Nilas MV®

Measuring Health

Straightforward – Accurate – Revealing

The Heart Rate Variability Analysis of Nilas MV®

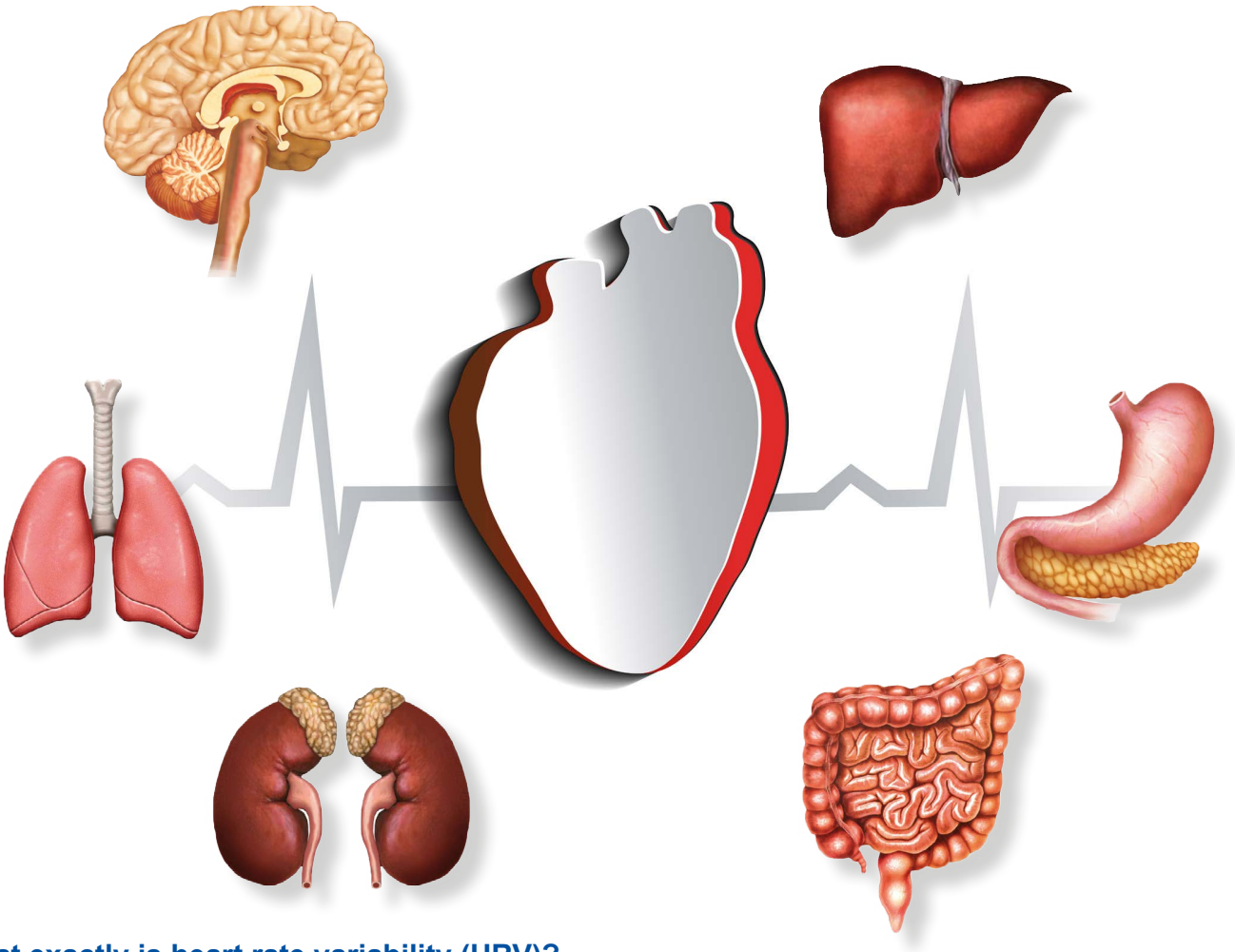
www.nilas-mv.com

Content Overview

Heart Rate Variability

The smart health index

Did you know that our heart is a resonating body for many vitality processes and biorhythms steered by the central and autonomous nervous system? It is inter alia closely linked with our brain via neurotransmitters as well as with the organ, immune and endocrine system and perceives every little change occurring there. The activity level of these vital functions can be extracted from the heart rate variability and qualitatively evaluated. Hence, HRV is a global indicator for identifying the individual health status.

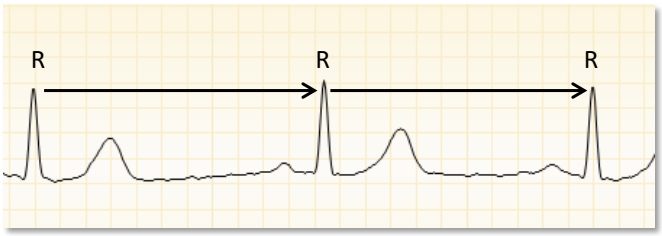


What exactly is heart rate variability (HRV)?

Heart Rate Variability (HRV) refers to the heart's regulatory capacity to vary the time interval between heartbeats consecutively in response to a variety of sources of stress-induced stimuli. It is a reliable performance indicator of the organism delivering sound information of the heart's and the body's overall health. The concept of HRV, when it is within normal parameters, is considered to be a welcome phenomenon.

How does Nilas MV® extract the HRV?

With a measurement of the cardiac cycle Nilas identifies how variable the heart operates to compensate and regulate stress at an optimum level. For this purpose mean values and standard deviations of so-called RR-intervals are used.



Heart beats illustrated as RR-intervals

Nilas MV®: Unsurpassed value to your work

Medical Application

- Cardiovascular and metabolic risk determination
- Diagnostic work up of acute cases
- Post-infarction check up
- Basic clinical diagnostic method of diabetic neuropathy
- Physical and psychological therapy and rehabilitation monitoring
- Progress and success evaluation of therapeutic measures

Prevention

- Stress analysis and burn-out prevention
- Risk evaluation, severity of stress, therapy response (e. g. with chronic stress and burn-out)
- Gerontological regulatory capacity
- Sleep-wake cycle timeline

Nutrition counselling

- Metabolic functioning and regulation
- Acid-base balance
- Body weight management
- Digestion and obesity issues
- Nutritional changes

Popular and professional sports

- Performance diagnostics and intensity regulation in the training division
- Monitoring parameters for (over)training
- Regeneration monitoring and optimisation

Coaching

- Situational and personality analysis
- Holistic interpretation
- Assessment of personal competencies
- Awareness raising on self-reflection
- Managing resources
- Strategy of communication
- Overcoming conflicts
- Psycho-educative personal management training

For . . .

