A Simple Device for Continuous Measurement of Inspired Oxygen Concentration

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There is increasing recognition of the need for continuous monitoring of inspired oxygen concentrations delivered by ventilators to critically-ill patients. Despite advances in the development of calibrated air-oxygen mixing devices, it is nonetheless still important to have the capability for continuous recording of moment-to-moment changes in the delivered concentration of oxygen.

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At Wilford Hall USAF Medical Center the device described here (fig. 1) enables the physician and nurse to be continuously cognizant of changes in the inspired oxygen concentration. The figure shows a standard plastic three-way stopcock, attached to B, the input line of a Beckman oxygen analyzer. The male arm of the plastic stopcock is inserted into the superior opening of a standard Bird Y piece connector, C, which is in turn attached to the patient (D). The entire assembly is then connected to the ventilator. When the control lever of the stopcock is

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placed as shown in the figure the inspired partial pressure of oxygen can be monitored continuously as the gas drive of the ventilator will continuously fill the input line of the oxygen analyzer.

Adjustment of the control lever of the stopcock will also permit sampling of gas for measurement in electrode systems, continuous sampling for other measurements (e.g., pneumotachograph, CO₂ analyzer, etc.), cessation of flow through the O₂ analyzer, or cessation of flow through any portal of the stopcock. This device is inexpensive, simple to install or replace, and allows expansion of monitoring capabilities in patients who require constant ventilatory support.

Bupivacaine Hydrochloride: Laboratory and Clinical Studies

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A long-acting aniline local anesthetic agent, bupivacaine (1-n-butyl-DL-piperidine-2-carboxylic acid-2,6-dimethylanilide hydrochloride) (LAC 43, Marcaine), was synthesized in 1957 by Af Ekenstam et al. Its chemical and pharmacologic properties have been studied in the laboratory, and at least 24 reports of its clinical use in Europe, Japan, and South America have appeared.²-²⁶

The present study of bupivacaine was designed to: 1) measure bupivacaine in whole blood over a four-hour period following a single dose, as an index of elimination from the blood; 2) discern toxicity, i.e., changes in blood morphology, blood chemistry, and urine; 3) correlate dosage with blood levels and de-