

# DA VINCI SURGERY ROBOT

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Ms.Gigg | 2022.11.30

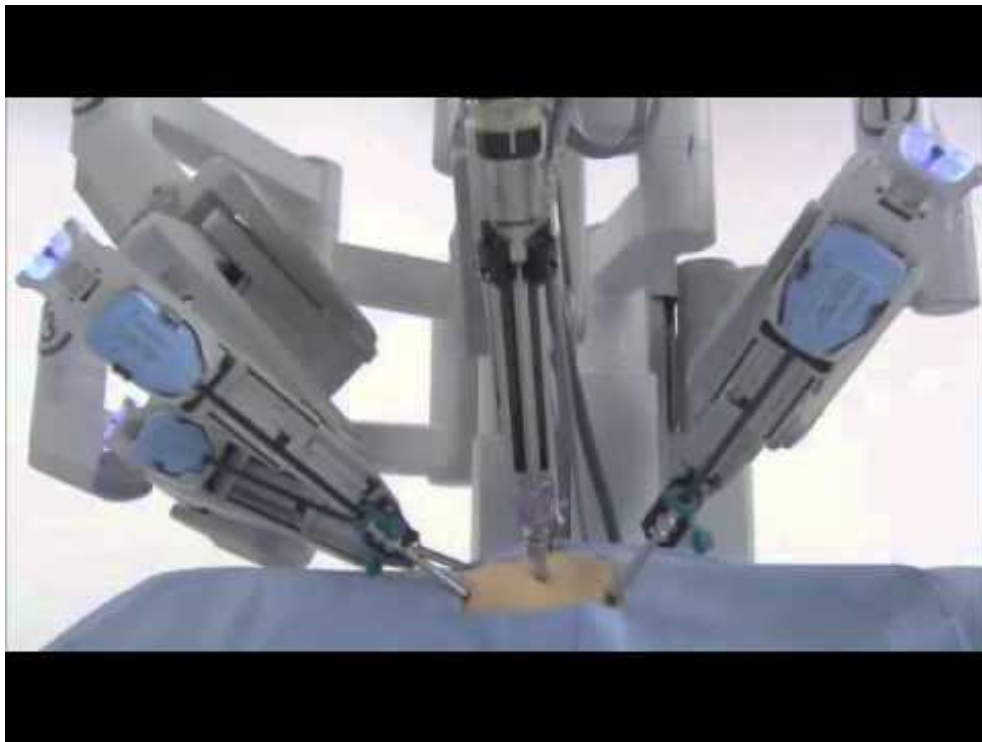




# INTRODUCTION

- Robotic surgical system
- Less invasive approach
- Extends the capabilities of the surgeon

