



TERMS OF MEDICAL INFORMATION SYSTEM

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Article history:	Abstract:
Received: March 30 th 2024 Accepted: April 26 th 2024	The work discusses the basic definition of a measuring medical information system. It is shown that to study the electrical parameters of a biological object using the influence of a given electrical power, it is necessary to use an information-measuring system based on digital measuring generators of a given electrical power.

Keywords: measuring medical information system, biological object, digital measuring generators of a given electrical power.

The end of the XX - the beginning of the XXI century characterized by the quantitative and qualitative development of measurement information systems (MIS) throughout the world. The creation of information technologies and the "information" society is associated with IIS. Every student should know the basic concepts related to information systems, their functions, stages of creation (design), analysis of functioning and efficiency [1-4].

Some basic terms of MIS include the following concepts: A system is a set of interconnected elements, each of which connected directly or indirectly with every other element, while any two subsets cannot be independent without violating the integrity and unity of the system; Information - information about an object that is obtained as result of interaction with it. Information transmitted using signals that display the characteristics of an object;

MIS - set of functionally integrated measuring, computing and other auxiliary technical means for obtaining measurement information, converting it, processing it in order to present it to the consumer in the required form or automatically implement the logical functions of measurement, control, diagnostics, identification;

Continuous signal - signal described by a continuous function of time;

Discrete signal - signal described by a discrete function of time;

Technical support - a set of technical means designed to ensure the operation of the measuring information system;

Compatibility of MIS - the possibility of interconnected functioning of MIS of different levels and different functional purposes;

Reliability of the MIS - the ability of the MIS to perform functions while maintaining operational performance within established limits for a given time interval under given operating conditions;

Technical diagnostic system - auto control systems, in which not only the fact of operability is established, but also the location of the failure is determined and faults are localized. This is achieved by special methods and troubleshooting methods implemented by diagnostic algorithms;

Diagnostic algorithm is a set of instructions leading to the correct implementation of a technical process in any device or set of devices;

Stages of MIS design:

pre-design - feasibility study (DFS),

technical specifications (TS);

design - technical proposal (TP),

preliminary design (PD),

technical design (TD),

working documentation.

Stages of MIS implementation: commissioning, operation analysis, implementation.

Metrological support is a set of technical means and software for establishing and applying scientific principles, rules and regulations aimed at achieving the unity and required accuracy of measurements.

Since the subject of MIS in medicine considers the role of multiple measurements in production and scientific experiment, types and structures of measurement information systems, measuring systems, automatic control systems, technical diagnostics, telemeasuring systems, principles of separation of measuring channels, ensuring accuracy, speed and noise immunity of MIS, design features of the MIS, metrological analysis, MIS based on processor tools, MIS interfaces, every student should know the above mentioned terms.

When conducting medical research, due to the significant heat dependence and nonlinearity of the research objects, it is advisable to use a measurement mode that provides an unambiguous energy effect on the measurement object, in the sense that a given electrical power will be dissipated in it per unit time. In this case, the thermodynamic state of the object during repeated measurements will be the same within the



limits of a certain error, which will make it possible to obtain repeatable and unambiguous measurement results [2].

Information and measuring technology studies methods for determining the electrical properties of local zones of human skin in the mode of exposure to a given electrical power. One of the approaches to carrying out measurements is to expose a biological object to pulses of electrical power of a certain duration, during which the current and voltage drop across the biological object and changes in its resistance recorded. In the intervals between power pulses, the electrical voltage or current generated by the biological tissue is determined. The obtained values of these parameters, as well as certain relationships between them, potentially carry information about the state of the body and can be used for diagnostic purposes.

To implement this measurement technique, it is necessary to develop electronic devices that provide a constant value of electrical power dissipated in an arbitrary load resistance connected to their output, with an error not exceeding a specified value, called measuring generators of a given electrical power (MGEP) [3]. One of the ways to maintain a given value of electrical power dissipated in a load is to apply voltage to it, the value of which is determined based on the value of the impact power and the current load current based on

$$U=P/I$$

An integral part of the MGEP, which implements this approach, is the node that carries out the division operation - the divider. Analog integrated circuits of dividers, digital circuits implemented on the basis of logic element microcircuits,

To study the electrical parameters of a biological object using the influence of a given electrical power, it is necessary to use an information measuring system (IMS) based on a digital MGEP [4]. This MIS must provide:

1. Measurement of the voltage falling across the biological object, the current flowing through it, the resistance of the biological object and the average value of the voltage created by it after exposure to pulses of electrical power;
2. The ability to carry out multi-channel measurements;
3. Adjustment of the time and amplitude parameters of the MGEP operation - the period, sign and amplitude of pulses of exposure to electrical power;
4. Transfer of measurement information to a PC via a standard interface;

5. Software developed for MIS must provide for maintaining a database of measured parameters, the ability to analyze, statistically process and graphically display measurement results.

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