Sponge counts are necessary. Yet they can occur at the busiest phases of an operation, heightening the risk for error. And the human element means an error is always possible.

Help from technology is on the way.

Two new sponge-count technologies may help improve patient safety and OR efficiency. Both systems alert the surgical team to any missing sponges before the surgeon closes the incision.

The Safety-Sponge System (SurgiCount Medical, Temecula, Calif), cleared by the Food and Drug Administration (FDA) in March, uses a scanner to count and record sponges and towels embedded with data matrix tags.

The SmartSponge System (ClearCount Medical Solutions Inc, Pittsburgh) uses radiofrequency identification (RFID) to scan sponges embedded with smart chips to make sure none are left in a patient. The company expects FDA clearance by the end of 2006.

Sponges have ID tags

Similar to groceries with barcodes, each sponge and towel in the Safety-Sponge System is labeled by the manufacturer with a data matrix tag.

“Each sponge has its own unique identification, so the system can tell whether you are missing a 4 x 4 or a lap sponge,” notes Rick Bertran, president of SurgiCount.

The system is on the market and has 4 customers with others conducting trials.

The tags, made of liquid-shedding polymers, are heat sealed into the sponges and towels to prevent them from detaching. The tags can store more information than barcodes and can still be read even if degraded up to 25%, which isn’t true of a barcode, says Bertran. A nurse uses a scanner with a touch screen to read and record the data tags. The scanner can be handheld or attached to an IV pole for hands-free counting (photo).

Counting with the scanner

At the beginning of the case, the scrub nurse passes each sponge under the scanner, and it is counted by the system. At the end of the case, the circulating nurse manually counts the sponges again and passes each one under the scanner. The system takes a half second to count a sponge, and Bertran says the method is consistent with the recommendation of the Association of periOperative Registered Nurses (AORN) to separate and count each sponge.

The scanner records the time the sponge is introduced to the sterile field and the time it is removed, providing an audit trail for every sponge. The software does not allow an item to be counted twice, and no item can be counted out that was not counted in. For example, if a relief nurse tries to count a sponge that has already been counted, the scanner will alert the nurse.

During the case, the scanner’s touch screen shows the circulating nurse the current status of the sponge count. The circulator can take the sponges out of the kick bucket and count them in any order. The nurse can choose to pile the sponges in groups of 5 or 10 or not.
At the end of the case, the circulating nurse places the scanner in its printing device to print a report for the patient’s record. The report also can be downloaded to other information systems.

Besides patient and staff information, the report lists every sponge counted in and out by ID number, including the time each was counted in and counted out.

“If a sponge is missing, the report can tell you what kind of sponge it is and what time it was scanned into the case, which gives the team an idea of when it was used and where it might be,” says Bertran.

The scanner’s software will not verify a final count until all items scanned in are accounted for.

Bertran says SurgiCount continues to refine the scanning software, and says improvements are coming that will make the system faster and easier to use. The company also is looking at how the technology can be expanded to counting of needles and instruments.

He says the cost of the system averages $8 to $10 per procedure.

Common sense approach

Janet Lewis, RN, MA, CNOR, describes the Safety-Sponge System as “a common-sense approach to address a safety issue.” The system has been used since July at Integris Baptist Medical Center, Oklahoma City, where Lewis is administrative director for surgical services, outpatient care, the burn center, and renal transplant clinic. She says nurses agree the system is a help, though there is always some resistance to change and a learning curve.

Each OR has a scanner, and all sponges have data matrix tags.

“The system gives us trackability we have never had before. It helps take that human factor element out of the count,” she says.

Lewis says an analysis showed the system is cost-effective.

A better way

“There has got to be a better way,” Sharon Morris, RN, BSN, CNOR, said to herself after a tedious day of accounting for sponges. She went home that evening and began drawing up ideas for a smart chip for sponges using radiofrequency identification (RFID). Ten years later, Morris, who is OR manager at Montana’s Kalispell Regional Medical Center, says her idea is becoming a reality in the SmartSponge System being developed by ClearCount Medical Solutions Inc.

Her idea was to be able to pass a wand over the patient’s body and know immediately if anything was left inside. The wand evolved into a flat 8 in-by-10 in scanner that weighs slightly more than a pound. The smart chip is the size of a dime and about as thick as a shirt button (photos). The chip, embedded in the sponge, acts as a transponder, listening for a radio signal sent by the scanner and responding with a unique ID code. The chip contains specific data, such as the type of sponge, its inventory number, and its date of manufacture. The chip is made so it can function after sterilization.

Morris says the company continues to work on making the scanner and microchips smaller and lighter.

The company can’t make the scanner too small because scanning is easier and faster with a larger scanner, notes ClearCount Medical Solutions cofounder and chief marketing officer, Gautam Gandhi.

Replacing the postop x-ray

Gandhi says he sees the scanning system replacing x-rays, which are used in certain situations to verify that no sponges are left behind. He says the system could also save the time of waiting for x-ray personnel to come to the OR and take the x-ray and to have the x-ray read.

Even with x-rays, mistakes are sometimes made, he points out.

“More than 30% of intraoperative x-rays after incorrect counts are inconclusive,” he says. “And the mistakes are always made when the counts are documented as correct.”
Once the SmartSponge system is cleared by the FDA, Gandhi says ClearCount will suggest it be used on every case.

“You wave it over the patient, and if there is something there, you will know immediately. The scanner will tell you how many sponges are there and what kind of sponge it is,” he says. “If there is nothing there, you also will know that immediately. It is recorded in a window on the scanner.” The cost of the Smart-Sponge System has not yet been determined.

**Study shows scanning effective**

When creating the scanner, Gandhi says the company’s biggest question was whether the technology could read through the body 100% of the time. A feasibility study, conducted by Alex Macario, MD, of Stanford University School of Medicine’s Departments of Anesthesia and Health Research and Policy, proved that was possible, he says. The study found the scanner was 100% correct every time used and took less than 3 seconds to find the sponge or sponges.

The scanner can count multiple sponges at once without separation and can distinguish types of sponges such as 4 x 4s and lap sponges.

Dr Macario told *OR Manager* that the challenge now is how to incorporate the device into the work flow of the operating room.

“We need a counting system that is fail-safe—that does not allow a patient to leave the operating room with a retained foreign body,” he says. Though the device may need further testing in a variety of surgeries and modifications to make it as easy as possible to use, Dr Macario says he believes in the future, RFID tags will be used to track all surgical items and supplies as they enter and leave a patient’s body.

—Judith M. Mathias, RN, MA

**References**


