Breathing Well-being and Health?

Evidence of the connection between inhaling energised air and harmonising the autonmic nervous system by measuring heart rate variability (HRV)

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Scientific starting point:
The first retrospective scientific analysis (trend analysis) of the opinions of end users and therapists employing Airnergy plus apparatus for activated air inhalation took place in 2007. This analysis, the first since the method was introduced, was quite revealing overall and yielded some amazing results.
42 records related to 163 disorders or cases of ill health (3.9 per record). 77 percent of the reported symptoms concerned functional, 23 percent organic factors. Success was not dependent on age. Subjects ranged from 21 to 91 years old. Subjects' condition sometimes deteriorated temporarily yet, in each case, a clear subjective, and frequently also objective, improvement was observed at the latest after using this method for 7 days.
In the case of **organic disorders**, analysis of end users' comments on the effectiveness of inhaling activated air revealed it was used successfully with disorders involving various organ systems including the nervous system, respiratory tract, cardiovascular system, immune system, sensory organs, skin, musculoskeletal system, metabolism and hormonal system. The therapists' assessments referred to its effective use with pain management, in dentistry, in oncology, with diseases of the respiratory tract, eyes, musculoskeletal system, cardiovascular system, immune system and with metabolic disorders as well as with inflammation, post-operatively and as anti-ageing treatment.
As for **functional** disorders, end users revealed that inhaling activated air had a positive effect on their energy levels (performance, activity, resilience, strength, motivation), well-being (insomnia, mood, breathing, digestion, pain, immune state), regeneration (consolidation, acceleration, relaxation, pulse calming) as well as on the sensory system (smell, sight, skin, vertigo). The individual aspects applied to all end users although the order varied according to each subject's condition at the outset. Therapists considered that this form of therapy had a beneficial effect, in particular, on persons with reduced vitality, sleep disorders, weakened immune system and poor vision.
When these evaluations and individual experiences are all combined, the impression is gained that, similar to other naturopathic methods, activated air inhalation does not so much influence or cure the underlying illness itself (although it was possible to trace this outcome in some cases) but it does have a beneficial effect, above all, on accompanying autonomic symptoms. In most chronic (especially organic) disorders and with most patients these represent the negative aspects of which they are aware (pain, restricted movement, poor concentration, reduced vitality, sleep disorders, digestive problems, etc.). Getting this "autonomic" imbalance under control is a priority for those affected no matter what form of therapy is being used. They were able (if need be) to come to terms with the underlying illness itself.

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In concrete terms activated air inhalation was shown to be particularly effective in patients with, for example, multiple sclerosis, Parkinson's disease, chronic obstructive pulmonary disease, skin trouble, burnout syndrome and sleep apnoea.

The long road from the one-sided cellular pathological disease model to therapeutic approaches combining cellular and humoral pathology:
In acute situations it is necessary to proceed as quickly as possible in a manner correlated with the dose or by actually eliminating specific noxae. Both responses relate principally to the cellular pathological level (an example from aquatics by way of comparison: treating the goldfish but not its environment, i.e. the surrounding water), are well covered by "conventional" medicine and lend themselves well to scientific (as well as subjective) analytical methods.
The situation is different with chronic disorders (which in the past made up a small proportion of all diseases but which have been growing steadily for years and now account for over half of all diseases and deaths). Chronic (degenerative) diseases (resulting from the effects of modern civilisation) generally relate to complex regulatory systems (the environment rather than the individual cell) and consequently tend to be more difficult to treat using "conventional" medicine and increasingly are a main indication for treatment using (the affected person's preferred) naturopathic methods which generally satisfy a humoral pathological approach.

