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*In Reply:*—We appreciate the opportunity of responding to Dr. Levy's critique of our study design. Briefly, he suggests that the statistical analysis of our ECG data may have been invalidated by our failure to make a positive exercise-ECG response a criterion for admission to our study. His assumption is that patients with negative stress ECGs could not subsequently develop ischemic ST segment depression during anesthesia and surgery. We do not feel that that is a valid assumption. First, the two types of "stress" are not comparable. Secondly, a patient's exercise response may be limited by factors such as fatigue, respiratory disease, claudication, and patient cooperation. These factors are not operative in the anesthetized patient.

Assuming, for purposes of argument, that there were some validity to Dr. Levy's assumption, the process of randomization should have distributed patients with "negative" tests equally among the three treatment groups. Assuming an incidence of negative tests of up to 30% does not alter the significance of our results as long as the patients with negative tests are distributed equally among treatment groups. Only when one assumes, as Dr. Levy has done, that patients with negative tests would be confined almost exclusively to the metocurine and mecurine-pancuronium groups does the actual *P* value

slightly exceed 0.050. Such hypothetical considerations should not alter the way in which an informed reader interprets the results of our study.

We cannot report on the distribution of negative stress tests in our study because our patients were not systematically stressed according to a rigid protocol during the period immediately preceding surgery. We will not be instituting such a program as part of future investigations.

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### Anesthetic Management of Patients with AIDS

*To the Editor:*—Several reports on the risk of acquired immune deficiency syndrome (AIDS) in health-care workers have appeared recently.\* In a recent report on 300 health-care workers who worked with AIDS patients at San Francisco General Hospital no cases of AIDS were reported.† Seventy-five per cent of these workers had been caring for AIDS patients for more than 1 yr. More than one-third of those interviewed had been exposed to contaminated fluids, and 89 had accidentally punctured their skin with a needle from an AIDS patient.

Although the AIDS virus does not seem extremely vir-

ulent based on this information, we recognize that the disease has a relatively long incubation time (possibly 5 yr), and that data on transmissibility of AIDS is still being accumulated. Two cases of probable HTLV/LAV transmission to a health-care worker by exposure to blood products have been reported in this country.\* While transmission of the virus is extremely rare (two cases of 1,785 workers studied), measures for the protection of health-care workers must be taken. At the same time, this must be balanced by a concern with maintaining a rational and empathetic physician-patient relationship.

The Centers for Disease Control (CDC) has provided guidelines for the protection of health-care workers,‡ although little information directly related to anesthesia is available. AIDS patients who come to surgery at San Francisco General Hospital are treated using precautions

\* CDC. Update: Evaluation of human T-lymphocyte virus type III/lymphadenopathy-associated virus infection in health-care personnel—United States. *Morbidity and Mortality Weekly Report* 34:575-578, 1985.

† Gerberding JL, Moss AR, Bryant CE, Levy J, Sande MA: Risk of acquired immune deficiency syndrome (AIDS) virus transmission to health care workers. Presented at the 25th Interscience Conference on Antimicrobial Agents and Chemotherapy, American Society for Microbiology, Minneapolis, MN, 1985.

‡ CDC. Acquired immune deficiency syndrome (AIDS): Precautions for health-care workers and allied professionals. *Morbidity and Mortality Weekly Report* 32:450-52, 1983.

generally taken for patients with active hepatitis B or cytomegalovirus. Gloves and masks are worn in the operating area. There is no evidence that gowns, hoods, or strict patient isolation is of value for routine patient contact. Patients are brought from their rooms or from the unit to the holding area through the usual route by our patient transport personnel. Patients wear masks only if reverse isolation is felt to be necessary. Because AIDS patients in later stages may be infected by transmissible, opportunistic agents (e.g., *Pneumocystis carinii*, *Toxoplasma gondii*), they are taken directly to the operating room rather than to a holding area. Gloves are worn for intravenous line placement, and needles are disposed of in containers marked "contaminated."

Although there is no evidence that the virus is spread by the respiratory route, airway secretions can be mixed with blood, which is a medium for transmission. We use a disposable anesthetic circuit with disposable soda lime (Dryden Corp., 401-10-01), and a disposable ventilator filter (Pall Biomedical, BB-50 T). A disposable laryngoscope (Welch-Allyn) is used, although current information indicates that routine sterilization should kill the virus. Anesthetists and operating room personnel wear protective glasses or their own prescription glasses. Gloves are worn by everyone in the operating room. Because cytomegalovirus infection has been noted in AIDS patients, pregnant operating room personnel do not work with these patients.

No particular anesthetic agents or techniques are used for AIDS patients in our hospital. Although these patients are young and most have been healthy previously, AIDS can result in significant systemic disease that may limit the choice of anesthetic. For instance, *P. carinii* pneumonia can result in significant impairment of gas exchange with the need to administer a high-inspired oxygen concentration.

Surgical specimens are marked with "H/A precautions" ("hepatitis" or "has AIDS") labels and placed in plastic bags with the label attached to the outside. Surgeons use disposable drapes and gowns that are put into standard "contaminated material" bags. At the end of the procedure, instruments are cleaned and sterilized in the usual way. The room is cleaned with a dilute (1:10) solution of 5.25% sodium hypochlorite (bleach) to which the virus is sensitive. Care is taken not to spill undiluted bleach, which generates fumes when it reacts with protein.

Postoperatively, patients who are not to be ventilated mechanically are extubated in the operating room. AIDS patients are brought to a section of the recovery room reserved for patients with communicable diseases. A nurse assigned to an AIDS patient does not take care of another patient at the same time. The recovery room staff observes the same precautions as operating room personnel.

Because anesthesiologists are usually involved in cardiopulmonary resuscitation (CPR), appropriate protection during CPR must be available. Masks, gloves, and glasses should be worn as in the operating room. Mouth-to-mouth resuscitation is avoided. While a variety of protective airway devices are available, early endotracheal intubation is the safest technique for both the patient and resuscitator.

We hope that our recommendations will provide rational guidelines for other hospitals to follow so that health-care workers may be adequately protected and able to treat these patients with appropriate caution and concern.

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### From the History of Anesthesia in Military Surgery

*To the Editor:*—I wish to correct a statement made by Aldrete *et al.*<sup>1</sup> They state, "Previous publications have reported the initial wartime use of anesthesia for surgery as occurring in either the Crimean or German-Danish conflicts after 1848."

Actually, it was used in the summer of 1847, just after July 8, in the Caucasus War by the Russian surgeon Proff. Nicolay Pirogov.<sup>2</sup>

In the Mexican-American War (spring 1847), the use of ether anesthesia was occasional. Pirogov has reported more than 100 surgical operations in war situations in which ether anesthesia was used.

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