A Possible Cause of Temperature Probe Failure

To the Editor: — Chapman and Moravec expressed a real concern for the operating room staff when they cautioned against immediate treatment to remedy an increase in patient temperature as recorded by a temperature probe. One can readily understand how, if false readings are obtained when measuring patient temperature directly, this could lead to therapeutic steps by a physician. This could very well result in emergency measures or the curtailment of a surgical procedure, or even the cancellation of scheduled surgical procedures. The situation could be equally disastrous if the probe is being used as the sensing component of a controller to regulate patient temperature during hyperthermia or hypothermia. Unnecessary corrective steps may be taken with the thermia unit, which could prove injurious to the patient.

At the Downstate Medical Center, during one period, we noticed several instances where a patient's temperature is indicated by a physiologic temperature monitor did not correlate with the patient's physical condition. The suspect thermometer probes were removed to our clinical engineering department and tested on a Yellow Springs Instrument (YSI) temperature bridge. In all cases the readings obtained were in accordance with the temperature of the bath in which the probes were immersed. However, when they were tested on the physiologic temperature monitoring system that is normally used in our operating rooms, the readings were 2 to 4 degrees higher.

The difference between the YSI temperature monitor and our operating room system is that the YSI is a DC-excited bridge while that used in our operating rooms is an AC-excited bridge. We took several new probes, which read correctly on both systems, and shunted them with sufficient capacitance to make them respond incorrectly on the AC bridge only. The problem seemed to be one of high capacitance.

We investigated the cleaning method used by our nursing staff and found that they were soaking the probes in Cidex® for cleaning and sterilization. The Cidex apparently penetrated the plastic sheathing of the probe and caused sufficient capacitance to build up to cause incorrect temperature readings. After the probes were washed thoroughly in water and then allowed to dry for 24 hours at room temperature, they responded accurately and provided correct temperature readings.

At present, in lieu of Cidex, our nursing staff washes thermometer probes in water and a germicidal solution of Vesphe® before sending them for gas sterilization.

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Reference
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Intrathecal Opiates, a Potent Tool to be Used with Caution

To the Editor: — The letter of Davies, Tolhurst-Cleaver and James reports respiratory arrest ten hours after intrathecal administration of morphine (1 mg). Others have also reported this complication. That respiratory arrest can occur when morphine and perhaps other narcotics are introduced in the subarachnoid space, at least in the dosage now being utilized, should come as no surprise to those familiar with the pharmacokinetics of narcotic compounds. Only a small fraction (0.1 per cent) of an intravenously administered dose of morphine is able to penetrate into the entire CNS. The same is true with meperidine and probably many other narcotic compounds as well. If only 0.1 per cent of an intravenous dose of morphine of 100 mg (a dose that produces respiratory arrest in all nonaddicted patients and general anesthesia in most) enters the central nervous system, less than 0.1 mg will appear in the entire brain.

One milligram of morphine injected intrathecally is more than ten times the amount of morphine found in the entire brain, and probably at least 100 times that found in the region of medullary respiratory centers following a 100-mg intravenous dose of the drug. Considering the potency of morphine after it is in the central nervous system, the free communication of cerebrospinal fluid (CSF) between the brain and