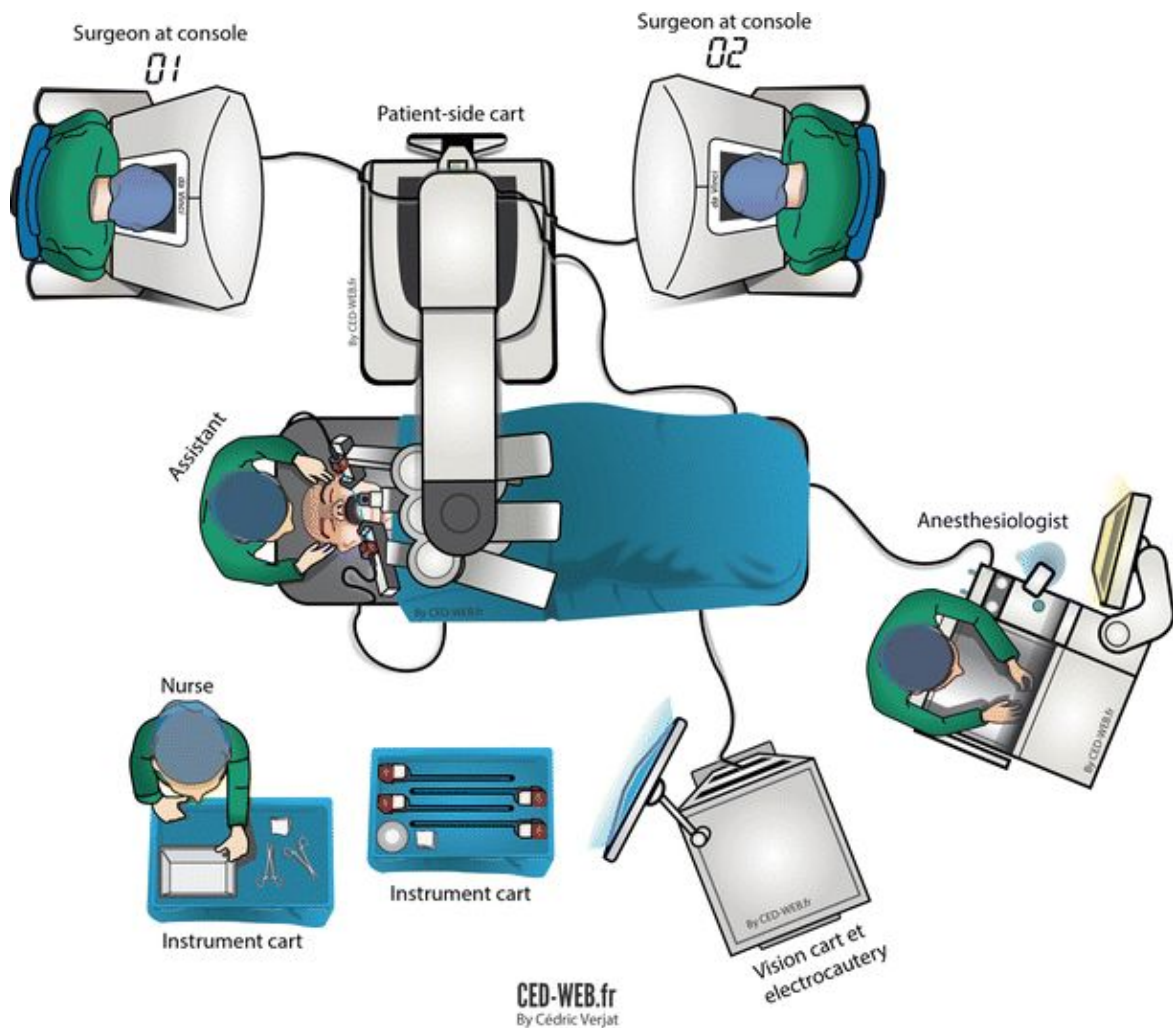
# How it Works



A futuristic, high-tech scene featuring several white robotic arms with blue glowing joints and sensors. The arms are positioned around a central area, some holding small components. In the background, there are floating digital screens and panels displaying various data, including DNA helixes, bar charts, and abstract patterns. The overall color scheme is dark blue and black, with bright blue and white highlights from the technology. The word "HARDWARE" is prominently displayed in the center in a bold, white, sans-serif font.

# HARDWARE

# Birds-Eye View of the Operating Room





# Surgeon Console

- ❑ Where your surgeon sits during the procedure
- ❑ Close-up + 3D view of anatomy
- ❑ Control the instruments



# Patient Cart

- ❑ Portable hand-cart near surgery bed
- ❑ Performs the surgery
- ❑ Robotic arms with tools and cameras



# Vision Cart

- ❑ Provide communications across components
- ❑ Advanced vision tech
- ❑ Energy generation systems
- ❑ Large high definition display





# E100 Generator



- Da Vinci Energy
- Increased efficiency, speed, results
- Precisely seal/cut vessels and tissues