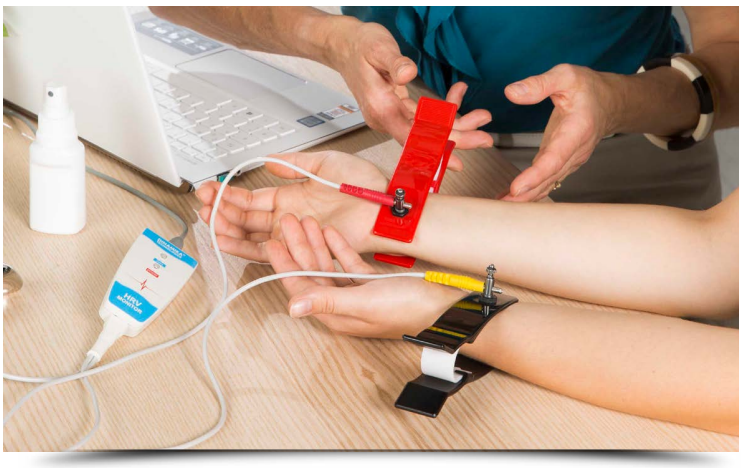
- Physicians
- Natural Health Professionals
- Manual therapists
- Pharmacists
- Dietician
- Corporate healthcare management
- Coaches and trainers

. . . for the healthiness and well-being of your patients and clients

High level quality standards meet operative efficiency

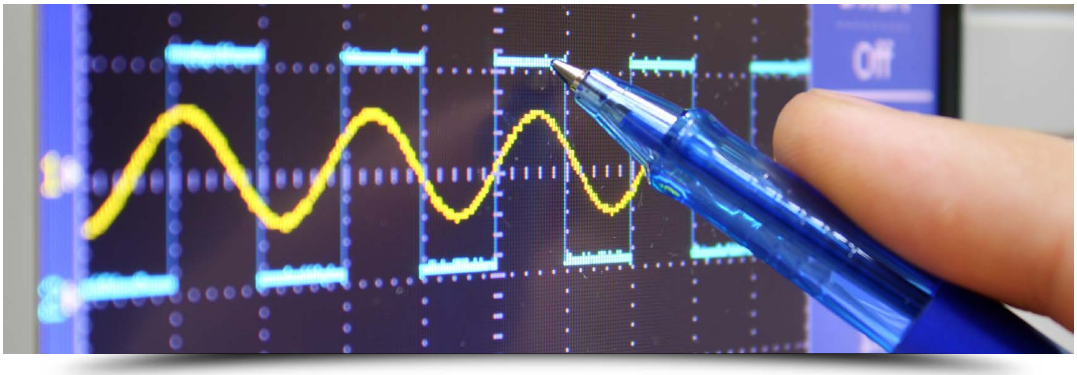
Convenient and practical application

The HRV-Scan is conducted with the aid of two non-invasive clip electrodes, suitably for wrists and foot joints - ***without undressing.*** The user-friendly measuring appliance therefore permits a direct integration into the daily work routine and can be easily delegated to assistants.



Reliable measuring technique - Genuine heartbeat recording

The measuring application of Nilas MV® serves to record human biological signals as a solid basis for diagnostics of the organism's functional state. In contrast to a pulse measuring procedure which only records a pulse wave without a specific punctum maximum (point of maximal impulse) the Nilas MV® cardiograph records the exact R wave peaks.



In this way Nilas MV® provides measuring results in an accuracy margin of one millisecond with a yet unattainable degree of precision in HRV recording by capturing the exact length and intensity of every single heartbeat. This measuring accuracy is verifiable in a metrological test during which fed-in pre-defined amplitudes are recorded without any divergence by Nilas MV®.

Information security and free of electromagnetic smog

Nilas MV® works completely without any radio signals such as WLAN or Bluetooth, which are used with some HRV systems. Those procedures impact the data consistency as well as the biorhythms of the organism. Thus they distort the picture about the actual health status of the person tested.

Detecting the root cause of symptoms

Ahead of every health measure a thorough analysis and evaluation of the current situation is required. Only in this way a tailor-made and effective aid can be developed and provided.

Nilas MV® offers a variety of unique parameter functions which illustrate objectively the stress situation of the organism that can be a trigger of discomfort as well as symptom of health impairments.

Understanding health issues und measures

According to a representative study conducted by the University of Bielefeld 54.3 % of patients in Germany are unable to cope with health-related information. They have difficulties in comprehending relevant content presented by their therapist, in assessing treatment options suggested or in being able to relate to the effects of applied measures.

Hence, it is crucial for even the most technically qualified therapist to be able to successfully enlighten the patient on his own situation and in this way increase his compliance to become actively involved in treatment measures.

Facilitate the communication with your patients

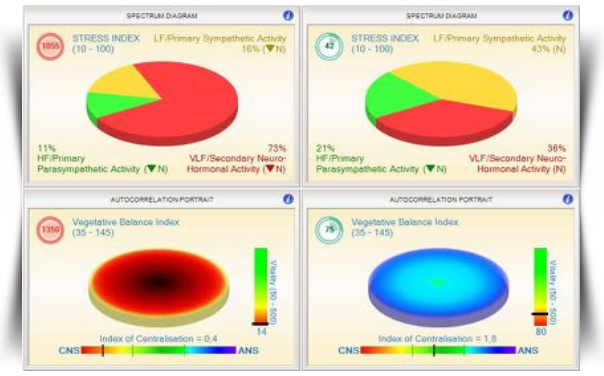
For this purpose Nilas MV® pays particular attention to the explanatory power and comprehensibility of the biological data gathered during the HRV measurement. The compiled information is appealingly depicted in a colour-coded and/or numerical assessment system. This allows for an easy entry into the work with Nilas MV® and a time-efficient evaluation routine in your everyday practice. At the same time the informative overviews also help your patients to better understand their overall situation.

Visualise the efficacy of your treatment!

Enhance your patients' compliance to stick to treatment plans by providing evidence on improvements already at a stage when benefits are not yet subjectively perceptible.

