

HI-TECH HEALTH CARE

ROBOTICS IN HEALTH CARE

by Sue Bradford Edwards



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AT A GLANCE

- A robot is a machine designed to do a job. A robot may do one job or many.
- The robot Unimate went to work in 1961. It was a robotic arm. It helped build cars for the company General Motors.
- Scientists at NASA were among the first to think about robots that could do surgery. Their goal was to help astronauts in space.
- Doctors commonly use robots in surgery today. Robots can reach where people cannot. They can make delicate, precise motions.
- Robots are used to deliver things in hospitals. They can carry meals or medicines. This frees up time for human hospital staff.

WHAT IS THE HISTORY OF ROBOTICS IN HEALTH CARE?

The first programmable robot was Unimate. In 1961, the car company General Motors used it in a factory. This robotic arm lifted hot metal. Scientists looked for other ways to use robots. Some people thought robots would make good



In a 1960s demonstration, a Unimate robot poured a cup of tea to show off its abilities.

teachers. They looked for ways robots could help young learners.

Other people looked for ways to use robots in space. In the 1970s, the National Aeronautics and Space Administration

(NASA) investigated this. NASA wanted to do tele-surgery. “Tele” means at a distance. The agency studied the idea of long-distance surgery. NASA worried an astronaut might get hurt or sick in space. NASA thought a doctor could work through

ROBOTS FOR CHILDREN

Robotic technology has been in toys for several decades. In 1978, parents could buy the Speak & Spell. It was built by Texas Instruments. It was a handheld computer. The computer would say a word. Then the child would type the word. By 1998, one robot toy looked like a stuffed animal. It was called Furby. When a person first bought one, Furby spoke Furbish. This was a language of nonsense words. Furby was programmed to use more English words over time.

a robot. The robot would be with the astronauts. The doctor would be on Earth. The doctor would direct the robot. However, scientists could not make it work. A signal takes time to travel a long distance. There is a delay before it reaches the other end. In surgery, this delay could be deadly.

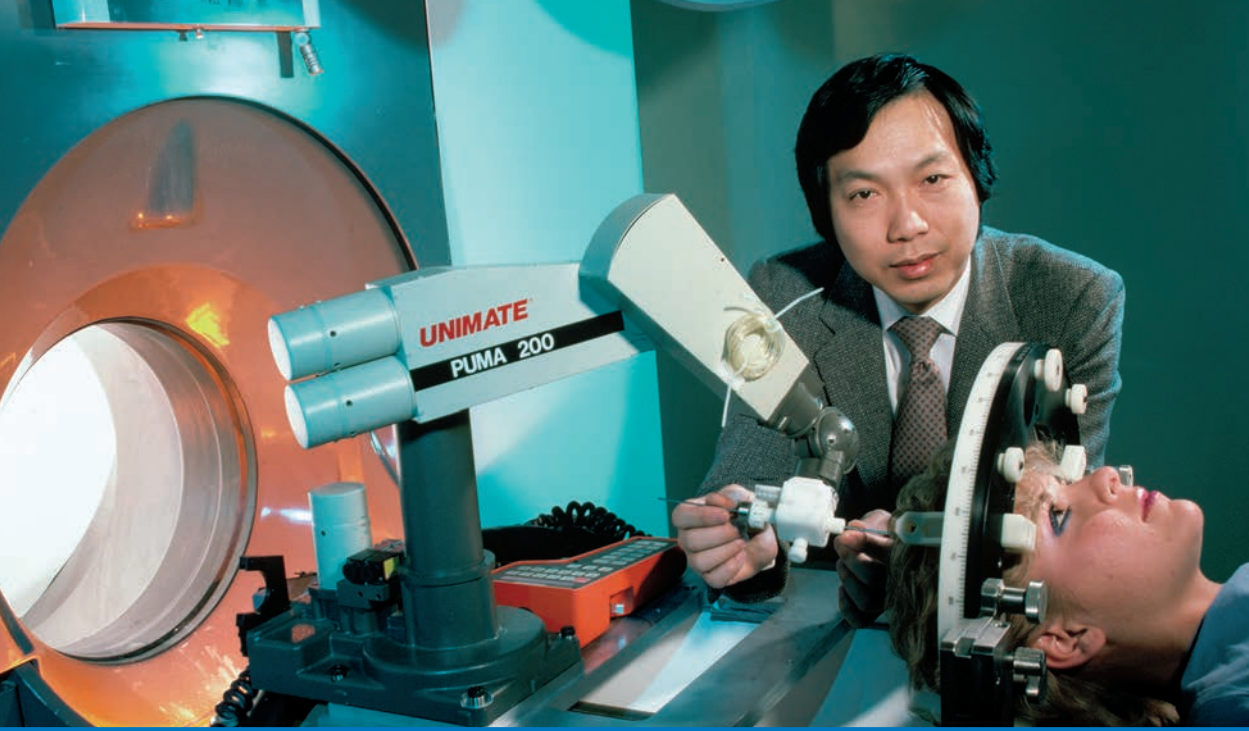
Surgery robots also had military uses. A soldier might need an operation in a war zone. A robotic arm could be in the dangerous area. A doctor could be someplace safe. He could remotely control the arm to operate.

