

② **Robotic**

surgery

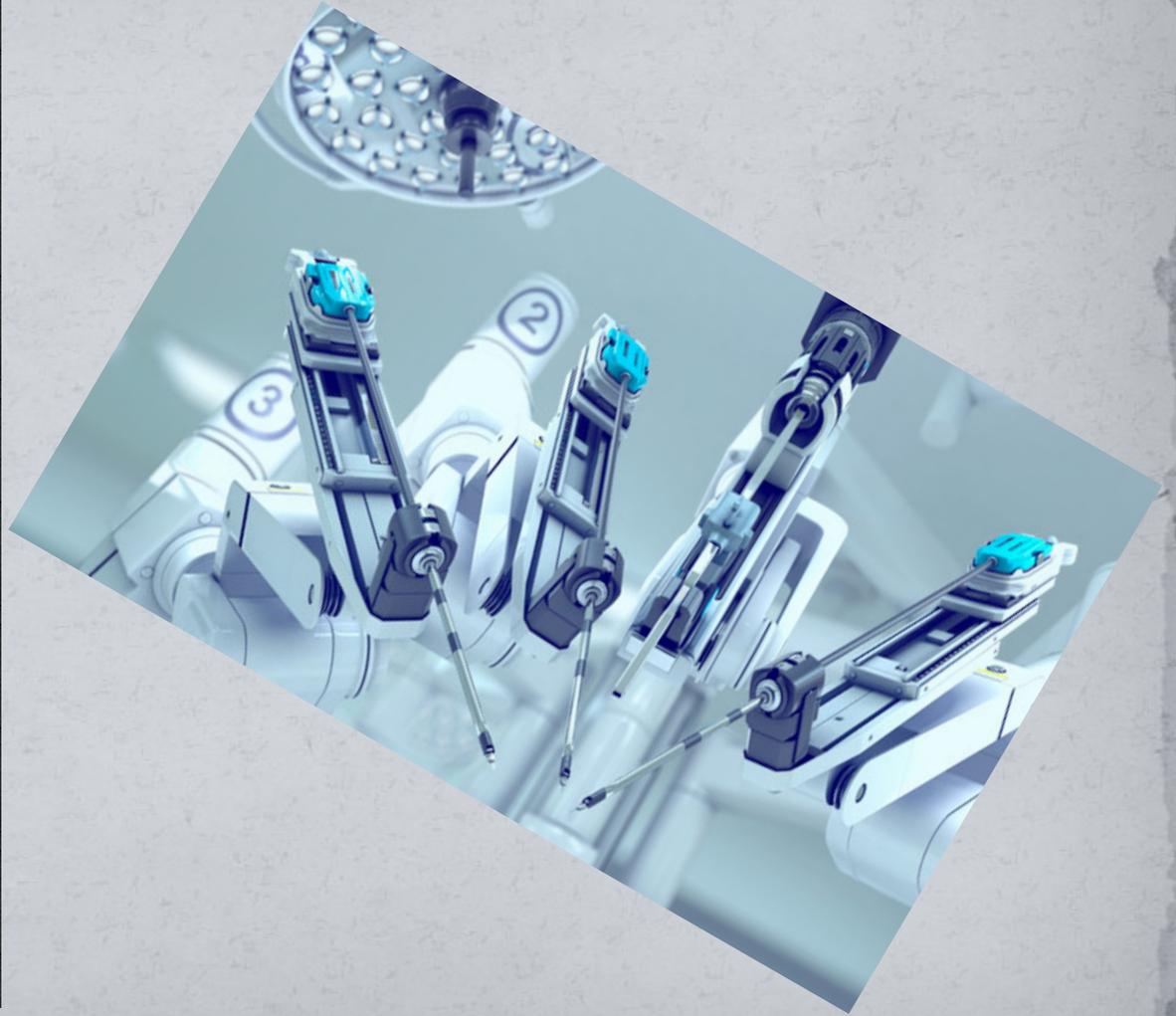
Work of the future

- **Robotic surgery**
- **What is a robot?**
- **The history of robotic surgery**
- **Advantages/Disadvantages**
- **How to use robotic surgery**

The robotic surgery

For many years, science fiction movies and books have been showing us surgeries where robots and machines were employed. In reality, it is decades since surgeons have used robots to help them perform operations with more precision and accuracy. The usage of machines in operating rooms is referred to as “robotic surgery”

Robotic surgery is wrapped in myth: does the machine work better than man ?



robot??

- A robot is a mechanical-electronic system which is able to process data and proceed autonomously according to a program
- In the case of robotic surgery, the surgeon doesn't have to be present with the real patient but can use two methods to have the robot perform the operation on the patient:
 - the operator can use manipulators to make the robotic arms carry out the movements and perform the actual surgery on the patient;
 - or the operator can use a computer to control from a distance the robotic arms while a video camera, pliers, scissor, electro coagulant, a suture machine are inserted into the patient's body through small holes



robotic surgery



The history of the use robotics in surgery began in the United States in 1985, with a machine called Puma 560 which allowed the surgeon to be extremely precise, so much that it was used for brain biopsies. Then, in the early 1990s, other robots were created with the same purpose and soon after two US devices for robotic telemedicine arrived: *Da Vinci*, today the most popular surgical robot in the world, and *Zeus*.

Advantages / Disadvantages

Major advantages coming from surgical robots are: less risks for the patients and reduced cost for hospitalization - if compared to the existing open surgery technique

The disadvantages are, first of all, the cost: a robot costs 2.7 million euros and 150-200 thousand euro for the annual maintenance. Moreover, learning how to use surgical robot requires a lot of practice for a surgeon. In Italy most surgical robots do less than 150 interventions per year and only in 3 medical centers out of 200

surgery

Which skills are need to learn how to use surgical robots?

First you need :

- Medical school and surgical residency program.
- Master in robotic assisted surgery, focusing on robotic engineering and including a specific training for the usage of robots.

According to a survey made in 2016 there are about 4000 robotic surgery systems in the world, of which 600 in Europe and 84 in Italy. In Italy, Pisa is the leading center for training in thoracic robotic surgery and Tuscany is one of the leading regions because excellent robotic systems are used.

We don't know yet if future robots will operate on their own. What we know for sure is that every surgeon will have to know how to work with these machines.