Nitrous Oxide and Hypoxic Ventilatory Responses

To the Editor:—The article by Yacoub and colleagues (Anesthesiology 45: 385–389, 1976) is both interesting and important because nitrous oxide has long been regarded as a harmless gaseous anesthetic, causing minimal physiologic derangement. When describing the ventilatory response to hypoxia, Yacoub plotted ventilation (V_e) vs. alveolar P_O2 (P_AO2). A hyperbolic function was obtained and an “A” value derived as described by Weil et al.1 It is now recognized that the ventilatory response to hypoxia varies linearly with arterial oxygen saturation (S_AO2).2–4 Thus, by plotting V_e vs. S_AO2, a linear function may be obtained. The straight lines thus generated are suitable for analysis by simple, conventional, statistical methods. Ear oximetry, with its advantages of non-invasiveness and immediate information, may be used to measure S_AO2 during experiments.5

We have taken the data presented in figure 1 of Yacoub’s article and converted P_AO2 to S_AO2. We then replotted Yacoub’s data in the format suggested by Reubuck and Campbell3 and Reubuck and Woodley4 and obtained a linear function of the ventilatory response to hypoxia. Severinghaus has recently used a similar method to reexamine his previous data and has confirmed Reubuck’s observations.6 Using this method, the ventilatory response to hypoxia (without added resistance) in figure 1 of Yacoub’s article becomes 0.41 l/min/l per cent decrease in S_AO2. The correlation coefficient of the line is 0.9. With nitrous oxide, the slope decreases to 0.11 l/min/l per cent decrease in S_AO2. The decrease in the ventilatory response produced by nitrous oxide inhalation is highly significant (P < .001).

References

(Accepted for publication November 29, 1976.)

Removal of an Inflated Endotracheal Tube Cuff

To the Editor:—As developers of the Bivona Cuff, we were perturbed by the report by Doctors Tavakoli and Corssen1 of an isolated case in which a “hazardous complication” occurred because of separation of the pilot tube from the body of the endotracheal tube, thereby making routine deflation of the cuff impossible.

Directions for the use of a Bivona Fome-Cuf tube, accompanying each package, clearly state that the unit may be removed without cuff deflation. In no way is extubation hampered by an accidental loss of the pilot tube. The foam-filled cuff can be contracted either by applying suction to the pilot tube or by squeezing the cuff. The former, of course, is the common clinically accepted practice. But, in the event the pilot port is accidentally sheared off, the cuff will still collapse as it is gently pulled out (squeezed) through the vocal cords. This can be easily demonstrated by pulling a lightly lubricated cuff through one’s partially opened fingers.

Several of our colleagues have commented that they prefer not to deflate the cuff prior to extubation because they believe that accumulated secre-