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In Reply:—We began to use the size 2 laryngeal mask within weeks of its becoming available. At that time, the recommended technique was as shown in our figure 3,[1] that is, without the current emphasis on pressing the tip of the mask firmly against the soft palate. This difference may explain our 7% incidence of multiple insertion. We agree that figure 3 may suggest that the mask is inflated for insertion, although we did emphasize in the text that the mask should be deflated as the first step in the sequence of insertion. We apologize for any confusion this discrepancy has caused.

Dr. Brain comments on the position of the mask relative to the epiglottis (our fig. 2) and states that the epiglottis is usually within and not above the mask. We suggest that figure 2 shows the mask abutting on the epiglottis, and not below it; the figure was deliberately drawn this way to avoid the suggestion that the epiglottis should always be included within the mask. Our observations of x-rays of the mask in place showed that the epiglottis did not have a constant relation to the upper border of the mask. We did not wish to suggest that correct placement requires the epiglottis to be within the mask.

We hope that these comments help further elucidate Dr. Brain's observations on our paper, and we remain grateful to him for the invention, which has been such an advance in anesthetic practice.

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REFERENCE

1. Grebenik CR, Ferguson C, White A: The laryngeal mask airway in pediatric radiotherapy. ANESTHESIOLOGY 72:474–477, 1990

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Anesthesia Machine for Use during Magnetic Resonance Imaging

To the Editor:—Magnetic resonance imaging (MRI) is becoming an increasingly popular noninvasive radiologic diagnostic procedure because it does not involve ionizing radiation and because it provides better image quality. MRI requires the patient to be absolutely still for the duration of the procedure, which may last from several minutes to hours. Most patients can undergo imaging while awake or under light sedation; however, certain patients require deep sedation or general anesthesia and tracheal intubation.[1]

Most MRI units use a 1.5-tesla superconducting electromagnet, which interferes with the function of currently available conventional anesthesia machines, electronic monitoring devices, and alarm systems. In addition, an anesthesia machine's ferromagnetic components may cause it to be forcibly attracted toward the MRI magnet and may also cause distortion of the image. We approached the Ohmeda® company to explore the feasibility of manufacturing a commercially available nonmagnetic anesthesia machine for use near the MRI magnet.

All ferromagnetic material in the Ohmeda Excel 210 model has been replaced with aluminum or nonmagnetic stainless steel. The frame, chassis, and drawers were made of aluminum. Oxygen and nitrous oxide tanks were replaced with aluminum tanks. The machine can also accommodate pipeline hoses for oxygen, nitrous oxide, and air. Two Tec-4 vaporizers, gas management system (GMS) absorber, a waste-gas–scavenging interface valve assembly, an oxygen monitor (5120), and a GMS–PEEP valve, all manufactured by Ohmeda®, can be used with this machine with optimal function in the 1.5-tesla magnetic field. This machine is also equipped with the recommended safety features, including hypoxic guard, oxygen supply pressure alarm, pin-indexed cylinder hanger yokes, and a recessed oxygen flush valve (fig. 1).

We evaluated the MRI-compatible anesthesia machine on several children and adults. We found the machine to perform satisfactorily in close proximity to the 1.5-tesla magnet, within the MRI suite. The output of the Ohmeda® vaporizers was checked with a mass spectrometer and found to be accurate.[2] Alternatively, the presence and use of the anesthesia machine in the proximity of the magnet did not disturb the image quality. The machine is approved by the Food and Drug Administration and is now commercially available.

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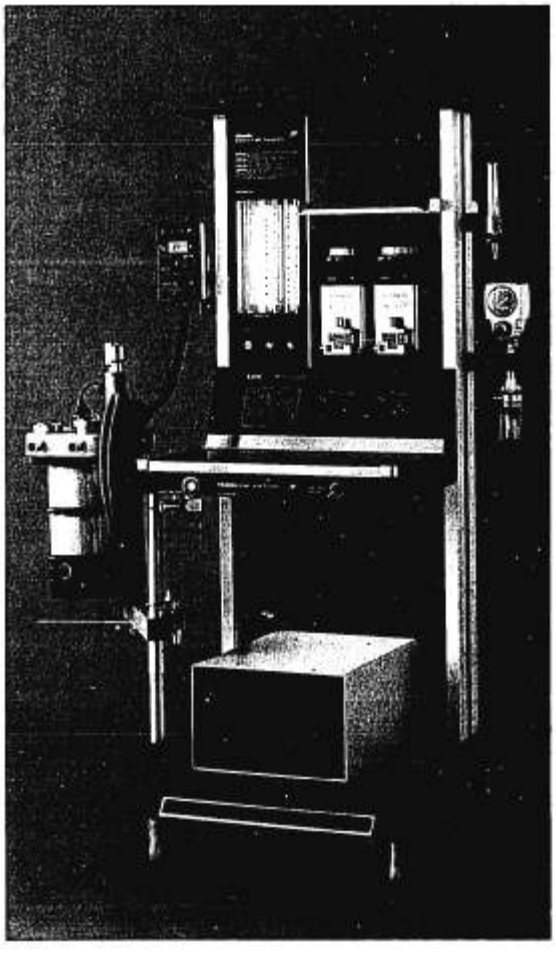

FIG. 1. Commercially available, MRI-compatible Ohmeda® Excel 210 anesthesia machine.