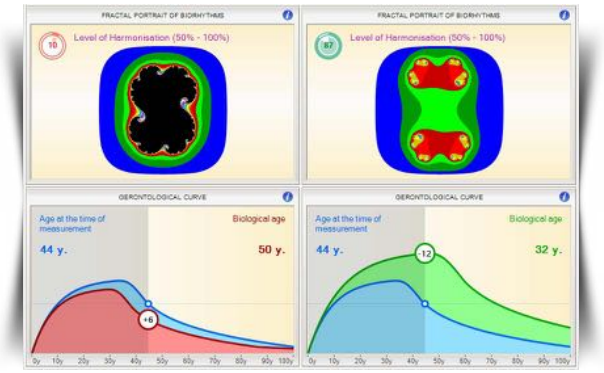
In just about 5 minutes Nilas MV® provides a comprehensive assessment of biorhythmic health parameters, which deliver information about the development of systemic core values and the regulatory capacity of a patient.

Before **After**



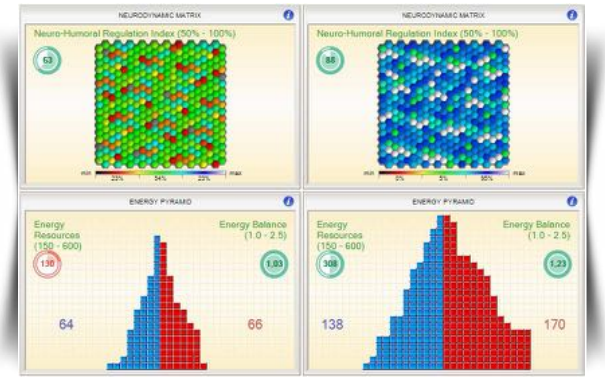
The measurement of heart rate variability with Nilas MV® displays explanatory and understandably alterations of physiological, neuro-endocrine and psycho-emotional origin.

Before **After**



A major asset for you: The software allows comparative measurements to support effectively and efficiently your success and progress monitoring with therapeutic applications.

Before **After**

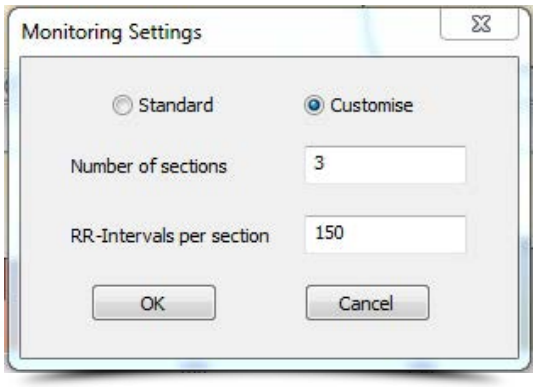


Nilas MV® offers an integrated report function to export and document the measuring results. With the separately available add-on module "Vitality Report" a personal status report for patients/clients can be created that helps to further facilitate the understanding of the result's context.

HRV monitoring for long-term measurements

In HRV measurements with Nilas MV®, heartbeat sequences are usually measured for a period of approx. 5 minutes. However, the integrated "Monitoring" function also allows you to carry out self-defined long-term measurements or measurements beyond 5 minutes. It is ideal e. g. for testing the orthostasis reaction or for evaluating the biological reaction to measures and substances in **real time,** such as dietary supplements, infusions, bioresonance, acupuncture, manual treatments etc.

Monitoring Sequence Extraction



In addition to a time-independent measurement, you can also define your own run protocol for the monitoring function.

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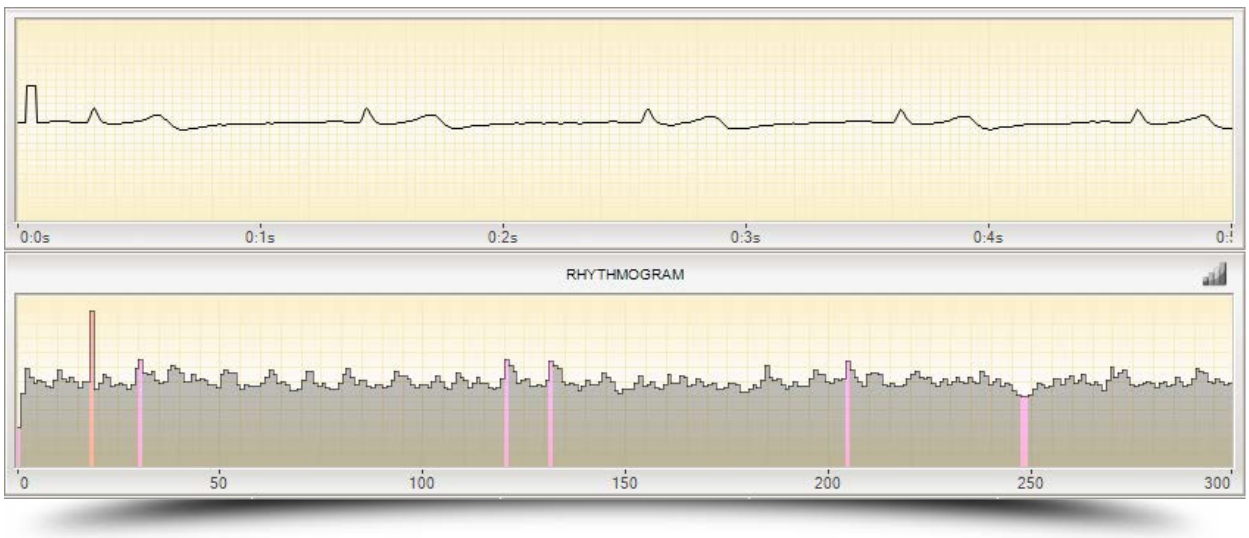
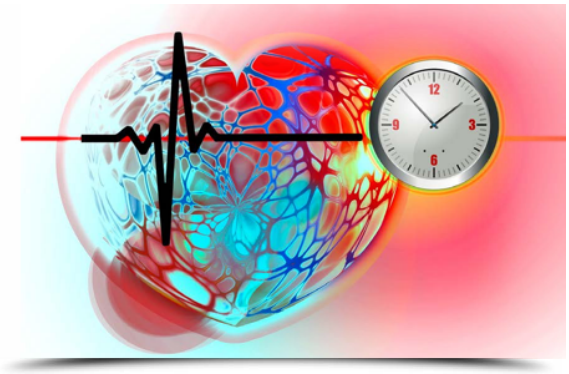
Depending on the treatment applied you can extract sections from the measurement (e. g. every 10 minutes) to verify the effect on the organism in the course of the measure and to document the efficacy.



In subsequence to the long-term recording you can review the selectively saved sections for evaluation or analysis purposes. Each section is saved as a separate measurement.

