

SURGICAL INSTRUMENT REPAIR AND PREVENTATIVE MAINTENANCE

By Mobile Instrument Service & Repair

Hospitals are committed to creating an environment that is safe for patients and where medical/surgical outcomes are optimized. By making regular, preventive maintenance of surgical instruments a top priority, hospitals can enhance the performance of the instruments during surgery and most importantly, increase patient safety and improve surgical outcomes.

Properly functioning instruments are safe instruments

There is an adage among carpenters that “sharp tools cut wood, dull tools cut hands”. The same principles apply when considering surgical instruments.

A surgeon that has to apply more force to a sharp instrument loses the ability to direct the device. A clamp that does not hold can result in a loss of control which may result in slower surgery, or worse an unintended surgical outcome.

For example, a sharp trocar is much safer to insert into the abdomen as the likelihood of pushing too hard and puncturing underlying organs is reduced. Scissors that chew rather than cut cause more trauma to the tissue. Clip appliers that are misaligned may leave vessels only partially sealed.

A qualified repair technician will understand the correct function of each surgical instrument. He or she will carefully adjust, sharpen or repair the device so that it performs as intended and will function-test the product using established best practices (e.g. scissor cutting right to the distal tip) before releasing it back to the customer.

A combination of proactive preventative maintenance and reactive instrument repairs will contribute to the overall quality of a hospital's surgical program. Surgeons will have more confidence in the devices they are using and surgery time will be reduced. Most importantly the patient outcomes will be improved with optimally functioning surgical instruments.

Preventative maintenance reduces instruments deemed beyond repair

The average hospital in Canada has hundreds of thousands of dollars of surgical instruments in its possession. For large acute care settings, the figure is certainly in the millions. Yet, very few Canadian hospitals have a true preventative maintenance plan for the management of its surgical instrument inventory like they do for large hospital equipment such as sterilizers, or medical imaging devices. Instead, surgical instrument repairs are undertaken in a reactive manner with the result being that many instruments end up being considered beyond repair by the time they are seen by a repair technician.

There are many reasons that an instrument would be deemed beyond repair. Cracking/fracturing of the metal, pitting and corrosion, or previous poor repairs that cannot be corrected are all examples. In many cases, small defects in an instrument can be repaired before they are allowed to progress into a problem that is irrecoverable. A qualified repair technician can also point out to hospital staff if a defect is the result of misuse of the instrument (e.g. use of a scissor rather than a wire cutter to cut wire).

A program of preventative maintenance will lengthen the life of most surgical instruments. Every instrument in the inventory should be inspected for defects, as well as descaled, function-tested, and where required adjusted, sharpened, and/or lubricated at an interval no longer than 12 months. The simplest process to ensure instruments are well maintained is to work through the instruments set by set. There are various methods to track maintenance records of sets including computer systems, simple spreadsheets or good old-fashion pen and paper.

Off-Site, On-Site, and In-Site – use an expert

Surgical instruments can be repaired at a number of different physical locations, including Off-Site (at the repair facility's shop), On-Site (in a mobile repair vehicle parked at the hospital), or In-Site (in the hospital by a biomed or contractor). Depending on the specifics of the hospital and the instruments in question, there are pros and cons to each option.

Most hospitals ship products Off-Site for repair. The advantage of this process is that the repair facility likely has a full-service shop that can complete most, if not all, of the general instrument repairs. Finishing of instruments in a shop setting is generally better than the other options as equipment such as bead blasters or kilns used for colour dipping are not generally available for On-Site or In-Site repairs. Many repair shops have more than one technician, so there is back up in the case that one technician is not available due to vacation or illness. Having more than one technician also allows for some specialization. If the damaged instrument is critical to a set, it may be possible to rush the repair and receive quick turnaround; however, most repair shops aim for a five day turnaround as best case scenario and many repairs shops take longer. Delays that could affect regular turnaround include shipping to and from remote areas or delayed transport during bad weather. Securing administrative approvals from the hospital for repair estimates may also push back the return of a repair order. Shipping instruments is expensive and time consuming for the hospital staff to inventory, package and assemble. There is always the potential for products to be lost or damaged in transit.

On-Site repairs have the convenience of “same day” service and the instruments never leave the hospital premises. Full sets can easily be accommodated by an On-Site repair process which makes On-Site a great option for preventative maintenance programs. But On-Site also has limitations. Some repairs cannot be completed On-Site so not all instruments will be repairable without having to be shipped out. If a device is broken the day after the repair technician has been On-Site, there may be a long delay for the repair to actually occur, negating the concept of “same day” service. In some cases, remote locations are unable to schedule regular On-Site repairs. Relying on a single technician may not be optimal depending on the reliability of that technician. Finally, some finishing capabilities are not available on a mobile repair vehicle due to space or safety considerations.

In-Site repairs can sometimes be completed by a biomedical engineer or third-party repair contractor. There is a tremendous convenience in being able to walk damaged instruments over to another department in the hospital as well as removing the costs and risks associated to ship instruments Off-Site. Preventative maintenance programs are also possible using an In-Site repair process. The greatest risk to In-Site repairs is that the biomedical personnel may not be properly trained to repair surgical instruments or the shop may not have the required equipment to complete all repairs. If a repair company is contracted to provide the equipment and personnel for an In-Site repair process, these issues may be avoided; however, most Canadian hospitals do not have the extra funds or repair volume to justify an In-Site solution.

As can be seen, each of the repair processes has pros and cons. For most Canadian hospitals a combination of Off-Site and On-Site repairs will provide the best mix of reactive instrument repairs and proactive preventative maintenance. Larger hospitals or hospital systems may have the capacity to utilize an In-Site repair process.

Regardless of the process, it is vitally important that the hospital interview the repair personnel and repair company fully. Is the technician reliable, properly trained, and able to complete a full range of repairs? Does the repair company have a Health Canada Medical Device Establishment License, a technician training program and sufficient liability insurance? Is the company trustworthy, service-orientated and a good partner? Are you able to see the repair shop or repair vehicles and assess the quality of the overall operation? Choosing who repairs your instruments is as important as choosing who you buy them from in the first place; take your time and choose wisely!