

MEDICAL ELECTRONICS

Sodikova Dilnavoz Kambaraliyevna

dilnavoz_sodiqova@bsmi.uz

Bukhara State Medical institute named after Abu Ali ibn Sino

Abstract - this article examines the types of medical electronics, as well as the role of medical technology in modern medicine, and what advantages data obtained using medical devices for monitoring patients' condition can bring.

Keywords: Diagnosis, treatment, rehabilitation, electrocardiography (ECG), speedometry, activity monitoring

Medical equipment is a variety of devices, tools, and equipment used for medical purposes for the diagnosis, treatment, and rehabilitation of patients. It includes devices such as medical devices, monitors, scanners, X-ray machines, surgical instruments, ventilators, defibrillators, and more. Medical technology plays an important role in modern medicine, providing accurate diagnoses, effective treatment, and improved quality of life for patients.

Medical technology plays a key role in modern medicine in many aspects:

1. **Diagnosis:** Medical technology allows for accurate and reliable diagnostic methods such as computed tomography (CT), magnetic resonance imaging (MRI), ultrasound, radiography, and others. Thanks to these methods, doctors can quickly and accurately make a diagnosis.

2. **Treatment:** Medical equipment is used for surgical operations, treatment of various diseases and injuries. For example, surgical robots, laser devices, ventilators and other devices help doctors to carry out effective treatment.

3. **Monitoring:** Medical equipment is used for continuous monitoring of patients' condition, such as measuring pulse, blood pressure, blood oxygen levels and other indicators. This allows doctors to respond quickly to changes and provide the necessary care.

4. **Rehabilitation:** Medical equipment also plays an important role in the rehabilitation process of patients after injuries, surgeries or illnesses. Physiotherapy devices, prosthetics, orthoses and other devices help patients to restore body functions.

Thus, medical technology significantly improves the quality of medical care, making it more accurate, effective and safe for patients.

Medical devices for monitoring the condition of patients perform a number of important functions, ensuring continuous monitoring of various health indicators. Some of the main functions of such devices include:

1. Vital signs measurement: Medical devices can measure important indicators such as pulse, blood pressure, body temperature and respiratory rate. These data help doctors assess the general condition of the patient and identify any abnormalities.

2. Blood Oxygen monitoring: Patient monitoring devices can measure blood oxygen levels using a pulse oximeter. This is especially important for patients with lung or heart diseases.

3. Electrocardiography (ECG): Medical devices can record the electrical activity of the heart using an ECG. This allows you to identify arrhythmias, ischemia, and other cardiac problems.

4. Respiratory function monitoring: Some devices can monitor the patient's respiratory function, detecting respiratory disorders or hypoxia.

5. Monitoring of brain activity: Electroencephalography (EEG) allows you to measure the electrical activity of the brain, which can be useful in the diagnosis of neurological diseases.

These and other functions of medical devices for monitoring patients' condition help doctors monitor changes in patients' health, respond promptly to them and provide the necessary treatment.

The data obtained with the help of medical devices for monitoring the condition of patients can bring many benefits for both patients and medical staff. Some of the main advantages include:

1. Continuous monitoring: Medical devices allow you to continuously monitor important patient health indicators, which allows you to detect changes in real time and respond promptly to them.

2. Quick diagnosis: The data obtained with the help of the devices can help doctors quickly diagnose and determine the optimal treatment based on objective indicators.

3. Improving the quality of care: Monitoring the patient's condition with the help of devices helps to ensure more accurate and individualized treatment, which ultimately improves the quality of medical care.

4. Prevention of complications: Early detection of changes in the patient's condition helps to prevent possible complications and timely adjust treatment.

5. Home monitoring: Some medical devices can be used to monitor patients at home, which reduces the number of hospital visits and provides a more comfortable environment for patients.

In general, data obtained using medical devices for monitoring patients' condition plays an important role in the diagnosis, treatment and rehabilitation of patients, contributing to improved treatment outcomes and overall health. Medical devices can monitor various health indicators, depending on their type and purpose. Some of the most common health indicators that can be monitored using medical devices include:

1. Vital functions: This includes measuring pulse, blood pressure, respiratory rate,

and body temperature. Medical devices such as pulse oximeters and thermometers are used to monitor these indicators.

2. Electrocardiogram (ECG): Medical devices for conducting ECG allow you to monitor the electrical activity of the heart, detect arrhythmias and other cardiac problems.

3. Blood glucose: For diabetic patients, it is important to regularly monitor blood glucose levels using glucose meters.

4. Spirometry: This test allows you to assess the volume of the lungs and the rate of exhaled air, which is important for the diagnosis and monitoring of lung diseases.

5. Sleep Monitoring: Special devices can be used to monitor sleep quality, detect sleep apnea and other sleep disorders. 6. Activity Monitoring: Wearable devices such as fitness trackers can track physical activity, number of steps, calories and other parameters.

7. Monitoring of eye pressure: For glaucoma patients, it is important to monitor intraocular pressure using special devices.

List of used literature:

1. Umarov S.H., "Medical equipment and new medical technologies"
2. Sodikova D.K., "Biomedical Engineering", Web of Scientists, 2010-2012
3. "Introduction to Biomedical Engineering" by John Enderle, Joseph Bronzino and Susan Blanchard.
4. "Medical Equipment: Application and Design" by John G. Webster
5. "Biomedical Equipment and Measurements" by Leslie Cromwell, Fred J. Vibell and Erich A. Pfeiffer.
6. "Medical electronics" by R.S. Khandpura
7. "Handbook of biomedical instrumentation" by R.S. Khandpura
8. "Medical electronics and instrumentation" by R. K. Shevgaonkar
9. "Biomedical signal Processing" by Rangaraj M. Rangayan
10. "Introduction to the application of medical electronics" by Joseph Carr and John M. Brown
11. "Biomedical Engineering: Combining medicine and technology" by W. Mark Saltzman
12. "Medical imaging: Principles and practice" by Mostafa Analui and Ronald M. Summers.