

Robotic surgery!



Robotic Surgery and how robots are being used!

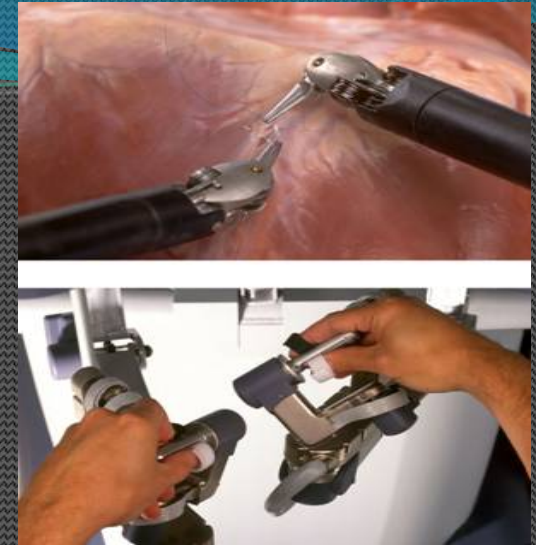


How Does Robotic-Assisted Surgery Work?

- ❖ The surgeon works at the computer console.
- ❖ There is an O.R. team by the patient's bed, along with the robotic equipment.
- ❖ The doctor makes tiny incisions about the size of a dime and guides the robotic arms with attached instruments and a tiny camera through the incisions (or "ports").
- ❖ At the computer console, the surgeon looks through a camera which magnifies the organs and other structures inside the body by 10x
- ❖ The surgeon can change the surgical view instantly, using foot pedals to zoom in and out.
- ❖ The movement of the surgeon's fingers is transmitted via the computer console to the instruments on the robotic arms. These instruments mimic the movements of the surgeon's hands and wrists.



THE BURGEONING USAGE OF THE TERM "ROBOTIC SURGERY" IS NOT JUST AMONG MEDICAL PROFESSIONALS, BUT ALSO IN LAYMEN VERNACULAR INDICATES AN INCREASED POPULARITY OF conducting surgeries with the aid of robots!



➤ people all over the world are getting robotic surgery done because there is a better chance of healing in a very short period of time!

The instruments that are being used that are controlled by a doctor!

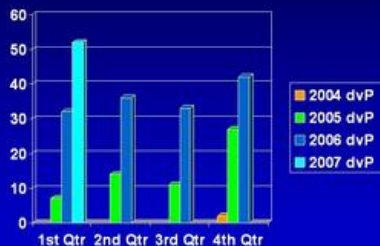


Overview on robotic surgeries!

□ Patients these days are demanding higher qualities of care and reductions in outcome variability, there is increasing pressure growing on the doctors to find out new methods to improve surgical success!!!

□ The use of computer and robotic assist devices is rapidly growing in surgeries today, and a major contributing factor in the ever advancing techniques in surgical outcomes.

dvP growth by quarter



□ Could we reach a point where the role of the surgeon is merely to turn a switch on and off and let a machine do the work?

OPERATION



- Picture of a doctors station where he will sit while performing the surgery!

The surgeon works at a console a few feet away from the operating table.

they use several controls while watching a 3-D (3 dimensional) image of the surgical field on the monitor. The robotic arms and instruments are directly in contact with the patient.



There are many advantages and disadvantages!

- Some advantages are.... all surgeries are minimally invasive, there is a significantly lower amount of pain, blood loss, and scarring. Recovery time is also shorter and better clinical outcomes can be achieved

- Some disadvantages are...a certain learning curve is present when surgeons use equipment like this for the first time. Thus, while robotic surgery systems attempt to reduce human factors, the "practice makes perfect" motto holds true.

The Robot Is In

The da Vinci Surgical System is finding a home in ORs across the country, including NewYork-Presbyterian Hospital/Columbia University Medical Center. During an operation the surgeon peers into two full-color screens—one for each eye—that magnify the field 10 times. Because the image is 3-D, the doctor feels as if he is working inside the patient when he is actually 8 feet away.



ROBO DOC: Dr. David Samadi now performs more than 80 percent of his prostatectomies robotically

Caught on Camera

Tiny cameras are attached to the end of one of the robotic arms and inserted into the patient. They provide a magnified view of the surgical field during the operation.

