Chapter 13 Case Project

**OVERVIEW**

The field of robotics has become a quickly successful application of artificial intelligence. From factory lines to hazardous jobs, robots are being utilized in place of humans where the task may be tedious or unsafe. The medical field is also taking advantage of this technology. Robots have been assisting doctors, dentists, and nurses for two decades. This paper will discuss how they are being used and the advantages and disadvantages of the da Vinci Surgical System.

**DISCUSSION**

Robotic surgery is a minimally invasive surgery using miniaturized instruments that fit through small incisions. Although the name is very deceiving, robotic surgery is not performed completely by a robot. It is a system designed to aid the doctor in operating with more precision. The goal of robotic surgery is to give the surgeon more control in a less invasive environment.

The da Vinci Si is the most advanced surgical robot in the world. A combination of three instrumental arms and one arm mounted with a 3-D camera gives the surgeon maximum range of motion and precision. The robotic arms replicate every movement made by the doctor. The movement’s scale can even be customized. For example, the surgeon can change it to where every three inches of their movement is only one inch for the robotic arm allowing for more precise work.

This advancement in technology has many advantages. Surgeries performed with the da Vinci system cause less trauma to the body, minimal scarring, and faster recovery time for the patient. There are advantages for the doctors as well including greater visualization, enhanced dexterity, and greater precision.

Unfortunately, there are disadvantages to this system also. There has been a rise of injury and death rates since 2004. This may come from a lack of advanced skills in using the device. Training protocols may also vary by hospital. Then there is the pressure from salespeople from the companies selling the equipment that are trying to meet quotas. They may push doctors to make the jump to robotics quicker than they are ready to do.

Another aspect to take into account is the cost. While a robotic surgery will initially cost more for a patient than a non-robotic surgery, the patient will probably save more overall by less need for blood transfusions, post-op meds, etc. With prices ranging from $1 million to $2.5 million, the cost for the hospital is something to consider as well. With the amount of training needed for surgeons to become adept in using these tools, I’m not sure that the advantage would outweigh the cost anytime soon.

**SUMMARY**

Advances in medical technology will always be growing field. Making procedures safer and less invasive for the patient is always the top priority. Doctors are now able perform surgeries that otherwise were more complex with the help of technological advancements. The future of robotic surgeries looks to be very promising.

**SOURCES**

<https://med.nyu.edu/robotic-surgery/physicians/what-robotic-surgery>

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