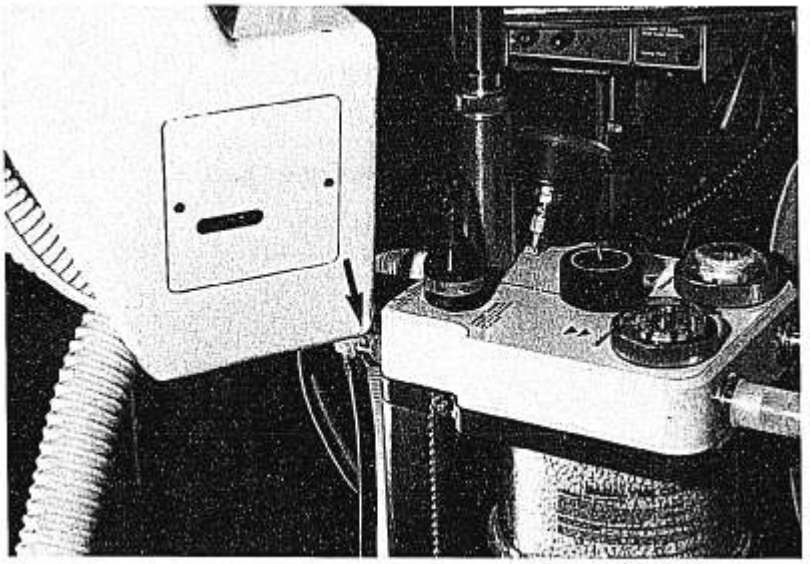

FIG. 1. C-arm of fluoroscope impacting the common gas inlet to the absorber manifold (arrow).

A 5-yr-old girl undergoing arteriography and embolectomy of a facial hemangioma in the angiography suite received a general inhalation anesthetic. During repositioning, the C-arm of the fluoroscope (Angioskop, Siemens, Solna, Sweden) struck the common gas inlet to the absorber manifold of the anesthesia machine and cracked the plastic manifold (fig. 1). The resulting leak prevented application of positive pressure ventilation. The system was disconnected from the patient, and ventilation was resumed with 100% oxygen delivered with a self-inflating bag. Anesthesia was maintained with small units of sodium thiopental. A modified Mapleson D circuit (Vital Signs, Totowa, NJ) was then attached to the anesthesia common gas outlet, and anesthesia was resumed with air/oxygen and halothane. The remainder of the procedure was uneventful and the patient recovered without sequelae.

As shown in figure 1, the fluoroscope's C-arm had apparently cleared the absorber manifold but subsequently impacted the fresh gas inlet connector nipple. Radiology personnel were unaware that the anesthesia machine had been struck by the C-arm, which automatically continued to move into the desired position after the impact. A pressure-limiting sensor on the C-arm might have alerted personnel to the obstruction and avoided damage to the other equipment. Alternatively, protecting exposed plastic parts of the anesthesia machine may offer greater resistance to breakage. The site of damage was identified by noting the time–effect relationship of the C-arm movement and loss of pressure in the breathing system. Anesthesiologists also could be more cognizant of contact with their equipment from any motorized, moving apparatus, as they probably already are with the surgical table.

Equipment failures appear to represent only a small percentage of anesthetic critical incidents.[1] Previous reports involved loss of gas supply, misconnections and disconnections of the anesthesia circuit, breakage of plastic circuit parts, malfunctioning of valves, and loss of electrical supply.[1] We report another source of equipment failure, that caused by interaction between machines. As technology advances and equipment becomes more sophisticated, the chance of physical, electrical, or magnetic conflict likely will increase. Therefore, our level of vigilance for potential interactions also must increase. We hope this letter will serve as a reminder of the hazards of providing anesthesia services outside the operating room, often in cramped quarters, and the need to ensure the presence of appropriate emergency equipment.

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REFERENCE

1. Cooper JB, Newbower RS, Kitz RJ: An analysis of major errors and equipment failures in anesthesia management: Considerations for prevention and detection. ANESTHESIOLOGY 60:34–42, 1984

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Anesthesiology
77:399–400, 1992

Design Flaw in an Anesthesia Machine

To the Editor:—Equipment failure has been identified as among the most common causes of preventable anesthetic incidents.[1] We would like to alert readers about a potentially fatal mishap resulting from design of the equipment rather than its malfunction.

