Telemedicine in oncology

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The development of telecommunications has influenced modern medicine and led to the emergence of a completely new branch of it known as telemedicine - the use of telecommunications technology to provide medical services to a patient in a remote location.

Currently, telemedicine includes many applications: video conferencing, image transmission, remote patient monitoring, patient consultations using telecommunications, as well as telementoring, training and demonstration of procedures and operations at a distance - that is, medical education also belongs to this concept. Telemedicine is increasingly used in many areas of medicine, such as cardiology, radiology, neurology, traumatology, dermatology, and many others. More and more projects related to the use of telemedicine in oncology appear in the world practice. It is believed that the first use of telemedicine technologies in oncology was recorded in 1990, when psychologists raised the possibility of using interactive video to solve the socio-psychological problems of cancer patients.

The increasing use of telemedicine in modern oncology has recently been associated with technologies used in this area for the diagnosis and treatment of patients. The rapidly increasing complexity of radiotherapy equipment due to the advent of innovative technologies (eg, modulated radiotherapy and stereotaxic radiosurgery) and information visualization requires closer collaboration between radiation oncologists and other specialists. New technologies in the field of telemedicine make a significant contribution to the development of such cooperation and information exchange, which will improve the quality of treatment and patient care. The use of telemedicine in the field of radiation oncology includes ensuring the quality and standards of care when considering and choosing radiation treatment regimens, radiation dose and communication plans with radiation oncologists, cooperation between oncologists and radiologists in the evaluation of a patient, determining the scope of surgical intervention. In addition, telemedicine in oncology is increasingly used for the purpose of training and continuing medical education of specialists. Many cancer centers in the US, Europe and Japan have telemedicine systems in their radiation oncology departments. The Mayo Clinic (USA), for example, interacts with regional clinics via satellite communications for videoconferencing and remote image display, patient consultations. In Sweden, telemedicine is currently being used by oncologists at major academic centers to jointly develop radiation treatment plans for pediatric cases.

At the beginning of the development of this field, traditional teleconferencing was used, and this was not enough to fully and safely provide direct interaction between the consultant and the client (the attending physician, student or operating surgeon, i.e. any recipient of telementoring).

Telemedicine is brought to a completely different level by the appearance of specialized telemedicine terminals (robots) for remote presence RP-7i manufactured by InTouch Health (Santa Barbara, California, USA), supplied to Russia by the exclusive representative of InTouch Health in the Russian Federation - Delante Medical Systems. Robot terminals have a number of such significant advantages that they are currently acquired and successfully used by many major US medical centers. For example, the terminals are improving staff efficiency at the University of California, Los Angeles Medical Center, which has achieved $1.1 million in savings in a short time. In the Michigan Stroke Hospital Network, which includes more than 30 district and rural hospitals, over a 4-year period of work with implemented technologies, it was found that the average waiting time for a central hospital specialist to call back for necessary procedures is 14 minutes, and the average time for a patient to arrive for treatment from a partner hospital is only 90 minutes. Only 30% of patients needed to be transferred to a central hospital. The other 30% of patients received interventional treatment, for which payments ranged from $25,000 to $70,000 per patient.

The RP-7i robot has been experimentally used for televising in intensive care units, and televising has been shown to provide continuity of care, improve patient contact, enable more frequent face-to-face discussions, and improve coordination of postoperative patient management. The robot allows the doctor to do almost everything that he could do at the patient's bedside, including viewing all the graphs, obtaining the necessary information, test results, studies and x-rays. According to the feedback of surgeons who used the KR-7^ robot in their work, it provides real-time teleinstruction and completely replaces the consultant.

This terminal is small, comparable to the size of a person. This allows a person to project themselves from one place to another in order to see, hear, move, talk and interact in real time just as if they were actually there. Most importantly, no special training or additional equipment is required to use the KP^ robot.

The work of a consultant consists in a remote mode of robotic consultation using a joystick and a specially configured laptop.

Remote terminal RP-7i

Provides doctors with mobility and autonomy

• Health care delivery management

• Relationship with patient, nurse, family

• Carrying out rounds

• The best way to use interactive telemedicine technology to control the movement of the robot and associated cameras.

The greatest advantages of RoboConsultant (YAR-7I robot) over traditional teleconferencing methods are its human-like size, maneuverability and versatility, as well as ease of use, which contribute to the effect of human presence in the operating room. YAR-7I, depending on the need, can be moved quite quickly from one room to another. The built-in camera acts as the consultant's eyes, the built-in audio receiver and transmitter allow you to talk to the consultant, hear his voice and execute commands in real time. The image of the consultant on the screen of the robot provides a direct connection between the remote surgeon and the consultant, in addition to the feeling of the remote presence of the consultant at the specialist working next to the patient. In turn, the consultant has the opportunity to receive all the necessary information in real time, see the operating room, the patient and the working team. Without asking anyone for additional help or distracting colleagues from their work, the consultant can zoom in on some parts of the image, display them on the robot screen and explain to the doctor or patient what they need to know about the features of this image. During the preparation for the operation, this function allows you to improve the planning of the operation, during the execution of the procedure, make appropriate corrections and predict technically difficult steps. An additional advantage of the RoboConsultant RP-7i in performing an endoscopic procedure is its ability to display images of the internal cameras on the screen. With this feature, the consultant can view an accurate image and provide more informed and comprehensive advice.

RoboConsultant can be used for training and consulting around the world, for tele-tutoring in the operating room of any remote location where broadband Internet access is available. The Robo-Consultant is especially useful in an emergency situation when unforeseen difficulties arise during the operation, requiring immediate consultation and the opinion of a second expert. When working with RP-7i, the surgeon, without interrupting the operation, can receive advice from another specialist who will connect to RoboConsultant using a laptop on demand from his current location. The RP-7i has already been successfully and effectively used in intensive care, surgical intensive care and emergency departments.

Delante Medical Systems has repeatedly demonstrated the robot at specialized medical events, where it has consistently found itself in the center of increased interest of visitors. At the conference

At the moment, Uzbekistan is at the very beginning of the introduction of information technologies, telecommunications and robotic technologies in medicine, but it is already clear that the next 10 years will be revolutionary not only

in the number of new diagnostic and therapeutic procedures in medicine, but also in the way information is transmitted, communication professionals among themselves and with patients, the way medical professionals learn. At the same time, it is important to remember that technology will not replace live communication, face-to-face training and work directly with patients in the near future, but the introduction and application of the latest advances in telemedicine can solve many problems of modern healthcare. First of all, it is saving the lives of many patients, improving treatment outcomes and improving the quality of medical care by saving time, money and the opportunity to get specialist advice without the need to travel or transport the patient to central clinics, avoiding unnecessary and, in many conditions, dangerous transportation of patients to remote specialized clinics. The use of telemedicine for training in new procedures and for telementoring will allow more professionals to quickly learn and implement new methods and procedures of treatment.

Many professional consultant doctors will be able to perform the most complex procedures on the spot under the supervision of experienced consultants without the need for these consultants to spend hours and daystraveling to distant clinics. Telemedicine is able to solve the problem of bringing closer and providing full and equal medical care to the population of the whole country.

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