Complex biological processes made fully transparent

A unique combination of reliable measurement methods

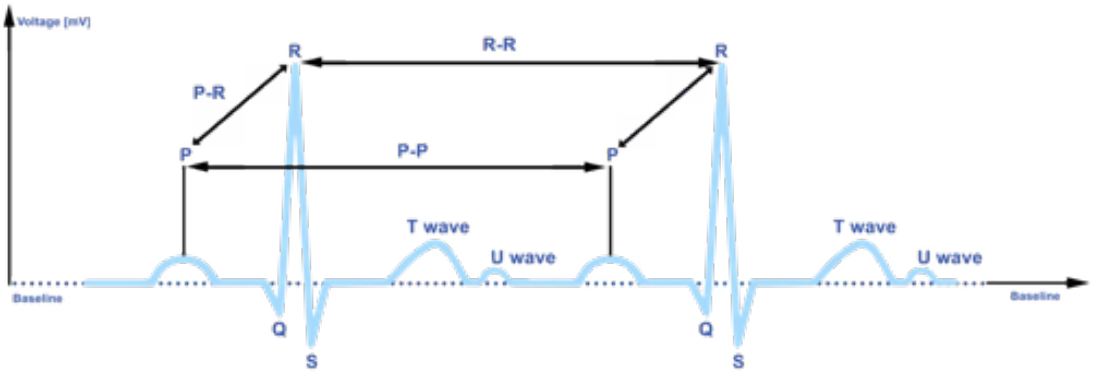


Traditionally, two main methods are distinguished in HRV analysis: the frequency domain method and the time domain method. While HRV systems often use only one of these methods for data recording, Nilas MV® uses both in combination.

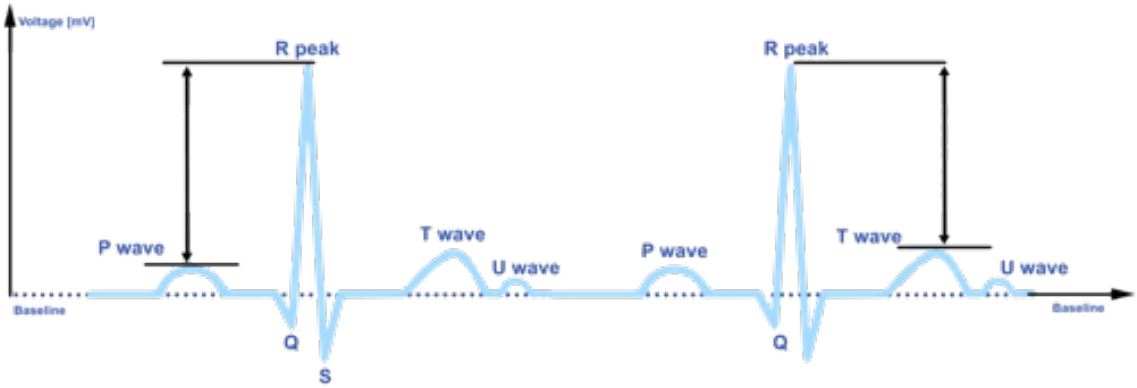
In the frequency domain the periodically recurring oscillations of the HRV with their different amplitudes are determined. These can be referred to physiological processes underlying HRV, the analysis of which allows a differentiated assessment of sympathetic and parasympathetic influences on the sinus node.

For analyses in the time domain, mean values and standard deviations of the R-R intervals are calculated and the HRV are displayed using descriptive statistical methods. These parameters provide specific information on overall variability as an expression of regulatory capacity and health (vitality).

In contrast to other measuring systems, Nilas MV® not only measures the actual R-R intervals, but also breaks down the HRV overall signal into its frequency components using spectral-analytical methods. This makes it possible to record the variance of the individual types of intervals and to relate them to each other in order to depict the events in the entire organism in an even more differentiated manner and to make them accessible to the user.



Nilas MV®: Measurement of real frequency components



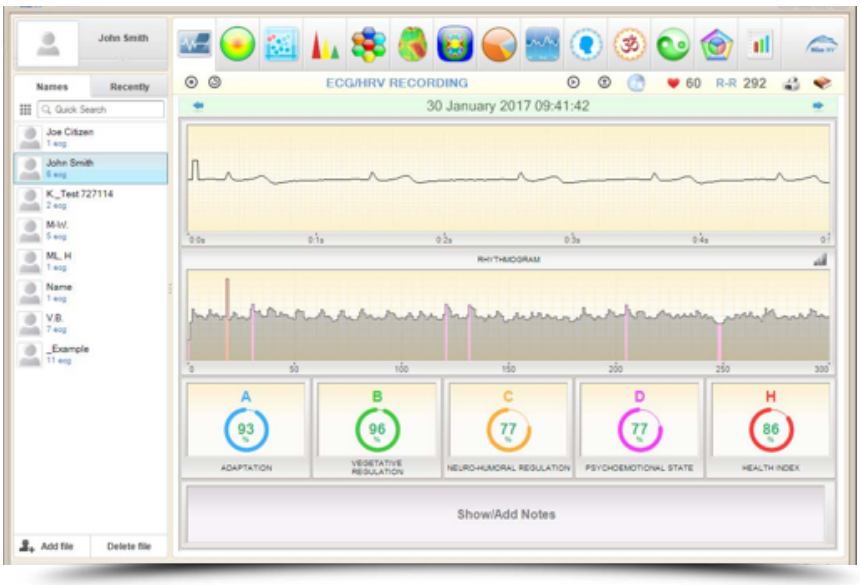
Nilas MV®: Measurement of real intensity parameters

Versatile functions for multi-purpose needs

The measurement and evaluation functions of Nilas MV® cover the areas of diagnostics, treatment, control and prognosis in a simple and efficient way.

Right on the heartbeat - The Rhythmogram

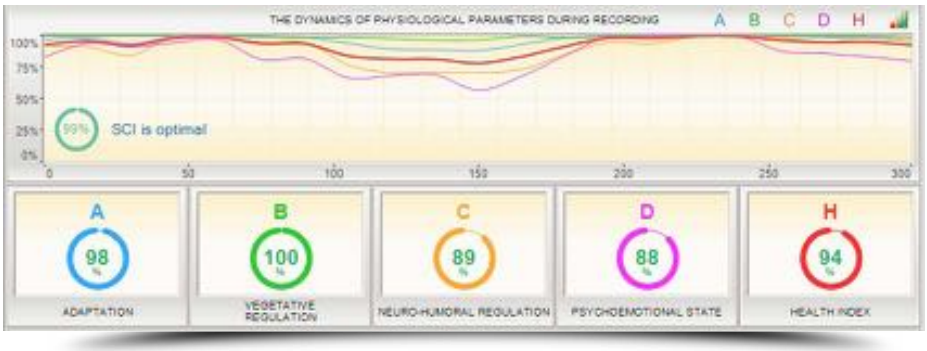
With the Rhythmogram the heart rate variability as well as sympathetic and parasympathetic influences on the sinus node are recorded and depicted on the basis of the heartbeat intervals.



