Anesthesiology
56:233, 1982

A Method for Prolonging Life—In Batteries

To the Editor:—Oxidation that occurs on battery terminals, used in anesthesia auxiliary equipment, has been a costly and time-consuming problem in our institution.

We assumed our location in the Gulf of Mexico and the salty air were two uncontrollable contributory factors toward the problem. In a 1980 seminar I learned institutions nationwide were experiencing similar problems.

We addressed the problem in an effective simple manner. While changing batteries, we apply a film of "Cramolin-Paste Anti-oxidizing Lub",* to both positive and negative terminals of the battery.

Our preventative maintenance records indicate we have practically doubled the useful life of treated batteries in all battery-powered auxiliary equipment.

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(Accepted for publication September 8, 1981.)

* Distributed by Caig Laboratories, Escondido, California 92025.

Anesthesiology
56:233, 1982

Hypothermia after Cardiopulmonary Bypass in Man

To the Editor:—Drs. Caldwell, Crawford, and Sinclair argue for the use of a heated humidifier located between the carbon dioxide absorber and the Y piece to prevent hypothermia in the post-bypass period.[1]

Mathematical considerations cannot uphold their contention. In a 70-kg man a 5,000 ml minute volume of completely dry gas will require $47/760 \times 5{,}000 = 309$ ml water vapor per minute to be completely saturated. (P_{H_2O} at 37° = 47 mmHg, P_B = 760 mmHg). This will demand $309/24{,}500 \times 18 = 0.227$ g water to be evaporated, which in turn requires $0.227 \times 580 = 132$ cal per minute. (1 Mol H_2O = 24,500 ml at 20° C, MW H_2O = 18, heat of evaporation of water is 580 cal). If the gas is inhaled at 47° C instead of at room temperature the heat conserved will be $5{,}000 \times (47 - 20) \times 0.0003 = 40$ cal. (The specific heat of air is 0.0003, it may be slightly higher for the humidified anesthetic containing mixture). Thus, the patient can conserve at most $132 + 40 = 172$ cal per minute. Per hour $60 \times 172 = 10{,}320$ cal can be conserved, which translates to a $10{,}320/70{,}000 = 0.15$° C prevention of fall in temperature. The capability of Drs. Caldwell *et al.* to maintain their patient's temperature must be due to other more efficient measures. Finally, humidifiers are not without problems such as leaks, overheating, and electrical (ECG interference, leakage currents, and electrocution). Their final comment that "the technique is a safe and effective way to prevent hypothermia" must be taken in doubt, at least in the adult patient.

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(Accepted for publication September 8, 1981.)