SURGICAL ROBOTS

Scientists saw that robots could help operate. Robot arms can move in ways humans can't. They can make small, precise movements. This could make surgery faster, easier, and safer. Doctors and scientists got to work. They built many different robots.

ROBOT HELPERS

In the 1980s, the Stanford Robotic Aid Project opened. It was at Stanford University in California. Researchers built robot helpers. The robots would help injured soldiers. The robots would do more than one job. They could lift and move things. They could help users brush their teeth and shave. The robots would help people live on their own.



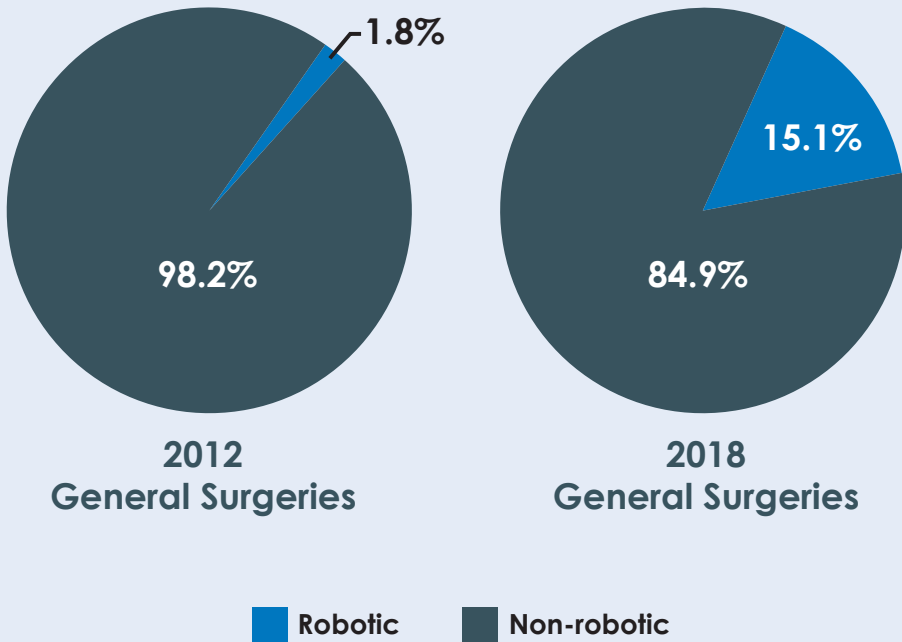
One of the creators of the PUMA 200, Dr. Yik San Kwoh, shows off the robot.

The PUMA 200 was the first surgical robot. A doctor first used it in 1985. First, he used a **CT scan** to look inside the patient. This scan showed where a needle needed to go. The PUMA 200 robot slid the needle into the patient's brain. It took a tissue sample. The **biopsy** was tested for cancer.

A robot called PROBOT was first used in 1988. Before the surgery, scans were made. They were of the patient's prostate gland. This gland is below a man's bladder. The doctor studied the scans. The robot would make cuts inside the gland. The doctor noted where to make the cuts. He programmed the robot. The robot reached the gland. The doctor watched PROBOT work. He could take over if needed. The robot made cut after cut. Each cut was exact. This was the perfect task for a robot.

Around the same time, ROBODOC was developed to help with hip surgeries. Hip

GROWTH OF ROBOTIC SURGERY



Source: Kyle H. Sheetz, MD, MSc; Jake Claflin, BS; Justin B. Dimick, MD, MPH, "Trends in the Adoption of Robotic Surgery for Common Surgical Procedures," JAMA Network Open, January 10, 2020. <https://jamanetwork.com>.

The use of robots in surgery became much more widespread in the 2010s.

Beth Israel Deaconess Medical Center. This is in Boston, Massachusetts. Robots are changing today's hospitals.

GLOSSARY

active

describing a robot able to act on its own

biopsy

a tissue sample that will be tested for disease

CT scan

a picture showing the inside of a patient's body

femur

the upper leg bone

incision

a surgical cut

passive

describing a robot controlled by a person

rehabilitation

exercises or treatments that restore health, also known as rehab

SOURCE NOTES

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