

Fundamental use of surgical energy (FUSE)

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For the **life** of the flesh is in the **blood (Leviticus 17:11)**.

Societies both ancient and modern share a reverence and wonder at the image and reality of blood relative to life and death. But no profession understands the importance of blood more than surgery. For surgeons, a central theme of our profession through the ages has been the delicate dance of preserving blood flow (and therefore oxygen delivery) while simultaneously preventing and controlling hemorrhage.

In the time of Halsted, bleeding was largely controlled using suture ligation and thermal heat in the form of operating room irons. Although this system indeed worked, the creation and application of the electrosurgical coagulation, the so-called Bovie machine, introduced the modern era of surgical hemostasis using electromagnetic energy. The first recorded case of electrosurgical energy use in surgery occurred at the Peter Bent Brigham Hospital in Boston in 1926. William T. Bovie, PhD, from Harvard, originally a plant physiologist, had devised the electrosurgical unit. Dr. Harvey Cushing wrote, "...With Dr. Bovie's help I proceeded to take off most satisfactorily the remaining portion of tumor with practically none of the bleeding which was occasioned in the preceding operation." These early Bovie cautery units were the size of a piece of furniture, were usually lime green, and produced a very satisfying intense buzzing sound when activated. For many decades, the Bovie machine became the sole and centerpiece device for control of surgical bleeding.

Over the last two decades, the number and type of available devices to control bleeding in the operating room have

multiplied. The environments in which they are used have also diversified. Endoscopic and laparoscopic coagulation are now just as important as open surgical coagulation. Before this explosion, surgeons were comfortable and confident in their safety training and their use of the Bovie machine within their residency training, even if the understanding of the physics may have been more empirical than factual. In today's environment, apart from a detailed course of study and/or training, a clear understanding is unlikely given multiple circumstances and devices.

The Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), one of two societies (EAES being the other) with editorial responsibility for *Surgical Endoscopy*, has created and managed educational and testing programs important to the training and practice of gastrointestinal and general surgery. The first of these are the Fundamentals of Laparoscopic Surgery and the Fundamentals of Endoscopic Surgery. Now SAGES is building the next in this series, the Fundamental Use of Surgical Energy (FUSE), which will be a didactic education and testing program that will address the use of energy directed to surgical effort in interventional settings. In this issue of *Surgical Endoscopy*, Sankaranarayanan et al. [1] provide the evidence-based framework developed collaboratively by surgeons, anesthesiologists, and nurses that underpins FUSE. All members of the operating room team using or planning to use these modalities would benefit from understanding the information contained in this article. The goals of FUSE, and this article, are straightforward: maximizing patient safety in our operating rooms and procedure suites.

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