face of this principle. On one hand, as was pointed out, the manufacturer appeared to be overreaching the drug's approved labeling through selective marketing. On the other hand, the manufacturer was only placing the approved labeling before practitioners who have every right to use the drug as they see fit. Both interpretations have merit, and to choose one is to accept responsibility for denying the merits of the other. Of course, making such choices is a primary function of regulatory agencies such as the FDA. In this light, I believe that the Editor appropriately deferred to that agency's authority when he was asked to choose one interpretation over the other.

However, this does not mean that an individual's opinion has no value when these situations arise. No agency is large enough to notice all the issues that arise under its jurisdiction. A concerned physician can bring to an agency's attention issues such as this, that otherwise might go unnoticed.

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76:478–479, 1992

Alternative Bronchial Cuff Inflation Technique for the Univent® Tube

To the Editor:—Recently Hannallah pointed out with respect to bronchial cuff inflation of the Univent (Fuji Systems Corporation, Tokyo, Japan) endotracheal tube that it is essential to identify the point at which a seal is obtained between the bronchial blocker cuff and the bronchial wall using the least amount of air, so that minimal pressure is exerted on the bronchial wall mucosa.[1] After inflating the cuff with the recommended 6–7 ml air, we measured inflation pressures exceeding 50 cmH_2O within the cuff. The following is an alternative method that we recommend to ascertain the initial point at which bronchial seal occurs.

End-tidal CO_2 analyzers draw gas samples from the anesthesia breathing circuit *via* tubing terminating in a standard Luer lock male connecter that inserts into a female port in the breathing circuit. The male connector also attaches to the female port at the proximal end of the Univent's bronchial blocker. The tracing from a gas analyzer, connected to the blocker with its cuff deflated, shows a typical respiratory waveform. As the blocker's cuff is steadily inflated, a point is reached at which the respiratory waveform abruptly ceases, and a straight line is seen, indicating that lung isolation has occurred (fig. 1). CO_2 concentration remains near its end-tidal value until the blocked lung has collapsed and then rapidly decreases.

There is, however, no guarantee that this seal will be maintained against a higher pressure gradient than that applied during the original test. Should the adequacy of the seal be in question, the capnograph may be reapplied to the blocker and more air inserted into the cuff if necessary. We believe that the strengths of this method include simplicity, repeatability, and ability to ventilate the unblocked lung continuously throughout the procedure, although care must be taken to prevent secretions and/or blood from occluding either the lumen of the bronchus blocker or the capnograph tubing.

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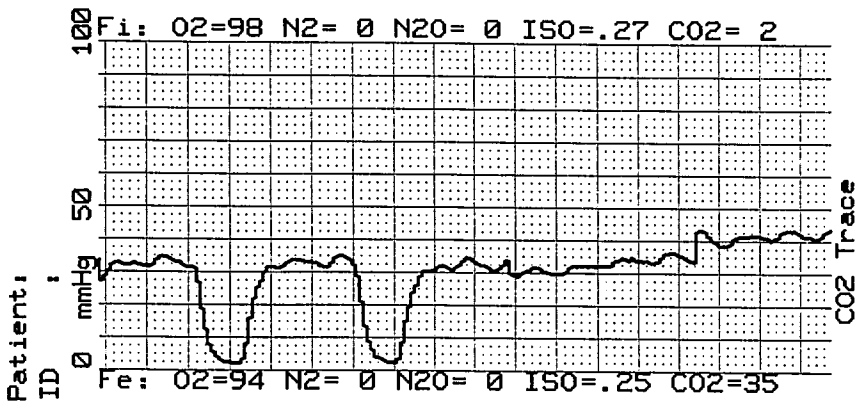

FIG. 1. Capnograph tracing showing normal respiratory waveform changing to a straight line as bronchial seal occurs.

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Mechanical *versus* Manual Ventilation of the Lungs of Infants in the Operating Room

To the Editor:—Steward's recent editorial[1] concerning managing infants in the operating room is extremely misleading when it states that "in this day of reliable volume-cycled ventilators . . . mechanical ventilation provides very predictable and constant gas exchange."

In most intensive care unit settings at present, the lungs of infants are ventilated with time-cycled pressure-limited ventilators. The tidal volume the infant receives will directly vary with the changes in the patient's compliance.

However, what is often not appreciated is that even with a "volume-cycled ventilator," as may be used by many anesthesiologists in the operating room, the tidal volume the infant receives still varies with any changes in the patient's compliance. This is because the tidal volume delivered by the ventilator flows into both the ventilator circuit and the patient. The relative distribution of the tidal volume between the circuit and the lungs is dependent on their relative compliances. Any change in compliance of the lungs will alter the fraction of the tidal volume delivered to the patient.

In a normal adult where the compliance of the lungs is much larger than that of the circuit, this correction factor is very insignificant. In an infant, especially one with pulmonary disease, the two compliances may be nearly identical despite the use of special low-compliance tubing and other modifications of the circuit and ventilator. The circuit will then receive a significant amount of the tidal volume.

An infant with significant pulmonary disease in whom compliance of the lung is constantly changing throughout a surgical procedure is very unlikely to receive predictable and constant gas exchange. One might refer to this as the mistaken faith in the "not-so-educated ventilator."

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In Reply:—I do not believe that I suggested that what comes out of any ventilator is necessarily what goes into the infant; I doubt if there are many anesthesiologists who are naive enough to believe this. I did, when considering manual ventilation, refer to the relative size of the compression volume of the anesthesia circuit compared to the small tidal volume to be delivered. This, of course, is still a factor if we replace the hand with a ventilator. Whether to take this latter step was the real question that I posed.

I did say that I believe many of us are relying more and more on mechanical ventilation even for small infants. A volume-cycled ventilator *can* produce predictable and constant ventilation over long periods of time (cf. manual ventilation), may avoid undesirable major fluctuations in arterial carbon dioxide tension, and leaves our hands free for other duties; in addition, the adequacy of ventilation *can* be continuously monitored by oximetry and end-tidal carbon dioxide sampling. If there is a change in the level of ventilation (*e.g.*, due to changing compliance), we note this either by our ears or our electronic monitors, and we make appropriate adjustments to the ventilator or we resume manual ventilation. This, I think, is the way that many of us now conduct the management of our infant patients. Nowhere did I suggest that we should place any increased faith in the ventilator. Rather, on the contrary, I suggested that, when things change, most will still respond by going back to the uneducated hand!

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