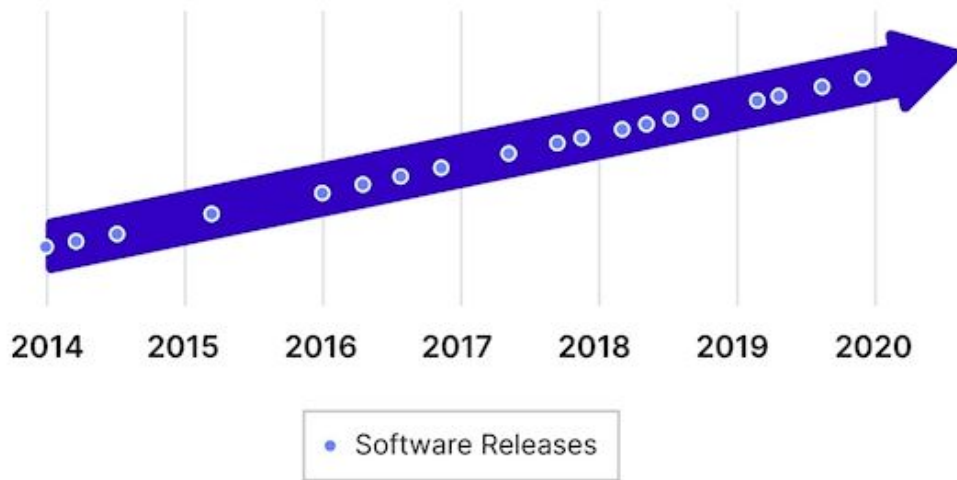
# Robotic Arms



An illustration of a person with a teal shirt and a grey face mask, eyes closed. They have multiple arms extending outwards, each ending in a hand. These hands are connected to a network of grey lines and circular nodes, resembling a data or software network. In the center of the person's torso, there is a red silhouette of a human figure with internal organs visible. The word "SOFTWARE" is written in large, white, bold, sans-serif capital letters across the center of the image, partially overlapping the network and the central figure.

