



FIG. 1 (upper). A nasal airway with an adapter connected to the breathing circuit.

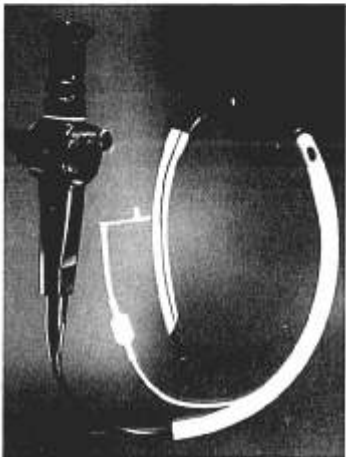


FIG. 2 (lower). A nasal airway with a longitudinal slit is used as a guide for the insertion of the fiberoptic bronchoscope during nasotracheal intubation.

for the insertion of the flexible fiberoptic bronchoscope in the other nostril (fig. 2). When adequate visualization of the cords is obtained, the nasal airway is removed and the prepositioned endotracheal tube is slipped over the bronchoscope into the trachea. The technique is advantageous in that intubation is achieved with minimal trauma and discomfort to the patient.

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### CPAP Oxygenation during One-lung Ventilation Using an Underwater Seal Assembly

*To the Editor:*—During one-lung ventilation (OLV), oxygenation can be optimized by insufflating oxygen at 10 cmH<sub>2</sub>O into the nonventilated lung.<sup>1</sup> This letter describes a simple device using an underwater seal (fig. 1) that can function as a device for applying continuous positive airway pressure (CPAP) to the nonventilated lung as well as a bronchial seal indicator.<sup>2</sup> When the oxygen flowmeter is off, the device becomes a simple underwater seal that functions as an indicator for a precise end-point inflation of the bronchial cuff. To provide CPAP oxygenation during OLV, the oxygen flowmeter is turned on; the required CPAP is controlled by the level of the underwater seal and checked by an aneroid manometer.

The device was used in eight adult patients undergoing thoracotomy in the lateral position. Anesthesia was induced by thiopental 5 mg/kg and succinylcholine 1.5 mg/kg. The patients' tracheas were then intubated with Robertshaw double-lumen tubes with the bronchial limb corresponding to the nonoperated lung. Anesthesia was

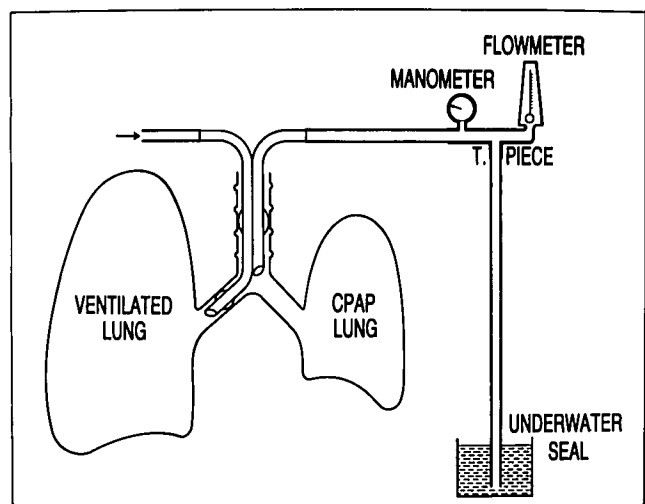


FIG. 1. Diagram of the underwater seal-oxygen flowmeter assembly. The device is attached by a tubing to the limb of the double-lumen tube corresponding to the nonventilated lung.

maintained with 1–2% halothane in oxygen supplemented by pancuronium. During two-lung ventilation, the  $P_{aO_2}$  was  $486.0 \pm 104.0$  mmHg. Shifting to OLV lowered the  $P_{aO_2}$  to  $191.0 \pm 144.0$  mmHg ( $P < 0.005$ ). Applying CPAP 10 cmH<sub>2</sub>O to the nonventilated lung increased the  $P_{aO_2}$  to  $353.0 \pm 178.0$  mmHg when 7 l/min of oxygen was used ( $P < 0.025$ ), and to  $355.0 \pm 175.0$  mmHg when 1 l/min of oxygen was used ( $P < 0.01$ ); there was no significant difference between the  $P_{aO_2}$  levels whether 1 or 7 l/min of oxygen was used ( $P > 0.2$ ).

The underwater seal assembly offers a major advantage when compared with other CPAP devices that include a pressure relief valve.<sup>3,4</sup> The pressure relief valve functions by limiting the escape of the inflowing oxygen and thereby creates constant distending pressure to the nonventilated lung. However, untoward occlusion of the pressure relief valve, an increase of the oxygen flow, or lung manipulation may result in an excessive rise of the airway pressure. The threshold resistor valves offer a better alternative to the pressure relief valves,<sup>5</sup> but different threshold resistor valves are required to achieve different CPAP levels. Also, both the pressure relief and the threshold resistor valves cannot function as an indicator for bronchial sealing. In contrast, the underwater seal is used as an indicator for bronchial sealing,<sup>6</sup> as well as a CPAP valve which can be adjusted according to the required CPAP level. The CPAP level shows minimal fluctuations secondary to changes of the oxygen flow or lung manipulation.

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### On the Acceleration of Epinephrine Absorption by Lidocaine

*To the Editor:*—We were interested in the recent report by Ueda *et al.*<sup>1</sup> describing the effect of lidocaine on the absorption of epinephrine. The authors compared 0.5% lidocaine containing 1:200,000 epinephrine with 1:200,000 epinephrine alone. No mention was made of how these solutions were prepared.

Moore<sup>2</sup> has noted that commercially prepared local anesthetic solutions containing epinephrine have a low pH and are not as effective for vasoconstriction as freshly prepared solutions. Guyton<sup>3</sup> states that low pH will cause vasodilation.

We found the pH of commercially available 0.5% lidocaine with 1:200,000 epinephrine (Astra) to be 3.78, whereas a 1:200,000 solution of epinephrine prepared by diluting 1:1000 epinephrine with preservative-free normal saline had a pH of 5. If Ueda *et al.* used solutions made in this fashion, the pH differences alone may have been responsible for the variation in epinephrine uptake attributed to the lidocaine.

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