Failure of Keyed Agent-specific Filling Devices

To The Editor:—The pin-index safety system was designed to insure that agent-specific vaporizers would be filled only with their designated inhalation agent. The American National Standards Institute recommends use of such a system to prevent accidental filling of vaporizers with the wrong agent, and a recent report attributed vaporizer filling errors at a large institution, in part, to an absence of this system. A recent experience uncovered a potential source of error in the keyed filler system.

During a case it became necessary to refill a halothane vaporizer that was fitted with a keyed receptacle. An unused bottle of halothane (Ayerst) was opened, but it was found that it would not fit the keyed halothane bottle adaptor. An enflurane bottle adaptor, however, readily fit this halothane bottle. Close inspection of the bottle revealed that the plastic collar on its neck was inverted and in this position would only accept the enflurane bottle adaptor. After much prying, the miscreant collar was removed and the correct bottle adaptor attached to the collarless bottle so that the vaporizer could be filled.

Experimentation with an enflurane bottle produces an analogous situation: removal and then upside-down replacement of the collar results in an enflurane bottle that will fit only the halothane bottle adaptor. The reason for this mismatching lies within the keys themselves: the halothane and enflurane bottle collar keys are mirror images of each other. The angles between the large and small lugs on their collars are the same and simply inverting one collar replicates the others key (fig. 1). During production, the collars are placed manually on the bottle neck, and a machine pushes the collars down onto the bottles (Marilee Wein, Ayerst Laboratories, personal communication). Despite careful inspection, occasional upside-down placement of the collars is possible.

In addition to presenting the wrong key, inverted collars can be identified because their lugs are flush with their sharp-edged upper surfaces. On a correctly seated collar, the lugs are flush with the bottom surface and do not reach the upper surface, which has a slightly rounded edge (fig. 2). Unlike the halothane and enflurane collars, inversion of an isoflurane collar produces a unique key that matches no bottle adaptor because the angle between its lugs is unique. The similarity between the halothane and enflurane keys could be eliminated by changing the distance between the lugs on either of the collars so that all three agent’s collars and their mirror images were unique.

Besides collar inversion, other potential sources of errors in the pin-index safety system include distribution of bottles without collars, enabling them to fit the wrong adaptors, and incorrect assembly of the vaporizer receptacle, allowing mismatching of the bottle adaptors to vaporizers. The keyed filler system was designed to prevent vaporizer misfilling and though the system is color

![Collars on Bottles](Fig. 2. Correct and incorrect positioning of collars on bottle necks. The inverted collar is identified by the lugs being flush with its upper but not its lower edge (arrows).)

![Bottle Adaptors](Fig. 1. Bottle adaptors and collars for halothane and enflurane (studded). The top view of the collars shows that their keys are mirror images.)
coded, inversion of the bottle collars may lead to confusing and potentially hazardous bottle adaptor mismatch.

THOMAS M. GEORGE, M.D.
Department of Anesthesiology
University of Michigan Medical Center
Ann Arbor, Michigan 48109

REFERENCES

1. American National Standard Minimum Performance and Safety Requirements for Components and Systems of Continuous-

Anesthesiology
61:229, 1984

Use of Spinal Anesthesia in Patients with Idiopathic Hypertrophic Subaortic Stenosis

To the Editor:—Without question, the patient with undiagnosed idiopathic hypertrophic subaortic stenosis (IHSS) who was given a spinal anesthetic tolerated it poorly.\(^1\) However, without knowing the level of the spinal block, which was not stated in the report, and from this one must conclude that it was not measured, it is impossible to know the mechanism(s) for the untoward events that occurred following completion of the block. Furthermore, by publishing this report, Drs. Loubser, Suh, and Cohen and the Editorial Board of Anesthesiology imply that spinal anesthesia may be hazardous in patients with IHSS. Such an implication is unjustified. The presence of IHSS may have had nothing to do with the untoward events that occurred.

The symptoms of chest pain and nausea; the signs of diaphoresis, vomiting, hypotension, tachycardia; and ECG changes denoting ischemia can occur in elderly patients who do not have IHSS if the level of spinal block is sufficient to produce a near total chemical sympathectomy. Even the rapid onset of the symptoms and signs after the block does not preclude this possibility. Supposing the patient had not been found to have IHSS when evaluated following the spinal anesthetic, which is altogether plausible and, in fact, a much more common event than spinal plus IHSS, then the diagnosis would have been an adverse response to high spinal anesthesia, and the case would not have been reportable.

The point of raising this issue is twofold. First, it is imprudent to conclude that because something unexpected is found after an untoward event, that caused or even contributed to the event, particularly when the event is well known to occur in the absence of the unexpected finding. Such is the situation in this case report. Second, this gives me the opportunity to reemphasize the value of continuous spinal anesthesia in situations such as this one. The insertion of a catheter into the subarachnoid space makes the technique highly controllable and quite appropriate in elderly patients with all varieties of heart disease requiring anesthesia for lower extremity surgery.

C. PHILIP LARSON, JR., M.D.
Professor of Anesthesia
Stanford University School of Medicine
Stanford, California 94305

REFERENCES


Concerning the Antiemetic Efficacy of Metoclopramide

To the Editor:—The results reported by Cohen et al.\(^1\) confirm a finding from this Department concerning the brevity of action of metoclopramide.\(^2,3,8\) In patients premedicated with morphine or meperidine with metoclopramide and having minor gynecologic operations with a standard anesthetic technique, we found a minimal reduction in postoperative vomiting unless a second dose was given at the end of operation. Our doses were 10–20 mg, and these had a short therapeutic but also minimal toxic effects. We would suggest caution with higher doses of metoclopramide, as these can produce extrapyramidal side effects.