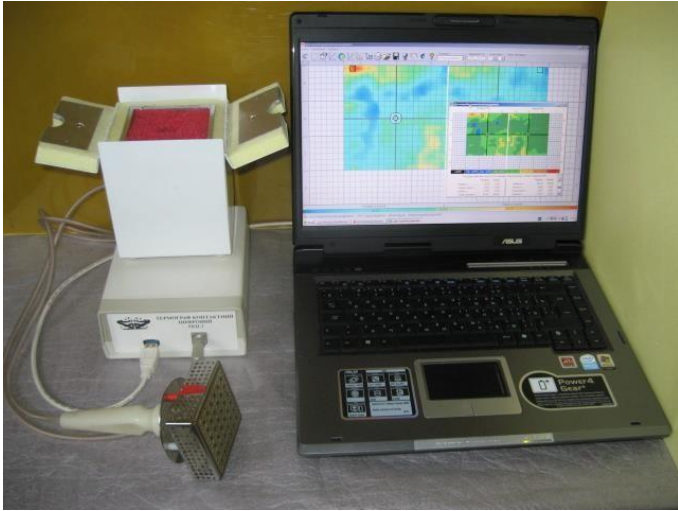


Digital Contact Thermograph DCT-1

Purpose – early diagnostics of tumour diseases. Provides preventive screening on a mass scale and monitoring of treatment.



General view of DCT-1

Principle of operation: contact temperature measurement on large surfaces with the help of matrix of intellectual sensors; imaging of temperature distribution over the area under investigation; statistical analysis; calculation of absolute and differential diagnostic parameters.

Novelty: consists in a number of conceptual, design and methodical solutions, the totality of which has led to appearance of a new device capable of recording pathologies that are accompanied by local temperature change.

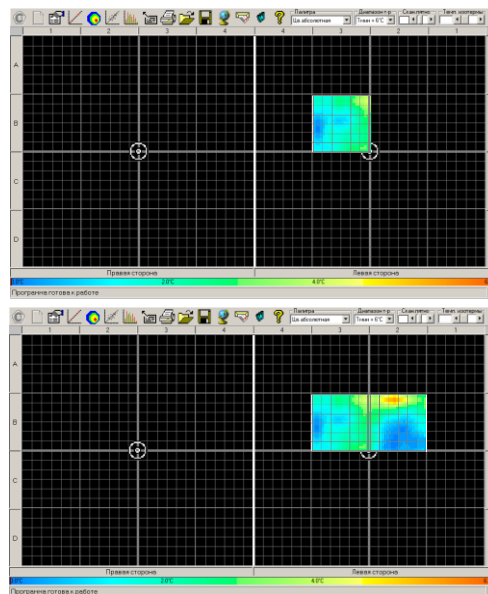
Conception: temperature distribution measurement over the breast surface by means of a number of uniformly distributed sensors.

Design: matrix with sensors (36 pieces) is placed on very fine construction that minimizes the influence of parasitic heat transfer channels. Microprocessor-based intellectual temperature-to-code converters are used as sensors. The sensors are connected to computer by means of 1-wire bus.

Procedure: by means of consecutive positioning matrix on parts under examination one composes a mosaic thermogram of total breast. During the procedure some special actions on sensor reading verification and artifact exclusion are being taken. The result is produced in the form of colour and black-and-white thermograms. About 30 statistical parameters are being calculated. The parameters threshold markers are indicated. The possibility of printing and saving the results is also available.



Obtaining of mosaic thermogram

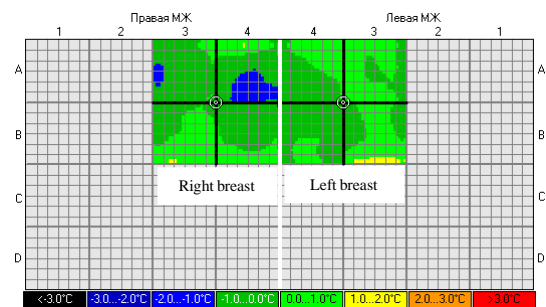


Why just thermography?

Such widespread diagnostic methods as X-ray and ultrasonic mammography detect only structural changes in human body organs. Meanwhile, it is known that these changes are always preceded by physiological changes accompanied by temperature increase at the position where tumour arises later on (often in 3-10 years). That is why thermography has principal advantages in early detection of tumour. Besides, thermography is absolutely safe for patients and staff. So, it allows harmless use as often as one likes and is indispensable for monitoring of disease evolution and effectiveness of treatment.

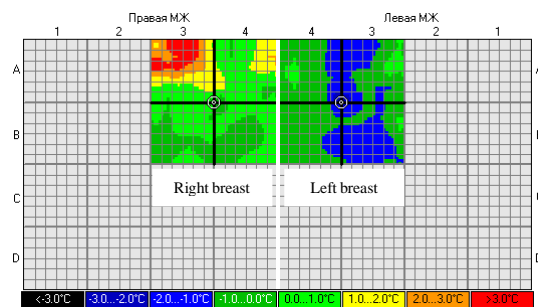
Why contact thermography?

Of two thermographies – infrared and contact – the latter one is the most suitable for screening on a large scale. The infrared thermography is well-known in medicine. Nevertheless, it has not taken up such a place as X-ray and ultrasonic mammographies had. That is mainly because of comparative expensiveness and complexity of use. This technology needs a large room with temperature control, cryogenic liquid for infrared receivers cooling, calibration of these receivers and so on. In actual practice widespread adoption of this technology for aim of large-scale screening is somewhat problematic. On the other hand, contact digital thermography guarantees direct temperature measurement (without intermediate substance that introduces thermal noise) and direct temperature-to-code conversion that minimizes electromagnetic noise. This technology, without any change, may be used in ambulances, which is very important for large scale screening.



Thermogram of healthy breasts

Thermogram of cancer in upper outer quadrant of right breast



Operating characteristics:

- Range of temperature measurement – from 20 to 38°C;
- Temperature resolution – 0.06°C;
- Space resolution – 1cm;
- Computer – Note-book;
- Software – original, operating system Windows XP, Windows 7.

Now thermographs TCD-1 are in use in a number of municipal hospitals and medical centers of Ukraine.

The thermograph is equipped with an automated expert system for evaluating thermograms, which makes it possible to identify the pathology of the breasts and to distinguish between women during medical examination into groups with and without pathology of the breasts. This allows screening tests to be carried out by a trained medical professional with nursing or paramedic education, a family doctor.

Component parts: interface unit, scanner, thermostat, computer, software, user manual, handbook for physicians with atlas of thermograms.

Delivery conditions: thermograph is supplied on special order, with built-in software.

Conformance certificate: TCD-1 is entered in the Ukrainian State Register of Medical Goods.

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