

## Current Comment

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### CASE REPORT

#### Overdose with Ohio Halothane Vaporizer

Drs. Peter Safar, and Stephen J. Galla, of the University of Pittsburgh School of Medicine and Presbyterian-University Hospital, Pittsburgh, Pennsylvania, report that since the introduction of nitrous oxide-halothane anesthesia at the Presbyterian-University Hospital of Pittsburgh over 3,000 halothane anesthetics have been given without a death specifically attributed to the agent. However, on successive days, there were two similar accidents associated with the use of an Ohio halothane vaporizer (catalogue no. 309-0235-800; this is *not* the Vernitrol vaporizer). Both patients were successfully resuscitated and survived without complications.

**CASE REPORT:** A 72 year old man was anesthetized with thiopental and the trachea was intubated with the aid of succinylcholine. While waiting for spontaneous respirations to resume, nitrous oxide-halothane was given with controlled ventilation. Since the patient moved slightly during positioning, the anesthetist increased the vaporizer dial setting to "3.5," because in the preceding case it was impossible to keep the patient anesthetized at a lower dial setting. A few minutes later no pulse could be palpated in the carotid or femoral arteries. Prompt flushing of the lungs with oxygen, rapid intravenous infusion of phenylephrine, and external cardiac massage for three minutes were followed by the return of a palpable pulse, consciousness, and complete recovery without sequelae. The patient's color remained pink and his pupils were constricted throughout the episode.

Analysis of the events in retrospect revealed that prior to this anesthesia the anesthetist had refilled the jar of the vaporizer inadvertently to a level 4 mm. above the 'full' line (see fig-

ure). Consequently, the metal inflow tube extended about 1 mm. beneath the fluid level causing bubbling of the nitrous oxide-oxygen mixture through the liquid halothane. When the jar was filled exactly to the 'full' line the inlet tube extended to 3 mm. above the surface of the liquid halothane, leaving a minimal margin of safety.

Subsequent analysis of the halothane concentration delivered by this vaporizer revealed



Halothane Vaporizer

Percentage Halothane Delivered with 5 Liters/  
Minute Oxygen Flow Through Ohio Vaporizer  
at 23° C.\*

Dial Setting	Jar One-half Full	Jar Full	Jar 4 mm. Above Full
Off	0	0	0
0.5	0	0	0
1.0	0	1.0	0
1.5	0.5	2.2	0
2.0	0.6	3.0	9.9†
2.5	0.6	3.4	11.9†
3.0	0.6	3.4	11.9†

\* The mixture of gases exiting from the vaporizer was passed into a Model E2 Beckman Oxygen Analyzer. The zero adjustment was set with 100 per cent cyclopropane at a flow of 250 ml. per minute and the span adjustment set with oxygen at the same flow rate. The percentage halothane was obtained by subtracting the subsequent reading from 100 per cent.

† At this dial setting oxygen bubbled through halothane.

that overfilling the jar 4 mm. above the 'full' line resulted in concentrations three to four times those indicated by the dial setting (see table). In contrast, with the halothane level below the 'full' line the concentrations remained lower than the dial setting and essentially unchanged regardless of the dial setting. Even with the jar filled to the mark the concentrations delivered were inaccurate. It was discovered that the same vaporizer had been used in the other case of sudden pulselessness which had occurred during spontaneous breathing a day earlier.

Human error is an important factor in anesthetic mortalities, particularly in teaching institutions where personnel with varying degrees of training utilize the same equipment. A vaporizer which can deliver lethal concentrations merely because of inadvertent overfilling should either be prohibited or redesigned.

## GADGETS

### The Swivel-Joint

Dr. Joseph Galasso of New York City has devised a new means of connecting the endotracheal catheter to the gas apparatus assembly. He calls the device the "Swivel-Joint."

The joint consists of a male adapter for insertion into the endotracheal catheter (it comes in sizes 18F through 42F) and a female adapter which connects the male adapter to the gas apparatus assembly.

The female adapter is "universal" in that it fits all sizes of the male counterparts. It does not have to be twisted manually for assembly or disconnection; just a little snap will suffice.

Furthermore, it can be rotated 360 degrees in any direction. This maneuver enables the anesthesiologist to keep his hands away from the sterile field during head and neck surgery and eliminates obstruction of the airway caused by twisting of the endotracheal catheter. It is leakproof.