# SOFTWARE

# Generation

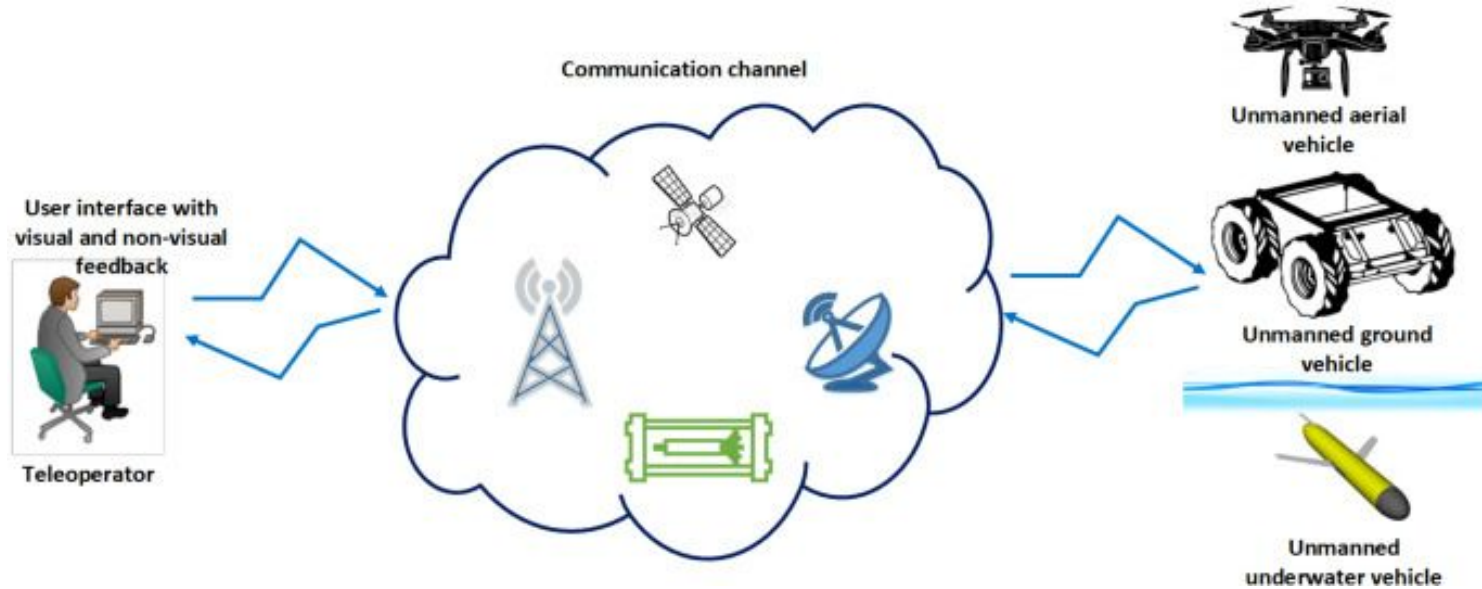


- Upgradable Architecture
- Settings and modes can be altered according to the surgeons expertise
- Latest: Da Vinci OS4

The background is a dense collage of scientific and mathematical elements. At the top left, there's a coordinate system with vectors  $\vec{v}_1$  and  $\vec{v}_2$  and angles  $\theta_1$  and  $\theta_2$ . Next to it are several mathematical identities like  $\frac{a}{b} = \frac{ac}{bc}$  and  $\frac{a}{b} + \frac{c}{d} = \frac{ad+bc}{bd}$ . In the top center, a graph shows a curve passing through (0,1). To the right, there's a diagram of an atom with a central nucleus and orbiting electrons, along with chemical formulas like  $2C_2H_2Cl_2$  and  $2KrF_3 + 2H_2O \rightarrow 2KrF_4 + 2H_2O_2 + O_2$ . Below the atom, a chemical structure of a complex organic molecule is shown. In the center, a robot head with glowing eyes is visible. To its right, a cone is depicted. At the bottom left, there's a Venn diagram with three overlapping circles labeled A, B, and C. In the bottom center, a hand is shown holding a small object. The word "Networking" is written in a large, bold, black font across the middle of the image.

**Networking**

# Principle: teleoperation



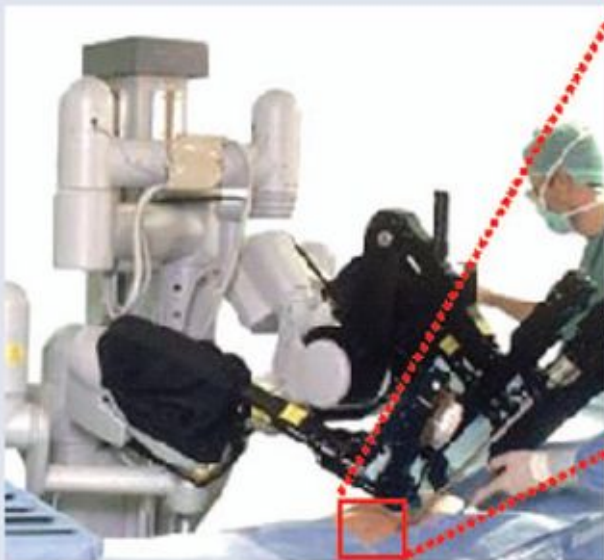


Patient Side Robots

EndoWrist Tools

Master  
Control  
Console

Master  
Manipulators



Stereo  
Video



Motion Controller






# Pros & Cons

Pros	Cons
Better precision	Device malfunction
Faster recovery time	doctors' lack of practical experience
Less blood loss / scarring	Possible burns / cuts / tears to surrounding organs
Less risk of infection	High price

