To the Editor—Condensation of water vapor and accumulation of water in the breathing circuit of anesthesia machines may cause an increase in resistance to gas flow and its associated complications. We present a case of steadily increasing pressure in the breathing circuit after drainage of the water that had accumulated in the 19-mm hose that leads from the breathing system adjustable pressure limiting valve (through the absorber pole) to the 19-mm terminal on the scavenger interface. After the drainage of the water, the hose was reconnected by mistake, not to the 19-mm hose terminal from which it had been disconnected, but to the 22-mm adjustable needle valve (ANV) terminal on the closed reservoir scavenger interface of a North American Drager Narkomed 2B machine (Drager Medical, Telford, PA).

A 33-yr-old man was scheduled for retroperitoneal lymph node dissection under general anesthesia. Five hours after induction of anesthesia, during maintenance with isoflurane 1–2% in a 50:50 nitrous oxide:oxygen mixture with a fresh gas flow of 1 l/min, a gurgling sound was noted during the expiratory phase of ventilation. A survey of the machine revealed the cause to be accumulation of water in the 19-mm hose connecting the ventilator relief valve to the scavenger interface, “hose A” (fig. 1). To drain “hose A,” the ventilation was switched from automatic to manual mode; but while the patient was being ventilated manually, similar sounds were heard again, but now were emanating from the 19-mm hose that leads from the breathing system adjustable pressure limiting valve (through the absorber pole) to the 19-mm terminal on the scavenger interface, “hose B” (fig. 1). The water was drained from “hose A” and the ventilation was switched back to automatic mode to drain “hose B.” However, during emergence 3 h later, while attempting to restore spontaneous ventilation through manual ventilation of the patient, the end-expiratory pressure continued to increase from 1 cm H₂O to a maximum of 8 cm H₂O in spite of the fact that the adjustable pressure limiting valve was opened completely. As an immediate remedy for this situation and to decrease the risk of barotrauma, the breathing circuit was disconnected from the Y-piece. At this time it become apparent that after drainage of the water, “hose B” had been reconnected by mistake to the 22-mm ANV terminal on the scavenger interface (fig. 2). Such a mistake would not have been possible if the wing nut type of the ANV had been present instead of the screw type.

Discussion

The “screw” type ANV in Narkomed machine was changed to “wing nut type” by North American Drager in 1982 to allow easier manual adjustment of gas flow through the scavenger system. This modification of ANV eliminates using a screwdriver for regulation of the waste gas exhaust flow. However, using the screw type ANV is still approved by North American Drager for scavenging system.

To increase the safety of anesthesia and to decrease the chance of inadvertent improper connection of scavenger hoses and the resulting complications, we recommend changing all screw type ANV to a wing nut ANV in all Narkomed machines. The wing type ANV has a large
plastic wing nut and one inch round metallic lock nut, which renders the 22-mm terminal for the needle valve even more incompatible with 19-mm scavenger hose. This modification can be accomplished with a cost of $120. Furthermore, we recommend that all components of the breathing circuit be clear and transparent. This would include endotracheal tubes, face masks, breathing tubes, ventilator bellows, breathing bags, scavenger hoses, and scavenger reservoir bags. The benefit of such change is twofold: to add the benefit of visualization of the interior content of breathing circuit and to improve hygiene by early detection of contamination on the exterior surface.

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For clarification, the list price for the needle valve components is $100.00; however, prices are subject to change. Labor and travel would be extra if the customer wants the valve components installed by Draeger Medical, Inc.

The authors state that using the screw type needle valve is still “approved by North American Drager.” It is ambiguous what the authors mean by that statement. The screw type scavenger needle valve has not been used in the manufacture of North American Drager (Draeger Medical, Inc.) anesthesia machines since the design changed in 1982. The decision to use or not use medical devices of any type rests with the health care professional, not with the manufacturer.

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