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In reply.—Dr. Gelb asks for more details about the leukocytes we used in our experiments. We performed one measurement at each concentration on three individual’s leukocytes for each drug. The control values all were within the normal range for our laboratory and all the standard errors were small; thus, it seems inappropriate to conclude that triplicate measurements on each sample would be preferable.

Dr. Gelb raises the question of the application of our in vitro findings to clinical practice. It is a conceptual error to attempt any correlation between an in vitro study and a clinical conclusion. The purpose of our study was strictly analytic; were the tested drugs able to induce any change in leukocytes oxidative activity? We answered positively. Using lower concentration and another technique, Dr. Gelb and associates did not demonstrate any statistical difference in leukocyte oxidative activity under the influence of diazepam, although numerically the activity observed at a concentration of 2.5 μg·ml⁻¹ was lower than the control value. Concerning the leukocyte solutions used for in vitro experiments, these absolutely cannot be compared with normal human blood. We totally ignore the amount of drug penetrating the leukocytes; since protein-bound and -unbound concentrations of diazepam were not measured either by us or by Dr. Gelb and his colleagues, it seems impossible to draw any conclusions about the influence of the percentage of serum added to the Krebs–Ringer’s solution. Concerning the inverse correlation between a drug’s concentration and its incubation time on leukocyte’s functions, this is a pharmacologic hypothesis used largely to study a drug’s cytotoxicity in the cancer research field; however, the viability of leukocytes is brief on account of aggregation, autolysis, spontaneous activation, or membrane modifications, and thus, this hypothesis cannot be tested for incubation times exceeding 30–60 min.

Concerning the noninfluence of washing on the leukocyte depression, there are different possible explanations. The time necessary to wash and to resuspend the leukocytes is about 10 min; it could be too short to cause an important decrease in the intracellular concentration of the drugs. Other possible explanations could be an irreversible binding between the drugs and some leukocyte receptors or a cytotoxic effect of the drug. Further studies are necessary to determine the mechanism of the depression of the leukocyte oxidative activity we have observed.

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Pulmonary Artery Catheter Sheath Malfunction with Sternotomy

To the Editor:—In their correspondence, Campbell and Schwartz comment on the intraoperative failure of pulmonary artery catheter (PAC) placed via the right external jugular vein (EJV) as reported by Bromley and
Moorthy. Campbell and Schwartz attribute the functional failure of the catheter to kinking as the catheter exits the introducer sheath. They further comment that withdrawing the sheath restored catheter function in their experience, and that the report of Bromley and Moorthy should not be taken as an indication to avoid the EJV when placing PACs. I would like to report my experience in using the infraclavicular subclavian (ISC) approach for PACs.

In our facility, it is the rule for our cardiologists to place PACs preoperatively via the ISC approach. The left side is used preferentially, because of the anatomical ease of placement, with the right side being used only occasionally. The sheath assembly almost always is withdrawn completely. Under such circumstances, in more than 400 cases, I have never seen a catheter malfunction due to kinking. In the five cases where the sheath was left in place, three have kinked and become totally obstructed when the sternum was retracted. Two of these were on the left and one on the right. In every case, the catheter resumed normal functioning as soon as sternal retraction was relaxed.

In reviewing the previous reports, and my experience, it appears clear that catheter kinking is likely when the introducer sheath is left in place and the sternum is retracted, whether the EJV or ISC approach is used. I am unaware of reports involving the internal jugular vein. It would seem appropriate to recommend that, rather than avoiding one’s preferred approach to the central venous circulation, one should withdraw the introducer sheath before a sternal splitting procedure.

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Oxygen Pressure Sensor Shutoff Valve Failure in the Ohio® “Wedge” Anesthesia Machine

To the Editor:—We recently experienced an unusual failure of the Ohio modulus “Wedge” anesthesia machine, which has caused us to revise the preventive maintenance schedule proposed by the manufacturer.

REPORT OF A CASE

A 36-year-old white man was scheduled for left inguinal herniorrhaphy and requested general anesthesia. A 6-month-old Ohio® “Wedge” anesthesia machine was checked preoperatively for low-pressure and high-pressure leaks with the semiclosed circle system and in-line vaporizers both on and off. The attached Ohio® volume ventilator had been used during the preceding case and was not reevaluated.

After induction of anesthesia with sodium thiopental and succinylcholine, the patient’s respirations first were assisted and then controlled using a semiclosed circle system and 2.5% halothane in 70% nitrous oxide and oxygen. Shortly after the incision, the patient was placed on an Ohio® volume ventilator (V5) with a measured exhaled tidal volume of 15 ml/kg and rate of 6 breaths/min. Five minutes later, the anesthesia machine made an explosive noise, and a loud continuous rush of gas was audible from the back of the machine. Nitrous oxide and halothane were discontinued and manual ventilation performed using the reservoir bag of the circle without change in the noise. Ventilation pressures and volumes were unchanged. The flow meter bobbin fluctuated when the circle was pressurized, both at low and high flows, and the oxygen analyzer indicated that 100% oxygen was being provided. A brief check of the machine demonstrated that wall gas pipelines were not loose or damaged. The noise persisted despite conversion from external pipeline oxygen to tank oxygen and disconnection of all external gas lines. Finally, turning the machine off stopped the presumed internal leak. The patient was ventilated with portable oxygen and a Mapleson D system as the surgery was concluded speedily under intravenous anesthesia.

FIG. 1. Valve assembly.