

## CORRESPONDENCE

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*In Reply:*—The observations by Edmonds and Chabot and their colleagues raise several important issues. The technical limitations of Bashein's work are recognized, and the suggestion of an eight-channel montage of bipolar pairs specifically selected for watershed areas is, from a neurophysiologic viewpoint, preferable to the more common two-channel montage. The suggestion of a statistical adaptive analysis has merit for dealing with the great variability in the electroencephalograph (EEG). Unfortunately, the history of EEG analysis during anesthesia contains many optimistic reports of new analysis techniques that subsequently proved less valuable than suggested by initial reports. Whether the proposed adaptive statistical approach suffers the same fate will depend upon prospective, randomized, blinded-observer investigations using standard neurophysiologic tests, studies yet to be performed.

Anesthesia practice for cardiac surgery varies widely, and not all anesthesiologists eschew inhalational agents, bolus doses of opioids and sedatives, and other factors that are likely to increase EEG vari-

ability and complicate EEG interpretation. Until the implications of such variations are understood, the generalization to all patients of results derived from a restricted protocol is problematic. For the clinical anesthesiologist searching for a technique to improve patient care, such difficulties are an important disincentive to the use of EEG monitoring, and the data presented by the respondents are insufficient to alter this conclusion. While these data suggest a need for further studies, those who would engage in such research must be prepared for the effort and the difficulties.

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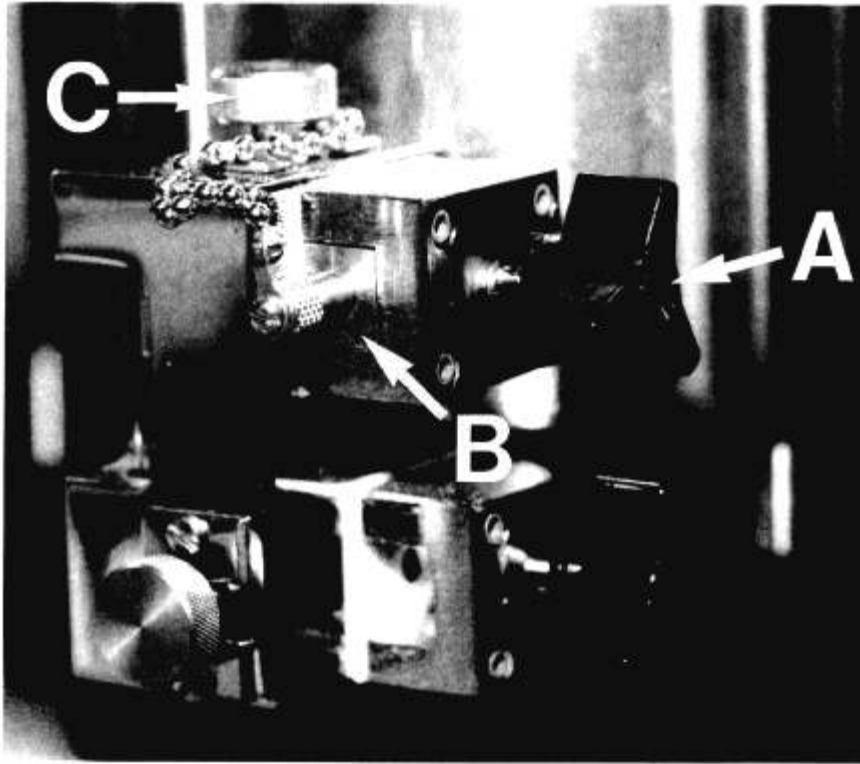
## Potential Fresh Gas Flow Leak through Dräger Vapor 19.1 Vaporizer with Key-Index Fill Port

*To the Editor:*—Most newer anesthetic vaporizers are equipped with a fill and drain port. Malfunction or improper use of the fill and drain ports may allow a significant leak of anesthetic agents.<sup>1,2</sup>

The Dräger Vapor 19.1 anesthetic vaporizer equipped with a key-index fill and drain system prevents inadvertent use of the wrong anesthetic agent (fig. 1). However, under certain conditions, a significant leak can exist that may not be readily located. If the fill port lock screw is not tightly secured with the filler plug fully engaged prior to using the vaporizer, then total fresh gas flow through the anesthetic machine can leak through the vaporizer and out of the fill port. Importantly, it is inadequate to have only the filler plug in place; the fill port lock screw must be tightly secured to prevent such a leak. Closure of the fill valve has no effect on this leak.

It is our opinion the problem is one of design and therefore requires an additional step be included in testing the anesthesia circuit and breathing system. After closing the pop off valve and occluding the breathing system at the patient end, the system is filled *via* the O<sub>2</sub> flush valve to 20 cmH<sub>2</sub>O pressure. Each vaporizer should be turned on to test the patency of the fill port filler plug and fill port lock screw apparatus. If this apparatus is not properly secured, then the 20 cmH<sub>2</sub>O pressure within the system rapidly falls and there is a detectable odor of the agent. Although the key-index fill and drain system prevents inadvertent filling with the wrong anesthetic agent, unless the fill port filler plug and fill port lock screw apparatus are properly secured and tested with the vaporizer turned on, a clinically significant leak may exist.

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**Fig. 1.** Photograph of the key-index fill and drain system of the Dräger Vapor 19.1 anesthetic vaporizer. A fill port lock screw; B fill port with filler plug; C fill valve.

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*In Reply:*—We believe that proper use of the key-index fill and drain system as outlined in the instruction manual will prevent the occurrence of the fresh gas leak described in the letter. Specifically, instructions to fully insert the fill port plug to the stop position and tighten in place by clockwise rotation of the lock screw. A labeled diagram is also included in the manual.

Tightening of the lock screw does not require excessive torque to effect adequate closure.

It should be noted that a leak large enough to produce a detectable

odor of the agent during the pre-use check also should produce a detectable agent odor during use of the vaporizer.

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