The Gas Trap: A Device To Minimize Chronic Exposure To Anesthetic Gases

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Recent studies 1–4 suggest possible deleterious effects of chronic exposure to certain common anesthetic agents. This report describes an inexpensive, easy-to-construct device which protects the anesthesiologist from these agents. It is simple to operate and is being used successfully in routine clinical practice.

MATERIALS AND METHODS

The device is a simple gas trap, constructed from a balloon, a straight endotracheal tube connector, and a piece of conductive rubber tubing. Anesthetic vapors are diverted from the pop-off valve either to suction or to an area of the operating room near the ventilation outlet.

The materials are assembled as shown in Figure 1. The balloon must be adapted appropriately to cover the various pop-off valves on different anesthesia machines. A hole cut in one side of the balloon, placed over the valve, traps all the escaping gases.

The balloon should be at least 3 inches in diameter (unexpanded) to allow for adjustment of most pop-off valves with the device in place. The hole in the balloon must be cut small to insure a tight seal. In constructing this device, it is important to use wide-diameter rubber tubing, at least ½-inch bore. A smaller size will offer too much resistance to the flow of escaping gases. If the device is connected to wall suction, the negative pressure of the suction apparatus should be set between 20 to 40 cm H₂O, which is usually adequate for a 5–6 L/min flow from the anesthesia machine. Alternatively, the rubber tubing outlet can be placed near a ventilating outlet and suction disregarded.

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FIG. 1. The gas trap disassembled, showing the component parts (upper drawing); and assembled and installed on a pop-off valve (lower drawing).

It is generally easier to use the device if the rubber tubing is divided into two sections joined by a connector. The shorter piece, connected to the balloon via the straight endotracheal tube connector, should be 6 to 12 inches in length. This facilitates connecting the gas trap to the pop-off valve. Once the trap is in place, the longer tubing, which may be of any length, depending on the distance to the suction apparatus or the ventilation outlet, is connected to the shorter tubing.

REFERENCES