

# **ROBOTIC SURGERY**

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## **ABSTRACT**

Surgery is a field of study that deals mainly with lives especially that of the human life. A lot of activities take place in the theatre, as surgeons and other medical personnel are usually faced with problem of saving human live via surgical operations. Sometimes, errors occur in course of operating on delicate parts of the body, which might result to severe injury and sometimes death due to inaccuracy on the side of surgeons. This is the reason why it is imperative that the issue of error should be corrected using a well developed machine called ROBOT to perform delicate surgical operations as they can only do that which they have been programmed for.

## **INTRODUCTION**

Robot is a computer-controlled machine that is programmed to move, manipulate objects, and accomplish work while interacting with its environment. Robots are able to perform repetitive tasks more quickly, cheaply, and accurately than humans. The term robot originates from the Czech word robota, meaning “compulsory labor.

Robotic surgery is the use of robots in performing surgery. Three major advances aided by surgical robots have been remote surgery, minimally invasive surgery and unmanned surgery. Some major advantages of robotic surgery are precision, miniaturization, smaller incisions, decreased blood loss, less pain, and quicker healing time. Further advantages are articulation beyond normal manipulation and three-dimensional magnification, resulting in improved ergonomics.

## **HISTORY**

In 1985 a robot, the PUMA 560 was used to place a needle for a brain biopsy using CT guidance. In 1988, the PROBOT, developed at Imperial College London, was used to perform prostatic surgery. The ROBODOC from Integrated Surgical Systems was introduced in 1992 to mill out precise fittings in the femur for hip replacement. Further development of robotic systems was carried out by Intuitive Surgical with the introduction of the da Vinci Surgical System and Computer Motion with the AESOP and the ZEUS robotic surgical system. (Intuitive Surgical bought Computer Motion in 2003; ZEUS is no longer being actively marketed. The da Vinci Surgical System comprises three components: a surgeon’s console, a patient-side robotic cart with 4 arms manipulated by the surgeon (one to control the camera and three to manipulate instruments), and a high-definition 3D vision system. Articulating surgical instruments are mounted

on the robotic arms which are introduced into the body through cannulas. The device senses the surgeon's hand movements and translates them electronically into scaled-down micro-movements to manipulate the tiny proprietary instruments. It also detects and filters out any tremors in the surgeon's hand movements, so that they are not duplicated robotically. The camera used in the system provides a true stereoscopic picture transmitted to a surgeon's console. The da Vinci System is FDA cleared for a variety of surgical procedures including surgery for prostate cancer, hysterectomy and mitral valve repair, and is used in more than 800 hospitals in the Americas and Europe. The first robotic surgery took place at The Ohio State University Medical Center in Columbus, Ohio under the direction of Dr. Robert E. Michler, Professor and Chief, Cardiothoracic Surgery.

- In 1997 a reconnection of the fallopian tubes operation was performed successfully in Cleveland using ZEUS.
- In May 1998, Dr. Friedrich-Wilhelm Mohr using the Da Vinci surgical robot performed the first robotically assisted heart bypass at the Leipzig Heart Centre in Germany.

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