In contrast to a pulse measurement procedure, the real-time recording of Nilas MV® measures the exact peak of the heartbeat. Thus, Nilas MV® delivers measurement results in an accuracy margin of one millisecond with a yet unattainable degree of precision in HRV recording by capturing the exact length and intensity of every single heartbeat.

In addition, the software automatically removes all artifacts from the evaluation and thus enables a time-saving specific evaluation.

The dynamics of health



The dynamic function provides global information on the overall variability. The curves display the energy level and the resource consumption of physiological and psycho-emotional adaptation and regulatory parameters as well as their harmoniousness and interactions. This allows for concrete conclusions in the assessment of causes with deficits and increased need for regulation.

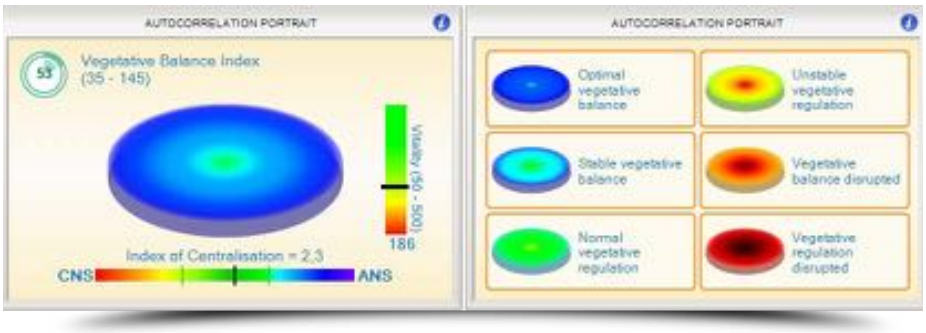
The autonomic nervous system - unconscious nervous system

Health and well-being are directly dependent on the proper functioning of the autonomic nervous system. In healthiness the influences of the sympathetic and parasympathetic nervous systems alternate with one another without falling into extremes. Shifts in this health balance, e. g. due to stress and in particular persisting stress, can be identified and analysed with Nilas MV®.

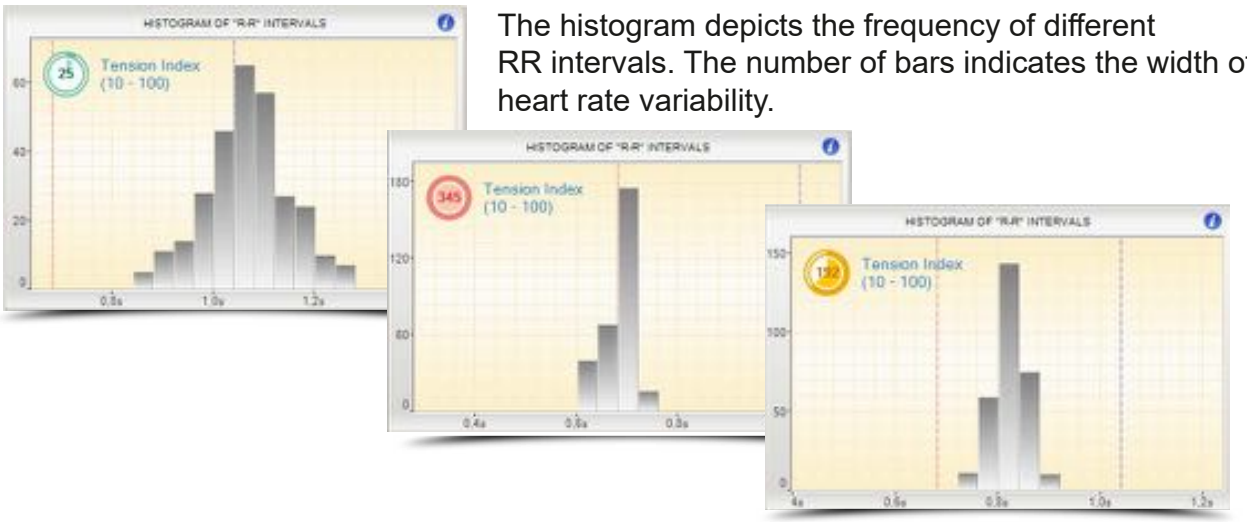
The frequency spectrum diagram shows the percentage activity level in the distribution of the three frequency segments:

- parasympathetic nervous system
- sympathetic nervous system
- neurohormonal system

The index of stress evaluation informs to what extent the overall constellation of the frequency spectrum is in balance.

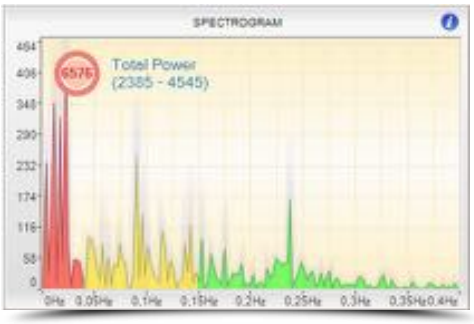


The autocorrelation portrait provides information on the current capability to adapt to stress. The clear legend enables a simple and quick classification of the measurement results.



The histogram depicts the frequency of different RR intervals. The number of bars indicates the width of the heart rate variability.

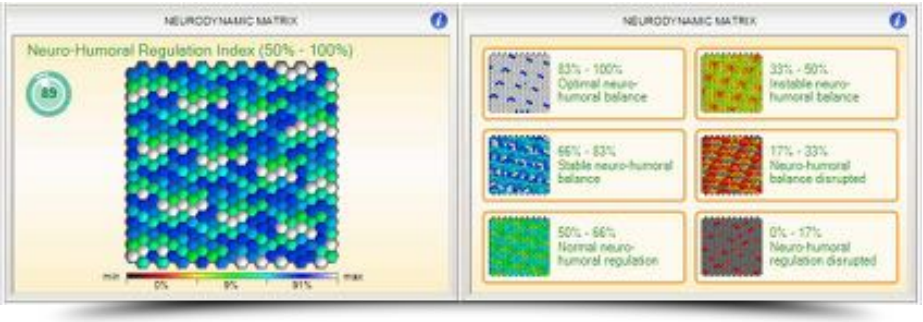
The Scatterogram is a two-dimensional depiction of the heart rhythm and a summary of the entire RR time series of the electrocardiogram.



