

Robo Surgery

a text for interpreting practice in the
Classifiers in Context: Disc One, Medical Settings DVD-ROM
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Based on:

Noonan, David (2001, June 25). The Ultimate Remote Control.
Newsweek (next frontiers: a special report)..

Surgeons are doing amazing things in the operating rooms these days. They are able to sit across the room – away from the operating table and use a surgical robot to actually perform heart bypass operations without having to do serious invasive type of surgery we are familiar with. The “incision” for this new type of surgery consists of only five tiny cuts into the patient’s chest. While the robot performs the bypass surgery, the patient’s heart is still beating – another change from past practice. The typical open-heart surgery entails sawing open the breastbone, stopping the heart while the surgeon works on the heart, with hands deep in the chest cavity.

The advantages of this type of surgery include fewer post-operative complications. While these operations are remarkable, they are but the first step on a long journey to a future where the only limits will be people’s imaginations.

Barely three years after the first robotic systems reached the market; over 400 surgeons were using robots to fix hearts all over the world. They are using robots to perform procedures such as heart valve

repairs, heart bypass surgeries, removing gallbladders, repairing fallopian tubes and removing prostates.

The patient loses very little blood with this new technology. The incisions and movements during organ removal are very precise. Despite the advances that have been made in the medical field over the years, some of today's "standard" procedures seem crude by comparison.

When surgeons (aka robosurgeons) sit at a console, they don't touch their patients and therefore do not have to wash their hands before they operate. They do wear scrubs, head coverings and surgical masks however since they are still in a sterile environment, situated a few feet away from the operating table. From there they watch a color video monitor and manipulate two control instruments. A computer links the controls to instruments held by robotic arms. It is these robotic arms that do the actual cutting and sewing inside the patient.

The monitor is connected to a tiny camera that is being held inside the patient by the robot. This enables the surgeons to see what they are doing. The surgical instruments and camera go through the tiny incisions into the body. The actual cut is only as wide as a pencil. There is a second surgeon in the operating room, ready to assist the robot – changing instruments when that needs to happen, and available in case something goes wrong.

Surgical robots can do things that human surgeons cannot do. For example, they can tie tiny knots that are so small that one can barely see them with the naked eye. A computer program is used to filter out the natural tremor that is present in the human hand as it performs surgery. There is another program that is used to reduce the size of the motions made by the human surgeon. For example, a two-inch movement the surgeon makes with the control arms of the robot will become only two-millimeter movements inside the patient's body. Additionally, the tiny endoscopic camera inserted inside the incision can magnify images up to 25 times, giving the surgeon far greater vision than they would normally have with the typical magnifying glasses that surgeons have traditionally worn.

It is still too early to know for sure what all the benefits of robotic surgery are. One thing for sure, however is the speed of patient recovery. Patients who undergo the usual open-heart surgery tend to spend a minimum of six or seven days in the hospital after their surgery. A robotic bypass patient on the other hand, typically spends only two or three days in the hospital after their surgery. They also lose less blood and have fewer post surgical complications.

Perhaps the most intriguing aspect of robotic surgery is the possibility of telesurgery – performing operations over long distances. Long-distance robotic surgery has been considered as a means to treat those patients who live in remote locations. As ideal as it sounds, telesurgery is not without its risks. There can be technical problems, e.g., a time lag in signal transmission, which would result in a delay

between when the surgeon moves his control arm, and when the robot moves the operating instrument. When the signal travels a long distance, and when it results in a delay, which decreases the surgeon's control, it is considered a risk to the patient.

Then there are the ethical considerations. Is it ethical for a surgeon to operate on a patient in another city, or other distant location where there is no second surgeon standing by, and there is no way to physically intervene if something goes wrong?

In the meantime, while waiting for this specialty to evolve further, the robosurgeons will probably not be operating via the robot. They will however, still be able to sit at their console in the operating room with their patient, while a mentor, sitting at a console of his own, watches the procedure and offers advice or assistance from a distance. Worse case scenario, the mentor could actually take over and complete the procedure remotely. Makes one wonder if with all this technology, will the surgeon lose the human touch?