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ROBOTICS IN SURGERY

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The first surgical robot “Unimate Puma 560” was created in the late 1980s in America. In 1986 the University of California at Davis and Research Center Thomas J. Watson and IBM began working together to create a robotic surgeon. In 1992 CUREXO Technology Company on the basis of the results of these studies established a system of assistant surgeon, which was called - Robodoc Surgical Assistant System. By this time ROBODOC ® system has performed 24,000 operations, proving less invasiveness and greater accuracy in comparison with the operations conducted manually. Today's the most popular robot surgeon is the robot named after the inventor Leonardo da Vinci Robot system "da Vinci" has several manipulators (2 or 3 manipulators, where instruments are connected, and a manipulator on which the camera is fixed) and repeats the movements of human hands in the patient's body. The surgeon sits at a control panel, sees the operation field with stereoscopic video channel and by joystick controls the instruments in the "hands" of the robot. With these tools, put in the patient's body by a puncture in the skin, the operation is carried out with great precision. The surgeon watches the progress of the operation using an optical device that gives him a real image of the operation field. Such image allows to determine the depth of instruments inside the patient's body.

Robotic System "Da Vinci" consists of three main parts, which form a functional unity: control panel, operation panel, and an optical system.

Advantages of “Da Vinci”:

- The system provides constant clear visualization of the operative field using a program of automatic maneuvering image changes depending on the surgeon's head position and location of surgical procedures.
- “Da Vinci” allows the surgeon to interpret hand movements into corresponding micro-motion instruments inside the patient.
- System “Da Vinci” reduces the risk of infection of like hepatitis, HIV, etc
- The accuracy of surgical operations is provided by eliminating the effect of the natural tremor of human hands

The main disadvantages of “Da Vinci” is the equipment adjustment duration, its high cost (about 3 million €), the duration and cost of preparation and training of medical personnel. Design and manufacture of medical robots in the XXI century reached such technical and economic success that the information about them every year doesn't look like science fiction. Reports of successful operations carried out by using the "electronic surgery" come from different medical centers in the world, including Russian ones. Modern robots provide remote check-ups and consultations, patients' nursing and allow doctors to look into the most inaccessible parts of the patient's body and accurately make ultraprecise interference.