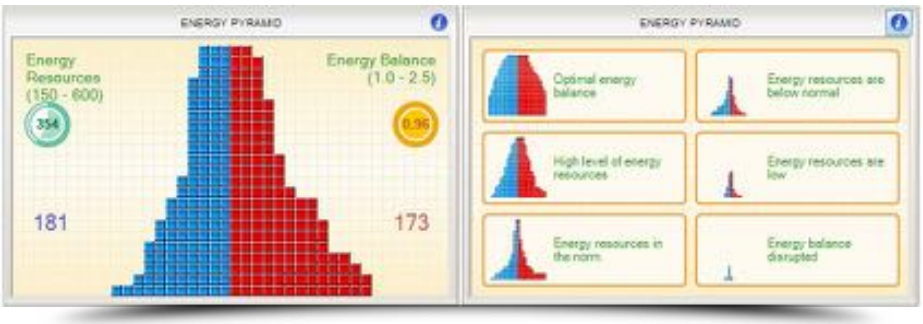
The stress level is scaled in the frequency spectrum. It provides information to you about the intensity and distribution of the individual signal components: Very low frequency (neurohormonal part), low frequency (sympathetic part) and high frequency (parasympathetic part). The "Total Power" index shows the measured total energy of the organism in the frequency spectrum (HF, LF, VLF) and its distribution as a numerical value.

In the risk analysis you will find a quick overview of important parameter values of the vegetative regulation. In addition to relevant HRV core values, it also includes indices for systemic processes.

Central Regulation

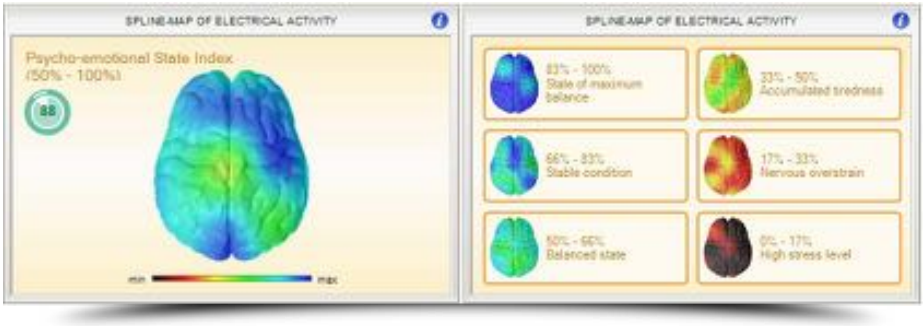


The periodically recurring oscillations of HRV with their different frequencies can mainly be assigned to individual physiological processes underlying HRV. The Neuro-Dynamic Matrix evaluates the balance and dynamics of physiological adjustment processes between the central nervous system and internal organismic subsystems.

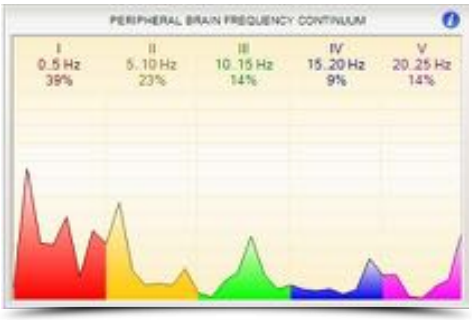


The pyramid shows the energetic equilibrium in the different organic and subsystems with the aid of blue (anabolic = building up) and red (catabolic = degradation) elements and values. It compares the energy intake and energy consumption of the organism.

Psycho-emotional state

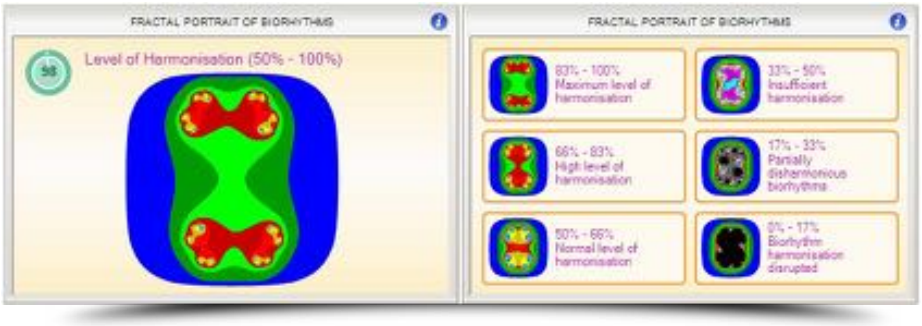


The spline map is a topographic matrix simulation of the active functional areas of the central nervous system. Nilas MV® measures the condition of each heartbeat at intervals of 50 beats and displays it in its entirety as a two-dimensional animation.



The neuroelectric activities during the measurement period are closely related to the psycho-emotional state and do range within certain frequency spectra, which are recorded with Nilas MV®.

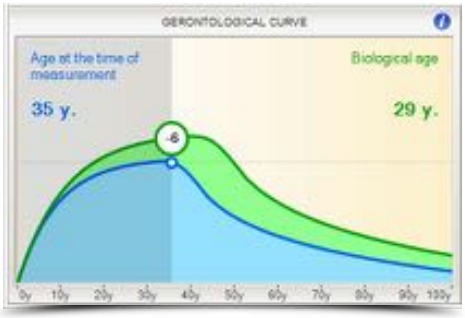
The harmony of biorhythms



Through the fractal analysis of the biorhythms, Nilas MV® provides information on the long-term consequences of stress load and regulatory loss. It illustrates to what extent the different biorhythms of the organs and subsystems of the organism harmonise with each other.