The master on/off switch on the Excel 210 Ohmeda anesthesia machine has recently been redesigned by the manufacturer. Previously the switch was in the shape of a corrugated knob. It now forms a protruding plate, supposedly to facilitate rotation between the on and off position.

During general anesthesia for abdominal surgery, a sudden massive

blood loss necessitated the initiation of resuscitative measures. While the attention of the anesthesiologist was focused on the securing of the central venous access, the back of the anesthesia chair bumped the knob, resulting in the sudden loss of gas and power supply, totally disabling the anesthesia machine. Fortunately, the brief alarm sound was noticed promptly, and the switch was turned on again. The consequences of missing this single alarm sound could have been fatal because no other alarms would follow.

This safety hazard can be eliminated either by placing a protective guard around the current switch or by replacing it with the corrugated knob.

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REFERENCE

1. Cooper JB, Newbower RS, Kitz RJ: An analysis of major errors and equipment failures in anesthesia management: Considerations for prevention and detection. ANESTHESIOLOGY 60:34–42, 1984

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Anesthesiology
77:400, 1992

In Reply:—The safety of patients and operators is of utmost importance to Ohmeda. The switch referred to in this report has been used in Excel machines since mid-1989. Pomykala and Schechter's report is the first of its kind received by Ohmeda.

Ohmeda has conducted laboratory testing and has been able to duplicate the event described but with some degree of difficulty. When the event was duplicated, a machine alarm activated, as expected. This alarm condition is documented in the Excel's Operation and Maintenance Manual.

Given these facts, Ohmeda does not perceive the existence of a safety problem that would warrant modifying the switch. If other users have experienced similar events associated with the switch, Ohmeda would be interested in hearing from them. They can contact the Product Complaint Specialist at 1-800-521-0086.

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77:400–401, 1992

A Simple Alternate Technique for the Application of the Pulse Oximeter Probe to Infants

To the Editor:—Because of the difficulty in applying adhesive-backed oximeter probes to the extremities of small infants, we were interested in learning whether adult clip-on probes worked accurately in these patients. The clip-on probe for adults is placed on either part of the infant's hand, including some fingers, or part of the foot, including some toes (fig. 1). We concurrently applied two identical pulse oximeters, one using the adhesive infant probe and one using the clip-on adult probe, to the finger, hand, or foot of 12 infants undergoing ophthalmologic surgery. In each infant, we observed that the adult probe gave hemoglobin oxygen saturation readings that were within 1% of those obtained by the concurrent conventional procedure. We have successfully used this procedure in more than 100 infants and small children. Almost all of the procedures were completed within 1 h and without any complication. However, for long-duration anesthesia, caution should be exercised to prevent probe-induced complications (*i.e.*, pressure marks, burn, erosion, or necrosis). Further studies are therefore required to extrapolate this technique to neonates, whose skin is more delicate, and in lengthy cases during which burn or erosion may occur.

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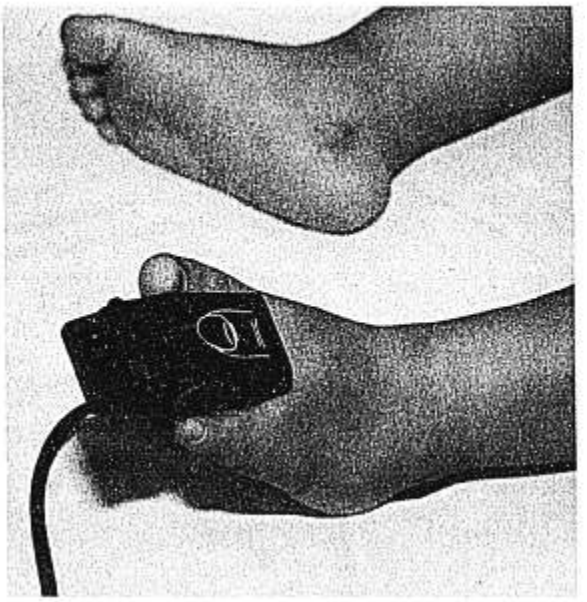

FIG. 1. Fixation of adult clip-on probe (Cardiocap®, Datex, Finland) in a 10-month-old infant undergoing ophthalmologic surgery. This procedure can be applied to pulse oximeters from several companies (*e.g.*, Ohmeda and Nellcor).