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full dentition. She stood 158 cm tall, weighed 80 kg, with the majority of her weight distributed to the lower portion of her body. No other significant medical history existed. After intravenous sodium thiopental and succinylcholine, one unsuccessful tracheal intubation attempt by the student nurse anesthetist, two attempts by the certified registered nurse anesthetist, and two attempts by the staff anesthesiologist included varying head position, cricoid cartilage pressure, and use of both Macintosh and Miller laryngoscope blades. Laryngoscopy in all attempts permitted visualization of the epiglottis but not the vocal cords. Adequate ventilation was possible *via* face mask between intubation attempts. A call for help and a request for the difficult airway cart occurred simultaneously with return of the patient's spontaneous respirations. A blind nasal tracheal intubation by a second staff anesthesiologist succeeded on the third attempt. The gynecologic surgical procedure progressed uneventfully. A second airway assessment postoperatively was similar to her preoperative airway evaluation. Postoperatively, the patient experienced hoarseness and soreness of her pharynx and larynx for 10 days. The patient registered with the Difficult Airway Medic Alert Registry and purchased a Medic Alert bracelet.*†

Subsequently, her edentulous mother, at another hospital, after intravenous induction of general anesthesia and use of a combination of rocuronium and mivacurium for muscle relaxation, was found to require three attempts before successful tracheal intubation. Her

* Mark L: Medic Alert National Registry for Difficult Airway/Intubation, The Johns Hopkins University, Alert or Patient Enrollment, 1-410-955-0631 or fax 1-410-955-0994.

† Medic Alert 1-800-432-5378, Medic Alert Foundation, Turlock, California 95381-1009.

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Technical Failure of Desflurane Vaporizer Tec-6

To the Editor:—We would like to report a case in which we encountered two problems with the Ohmeda Tec-6 vaporizer: (1) a significant fresh gas leak developed after Tec-6 was turned off, and (2) neither the Tec-6 nor other vaporizers (isoflurane and enflurane), which were mounted on the same anesthesia machine, could be turned on after the Tec-6 was turned off.

The patient was a 44-yr-old man who had undergone septorhinoplasty under general anesthesia with nitrous oxide and desflurane in oxygen using a Tec-6 vaporizer mounted on a North American Dräger anesthesia machine (Narkomed 2B). The induction and intraoperative course were uneventful. At the end of the procedure, desflurane was turned off, and the patient's trachea was extubated. On attempting to assist his ventilation *via* mask and despite a tight seal of the mask and a high flow of oxygen, it was noted that the reservoir bag could not be filled with oxygen. The fresh gas flush button was pushed several times while the adjustable pressure limiting valve was closed to allow filling of the reservoir bag. However, the reservoir bag only

height was approximately 153 cm, and she weighed approximately 68 kg, with most of her body weight in her abdomen, hips, and thighs. Again, visualization of the epiglottis but not the vocal cords occurred. The patient had previous laminectomy surgery many years ago, but these medical records were not available. Her orthopedic surgery progressed uneventfully, and postoperatively, she experienced a minimal sore throat. Postoperatively, no other existing medical conditions revealed a potential for a difficult intubation, and her previous medical records for her laminectomy could not be located. She also wears a Medic Alert bracelet.

When assessing the surgical patient preoperatively, one includes a question about family problems with anesthesia. We suggest a heightened awareness when taking the preanesthetic history regarding possible difficult intubation in family members. As the registry of difficult intubations acquires data, the presence of genetically related patients might be addressed.

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minimally filled while the oxygen flush valve was continuously activated. During these maneuvers, the selector switch was turned to the "bag" mode. While flushing, we could hear a leak around the area of the Tec-6 desflurane vaporizer. Because the patient was still unconscious and required a more secure airway, his trachea was electively reintubated and the lungs were ventilated using a manual self-inflation resuscitation (Ambu) bag. We tried to manipulate the dial of the desflurane vaporizer as well as the concentration dials of the other vaporizers that were mounted on the anesthesia machine to determine whether the "leak" situation could be corrected; we found that all of the vaporizers were in a locked "off" position and could not be turned on. Another anesthesia machine was brought into the operating room, and we subsequently ventilated the patient's lungs in a normal and uneventful manner.

The Tec 6 vaporizer used to deliver desflurane differs in design from the variable bypass concentration-calibrated vaporizers (such as the Ohmeda Tec 4 and Tec 5 and the Drägerwerk Vapor 19.1),

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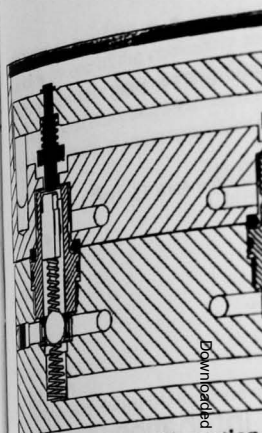


Fig. 1. An engineering illustration of a manifold valve assembly for use of the Tec 6 NAD vaporizer. This diagram illustrates a significant fresh gas leak when the valve is not fully seated, such as at the end of a procedure, by a manifold valve being held in the "off" position. The internal plunger of this valve can flow control holes of the valve for a gas leak. A leaking sound is present. (Courtesy of Ohmeda, Inc.)

used to deliver halothane, enflurane, and isoflurane. The physical properties of desflurane. The Tec 6 are described elsewhere.^{1,2,3}

The investigation conducted by C. Umali, M.D., and J. Siler, M.D., in which the valve piston could be temporarily lodged into a cross-hole in the valve body (Fig. 1). This situation would be a gas path would be flow to the atmosphere.