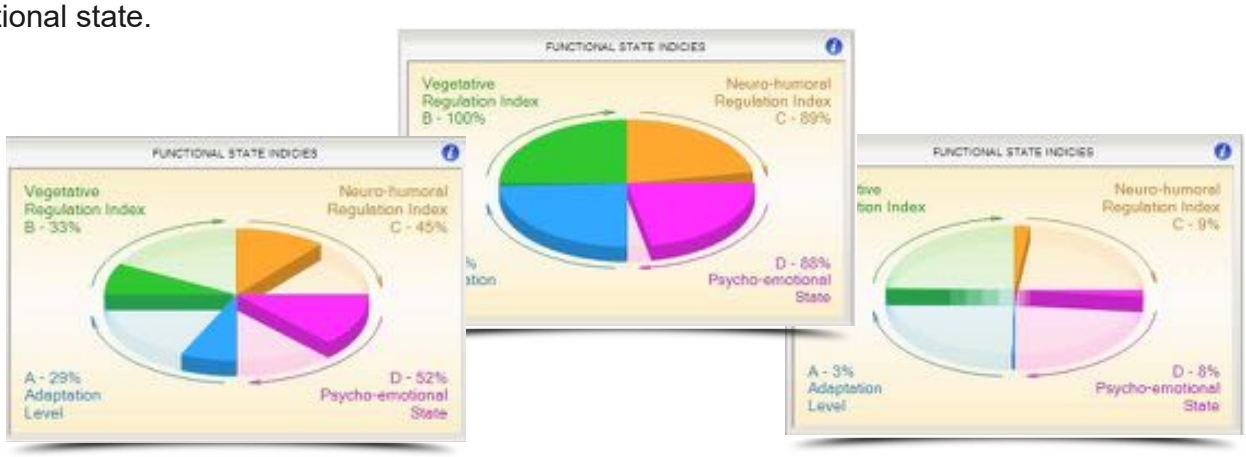
The biological age

Vitality means that the biological age is younger than the calendrical age. Aging processes are intensified if the organism does not have sufficient opportunities for regeneration and compensation. The gerontological curve from the HRV measurement with Nilas MV® allows for conclusions to be drawn about the biological age of the body.

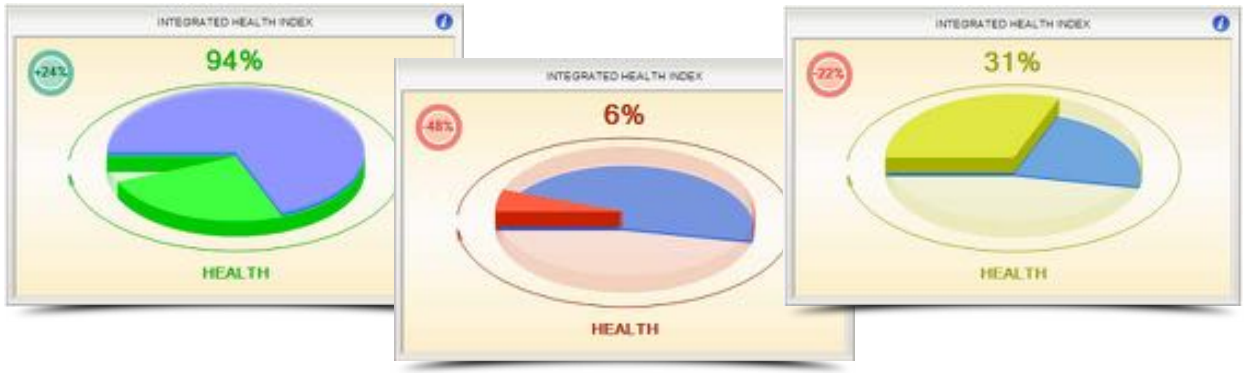


Everything at a glance: The overall assessment

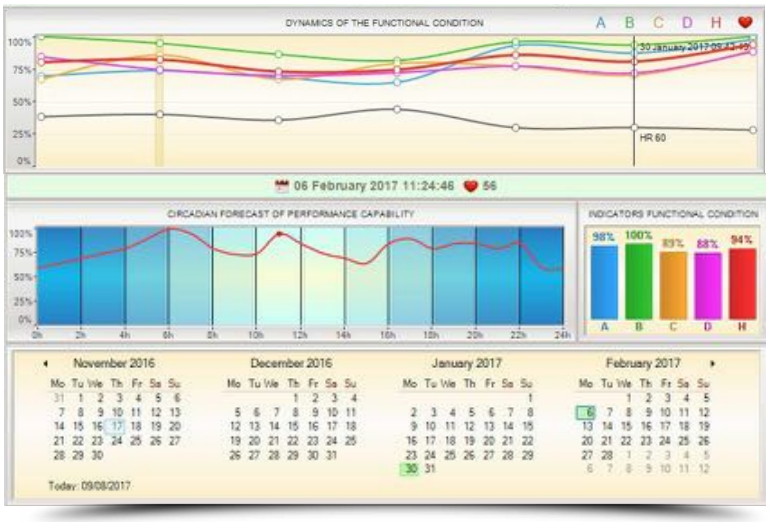
The global analysis provides an immediate overview of the ratio and balance of the regulatory effective functional areas among each other and thus, where applicable, of deficits in the overall functional state.



The integrated health index shows the organism's capability to regulate itself. An age-specific ideal value (blue) is compared with an actual value (circle segment in a different colour) in order to assess the functional and regulatory potential.



Progress monitoring

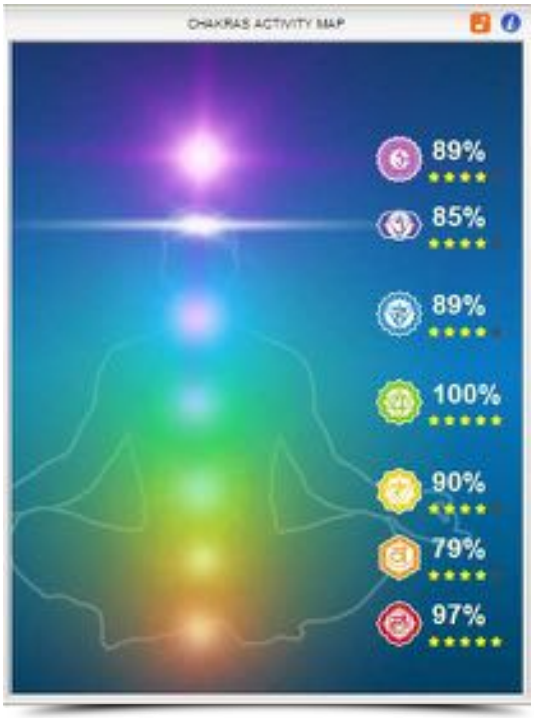


This overview shows the development of the indices of the functional state from all measurements of the same person tested. The dynamics of the values of the functional state are therefore qualified for follow-ups. The Circadian Forecast of Performance Capability shows the individual output curve over a 24-hour period.

Aura Portrait

This illustration of the local frequency spectrum visualizes the available total energy and its distribution in the different body regions.

Chakras Activity Map



In addition to the current snapshot of a measurement, a chakra analysis allows statements to be made about psycho-emotional backgrounds, connections between various disorders or symptoms.

