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## High-frequency Electrical Equipment in Hospitals

TRUSTING, indeed, is the surgeon who turns to scrub while the least trained member of the operating room team attaches the high-frequency electro-surgical instrument to the patient. Commonly misnamed "the cautery," surgical diathermy figures in more than a fourth of all incidents associated with electrical apparatus in hospitals—and the incidents tend to be grave: operating room fires and serious burns. The high-frequency electro-surgical instrument also limits choice of anesthetic agents, interferes with pacemaking, and frustrates effective ECG monitoring. Even when the device is inactive, its own circuits for "safety" and automatic operation inject "noise" into the ECG monitor and possibly hazardous voltages into the patient.

Granted that the electro-surgical instrument is the surgeon's tool and never is used by the anesthesiologist, no conscientious physician with a prudent regard for his patient's welfare can ignore a disruptive force intruding so impudently into the operating milieu.

Safety in the use of conventional 120-volt alternating current holds few subtleties. High-frequency electricity, however, is "another breed of cat." Preferring conventional conductors, yet able to ignore them if compelled to do so, it enjoys so many prerogatives under Ohm's Law as to seem exempt from control—if not uncanny. Moreover, the surgical diathermy is not a passive instrument; it is designed to destroy tissue, and is unselective. One is entitled to question the wisdom of an institution that entrusts this device to the uninitiated.

Even before the autumn of 1926, when Harvey Cushing and W. T. Bovie trundled their spark-gap machine down Shattuck Street to the side door of the Peter Bent Brigham to inaugurate a revolution in neurosurgery, electricity had been applied in general and urologic surgery. Despite a long history of use, however, good information about the ubiquitous and hazardous electro-surgical instrument has been difficult to obtain. "High-Frequency Electrical Equipment in Hospitals—1970," recently published by the National Fire Protection Association, is a signal event.\* Designated NFPA No. 76CM, and assembled by a knowledgeable and experienced coalition of physicians and engineers, this manual provides essentials that should be appreciated by physicians, nurses, operating room supervisors, administrators, and engineering personnel concerned with high-frequency electrical equipment. The publication deals with properties of high-frequency circuits and their hazards, suggests protective measures, indicates administrative and maintenance considerations, offers sample regulations, and lists pertinent references. It is required reading for anyone who may be an accessory to the use of high-frequency electrical equipment in hospitals.

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\* Available from the National Fire Protection Association, 60 Battery-march Street, Boston, Massachusetts 02110, \$1.00 per copy.