A NEW LEVEL: ROBOT-ASSISTED MANIPULATION IN MODERN HEALTH CARE

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Abstract: The practice of using robotics in medicine shows that robots increase the efficiency and speed of processes in the course of diagnostic and therapeutic measures and contribute to the acceleration of rehabilitation.

Keywords: *Robopatients , robotic carts, robotic couriers, roboprostheses, exoskeletons, robotic pills, robotic caregivers*, *nanorobots and microrobots*.

Medical robots are the result of interdisciplinary efforts to automate healthcare. How can robots be categorized by application? We should first distinguish robots designed to automate physician work. Such systems include robots to facilitate disease diagnosis (including telepresence diagnosis), surgery such as da Vinci, radiation therapy, rehabilitation, anesthesia, etc.

Robopatients are a whole group of robotic simulators for training doctors and other medical personnel. Such simulators mimic a patient - the whole patient or only a "fragment" relevant to the training topic. There are robots that simulate a woman in labor or a baby born prematurely.There are robots designed to facilitate the work of junior medical staff, such as robots for injections and test collection, robotic carts for patient rounds, robots capable of entering data into medical records based on the doctor's speech (speech-to-text system or in the form of sound files). A variety of auxiliary robots are used in medical facilities, such as TransCar or TUG *robot couriers* for transporting medicines, instruments, and other things around medical facilities. A separate direction is *robots designed for rehabilitation of patients* after surgeries or active phase of diseases. There are various robotic systems for restoring mobility after surgery or stroke, such as the Swiss Lokomat systems. *Roboprostheses* are designed to be worn permanently by people with limited mobility. A distinction is made between prosthetic legs, prosthetic arms, and prosthetic hands. Active search is going on in the direction of reducing the cost of such prostheses, improving their controllability and autonomy. An advanced trend is the direction of prostheses with feedback - these allow patients to feel what they are touching in order to control their efforts. *Medical exoskeletons* can be used to return partial mobility to immobile categories of patients. They are usually divided into rehabilitation exoskeletons - for accelerating the recovery of patients after injuries and surgeries and those intended for permanent wear by immobile people at home and not only.

There is a promising direction of "*robotic p*ills" - such a pill is designed for long-term active functioning in the body. Swallowed by the patient, it injects the drug into his body where and in the dosages where and how it provides the best effect, allowing to reduce dosages and associated harm to the body. Telepresence robots can be used for remote communication with patients by their relatives, or, for example, for patients from different wards to communicate with each other - the use of such robots is especially relevant for infectious disease wards.

Caregiver robots and other robotic patient assistants are designed to make life easier for patients. They can, for example, help to get out of bed and go to the toilet or transfer to a wheelchair.

An unfamiliar direction is robots based on the theory of social mutual aid, aimed at the elderly.

Pharmaceutical robots - the direction of pharmacy automation, robots that can facilitate the work of pharmacists.

Nanorobots and micro-robots. The purpose of using micro- or nanorobots is to deliver therapeutic substances directly to target organs. They enter the body intravenously or orally. Nanorobots are too small to contain autonomous controls, so they are remotely controlled.

Scientists are trying to ensure that nanorobots can perform full-fledged non-invasive procedures in hard-to-reach parts of the body, such as dissolving blood clots and administering microdoses of drugs. In the future, nanorobots are being considered to penetrate the blood-brain barrier.

The use of medical robots provides a variety of positive effects:

- Increasing the level of automation facilitates doctors' labor, increases its productivity, and can provide access to fundamentally new levels of capabilities (increasing the complexity of available surgeries, reducing the invasiveness of surgeries and other treatments, as well as the probability of medical errors)

- Reducing the costs of middle and junior medical personnel, facilitating the work of these personnel, including pharmacists

- intensification of the processes of patients' return to normal life after injuries, diseases and surgeries

- Increasing mobility of low-mobility groups of the population

- Facilitating survival for elderly patients

- facilitating the stay of patients in hospitals, alleviating problems associated with the "detachment" of patients from their usual circle of communication, from their families, providing contact or remote monitoring of a patient in a hospital or an elderly person at home by family members who may be elsewhere.

The introduction of robotics in medicine is accompanied by radical changes and, as a result, leads to improved long-term patient survival rates. Development in robotics is ongoing, and the answer to the question "Can a robot perform medical operations?" is an unequivocal "yes" - although in serious cases, human control is still impossible. Nevertheless, this means that the medical industry will soon reach a completely different level, which was recently considered fantastic.

LITERATURE:

1.Роботизированная хирургия. [Электронный ресурс]: ru.wikipedia.org. URL:

2.Применение роботов в медицине и перспективные разработки на будущее [Электронный ресурс]: geekometr.ru. URL: https://geekometr.ru/statji/primenenie-robototekhniki-v-meditsine.html

3.Sayfullayeva D.I..Improving the methodical system of using information technologies in preparing students of medical higher. NOVATEUR PUBLICATIONS JournalNX- A Multidisciplinary Peer Reviewed Journal ISSN No: 2581 - 4230 VOLUME 9, ISSUE 1, Jan. -2023

4.Bazarbaev M.I.,Sayfullaeva D.I.,Isroilova Sh.A.The importance of digital technologies in improving the irc system in higher medical educational institutions. Science and

innovation.International scientific journal Volume 2 ISSUE 4 APRIL 2023 UIF-2022: 8.2 | ISSN: 2181-3337 | SCIENTISTS.UZ..

5.Bazarbaev M.I.,Marasulov A.F., Sayfullaeva D.I..Approach to teaching mathematics, informatics, information technologies and their integration in medical universities. Central Asian Journal of Medicine: Vol. 2018 : Iss. 2 , Article 15. https://uzjournals.edu.uz/tma/ vol2018/iss2/15

6.Базарбаев М.И.,Эрметов Э.Я.,Сайфуллаева Д.И.Информационно-коммуникационная технология в медицинских вузах. Реформы в медицинском образовании, проблемы и их решения. Сборник материалов XII научно методической конференции.Ташкент-2018