

Education

New curriculum aims to reduce hazards of energy devices in the OR

When it comes to patient safety in the OR, the risk of fire or other damage caused by surgical instruments is an area that deserves greater attention.

Professional medical societies concerned about such risks have developed a multidisciplinary curriculum that addresses appropriate and safe use of energy devices in surgery and endoscopy. Studies have shown that completing this curriculum increases knowledge about device use, and course developers hope that wider dissemination of the program will make the OR environment safer.



**Daniel B. Jones,
MD, MS,
FACS**

"In 1999, nearly \$600 million was paid out for injuries," according to Daniel B. Jones, MD, MS, FACS, Beth Israel Deaconess Medical Center, Boston. "About 550 to 650 such injuries occur annually, the same as for wrong-site surgery. The majority are minor, but some are significant, disabling, and totally preventable," Dr Jones said during a presentation at the 2014 American College of Surgeons (ACS) Clinical Congress.

In addition, he said, an ACS survey found 18% of surgeons have experienced insulation failure, and 54% know of colleagues who have had that happen.

Dr Jones, who participated in a panel session at the meeting on safe energy use in the OR, cited some examples of common practices in the OR that create potential hazards:

- wrapping a wire around a clamp to keep it out of the way creates energy in a piece of metal that could cause a skin burn
- using a metal cannula for laparoscopy—putting an insulated instrument through a metal cannula can create an energy source that can spark and burn
- in single-incision laparoscopic surgery or robotic surgery, instruments go in parallel and energy can pop from one instrument to the other even if the tubing is completely insulated, which means the grasper can burn tissue.

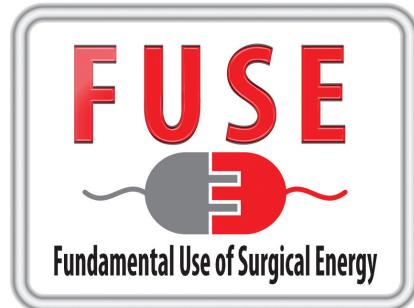
Many surgeons think they know how to use energy-based devices, but tests given during the 2011 Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) annual meeting revealed gaps in knowledge, according to an article in the ACS Bulletin by Pascal R. Fuchshuber, MD, PhD, FACS, and colleagues.

As part of a postgraduate continuing medical education (CME) course, 48 experienced SAGES surgeons took the test, and out of 11 answers, just 6.5 (59%) were correct. Fully one-third of the test takers did not know how to correctly handle a fire on a patient, 31% did not know which device was least likely to interfere with a pacemaker, and 13% did not know that thermal injury can extend beyond the jaws of a bipolar instrument. Similar responses—a median of six correct answers out of 11—were seen in the 27 postgraduates who took the test.

Development of FUSE

The Fundamental Use of Surgical Energy® (FUSE) is an attempt to educate surgeons, nurses, and allied healthcare professionals about the safe use of electrosurgical instruments.

In 2011, SAGES invited AORN to collaborate on FUSE. The FUSE task force



brought together surgeons, OR nurses, gynecologists, endoscopists, and anesthesiologists to create the FUSE manual and online curriculum, Dr Jones told OR Manager. Anyone can log on to the online module and learn basic principles for the safe use of devices in the OR for free. Afterwards, nurses can elect to purchase CEUs and physicians can purchase CMEs, explains Dr Jones, vice president of SAGES and chair of the FUSE task force.



*Charlotte L.
Guglielmi,
MA, BSN,
RN, CNOR*

"We've been engaged in the development of the curriculum and the high-stakes certification exam from the very beginning," says Charlotte L. Guglielmi, MA, BSN, RN, CNOR. Guglielmi, perioperative nurse specialist at Beth Israel Deaconess Medical Center, is a member of the SAGES FUSE task force.

The curriculum focuses on the key principles of safe and effective use of surgical and endoscopic energy devices. Each section has two to 20 objectives, for a total of 72 objectives. Task force members have ranked each objective and determined the number of test items for the written exam.

The following areas are covered:

- Fundamentals of electrosurgery
- Mechanisms of prevention of adverse events
- Monopolar devices
- Bipolar devices
- Radiofrequency for soft tissue ablation
- Endoscopic devices
- Ultrasonic energy devices
- Microwave energy systems
- Energy devices in pediatric surgery
- Integration of energy systems with implanted cardiac devices
- Prevention of OR fires.

The FUSE exam

The FUSE exam consists of multiple-choice questions designed to assess the understanding and application of the basic principles associated with the use of electrosurgery in the OR. Healthcare professionals must first purchase a voucher and complete the exam questions at a designated regional test center in the US, Canada, or at either the SAGES Annual Meeting or the ACS Annual Clinical Congress. (For a list of regional test centers, visit www.fuseprogram.org.)

There are 80 multiple-choice questions administered via Webassessor, a secure online testing website, and the test must be completed within 90 minutes.

In addition to licensed physicians, the curriculum is recommended for surgical technicians and for nurses who have at least 1 year of OR experience. For nurses, successful completion of the course and exam confers 12 AORN-approved continuing nursing education contact hours.

"Whether you're doing the online curriculum because you're studying to take the high-stakes exam, or whether you're doing it because you want the education and the contact hours as a nurse professional, the content isn't different. That's one of the outstanding features of the FUSE curriculum. It's a broader curriculum related to the uses of surgical energy—in particular, as it relates to the current technology," Guglielmi says.

"Two years ago, I was asked to look at a dispersive electrode, and because I had done the curriculum, I was more aware that I needed to study the manufacturer's

recommendations for this product before I could even begin to consider whether we might purchase it. Because of FUSE, I knew more about duty cycles, high energy, capacity, and all those things that I never would have thought about when I first looked at this product," Guglielmi says. "That's the value of FUSE; it can really be used in a lot of ways."

The future of FUSE

In April 2014, beta testing of the program and assessment was completed, with more than 170 surgeons and allied health professionals achieving a passing score. Additions to the FUSE curriculum, including an interactive bench-top simulation component and a portable virtual reality simulation-based educational tool for surgical trainees, are being developed.

In the future, modules tailored to individual energy devices are expected to be designed in collaboration with industry.

"As providers gain confidence in their knowledge, we are hopeful that they will elect an option to take a validated multiple choice examination leading to formal FUSE certification," says Dr Jones.

"FUSE gives the same education to everybody, so it fits into the high reliability concept of creating a shared mental model around the topic of surgical energy," Guglielmi says. "The same content being applicable to all the disciplines is one of the highest elements of this curriculum—it's a common language, it's a common competency, and it's a really good place for all of us to begin working together."

Dr Jones agrees. "AORN and SAGES can be very proud of this collaborative effort to promote patient safety," he says.

For more information, visit www.fuseprogram.org. ♦

—Elizabeth Wood

References

- Feldman L, Fuchshuber P, Jones D B. The SAGES Manual on Fundamental Use of Surgical Energy (FUSE). Springer: New York, 2012.
- Fuchshuber P R, Robinson T N, Feldman L S et al. The SAGES FUSE program: Bridging a patient safety gap. Bulletin. American College of Surgeons: 2014; 99(9):18-27.