

TABLE 1. The Results of Thirteen Patients

	Age (yr)	Weight (kg)	Height (cm)	Distance From Carina to LUL Bronchus (mm)	Movement of Proximal Tip (mm)	Movement of Distal Tip (mm)
Mean \pm 1 SD	60 \pm 14	50 \pm 7	159 \pm 8	56 \pm 4	28 \pm 6	27 \pm 6
Ranges	29-76	38-59	147-175	50-65	10-35	15-35

line encircling the tube at 4 cm from the distal tip (black in color) in the carina and the inflated bronchial cuff (blue in color) in the left main bronchus. We defined this position of the DLEBT as the neutral position. Two anterior-posterior chest x-rays then were taken in each patient, one with the neck flexed, another with the neck extended.

The position of the three radioopaque marks (distal tip, encircling line, and tracheal tip) were compared, by measuring the distance between each mark in the two chest x-rays. In all patients, flexion of the neck caused the DLEBT to move distally, while extension of the neck caused it to move orally. The results are summarized in table 1. There was no correlation between the height of the patient and the distance the DLEBT moved. There were two potential complications: in one patient extension of the neck almost caused the bronchial cuff to move out from the left main bronchus, in another flexion of the neck almost caused obstruction of the left upper lobe bronchus. Both were confirmed by bronchoscopy.

Our observations clearly indicate movement of the DLEBT in the trachea and bronchus with flexion and extension of the patient's neck. Since the distance from the carina to the left upper lobe orifice ranged from 50 to 65 mm, motion of the head could cause malposition of the bronchial port of the DLEBT with either inadvertent extubation or obstruction of the left upper lobe. Therefore, whenever the patient is repositioned, we recommend that the position of the DLEBT be rechecked by auscultation, bronchoscopy, and/or roentgenography.

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Are Seizures Caused by Nitrous Oxide or Isoflurane?

To the Editor:—Drs. Poulton and Ellingson have described a patient who developed both clinical and electroencephalographic evidence of seizure activity on induction of anesthesia with isoflurane and nitrous oxide.¹ The seizure was attributed to isoflurane. The investi-

gators considered that nitrous oxide did not contribute to the phenomenon observed.

I believe the possibility of an effect from nitrous oxide should not be discounted. The finding that the convulsive activity appeared with induction of anesthesia

but did not continue during maintenance of anesthesia with isoflurane or reappear on recovery supports a role for nitrous oxide, since the effect of nitrous oxide would be most prominent on induction (*i.e.*, before the development of anesthesia with the more soluble isoflurane). Perhaps nitrous oxide produced the seizure and isoflurane subsequently suppressed the convulsive activity. Isoflurane has been shown to possess anticonvulsant activity.² Such a hypothesis also is consistent with the absence of convulsive activity on recovery, since isoflurane would be eliminated more slowly than nitrous oxide and thus would continue to suppress any tendency toward nitrous oxide-induced seizures.

The publication by Krenn *et al.*³ may be used to support the hypothesis that nitrous oxide rather than isoflurane produced the seizure seen. Krenn *et al.* administered halothane three times to a 5-year-old boy, twice with nitrous oxide and once without nitrous oxide.

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In reply:—Dr. Eger makes a valuable and welcome point. We were unaware of the reference by Krenn *et al.* at the time the manuscript was originally prepared. It certainly does support the possibility that nitrous oxide rather than isoflurane may have produced the seizure observed in our patient.

It is noteworthy that, since publication of the manuscript, I have communicated with an established investigator who years ago was a junior member of a research team that prepared one of the early reports cited in my manuscript. On condition of strict confidentiality of my source, that investigator shared with me his recollection that "two or three" unpremedicated subjects experienced seizures during isoflurane anesthesia but were not re-

ported in the published series. The reason for the failure to report the data was attributed to "the pressure under which we were working."

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Simple System for Portable Positive End-expiratory Pressure

To the Editor:—Positive end-expiratory pressure (PEEP) frequently is required when transporting ventilated patients to and from the intensive care units and operating rooms. The two most common systems used in conjunction with a nonbreathing resuscitation bag are the Magnetic PEEP valves (Instrumentation Industries) and PEEP Accessory (Puritan-Bennett Corporation). These products are internally complex and require

testing and calibration prior to use. We have assembled an accurate, lightweight, inexpensive, and simple-to-use system that has been employed successfully in our institution (fig. 1). It avoids the necessity of monitoring PEEP levels in transit and limits the risk of undetected disconnection because all parts are simple in function and within the operator's view.

An expiration diverter (Laerdal Medical Corporation)

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