

## Robotic Surgery: An Overview

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### PERSPECTIVE

Robotic surgery refers to surgical procedures carried out with the use of robotic technology. Robotically-assisted surgery was created to help doctors perform open surgery by overcoming the constraints of existing minimally invasive surgical procedures. Instead of moving the instruments directly, the surgeon employs one of two methods to deliver them in robotically assisted minimally invasive surgery. Using a direct telemanipulator or computer control are two options. A telemanipulator is a remote manipulator that allows the surgeon to do all of the regular surgical manoeuvres. The actual surgery is carried out by the robotic arms, which use end-effectors and manipulators to carry out the actions. The surgeon utilises a computer to control the robotic arms and end-effectors in computer-controlled systems, while these systems can still use telemanipulators for input. One benefit of adopting the computerised approach is that the surgeon is not required to be present, allowing for remote surgery. The Arthrobot, which was designed and deployed for the first time in Vancouver in 1985, was the first robot to help in surgery. On voice command, this robot assisted in manipulating and positioning the patient's limb. James McEwen, a biomedical engineer, Geof Auchinleck, a UBC engineering physics graduate, and Dr. Brian Day, as well as a group of engineering students, were all directly involved. On March 12, 1984, at the UBC Hospital in Vancouver, the robot was employed in an orthopaedic surgical procedure.

In the first year, over 60 arthroscopic surgical procedures were conducted, and the gadget was featured in a 1985 National Geographic movie on industrial robots, *The Robotics Revolution*. A surgical scrub nurse robot, which handled operative equipment on voice command, and a medical laboratory robotic arm were also developed around the same time. With the debut of the da Vinci Surgical System and Computer Motion with the AESOP and ZEUS robotic surgical systems, SRI International and Intuitive Surgical continued to develop robotic systems.

Under the leadership of Robert E. Michler, the first robotic surgery was performed at The Ohio State University Medical Center in Columbus, Ohio. Remote surgery, minimally invasive surgery, and unmanned surgery have all benefited from surgical robots. The procedure is performed with precision, miniaturisation, and smaller incisions, resulting in less blood loss, less pain, and a faster recovery period. Robot-assisted surgery allows the surgeon more control over the surgical instruments and a better view of the operative site than previous minimally invasive surgery techniques. Furthermore, surgeons are no longer required to stand throughout the procedure and do not become fatigued as rapidly. The robot's computer programme filters out naturally occurring hand tremors. Finally, rotating surgery teams can employ the surgical robot indefinitely. In comparison to human help, robotically controlled laparoscopic camera setup is substantially more stable, with less unintended movements.

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