Arm's Length

During the procedure, a surgical assistant adjusts the robotic arms. Attached to the arms are 18-inch surgical instruments. The assistant makes sure each instrument is properly inserted into the patient.

Robotic Arms

Operating table

Scoping It Out

The scope has two optics, one for each eye, and two lights, so surgeons get a bright, 3-D image. Most of the systems used in conventional laparoscopic surgery provide 2-D images.



Optics

Lights

Tools of the Trade

The system comes with the traditional palette of surgical tools. Each is just 5mm or 8mm across, about half the diameter of a dime, and has the full rotation of a human wrist. When necessary, software filters out the surgeon's tremors.



Paddle blade

Forceps

Scissors

Scalpel

Remote Control

The surgeon manipulates the instruments with two knobs that he squeezes, castanet style. This dual-control design effectively renders surgeons ambidextrous: right- and left-handers can now operate using both hands.

Pedal to the Metal

With his feet, the surgeon controls the camera focus and zoom, the cautery (which seals off small blood vessels to control bleeding) and a clutch that disengages the instruments.

—PHOTOGRAPH BY ADAM FRIEDBERG FOR NEWSWEEK

—TEXT BY ANNA KILCHBERG AND JENNIFER BEARDETT
—GRAPHIC BY KEVIN HANDE

SOURCES: STEVE SCHNEH, ALUM, BISHOPSTANLEY, ASHLEY FISH, TERRY LAFARINO/SPC RADICAL; PROSTATECTOMY: CONVENTIONAL AND ROBOTIC; LAPAROSCOPY: ROBERTO TORRES, ROBERTO TORRES, M.D., COLLEGE OF SURGERY, COLUMBIA UNIVERSITY; HOSPITAL, COLUMBIA UNIVERSITY; MEDICAL CENTER, WEST PHOENIX; DIRECTOR OF INVASIVE SURGICAL

—IMAGE OF SURGEON BY WELLS; CATHERINE DODD ET AL.; —IMAGE OF STUDY BY CHALLINOR, RABENREISER, AMICI, JACOB, HORN, AND STASCHKE; FARRIS ET AL.

PHOTOGRAPH BY ADAM FRIEDBERG FOR NEWSWEEK

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Operating by remote control

Surgeons are increasingly using high-tech robotic systems to perform operations on patients by remote control. Hospitals in Orange County have four of the systems in use. How they work:

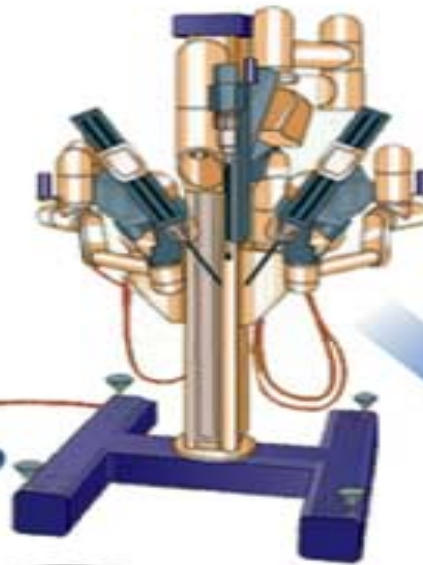
Surgeon

Works at a console, manipulating the device's mechanical arms with hand controls and cameras with foot pedals.



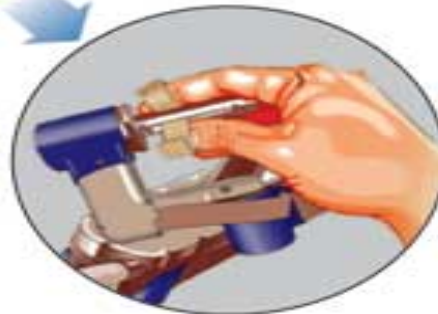
Surgical arm cart

Has three arms for instruments and one for optics. Pivot point on each arm eliminates use of patient's body wall for leverage, limiting tissue and nerve damage.



Surgeon's hands

Surgeon's motions are transposed into smaller, more delicate instrument movements: a half-inch hand movement becomes a 1.2 mm instrument motion.



