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Early Detection of Malignant Hyperthermia

To the Editor:—It has been suggested that end-tidal CO_2 should be useful in the early detection of malignant hyperthermia (MH) and should be followed to gauge the effectiveness of therapy.[1] Although capnographs and mass spectrometers are proliferating in United States operating rooms, most anesthesiologists still do not have the ability to routinely monitor expired CO_2. Gronert and Theye[2] found parallel increases in CO_2 production and O_2 consumption. By closing the circuit, the anesthesia machine becomes a "metabolic laboratory" and the measurement of whole-body O_2 consumption becomes straightforward.[3] Moderate leaks in the system are easily measured and have little effect on the accuracy of the O_2 consumption measurement. Therefore, all operating rooms have the capability to detect the early metabolic changes of MH.

On the basis of animal models, the O_2 consumption would be expected to increase by at least 30–50% if the patient has MH develop. Effective therapy with dantrolene will also be demonstrated by a decrease in O_2 consumption.[4] During treatment of MH, cooling is desirable so the circuit should be opened with high flows of oxygen and intermittently closed for 3–5-min periods to follow O_2 consumption. Expiratory CO_2 monitoring would be a valuable complement to measurements of O_2 consumption. Whenever MH is suspected, the anesthesiologist should measure O_2 consumption.

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Respiratory Monitoring for Children Undergoing Radiation Therapy

To the Editor:—Pediatric patients often require sedation or general anesthesia to prevent movement during high-voltage radiation. Because personnel cannot be present during this 2- to 3-min period of radiation, the anesthesiologist usually monitors such patients using closed-circuit television. However, resolution of the television monitor is poor, and movements of the chest or anesthesia bag are often impossible to see. Therefore, 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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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

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