

THE ROLE OF MODERN METROLOGY IN OBTAINING LOCAL DATA ON THE CONDITION OF THE HUMAN ORGANISM

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Abstract: *One of the main goals of metrology is to develop and improve new measurement methods that allow obtaining quantitative information about living organisms and the processes that occur in them. Improving the quality of measuring equipment is one of the solutions to the problem. Metrological measurements play an important role in many areas of human activity.*

Key words: *NCh, HR, ITT, SEIRT, exhaled.*

INTRODUCTION

One of the main goals of metrology is to develop and improve new measurement methods that allow obtaining quantitative information about living organisms and the processes that occur in them. Improving the quality of measuring equipment is one of the solutions to the problem. Metrological measurements play an important role in many areas of human activity. Due to the uniqueness of measurements in medicine, a special direction in metrology is defined - medical metrology. Digitization and computer support of modern medical metrology made it possible to find individual static quantities from the results of many dynamic measurements. For example, monitoring the diagnostically important variability of heart rate (HR) and respiratory rate (NCh), among the hundreds of HR and NCh values that are currently measured continuously over a period of time using automated measurement systems significantly easier to select and identify.

Progress in metrology will not depend only on the "invention" of new measuring methods. The most important requirement in this case is that new techniques and technological concepts should have significant advantages over existing ones.

The method of measuring the speed of the pulse wave (ITT) in the radial artery described by the author in [1] has advantages over the standard methods of assessing the stiffness of the vessel walls: it is free from recalculations caused by the branching of the vessels, and also ITT in the aorta reduces accuracy in calculation (direct ITT measurement is performed in the radial artery), b) is far from mechanical manipulations;



The study of thermovision imaging [2, 3] has aroused great interest among physiologists, which is confirmed by repeated citations in the world scientific literature. The obtained results allowed a new look at some metrological approaches used in medicine today. For example, a new, alternative interpretation was proposed for the diagnostic conclusions of Foll's method, which is popular among a number of specialists, based on the measurement of the electrical conductivity of the body between the main electrode and points on the skin. As it has been clearly shown in [2, 3] that the amount of secretion of individual sweat glands, which affects skin resistance, can vary significantly from gland to gland, variability in the functioning of these glands is possible.

SEIRT ((Sorption-Enhanced Infrared Thermography)) for measurement of lung breathing dynamics in humans and animals described in the work proposed [4] is free from the main drawback inherent in the methods used in biomedicine, and foreign or Direct mechanical contact of the elements of measuring devices (tube in the mouth, clip in the nose) with the breathing holes is not recommended. A perspective for the development of a method [4] aimed at determining the absolute quantitative characteristics of lung breathing may be the development of automated phantoms with adjustable parameters of the "exhaled" air flow (velocity, particle concentration, temperature and humidity).

Considered another innovative approach in modern medical metrology - simultaneous measurement of vital signs of the body through several (~10) information channels and processing of these data in a complex way, their interrelation shown [5].

The above examples show that the development of biomedical metrology in the modern world is in harmony with the progress in the field of medical informatics, digitization and computerization of measurements.

Books

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