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Neither the authors nor Indiana University has any proprietary interest in the product described in this letter.

REFERENCES

1. Rao CC, McNiece WL, Emhardt J, Krishna G, Westcott R: Modification of an anesthesia machine for use during magnetic resonance imaging (letter). ANESTHESIOLOGY 68:640–641, 1988
2. Rao CC, Brandl R, Mashak JN: Modification of Ohmeda® Excel 210 anesthesia machine for use during magnetic resonance imaging (abstract). ANESTHESIOLOGY 71:A365, 1989

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Wearing of Gloves by Anesthesia Personnel

To the Editor:—Anesthesia personnel are urged to wear rubber gloves while involved in patient care. There are at least two ways in which the wearing of rubber gloves is detrimental.

First, the skin of the hands becomes soft, macerated, and vulnerable when rubber gloves are worn continuously for many hours. It is well known that rubber gloves develop holes through which contaminants enter; therefore, the sense of security afforded by wearing gloves may be false.

Second, if anesthesia personnel are not wearing gloves and come into contact with secretions or blood, they quickly wash their hands. However, while worn, soiled gloves may come into contact with the pen, ear piece, stethoscope, papers, charts, anesthesia equipment, and other objects. Anyone, including nongloved anesthesia personnel, who touches any of these objects is therefore exposed to the contamination. Many people, for instance, put pens in their mouths.

Therefore, when gloves are worn, they should be removed and discarded as soon as the contact with blood or secretions has ended (after intubation). Clean gloves can be put on whenever such contacts are to recur. In the interim and for long periods, anesthesia personnel can and should be ungloved so that skin does not become macerated.

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Intravenous General Anesthesia Is *Not* Intravenous Sedation

To the Editor:—We write with concern about the article by Furman and Smith[1] describing "intravenous sedation" for repair of giant inguinal hernias in a ventilator-dependent premature infant. The authors conclude that by using "caudal anesthesia with iv sedation," they circumvented the use of halogenated agents and minimized pulmonary barotrauma and cardiovascular depression. At the time of the infant's preoperative evaluation, his respirations were assisted with an infant pressure-cycled ventilator set at 36 breaths per min. An additional 16 breaths per min of spontaneous ventilation gave him a total of 52 breaths per min. "Intravenous sedation" with 3.5 mg/kg ketamine plus 0.14 mg/kg midazolam was followed by caudal blockade with 1.1 ml/kg 0.25% bupivacaine containing 5 μg/ml epinephrine. Prior to incision, an additional 3.5 mg/kg iv ketamine was administered. Before completion of the hernia repair, both an additional dose of caudal bupivicaine and yet another 3.5 mg/kg iv ketamine plus 0.14 mg/kg midazolam was given. Thus, for the completion of a 3-h hernia repair, the patient received a total of 10.5 mg/kg iv ketamine, plus 0.28 mg/kg iv midazolam, in addition to continuous caudal anesthesia.

The anesthetic described above hardly constitutes iv sedation as an adjunct to caudal anesthesia, but rather suggests iv general anesthesia as an adjunct to a caudal block. No mention is made of the patient's spontaneous respiratory effort after the initiation of iv anesthesia, yet the authors conclude that by avoiding halogenated agents, opioids, and muscle relaxants, they prevented the need for controlled ventilation intraoperatively. It is likely that the patient was fully anesthetized with iv ketamine[2] and midazolam and that most of his muscles distal to his midthorax were relaxed due to the caudal block. In this situation, intermittent mechanical ventilation at 36 breaths per min should be more efficient and might even improve his blood gases, even in the absence of spontaneous breathing. The authors further point out that no increases in mechanical ventilation were necessary, thereby reducing the risk for pneumothorax, but offer no evidence by way of capillary or arterial blood gas analysis to support the efficacy of their choice. It is likely that the elimination of the 16 spontaneous breaths per min, with some combination of fentanyl, an inhalation agent, and a neuromuscular blocking agent with a local anesthetic block for postoperative pain relief, would not have altered this patient's ventilator course at all, and that recovery probably would have been swift and complete. Our assumption would be that decreases, and not increases, in the need for mechanical ventilation may have been the rule in this patient if he was sedated and given neuromuscular blockade.

It is our contention that this infant received an iv general anesthetic,