



GUEST Editorial

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Surgery to Improve Patient Care: Sometimes More, Sometimes Less

This is the ninth of a 12-part series: This year we're focusing on the phenomenal progress that the medical community has made in the 30 years of Federal Practitioner's existence. Each month we'll feature an editorial written by one of our Editorial Advisory Association members, reminding us how much has changed in their particular medical field over the past 30 years. This month's focus is surgery.

The art and practice of surgery has undergone many changes and advancements over the past 30 years. I have experienced many of these over the past 20 years during my surgical training and position as staff surgeon at a residency training program. Earlier in my training, the Bassini tissue inguinal hernia repair was a common surgical procedure, residents worked over 100 hours per week, and a trainee would have to argue why a costly computed tomography (CT) scan was necessary before proceeding to the operating room.

Surgery culminates in the combined product of many disciplines; therefore, advances in other areas have greatly impacted the specialty. Diagnostic advancements have increased the ability to determine the exact cause of a patient's presenting symptoms, leading to a more accurate and timely disposition. Now, CT scans are more liberally performed to clarify, classify, and guide treatment decisions and ultimately, surgical necessity

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and conduct. Additional imaging modalities, such as ultrasound, magnetic resonance imaging, and positron emission tomography, have aided in illuminating the preoperative clinical picture.

Surgical conditions that have traditionally mandated surgical treatment, often in multiple stages, are now performed in a single setting or not at all. One such example is the current treatment of diverticulitis and its complications. Complicated diverticulitis, which historically was handled with 3 operations, transitioned into a 2-stage approach. Currently, with initial interventional drainage, surgery can often be accomplished in a single setting. Recently, there has been questioning of whether surgery is needed at all for a single episode of a percutaneously drained abscess.

These modalities have also provided an alternative to traditional surgery for obtaining tissue from lesions in order to perform pathological diagnosis. Thus, a less invasive method to characterize lesions as benign, malignant, or metastatic exists so that a final determination can be made as to whether surgery would be beneficial and warranted. These preoperative measures that lead to a more definitive diagnosis have led to a decrease in overall exploratory surgery in which the operation is undertaken for both a diagnosis and curative intent. Rarely now, for instance, is a splenectomy needed to stage the extent of Hodgkin or non-Hodgkin lymphoma.

A minimally invasive approach through the use of laparoscopy has

caused significant changes in surgical approach as well as length of hospitalization and recovery time for patients. A key driver in the emergence of laparoscopy has been the technological advancement in instrumentation that allows for the replication of open surgery in a confined space. Advances in instruments that utilize either ultrasound or directed energy have increased the surgeon's ability to achieve hemostasis in both traditional open and laparoscopic surgery.

Technology for performing bowel anastomosis through use of stapling devices has provided an alternative to open hand-sewn techniques. Stapled anastomosis can be done as effectively and in a shorter time period than an open hand-sewn technique in order to facilitate the successful completion of the procedure. These devices have been adapted to be used laparoscopically, allowing the surgeon to replicate open techniques with less invasiveness. Up until the year 2000, the Roux-en-Y gastric bypass for morbid obesity was mostly an open procedure with a long hospital stay and was associated with significant morbidities in sick patients. But with advances in laparoscopy, patients can now leave the hospital in 2 days with minimal pain.

Many surgeries that are not amenable to a laparoscopic approach have become less radical and are performed with a more targeted approach. For example, lumpectomy and sentinel node biopsy, with or without chemotherapy and radiation, has largely replaced the more extensive modified

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radical mastectomy. In hernia surgery, the development of synthetic and biological materials has replaced repair that used the patient's own tissue. This has led to a decrease in postoperative pain and, more importantly, to a decrease in recurrence, which would require reoperation. The benefit of utilizing material other than the patient's own tissue was first seen in repair of groin hernias, but now is being harnessed in repairing incisional hernias or as adjuncts to abdominal wall reconstruction.

Many procedures are able to be avoided altogether following the development of the nonoperative treatment of trauma for a broad range of injuries. Many injuries previously requiring laparotomy are diagnosed and classified radiologically with subsequent treatment through endoscopic or interventional radiological methods. This approach has been widely adopted in the treatment of solid organ trauma, such as hepatic and splenic injuries.

Additionally, there has been a paradigm shift in trauma surgery to now do less in the initial operation, knowing there will be subsequent operations. The idea of damage control surgery has resulted in improved survival after injury and a more economical use of resources. Nowhere is this better exemplified than in the military. Forward surgical teams equipped to stop bleeding and reverse the lethal triad of hypothermia, acidosis, and coagulopathy, are placed on the battlefield and are ready to operate almost at the point of injury. Within hours of initial surgery, injured patients are quickly transported to the more established structures of a combat support hospital that are situated in more protected areas. Further resuscitation is continued, if needed, and relook operations are performed. Stable patients are then evacuated to garrison environment hospitals for another surgical evaluation. Within 24 hours, a soldier could have 3 operations at

3 different facilities in 2 different countries. This is a large reason why the injury survival rate of the conflicts in Iraq and Afghanistan is at an all-time high for combat.

No longer is surgical quality measured solely by the 30-day morbidity and mortality. Now, several performance projects are in place to measure outcomes not just for 30 days, but for years, as in the case of bariatric surgery. Significant national initiatives have been directed at improving the quality of surgical performance and outcomes across specialties. National databases for bariatrics, trauma, cancer, and transplant have been instituted so that improved studies can be performed. These databases are vital in providing data for research that can be utilized to generate disease- or surgical-specific pathways in order to reduce variability of treatment and to establish procedures in adherence to determined best practices.

In the operating room, surgical checklists and time-outs have been instituted that enhance team communication and ensure equipment availability in order to provide for optimal surgical performance. Additionally, the Surgical Care Improvement Project measures process, and the National Surgical Quality Improvement Program measures outcomes, and both have been utilized to improve the totality of surgical care.

Recently enacted work-hour guidelines and enforcement of adherence to them has changed the methodologies of surgical education. There has been much debate and much written as to the overall impact of these restrictions and whether this change has been positive or negative. Needless to say, it has led to a dramatic change in the way surgery is taught and currently performed. The emergence of surgical hospitalists and acute-care surgeons has developed to cover the gaps in care stemming from decreased resident work hours.

Many initiatives have been undertaken to mitigate the impact on work hours, such as simulation training. Simulation is now routinely incorporated into surgical training programs that utilize both technical exercises and cognitive scenarios to expose, train, and evaluate each resident's experience and performance. This gives the learner a safe, simulated, and standardized environment in order to acquire and practice new or infrequently used skills.

Most recently, the introduction of robotic assistance to improve surgical performance of selected cases has been developed. This potentially gives the operative surgeon better visibility and finer control of instrumentation in a confined operative field. The future and overall outcome of robotic surgery will need to be left for the next 30-year update.

In the future, surgery will continue to change with innovative solutions to surgical problems. Technology will allow the surgeon to apply new methods to traditional solutions. The ultimate quality and overall outcome, as experienced by the patient, will be the paramount goal. ●

Author disclosure

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