The Chart of the Meridians

The Chart of Meridian includes different analysis and evaluation parameters derived from the 12 organ system meridians of the Traditional Chinese Medicine (TCM). Both the meridian diagram and the organ body clock can be used for diagnostic and therapeutic purposes.

The Doshas and the 5 Elements

The individual dosha ratios are determined from a system-integrated questionnaire. On the basis of this evaluation, dietary recommendation is issued.

Overview of Parameters

OVERVIEW OF PARAMETERS

Parameters	Values	Norms
Parameters Heart Activity		
HR (beats/min)	56	[60-90]
IAB	52,9	[35,0-145,0]
VHR	0,40	[0,25-0,60]
IAR	21,1	[15,0-50,0]
SI	25,4	[10,0-100,0]
Parameters Vegetative Regulation		
B1 (%)	100	[60-100]
B2 (%)	81	[60-100]
Statistical Parameters		
RRNN (ms)	1066	[700-1000]
SDNN (ms)	84,5	[30,0-100,0]
CV (%)	7,9	[3,0-12,0]
RMSSD (ms)	82,3	[15,0-45,0]
NN50	159	[46-100]
pNN50 (%)	54	[15-34]
Frequency Spectrum		
HF (ms^2)	2459	[770-1078]
LF (ms^2)	2141	[754-1586]
VLF (ms^2)	1976	[600-1500]
HFnu	53,45	[26,00-32,00]
LFnu	46,55	[50,00-58,00]
LF/HF	0,87	[1,50-2,00]
TP (ms^2*1000)	6576	[2385-4545]
Parameters Histogram		
Mo (ms)	1040	[700-900]
AMo (%)	21,65	[30,00-50,00]
VR (ms)	416	[150-450]
HRV Index	16	[20-50]
Parameters Autocorrelation		
1k	0,517	[0,700-1,000]
m0	19	[0-18]
Z	186,9	[50,0-500,0]
IC	2,3	[1,0-3,0]

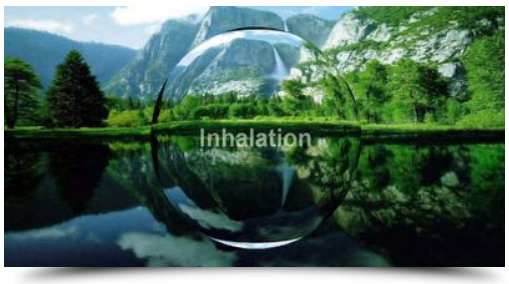
OVERVIEW OF PARAMETERS

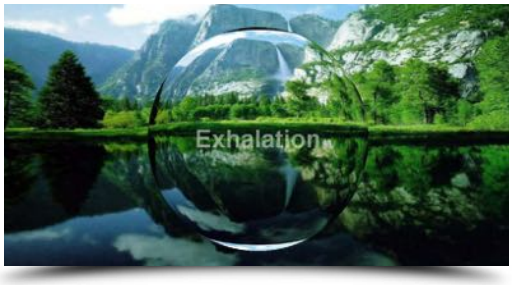
Reference
Parameters Heart Activity
Pulse
Differences RR-Intervals
Vegetative Index of Heart Rhythm
Index of Appropriate Regulation
Stress Index
Parameters Vegetative Regulation
Regulatory Level
Regulatory Reserve
Statistical Parameters
Duration of the Middle Interval
Standard Deviation of Middle Interval results
Variation coefficient
Root-mean square differences of successive R-R intervals
Number of Spontaneous Changes in Intervals of Longer than 50 ms
Percentage of Spontaneous Changes in Intervals of Longer than 50 ms
Frequency Spectrum
High Frequency Power (0.15 Hz – 0.4 Hz)
Low Frequency Power (0.04 Hz – 0.15 Hz)
Very Low Frequency Power (0.00 Hz – 0.04 Hz)
HF Frequency Performance (0.15 Hz – 0.4 Hz) in standardised units
LF Frequency Performance (0.04 Hz – 0.15 Hz) in standardised units
Ratio of Vegetative Balance: sympathetic(LF)/parasympathetic activity(HF
Total Power of the Entire Frequency Spectrum
Parameters Histogram
Mode
Amplitude of the Mode
Range of Variation
Heart Rate Variability Index
Parameters Autocorrelation
Correlation Coefficient After the First Shift
Number of Fluctuations With a Value of Less Than 0
Autocorrelation Index
Index of Centralisation

The raw data of the cardiac activity parameters are listed in this overview. In addition to the measuring ranges for HRV, it contains their standard and guideline values, the individually measured results and a legend with the associated units.

The power of breath for health and fitness - The Breathing Module of Nilas MV®

Breathing is an essential life function primarily intended to supply oxygen and expel carbon dioxide. However, how we breathe is also very important and can enable us to remain healthy, rectify disorders, improve energy supply and balance our physical and mental well-being. Nilas MV® creates based on the measured heart rate variability an individual respiratory rate pattern designed for a 5 minute breathing exercise.





When done according to the instructions, it helps to restore our own ideal rhythm, simultaneously regulating biorhythms, strengthening the parasympathetic system, reducing stress and increasing our energy levels as well as psychic abilities like concentration. It also serves for testing the individual regulatory capacity on the basis of the body's resources.

The respiration procedure is illustrated with the aid of a dynamic ball, which expands to correspond with when we breathe in and contracts as we breathe out. The pace of the expansion and the contraction of the ball as well as the length of the breather are determined by the results of the measurement data and individually tailored to the subject of each test.

The relaxation effect is enhanced by the interplay between the breathing ball, varying landscape scenery and embedded classical music.

The breathing module can be directly saved as a video file, burned on CD, saved on a USB stick, or delivered to the user via a file-hosting service.

Getting back to balance by setting the right tone - The Sound Module of Nilas MV®

Long ago, our ancestors realised the profound impact that the property of matter we call SOUND, has upon our lives. Recent research, carried out by Dr. Luciano Bernardi (Pavia University, Italy), shows that the heart responds to match the rhythm of the music being listened to.

The Nilas MV® software makes it possible to generate for each person a unique audio file containing a sound pattern designed to correct bio-energetic imbalances and deficiencies. It uses the difference between the optimal state and the actual state of the neuro-dynamic matrix to identify which signals are needed by you, to restore the body's optimal state of balance, which it then superimposes onto a background of natural sounds.

The file is approximately 20 minutes in duration and should be listened to every day for a period of two weeks. When after two weeks, the neuro-dynamic matrix adapts to the course of the sound regulation, it makes sense to conduct another scan to generate a new sound pattern file which calibrates to maintain and further improve the new state of health and well-being.