

# Robotic Surgery

**Robotic surgery may sound a little too high-tech for comfort, but rest assured, the accurate term is robotic-assisted surgery.**

A surgeon performs your procedure using very high-tech equipment. Originally designed for use on battlefields, today the “robot” has become the latest technology at hospitals worldwide.

## Surgery Alternatives

There are 2 basic ways to do surgery. In **open surgery**, the surgeon makes a large incision to look and work directly inside the body. In **laparoscopy (minimally invasive surgery)**, the surgeon makes 1 or more small incisions and inserts a light and a camera into the openings.

Many types of open surgical procedures can now be done laparoscopically. Advantages include smaller incisions, less blood loss (and less need for transfusions), less pain while recovering, and shorter hospital stays. Disadvantages include rigid tools, a need for the surgeon to operate tools in a tight space, and the surgeon’s view is on a video screen, which can be confusing.

## What Is Robotic Surgery?

Robotic surgery is a newer kind of laparoscopic surgery. The surgeon makes small incisions, but the instruments work through a robotic device. The surgeon sits at a console and operates the robot’s arms, which in turn move tiny tools inside the patient’s body.

There are many advantages to robotic surgery. The surgeon can view a high-quality, 3-D image and can move his or her hands and wrists more naturally. The robot can reduce tremors in the surgeon’s movements and is helpful for surgery in tight spaces in the body. Robotic surgery is particularly helpful for certain types of procedures in which access is difficult.

Disadvantages include a significant learning curve for surgeons to become fully expert. Some surgeons miss the “feel” of direct contact with the patient’s organs. And robotic surgery takes longer, regardless of the surgeon’s expertise.

## What Do the Studies Say?

There are few well-designed studies of robotic surgery compared with traditional laparoscopic surgery. A recent study found that there was no advantage to patients for robotic surgery, and it costs a great deal more than traditional laparoscopic surgery.

## Cost

Robots can cost \$1.5 million to \$1.75 million each plus the expense of annual maintenance and the necessary disposable instruments. There is no manufacturing competition to lower costs; in the United States, only 1 system has FDA approval.

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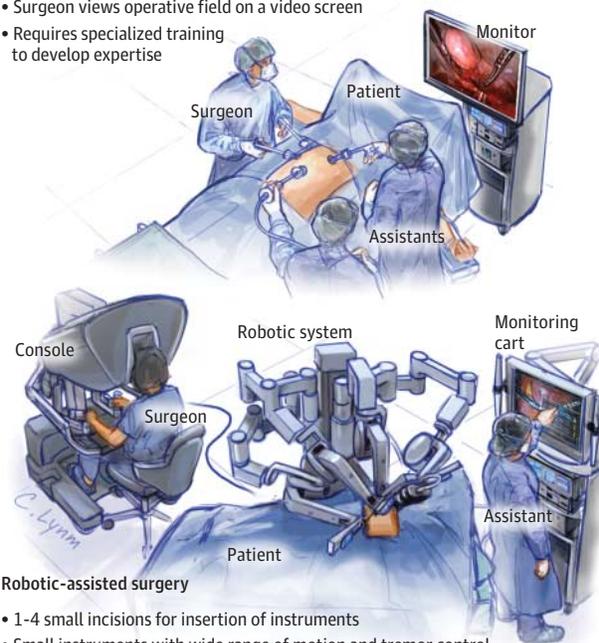
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**Source:** National Library of Medicine. Wright J, et al. *JAMA*. 2013;309(7):689-698.

Without much better outcomes, it is difficult for hospitals to justify the purchase price. In the end, patients will pay for the overall increased costs in the form of higher insurance premiums.

## Laparoscopic surgery

- 1-4 small incisions for insertion of instruments
- Small, rigid instruments with specific motions
- Surgeon operates standing in a traditional operating room arrangement
- Surgeon views operative field on a video screen
- Requires specialized training to develop expertise



## Robotic-assisted surgery

- 1-4 small incisions for insertion of instruments
- Small instruments with wide range of motion and tremor control
- Ability to operate in very tight or small spaces
- Surgeon operates seated inside a specially designed console to control robotic instruments
- Surgeon views 3-D image of operative field
- Requires substantial specialized training to develop expertise

## FOR MORE INFORMATION

- National Library of Medicine  
<http://www.nlm.nih.gov/medlineplus/ency/article/007339.htm>

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