Laparoscopic Safety Products: Weighing The Pros And Cons

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Do no harm. This is a well-known motto in healthcare that drives many of the decisions made by physicians and staff. Deciding which medical devices are to be used in the operating room is of critical importance. When it comes to laparoscopic electrosurgical instruments, there are many available technologies, each with their own pros and cons. Because the safety of the physician, staff, and patient are all at stake, this article is meant to guide you through some of the pros and cons of technologies available today.

One in 2,000 laparoscopic procedures results in some type of unanticipated injury. Many of these (50 percent) can be attributed to electrosurgical complication as a result of insulation failure or capacitive coupling and 67 percent of these go unnoticed during surgery (Werner, 2002). The surgeon can only visualize approximately 10 percent of the active electrode with the laparoscope. If there is a break in the insulation, injury can occur without any notice. When this occurs, there is a real risk of a burn and injury to the bowel. An even more alarming statistic is the fact that 25 percent of patients with a bowel injury die as a result of the wound, even following aggressive treatment with antibiotics. (Werner 2002). Those that do survive are often subjected to repeated surgical procedures and long cycles of IV antibiotic therapy.

There are several products currently on the market that assist the physician and surgical staff with identification of failed instrumentation and prevention of stray current burns. Because this decision is of such great importance, the section below is meant to help you understand what is available to you as well as the pros and cons of each option...

Active-Electrode Insulation Integrity Testing Devices
These devices are designed to test the integrity of the insulation surrounding the conductive shaft of the laparoscopic instrument. These devices are available either on the sterile field for use intra-operatively, or can be located in the instrument assembly area of the SPD to be checked prior to routine sterilization.

Pros
• Helps remind clinicians to carry out inspections

Cons
• Cannot detect damage during the procedure
• Cannot detect partial breaks in insulation
• May be no more effective than visual inspection
• Cannot protect against capacitively coupled currents

Active-Electrode Shielding Systems

An active electrode shielding system is interfaced with an ESU and is designed to continuously protect against leakage current resulting from either active-electrode insulation failure or capacitive coupling.

Pros

• Protects against burns during a procedure with no user action required
• Protects against capacitively coupled current

Cons

• Compatible only with the company's shielded active electrodes
• Cost may be an issue

Active Electrode Indicator Shafts

The shaft of the active electrode is equipped with two insulation layers. The inner layer is brightly colored while the outer layer is black. The bright color allows the clinician to easily identify breaks in insulation. When the inner layer is visualized, the instrument is disposed of.

Pros

• Makes visual inspections easier and more effective
• Can facilitate partial breaks in insulation
• May reveal insulation defects that occur during a procedure

Cons

• Cannot protect against capacitively coupled currents
• Does not limit leakage current

Choosing the right laparoscopic electrosurgical technology for your OR is important. Patient safety, staff safety, and physician safety are all affected by this choice.

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