The aim of treatment and its resulting success lies largely in an increase in subjectively perceived functional capacity and vitality, in other words an improvement in the person's quality of life. Causal therapy is not possible in most cases, nor is it intended.
In the context of holistic medicine, naturopathic methods are, by definition, concerned with stimulating the body's own individual regulating and healing powers using natural remedies or stimuli which have few or no side effects, as demonstrated by activated air inhalation for example.
Naturopathic methods can be used with chronic disease, functional disorders and ill health and also as adjuvants to typical conventional medical treatments.
The main goals here are:

1. increasing the supply and utilisation of oxygen
2. harmonising and stabilising biological cybernetic functions
3. improving the environment/milieu (intercellular substance)

All these aspects do not primarily relate to the actual local focus of disease but to the organism as a whole. Therapy aims at creating the optimal conditions that will allow self–healing or a healing process initiated with minimal external intervention.
A priority here is endogenous control circuits which should be maintained or restored or, in any case, improved and stabilised as far as possible in each individual case. Essential preconditions for this are oxygen supply and utilisation appropriate for the individual need and an environment whose self-cleaning system is properly functioning ("purification" of the intercellular tissue).
The biocybernetic influence on endogenous regulatory circuits employs certain selected stimuli (such as energising inhaled air) to activate desired reactions (microcirculation, oxygen supply, metabolism, waste disposal). The aim is to cause a "meaningful" response in the body, both locally and regionally and overall, especially

the autonomic, immunoactive and endocrinological system (psycho-neuro-endocrino-immunological system).
The individual course (intensity, duration and spread) of many diseases, especially chronic conditions, depends upon the person's responsiveness. Consequently measuring this responsiveness takes on ever greater significance for therapeutic action.
The main anatomical site of pharmacological action relating to the individual's regulatory state and, above all, regulatory range (negative: regulatory resistance) lies in the extracellular matrix (intercellular space, environment). The autonomic nervous system, the endocrine system, the immune system and the mind (psycho-neuro-endocrino-immune system) are the main physiological players (modes of action). As has been clearly demonstrated, they are closely linked to one another such that it makes diagnostic and therapeutic sense to favour a method which addresses the entire psycho-neuro-endocrino-immunological network but also delivers evidence-based results, is simple to perform, causes minimal disruption to both patient and therapist (as regards time, organisation and effort) and is cost-effective.
Just such a method has been developed and standardised with HRV (heart rate variability). It can be used in a range of applications and is now firmly established scientifically.

Autonomic nervous system – autonomic regulator of the vital functions:
HRV serves to measure the heart's autonomic neurovegetative activity and can be defined as the variation (bandwidth) of the heart rate over the course of the day. It is measured with an ECG or with heart rate meters by recording the time intervals between two heart beats (RR intervals) and depicting this in diagrammatic form in a coordinate system.
While the absolute level of the heart rate as a static parameter provides more information about the intensity of cardiovascular exertion (rest, physical exertion), the HRV scatter diagram also indicates the quality of cardiocirculatory regulation and the underlying parameters affecting it.
Whether at rest or exposed to physical and/or mental exertion, the heart reacts incessantly to signals from within the body and its surroundings, in terms of heart rate, contractility, output and cardiac phases (systole, diastole). This adaptability is based on a (normally, i.e. in healthy individuals) optimal interplay between the two strands of the vegetative or autonomic nervous system, namely the sympathetic nerve (associated with work) and the parasympathetic nerve (calming branch of the nervous system).
The high frequency electrical impulses of the **parasympathetic nerve** cause the entire body to adapt in various ways, with trophotropic aspects such as energy conservation, recuperation and restorative processes being a priority. From a metabolic perspective, assimilation is intensified (to build up energy and bodily substance) and the stroma becomes more alkaline. The supply of blood to the muscles declines while the blood flow to the digestive organs and skin is increased. Cardiac output, heart rate, contractile performance and irritability of the myocardium (heart muscle) are reduced. Adrenaline production (stress hormone) declines, basic mood improves, blood pressure decreases, the tendency to fall asleep increases and the propensity to become inflamed and inflammatory processes are reduced.

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The low frequency impulses of the **sympathetic nerve,** however, cause inverse ergotropic reactions in the form of discharge of energy and decomposition processes. More specifically this leads to an increase in catabolic (dissimulatory) metabolic processes and a more acid environment. The blood flow to the muscles and heart/lungs is intensified, their metabolism and consequently oxygen demand increases (nerve associated with work), at the expense of the digestive organs and skin. Cardiac output, heart rate, contractile performance and irritability increase accordingly, a consequence of the increased adrenaline production and secretion by the adrenal glands. The basic mood is more subdued, there is less tendency to fall asleep, blood pressure is increased, the propensity to become inflamed and inflammatory processes are activated.