# Risks

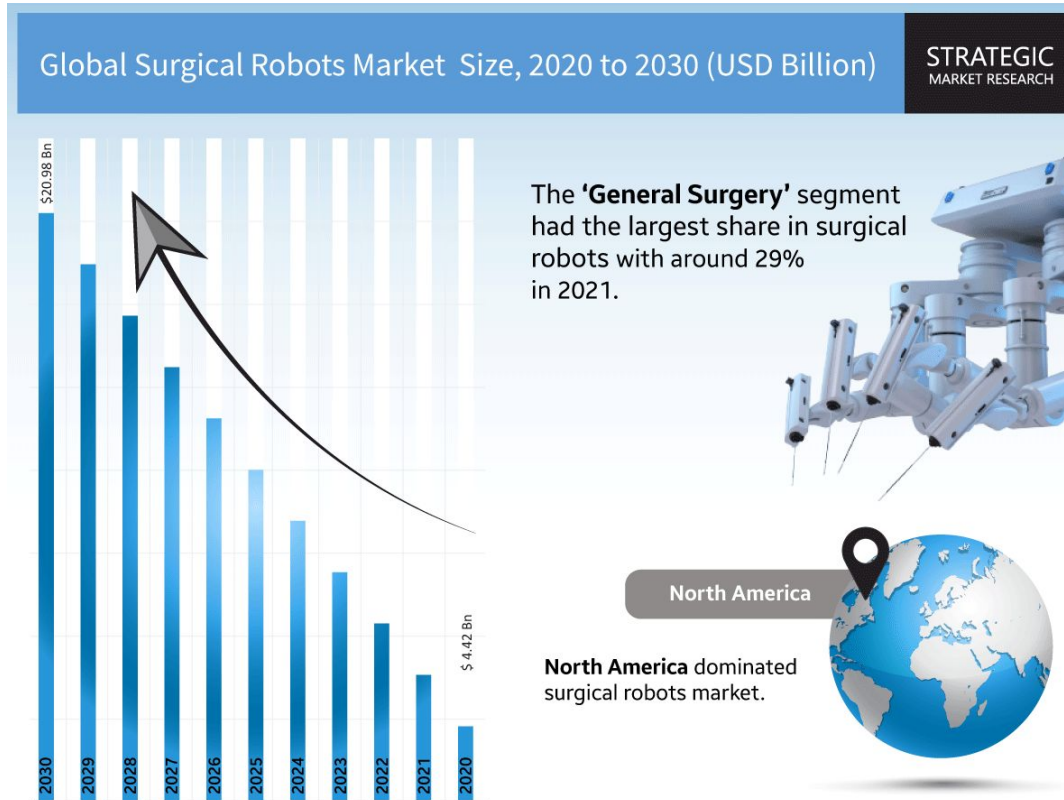
Between 2000 and 2013, 10,624 reports for injuries or adverse events associated with the da Vinci robotic surgery system:

- **8,061** device malfunctions
- **1,391** injuries
- **144** deaths associated with the da Vinci system.



**RISK ASSESSMENT**

# Connection to Society(Employment)

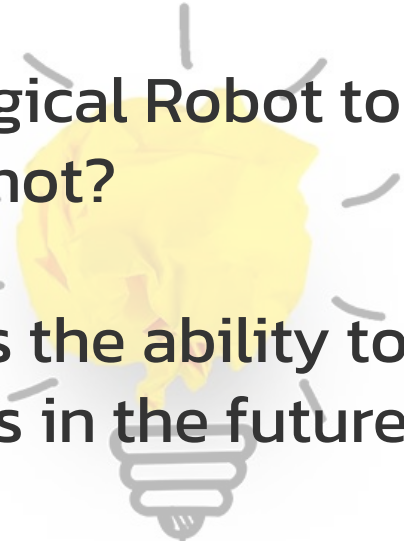




# Questions

**Q1:** Would you trust the Da Vinci Surgical Robot to perform your surgery? Why or why not?

**Q2:** Do you think robotic surgery has the ability to supplant the employment of doctors in the future?





**Q3:** Do you think this robot is worth the cost?

**Q4:** Do you think it is fair that only richer countries and higher class families can have access to this technology? If not, what are some solutions to this inequality problem.

**Q5:** Will the use of robotic surgeries weaken the skills and experience of a traditional surgeon as the doctors continue to depend on technological assistance?







# Thanks!