Иностранные языки

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Bionic prosthesis

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The real achievement in the prosthetics has become artificial joints that function as well as natural joints. Bionic limbs are the most advanced type of prosthesis at the moment. These electronic devices are made from synthetic materials, but the person can manage them using his/her own nervous system through the targeted muscle reinnervation (recovery disturbed innervation of organs and tissues surgically).

Principle of operation of bionic prosthesis. After the amputation because of a serious injury or a serious illness, there remains a stump that consists of many tissues: skin, muscles, bones, blood vessels and nerves. During a surgery, a surgeon attaches the surviving efferent nerve to the large muscle. After healing of the wound the efferent nerve is able to transmit a signal. This signal is perceived through the sensor mounted on the prosthesis. The perception of the nerve impulse involves operation of a complex computer program that controls the motors inside the prosthesis to keep it functioning.

The beginning of any movement is the thought. The brain sends signals to the muscles that are involved in a particular movement. The process takes place so quickly and smoothly, that we do not have time to realize what is happening. Work of the prosthesis is more complex in terms of transmission of nerve impulses. Initially the signal of the motion is read out by electrodes that are located near the nerve attached to a muscle. Then the signal goes to the processor inside the prosthesis. This process is also quite fast, but the speed of fulfillment of actions is still lower than the speed of natural limbs.

The prosthesis for each person has individual features, since not only the person adapts to the prosthesis, but also the prosthesis is adjusted to the person to provide the most comfortable interaction. The main objective of the prosthesis is maximal recovery of function of the lost organ.

In fact, the installation of bionic prostheses is the only opportunity for the disabled to return to full life.

Key words: prosthesis, bionic, reinnervation