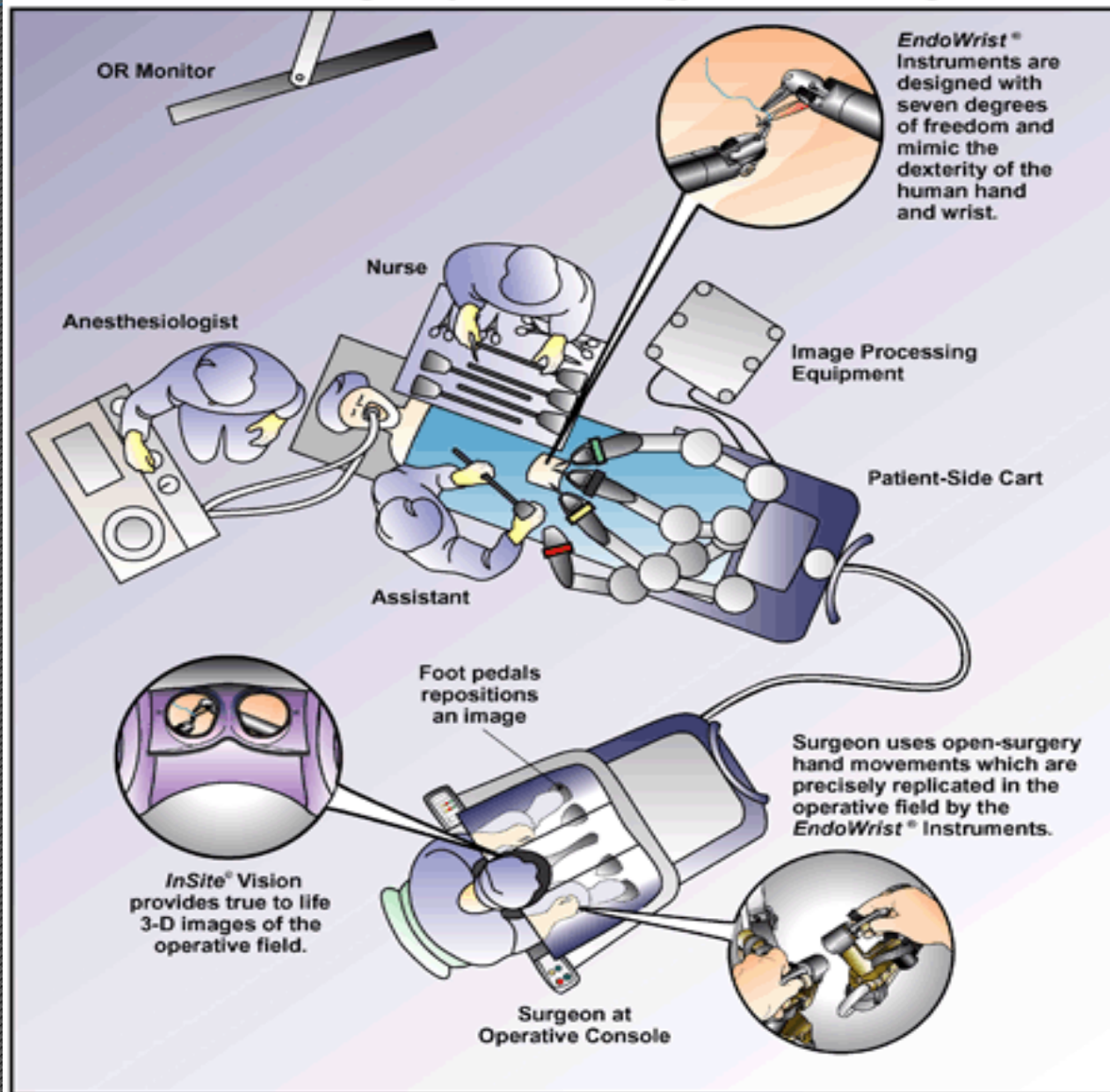
Robotic tool tips

Has interchangeable tools such as scalpels and forceps.

Sources: Intuitive Surgical Inc., Advocate Christ Medical Center

McClatchy Tribune

da Vinci[®] Surgical System in a Urology Procedure Setting



De Vinci system!

- The da Vinci Surgical System, created by Intuitive Surgical, was the first robotic surgical system approved by the FDA. Since its inception in 2000, the da Vinci System has allowed surgeons to perform various procedures on the body through minimally invasive, 1 cm keyhole incisions

Long distance surgery.....

With the robotic surgery devices and the use of nanotechnology people across the Atlantic Ocean are getting surgery performed from different sides of the world!



RESOURCES

- www.technologyview.com

- www.google.com

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