Personal thermograph
CEM®-ThermoDiagnostics
Problems in modern medicine:

- Global financial crisis affects medical expenditures of people
- Patients have less time for setting appointments and visiting doctors
- Growing costs of medicine
- Insufficient number of doctors in rural areas
- The lack of individual treatment approach
- Chronically ill patients are not well served
- Patients do not visit a doctor for diagnostic procedures as often as needed
- Most of the patients do not have tools for monitoring treatment of their chronic diseases
- Computer literacy and needs of patients often outbalance computer literacy and possibilities of doctors.
Solution: Personal Thermograph “CEM®-ThermoDiagnostics”

For prevention, early and differential diagnostics, and therapy optimization for many diseases in home and in professional conditions.

Saves time, energy and money.

How it works:
The device measures infrared radiation of the body and displays thermal picture on the computer screen. According to our local temperature patterns, we can detect many diseases at early stages of their appearance.
Social significance:

Personal thermograph helps to increase the effectiveness of therapy by **identifying the disease at early stages**, which helps to avoid disability and premature death.

The device especially useful in treatment of **chronic diseases**, for determining the effectiveness of medications and treatments, which is a key for **achieving better results of therapy**. Personal thermograph allows the patient to achieve maximal results from doctor’s visit.

The device is the part of the group of preventive tools. It facilitates the decline of insurance expenditures and **reduces treatment costs**.
OUR MAIN MARKET TARGET IS TELEMEDICINE

In the recent years, telemedicine has been growing dramatically. Its development is based on **4P concept** (predictive, preventive, personalized, and participatory medicine).

Now, medicine can provide the analysis of patient’s health condition with a frequency needed for that particular patient, considering his or her habits, environment, and other factors.

Just in the past several years, we could observe the emergence of a great range of home use devices for telemedicine.

Some examples:
Authenticity check of medications. Mobile device reads the information on the package and checks the authenticity, using Internet.

Mobile glucometer is done in a form of attachment to iPhone and it allows to measure the level of glucose in patient’s blood in home conditions. The device also informs the doctor about any deviations from the norm.
Mobile device for heart rate control

Electronic stethoscope is a mobile device for monitoring of heart tones

Mobile cardiograph is used for monitoring of electrocardiogram’s data
Attachment to mobile device for ear examination, useful for babies and small kids

Attachment to mobile device for eye examination

Attachment to mobile device for skin examination, which helps in early diagnostics of melanoma
Personal thermograph “CEM®-ThermoDiagnostics”

The device is intended for early diagnostics of diseases and home monitoring of treatment effectiveness.

Measurement Range: -33~110°C (-7.4~230°F)
Operating Range: 0~50°C (32~122°F)
Storage Range: -20~65°C (-4~149°F)

Accuracy (Tamb=23±3°C): +/-2.5% of reading or 2.5°C (4.5°F) whichever is greater

Resolution: 0.2°C /0.5°F at 9.9~110°C, otherwise 1°C/1°F

Response Time (90%): 1sec, Emissivity Range: 0.98. Auto switching-off: 15sec

The base of the device is non-contact infrared thermometer that gives hundreds of times more diagnostic information than regular thermometer. Special computer software allows to visualize heat, the most significant indicator of life and human livelihoods.
Usage areas of personal thermograph:

Medicine:

The majority of electronic medical devices for telemedicine are created by the principle: one problem – one device. Personal thermograph is multifunctional, it diagnoses thermo signs of more than 50 diseases:

- **inflammatory** (bones and joints, ENT diseases, diseases of the skin and subcutaneous tissue, diseases of the maxillofacial region, etc.)
- **vascular** (vascular pathology of the lower extremities, cerebral-vascular insufficiency, etc.)
- **oncology** (malignancy nevus, breast cancer, etc.)

Early detection of exacerbations for many acute and chronic diseases allows to objectively estimate the intensity of exacerbation to begin treatment timely and with appropriate dose of medication.
Usage areas of personal thermograph:

**Medicine**

With temperature control we can see the *influence of many classes of medications* on human organism, for example:
- Influence on the digestive tract and metabolism;
- Medicaments for therapy of skin diseases;
- Anti-neoplastic medicaments;
- Immune-modulators;
- Anti-inflammatory and anti-rheumatic medicine;
- Angioprotectors and many others.

We can also see the *effectiveness of dietary supplements and medicaments* on:
- cerebral and peripheral circulation;
- immune system functioning;
- musculoskeletal system functioning;
- digestive system functioning.
With the help of personal thermograph “CEM®ThermoDiagnostics” you can easily:

Monitor the effectiveness of physiotherapy and massage

Evaluate body’s functioning and health condition with diagnostics based on biologically active points

Monitor the effectiveness of cosmetic products and treatments
The major application of our device is internet consulting, in particular, tele-health consultations in different areas. On-line consultations are done on a basis of thermograms which are sent via Internet by users of personal thermograph “CEM®-Thermodiagnostics”.

In our opinion, about 90% of individual users need regular telehealth consultations and about 15% of professional users may also find tele-health consultations useful in case of clinically difficult diagnosis or problems with reading thermograms.

Consultations are accessible through our company’s web site and other means of communication, such as electronic mail, telephone, and Skype.
Operating principles of personal thermograph:

1. The user of the device takes a photo of the examined area. The user registers (infra-red) radiation from a body surface with personal thermograph in the examined area of the body. Measurement is carried out point by point. First, a doctor gives instructions and shows a patient how to make measurements. As the procedure is simple, patient can easily learn it and take measurements at home.

2. Results of measurements are transferred to the computer through wireless connection and are registered in special computer system, which creates the thermogram for its subsequent interpretation. Thermograms can be stored, compared, and exchanged.

