patients or those requiring positive end expiratory pressure, even small leaks can be dangerous.

The simple solution is for the anesthesiologist to empty the cuff at the end of the case and replace the gas with room air.

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Is Metocurine Better?

To the Editor:—The finding by Stirt *et al.*[1] that pretreatment of patients with a small "defasciculating" dose of metocurine could prevent increases in ICP induced by succinylcholine (Sch) is of particular interest to anesthesiologists who frequently care for patients with compromised intracranial compliance. However, in many centers, the use of metocurine is declining, and some hospitals are removing it from their formularies, thus decreasing its availability for use. Unfortunately, the efficacy of the various non-depolarizing muscle relaxants varies with respect to their ability to prevent some of the undesirable effects of succinylcholine,[2–4] so that this finding with metocurine cannot be extended to other agents without specific testing.

Another issue, as recognized by Stirt *et al.*, is the fact that airway manipulation, intubation, etc., can all raise ICP, and attention must be given to these other sources of intracranial hypertension. With this in mind, pancuronium, or other non-depolarizing relaxants, may still be preferred over the metocurine-succinylcholine combination. In work reported by McLeskey *et al.*,[5] four patients given 3 mg of d-tubocurarine for defasciculation followed by succinylcholine had either no change or a decrease in ICP 1 min after succinylcholine administration, but two of the four had increases in ICP greater than 9 mmHg during tracheal intubation. In contrast, none of the eight patients given pancuronium (0.1 mg/kg) had increases in ICP of more than 9 mmHg during intubation (one had an increase to 8 mmHg). These data suggest that pancuronium may help mitigate ICP changes during intubation, which succinylcholine, even after defasciculation, may not do. The fact that pancuronium decreases the MAC of halothane[6] and, possibly, of other agents may help account for its effect during intubation. However, the multiple, closely spaced manipulations carried out by McLeskey *et al.* make this suggestion speculative rather than definitive, and indicate the need for further work.

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In Reply:—We thank Dr. Young and her group for their interest in our paper,[1] and would offer two comments.

First, it is indeed true that the availability of metocurine, like that of gallamine, is decreasing, lessening its use even where it might be indicated. Thus, the anes-

thesiologist who chooses to safely employ succinylcholine with pretreatment in the neurosurgical patient population is faced with a dilemma, since no studies have evaluated the use of relaxants other than metocurine for pretreatment in a rigorously controlled fashion. However, we would predict, based on our clinical experience with each of the nondepolarizing relaxants as pretreatment agents prior to succinylcholine in the neurosurgical patient population, that 1 ml of any of the currently available nondepolarizing relaxants would serve equally well as protection against succinylcholine-induced intracranial pressure (ICP) increases.

Second, the effect of pancuronium on ICP has been explored in the clinical arena,[2] but not in a carefully controlled fashion, as Dr. Young *et al.* note. For example, patients in the study alluded to[2] received thiopental doses of 450–800 mg and were hyperventilated with 1% enflurane, making the effects of pancuronium itself on ICP rather hard to discern.

To attempt to protect against increased ICP during intubation by using pancuronium for muscle relaxation as opposed to other, newer nondepolarizing agents would be less than ideal. While pancuronium may not adversely affect ICP, its sympathomimetic effects in intubating doses may be undesirable. Atracurium[3,4] or vecuronium[5] have been shown to be without significant effects on ICP, blood pressure, and heart rate in neurosurgical patients at risk for ICP increases, and might be preferable alternatives.

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Separating the Lungs of Dogs without Obstructing the Right Upper Lobe Bronchus

To the Editor:—Doctors Muneyuki, Konishi, Yada, and Kinoshita have recently shown that the bronchial orifice of the right upper lobe originates above the level of the tracheal carina in the majority of dogs.[1] This anatomical feature precludes separation of the two canine lungs with any currently commercially available human or canine double-lumen tube without obstructing the right upper lobe. These authors are to be congratulated for recognizing this technical difficulty, designing a special double-lumen tube to eliminate the difficulty, and successfully testing their double-lumen tube. This is an important advance, because I believe that few physicians conducting research in this area are aware that this problem or a solution to it exist.

I recognized this problem in previous open-chested canine experiments and devised an alternative method of separating the two lungs without obstructing the right upper lobe bronchus. A single-lumen tube is placed into the trachea and advanced until the tip of the tube is palpated, from within the chest, to be just into the left mainstem bronchus (proximal to the left upper lobe). A ligature is placed around the left mainstem bronchus and single-lumen tube, and tightly tied around both structures. A second single-lumen tube is placed high in the trachea and used to ventilate the right lung. The ligature separates the two lungs, eliminates the need for potentially obstructing balloons, eliminates the need for hand-fashioning a special double-lumen tube, and works 100% of the time.

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