

# Editorial

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Robot-assisted procedures have now become more popular in a few kinds of surgeries. In 2017, there were about 4,500 of them scattered around the world's hospitals, and they took part in 850,000 operations. Most of those procedures were urological and gynecological. But robots also helped surgeons operate on colons, hearts and other organs. The operations that are performed laparoscopically can be made through the robot, with more accuracy and safety. The use of robot surgery favors a less invasive operation, with a much better view of the organs being operated, with great approximation of the structures, with the surgeon's vision in three dimensions, procedure even less invasive, and with less tissue trauma.



It is possible to have great accuracy, due to the interface of the "robot" between the arms of the surgeon and the patient's operated organs. da Vinci itself has four arms, three of which carry tiny surgical instruments and one of which sports a camera. The surgeon controls these with a console fitted with joysticks and pedals, with the system filtering out any tremors and accidental movements made by its operator. Robotic grippers are specially designed to simulate the movements of the surgeon's hands, allowing dexterity never achieved by laparoscopic surgery. The surgeon does not use any force to control the robotic arms, doing movements with the extremities of the fingers; thus, there is much less fatigue in prolonged procedures. The robot helps the trained surgeon perform operations even more safe and accurate.

The surgeon is aware of their performance by an assessment that appears immediately after exercise, showing numerous variables that exercise demand, directing the aspect that need to be improved, or if it was correctly done. The surgeon can thus become familiar with the equipment and thorough training, perform initial procedures with more skill and accuracy, reducing the learning curve and possibly reducing the risk of occurrence of accidents and complications, which occur in the learning curve of surgery, either open, laparoscopic or robotic approach.

Gynecologic surgery got significant upgradation in recent years, also leading to very good results. In the digestive tract, virtually all operations can be performed through the assistance of the robot. In obesity surgery, it allows better access to organs, maximized visualization and high precision in the sutures. In esophageal surgery, it provides precise, anatomic, minor assault procedures. When operating the intestine, the robot must allow release of the structures, preserving vessels and nerves which help preserve continence and potency functions, important to patients. Assisted by the robot, the operations greatly help the surgeon to bring greater benefit and safety for their patients, especially when there are anastomoses or dissections requiring high precision and privileged view; reoperations or revisions are thus much better performed with the aid of the robot. The dual console allows second surgeon to assist or interfere, facilitating training during the learning curve.

If a new generation of surgical robot can make things cheaper, then the benefits of robot-assisted surgery will spread. The continual miniaturization of electronics means that smarter circuits can be fitted into smaller and more versatile robotic arms than those possessed by Intuitive's invention. This expands the range of procedures surgical robots can be involved in, and thus the size of the market. The other is that surgical robotics is, as it were, about to go generic. Many of Intuitive's patents have recently expired. Others are about to do so. As a result, both hopeful startups and established healthcare companies are planning to enter their own machines into the field. The robotic platform is evolving exponentially.

The possibilities of computer program interactions are almost endless. Costs will decrease considerably in the next years. So, the future has arrived! In coming issues of WJOLS, we are adding more and more robotic articles and I hope readers will definitely like it. Your helpful comments are much appreciated, and your feedback will help us continually improve the standard of articles published in World Journal of Laparoscopic Surgery.

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