3. The computer expert system automatically gives preliminary diagnosis for some diseases. Doctor’s consultation is needed in the majority of cases. The user can receive telemedical consultation by phone, email, Skype, or through company’s web site, using web camera.
Application areas of personal thermograph “CEM®-ThermoDiagnostics”

Identifying diseases in early stages:

**Mammary glands cancer early diagnostics**

Asymmetric thermographic picture of mammary glands with “heating” of the left gland, which is a sign of possible tumor.

A woman can do as many measurements as needed (mammography can not be done often).

If she notices warning signs on the thermogram, she immediately contacts a doctor for further examination and analyses.
Identifying diseases in early stages:

Monitoring temperature changes on head for prevention of stroke

According to thermography data, head’s skin temperature reflects the condition of blood circulation and metabolism of the brain.

Causes of temperature change are disturbances in blood circulation (arterial flow, microcirculation, venous outflow) and metabolism.
Identifying diseases in early stages:

Early detection of exacerbations of many chronic diseases for preliminary estimation of exacerbation intensity

Thermographic signs of knee joint inflammation

Healthy knee thermogram

Thermograms for maxillary region inflammation before and after treatment
Identifying diseases in early stages:

Diagnostics of melanoma
Diagnostics of diseases:

Thermographic picture of varicose veins
Monitoring of treatment effectiveness for brain circulation insufficiency

Thermography picture before and after treatment.
Examination of functional state of thyroid gland

Normal thermographic picture

Thermographic signs of hypo-function of thyroid gland
Monitoring of treatment effectiveness for different diseases

Thermo-monitoring of otitis media treatment.
Changes of temperature before and after the treatment.

Thermograms for antritis and frontal sinusitis before and after treatment.
Estimation of treatment results and monitoring of treatment process:

Thermography picture before and after treatment of arthrosis.
Estimation of treatment results and monitoring of treatment process:

Arthrosis

First picture shows the knee thermogram before the therapy, second picture shows thermogram after the therapy.
Efficiency control of physiotherapy:

It is possible to **evaluate the effect from many physiotherapy treatments and methods**, which increase microcirculation and normalize vascular tone. For example, frequency pulse and therapy, high frequency therapy, ultra sound, magnethotherapy, cryotherapy, EHF therapy, and many others.

Personal thermograph is an easy and visual tool to objectively see results from massage. **The device helps to find individual, the most suitable massage form, intensity and length of massage treatments, and the number of treatments.**

Thermography picture before (1), right after one massage session(2) and after full course of massage(3).
Efficiency control and monitoring in cosmetology:

Detection of cellulite on early stages (including non-visible changes)

Evaluation of the effectiveness of cosmetic products (moisturizing creams, masks) and treatments.
Assessment of the impact of smoking:

With the help of «CEM®-ThermoDiagnostics» it is possible to monitor temperature changes happening in human body after smoking one cigarette, for example, spasms of brain vessels, upper and lower extremities.

Constant spasms of vessels cause many serious diseases.

Palm thermogram before (1) and after (2) smoking
The use of personal thermograph in sports medicine:

- Objective evaluation of muscles’ “warming” before exercising with a purpose of injuries’ prevention.
- For primary self-examination after injuries and for monitoring treatment's effectiveness.

Muscle’s temperature before and after warm up.
Who can use personal thermograph “CEM®-ThermoDiagnostics”?

- Common people for self check up and thermo-monitoring of therapy together with the use of tele-medical consultations;
- Doctors of all specializations, nurses and medical assistants;
- Cosmetologists;
- Masseurs;
- Sports doctors;
- Distributors of health related goods with a purpose of marketing of their products.
Our main competitor is **medical thermograph** or thermal imager. It has the same diagnostic capabilities as our device, but it costs from 25K Euro.

Medical thermograph:

- can be used only by medical professionals after a minimal 3 months training course,
- can not be used in home conditions,
- not easily transportable,
- not suitable for telemedical services.
Competitive advantages of personal thermograph “CEM®-ThermoDiagnostics”

High diagnostic and prognostic importance: personal thermograph is capable of receiving the exact values of temperature from any zone of a body, including a scalp, perineum, inguinal zones, areas behind an ear, in a nose and others. In other words, the device “sees” the those areas of body, which usual thermograph can't “see” because of shielding effect of hair or imposing of several thermal fields;

Multifunctionality: convenience and accuracy of monitoring of many kinds of therapy;

Evident, safe and exact revealing of thermo signs of illnesses at early stages;

Absence of analogs by price as well as by the volume of received information;

Medical consultation and teleconsulting service;

Easy to use device.
Our company has an experience of making infra-red thermography equipment since 1980.

Personal thermograph “CEM®-ThermoDiagnostics” is produced according to patented technology. The production has ISO Certification. We constantly improve technological process of making our equipment and methods of its use.

We guarantee reliability of our equipment, free guarantee and post-guarantee service.
Personal Thermograph “CEM®-ThermoDiagnostics”

Retail price of the thermography set “CEM®-ThermoDiagnostics” is 500 USD.

Thermography set includes:

• Personal thermograph “CEM®-ThermoDiagnostics”,
• USB-dongle for wireless data transfer from personal thermograph to computer;
• “CEM-ThermoImageBIO” CD disc for drawing thermograms on photos or 3D models;
• Manual and User’s Guide;
• Free Skype consultation with experienced professionals that are always ready to help.
You can find more information on personal thermograph CEM®-ThermoDiagnostics at:

www.cem-tech.ru
www.cem-thermo.ru

Contact us at:
cem.consultant@gmail.com
newmed@newmed@unn.ru

JSC “CEM-Technology”, prospect Gagarina Ave., 23/8, Innovative Technologies Center, office 208, 603022, Nizhny Novgorod, Russia