To address this possibility, Ohmeda has removed the cross-hole feature. For

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To the Editor:—Sood et al. also reported a false-positive esophageal detector to Wee.¹ This is a significant reinvention, the namegiver of the "Wee" test, and the first to publish a false-positive result.

* Pollard BJ: A test to verify accurate placement of the endotracheal tube. World Congress of Anaesthesiologists, 1980; Abstract 1112.

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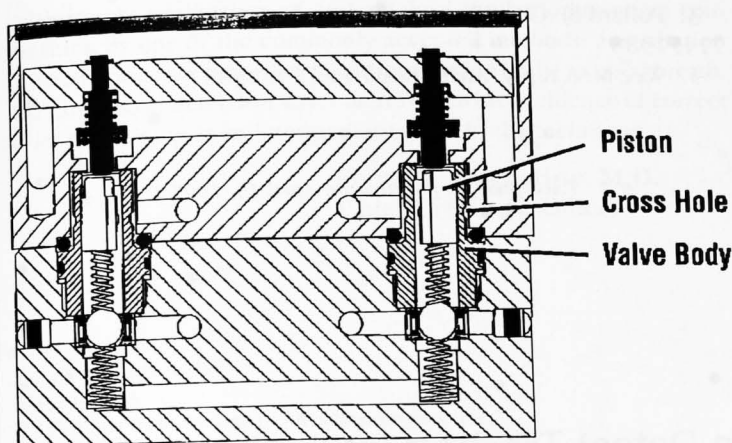


Fig. 1. An engineering illustration of section of Tec-6 vaporizer head and interface manifold. This adapter manifold required for use of the Tec 6 NAD Variant Vaporizer developed a significant fresh gas leak when the vaporizer was turned off after use, such as at the end of our case. This condition is caused by a manifold valve being held in an open position. The internal plunger of this valve can become lodged against the flow control holes of the valve body, creating a passageway for a gas leak. A leaking sound, such as a hissing noise, was present. (Courtesy of Ohmeda, Inc.)

used to deliver halothane, enflurane, and isoflurane, because of the physical properties of desflurane. The principles of operation of the Tec 6 are described elsewhere.^{1,2,3}

The investigation conducted by Ohmeda identified a possible situation in which the valve piston could stay in the depressed position when the vaporizer control dial was returned to the stand-by position (fig. 1). This situation would be a result of the piston becoming temporarily lodged into a cross-hole feature of the valve body. In this condition, a gas path would be created that could vent fresh gas flow to the atmosphere.

To address this possibility, Ohmeda revised the valve body design to remove the cross-hole feature. Further, Ohmeda has conducted a

field action to notify customers with affected units (Ohmeda Tec 6, desflurane vaporizer for use with North American Dräger Anesthesia Systems), provided appropriate additional instructions for the user in the event of such a problem, and replaced the affected units with vaporizers containing the revised valve body component. The second issue involved the requirement to check and adjust the North American Dräger anesthesia machine vaporizer interlock mechanism. This should be conducted on replacement of any vaporizer by authorized service personnel. After adjustment on the referenced machine, the interlock system operated appropriately, allowing the selection of any of the mounted vaporizers.

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References

1. Weiskopf RB, Sampson D, Moore MA: The desflurane (Tec-6) vaporizer: Design, design considerations and performance evaluation. *Br J Anaesth* 72:474-479, 1994
2. Graham SG: The desflurane Tec 6 vaporizer. *Br J Anaesth* 72:470-473, 1994
3. Eisenkraft JB: Anesthesia vaporizers, *Anesthesia Equipment: Principles and Applications*. Edited by Ehrenwerth J, Eisenkraft JB. St. Louis, Mosby-Yearbook, 1993, pp 57-88

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Invention of the Esophageal Detector Device

To the Editor:—Sood *et al.* ascribe the first description of the esophageal detector to Wee.¹ This is not correct. Wee was an independent reinventor, the namegiver of the "esophageal detector device," and the first to publish a formal study on this issue.² But the

¹ Pollard BJ: A test to verify accurate placement of an endotracheal tube. *World Congress of Anaesthesiology, Amsterdam, Excerpta Medica*, 1980; Abstract 1112.

first description of the syringe test was by Pollard 8 yr earlier.³ Pollard and Wee agreed on these facts in the correspondence section of *Anesthesia*.^{3,4}

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