

Media release

July 9, 2021

Innovation in surgery

New robotic systems in test phase at Inselspital

The further development of new robotic applications in surgery is part of a university hospital's core mission. Inselspital, Bern University Hospital together with the University of Bern, namely, the ARTORG Center for Biomedical Research, are involved in numerous projects. At the beginning of July 2021, two new systems with very different approaches were used for the first time. In the coming months, they will be tested extensively in clinical practice and research.

Since the US company Intuitive Surgical used the first surgical robot called "da Vinci" in a clinic in 1998, robotics in surgery has undergone enormous development. Today, systems are available that support sub-millimeter eye surgeries, and there are surgical robots that perform classic surgical steps largely on their own. Robotics have become an integral part of surgery.

Insel Gruppe has witnessed this development and has played a very active role in some areas. Several teams have contributed to the further development of the systems in research and in practice. Robot-assisted surgery now has a firmly established role in the treatment spectrum at Inselspital. For example, "da Vinci" systems from Intuitive Surgical, the company mentioned above, are currently in use in visceral and thoracic surgery, in gynecology and in urology. It is conceivable that robotics will play an even more important role in surgery in the future.

Two different new systems at Inselspital

At the beginning of July 2021, experts at Inselspital put two new, completely different systems into test operation: one system relies on artificial intelligence (AI) and the latest findings in machine learning as well as high-tech miniaturized instruments. The other system purposely allows the surgeon to switch fluidly between manual and robot-assisted procedures. Both systems combine advanced technology with a surgeon's expertise from practical use in the operating room.

High-tech and AI: the system of a global med-tech provider

A new system from Asensus Surgical is being tested in visceral surgery. The new technology platform called "Senhance® Surgical System" uses AI to provide an even more precise and individualized response to a patient's specific situation during surgery. In addition, the system provides haptic feedback, similar to the steering wheel's roadside tremor when the driver drifts from the road. The system controls the camera during surgery by tracking the surgeon's eye movements.

And it works with the smallest surgical tools currently available, measuring only 3mm. The strategy of this system is to perfect robotics in extremely close interaction between surgeon and robot. The high-tech system is to be tested intensively in practical use over the next 12 months.

Manual and robot-assisted: hybrid system from a startup in Lausanne

The innovation of the Lausanne-based startup Distalmotion called the “Dexter System” goes in a different direction. The system, known as a hybrid robot, aims to give surgeons the option of working purely manually or robotically in a smooth transition. The operating surgeon can use the advantages of classic laparoscopy without having to forego the advantages of robotics for certain phases of the operation. A surgeon can stay close to the patient for most of the operation and only has to move away for phases that are more delicate. Inselspital is one of the first university hospitals to work with the Dexter robot. A first operation took place on July 1, 2021, generating international interest among surgeons. Prof. Dr. med. Michael Mueller describes the first use: “We were delighted to have the opportunity to be the first team in the world to test the new hybrid system. Three visitors from Germany were present at the procedure. The initial experience exceeded our expectations in terms of ease of use and efficiency.” The plan for this system, too, is to test the current prototype in gynecology and urology and to gain experience from practical use.

Outlook – where is robotics in surgery heading?

As a university hospital, Inselspital is committed to being at the forefront in developing new technologies. Innovative computer-assisted interventions, for example, on the liver, the ear and in neurosurgery, have been developed in collaboration with the University of Bern, in particular with the ARTORG Center for Biomedical Research. Prof. Dr. med. Daniel Candinas explains: “We are convinced that further areas of application and systems will change and develop surgery in the coming years. Targeted development and research programs to accompany this are important. We anticipate upcoming trends and test new systems on an ongoing basis, while relying on multiple providers and working closely with developers.”

Experts:

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- Prof. Dr. med. Dr. h.c. Daniel Candinas, Chairman and Chief Physician, Department of Visceral and Transplant Surgery, Inselspital, Bern University Hospital

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Insel Gruppe is Switzerland's leading group of hospitals for university and integrated medicine. It offers comprehensive health care based on groundbreaking quality, research, innovation and education: in all stages of life, around the clock and in the right place. The six hospitals comprising Insel Gruppe (Inselspital, Aarberg, Belp, Münsingen, Riggisberg and Tiefenau) carry out over 800,000 outpatient consultations and treat about 60,000 in-patients using the latest therapy methods. Insel Gruppe provides training for a large number of professions and is an important institution for the further training of young physicians. Insel Gruppe employs a staff of over 11,000 (including students).

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