

Robotic Surgery

Will Roman
University of Rhode Island
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Robotic Surgery is the process of performing medical operations with the assistance of an electrical device that can either perform autonomously or with human assistance.

Currently three devices are on the market available for hospital use. These include the da Vinci Surgical System and the Zeus Robotic Surgical System using the AESOP Robotic System technology of the same company.

The da Vinci Surgical System became the first robotic system allowed in American operating rooms in July 2000 and cost 1 million dollars. The da Vinci Surgical System consists of two major components: a surgical arm unit and a viewing/control console. To use this system, the surgeon simply sits at few feet away from the operating table at the viewing and control console and uses joystick-like controls to control each of the 3 robotic arms at the table.



da Vinci Surgical System
control console on left, robotic arms on right

Currently with the da Vinci Surgical System, gall bladder surgery only requires three incisions about the diameter of a pencil, while heart bypass surgery requires three incisions of 1cm each. The small incisions required for such surgeries decreases recovery time, discomfort for such operations, and vulnerability to infection.

The Zeus Robotic Surgical System operates similarly to the da Vinci system in that it also has a control system and an operating arm system. AESOP Robotic System is an automatic endoscope (camera) positioning system for surgeries, and is how images are displayed to the operating surgeon.

So far, robotic technology has made significant advancements with new surgeries being performed frequently. However, these new operations have to first be cleared by the FDA before they are allowed to be practiced in the operating room. So far, the da Vinci System is cleared to assist in cutting and suturing, while Zeus is only cleared for grasping, holding, and moving things out of the way, but is not allowed to cut or suture like da Vinci.

The use of robotic surgery in the future could yield amazing possibilities such as performing surgeries from different countries or even having a computer control whole operations from start to finish. Currently though, such technology is not available because of time lag, and such programming has not been developed.

In the end, robotic surgery does promise few, if any hand vibrations, since programming ignores hand tremors from the surgeons operating the equipment, in addition to more precise operations and faster recovery times over non-robotic surgery. Together, this can potentially lower health costs by having fewer doctors in the operating room.

References:

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