

### Use of Charcoal to Rapidly Decrease Depth of Anesthesia While Maintaining a Closed Circuit

*To the Editor:*—The use of a charcoal filter in the inspiratory limb of the breathing circuit immediately drops the inspiratory concentration of volatile anesthetic agents to undetectable levels, and rapidly lowers the alveolar concentration. The patient's depth of anesthesia decreases at a maximal rate, independent of fresh gas inflow.

The adsorptive capacity of charcoal for volatile anesthetic agents is enormous.<sup>1-4</sup> The resistance to gas flow through charcoal is negligible.<sup>2</sup> Charcoal is inert and has been safely used in gas masks for decades. It poorly adsorbs high concentrations of nitrous oxide. Capon has shown that charcoal can be regenerated by autoclaving.<sup>5</sup> Heretofore, the recommended use of charcoal in anesthetic systems has been limited to the scavenging of waste gases. A recent article by Hawes *et al.*<sup>6</sup> does illustrate, without comment, an activated charcoal shunt located on the inspiratory limb of their experimental circuit.

We use 50 grams of charcoal\* placed in a 8.75 × 5 cm plastic cylinder. A two-way valve directs the inspiratory gas flow and initiates, or terminates, the "charcoal shunt" at any desired time. A 12-inch piece of disposable plastic tubing returns the filtered gas to the inspiratory limb.

This simple, inexpensive, and safe addition to a closed

circuit provides close control of circuit anesthesia concentration. Up to now circuit concentrations could be increased rapidly, but could not be rapidly decreased without opening the circuit and employing high flows. With the use of the charcoal filter, all the advantages of closed circuit anesthesia can be realized throughout the entire anesthetic, including emergence.

EDWARD A. ERNST, M.D.  
*Professor of Anesthesiology  
Department of Anesthesiology  
The University of Alabama in Birmingham  
University Station  
Birmingham, Alabama 35294*

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\* Purchased from Fisher Scientific, 711 Forbes Avenue, Pittsburgh, Pennsylvania 15219.

### Anesthetic Machine Explosion

*To the Editor:*—We would like to report a deflagration occurring in the flow-guard regulator of an anesthetic machine. The machine, manufactured by Dupaco, was equipped to operate from either E-sized cylinders attached to the machine or from the hospital's gas pipeline system and was in regular use in the Veterinary Medical Teaching Hospital (VMTH) of the University of Florida until it developed an audible gas leak at or near the oxygen pressure regulator, and was withdrawn from service to be repaired.

A representative of the manufacturer was asked to repair the leaking machine when he perchance visited

the hospital. The oxygen pressure regulator was replaced with a new part recently shipped from the company's main office. The repair process apparently required the use of a vice. A vice from the VMTH's building maintenance workshop was used. The machine was checked and, because it functioned normally, it was returned to normal service.

At the time of the machine repair, extensions were being completed to the VMTH's compressed gas pipeline system and the new lines flushed with nitrogen. On the afternoon of its repair, the anesthetic machine was used in checking the identity of gases delivered by the new