged with fresh charcoal by removing the proximal sponge. Used charcoal can be discarded or saved in a closed container for reprocessing.

This simple device allows rapid decreases in inspired concentration whenever required by the clinical situation. While maintaining a closed circuit, rapid emergence is produced without resorting to the use of nitrous oxide.

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