The vegetative nervous system is not really subject to the individual's will ("autonomic" nervous system). It regulates the functions of the individual organs such as blood flow, breathing, digestion and internal environment, thereby ensuring the homeostasis of the stroma without us being aware.

The individual organs or organ systems are supplied by both strands of the autonomic nervous system to the same extent in the form of a superordinate regulatory circuit. Sympathetic activation causes an increase in latent vitality with all that that entails for the individual organs while the parasympathetic system takes care of relaxation, recuperation and recovery.

Continuous activation of the sympathetic nerve leads in the long-term to exhaustion, depression and burnout, while a lifestyle which is permanently low in stimulation and dominated by the parasympathetic nerve causes atrophy of the individual organs, underuse and inability to adapt to altered environmental conditions.

A balanced, well co-ordinated interplay between the two strands of the autonomic nervous system is absolutely essential to maintain or restore health, with an indispensable requirement being that both elements are activated alternately in a more or less regular rhythm (circadian rhythm, the sympathetic nerve prevailing by day and the parasympathetic nerve at night)

Autonomic dysfunction occurs frequently and the trend is rising. Up to 70 percent of all outpatient consultations apparently relate to this issue. Concrete manifestations take the form of psychovegetative exhaustion, neurodystonia, state of exhaustion, vegetative interference, burnout syndrome, neurasthenia and nervousness.

Characteristic symptoms are outbreaks of sweating, especially night sweats, vertigo, difficulty falling asleep and sleeping through, loss of appetite, weight loss, sometimes also bulimia, diarrhoea, constipation, orthostatic complaints, synaesthesia, rapid heart rate and even racing heart, sexual problems, urge to urinate, backache in some cases involving the spinal column and generalised tendomyopathy.

Many chronic disorders are accompanied by disruption of the basic regulation and an imbalance in the psycho-neuro-endocrino-immunological axis which manifests itself subjectively as reduced quality of life, provoked by the characteristic symptoms described above. Alongside causal therapy (sometimes very difficult or not possible, such as with coronary heart disease, arthrosis, cancer) an important concern for modern medicine is to eliminate or at least relieve subjective symptoms associated with the underlying illness.

Many naturopathic methods, including inhaling energised air, appear particularly suited to this and better than traditional treatments based on cellular pathology.

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HRV is a recognised method of demonstrating these aspects, harmonising the autonomic axis and thereby helping improve basic regulation.

Heart rate variability (HRV) – evidence-based health indicator:
The variability of a person's heart rate indicates their regulatory range (synonymous with well-being and health). According to a Chinese sage from the third century, "if the patient's heartbeat is as regular as the hammering of a woodpecker or the pattering of rain on the roof, then they will die within four days". Just under one hundred years ago, the cardiologist Brauchle coined the term "isorhythm" indicating a threat to the blood supply to the heart.

At rest the greatest variability for a healthy heart beating between 45 and 100 times per minute, or an RR interval of between 600 and 1300 milliseconds, is most frequently between 60 and 80 beats/min. At the onset of physical or mental exertion the mean heart rate increases and variability declines. The greater the exertion, the more marked this trend becomes.
All individuals have a characteristic heart rate variability, determined by their age, sex, genetic predisposition, condition and lifestyle. Nevertheless it is possible to define average and target values within certain boundaries. As a result, resting variations in heart rate in excess of 100 msec indicate the heart is reacting "normally" and adapting to the external and internal stimuli encountered continuously in everyday life. Children generally display a greater variability than adults, which declines continuously with age.
Conclusions can therefore be drawn from heart rate variability about the body's important regulatory processes in order to obtain information on the current state of stress or health.
Sympathetic activity dominates in subjects experiencing chronic stress, as is clearly identifiable by low HRV. In a state of autonomic harmony, however (high level of well-being and health), there is marked HRV.
HRV analysis can be presented in three ways: firstly as a **rhythmogram** (continuous recording of the length of individual pulse periods, i.e. the intervals between two successive heartbeats along the abscissa; identifying the length of the individual RR intervals on the ordinate of a coordinate system), secondly as a **histogram** (recording the frequency of the length of individual pulse periods in a coordinate system; representing the frequencies on the ordinate, the individual RR intervals on the abscissa) and finally as a **scatter diagram** (entering the length of each individual pulse period on both the horizontal and the vertical axis of a coordinate system).
Health disorders and disease, permanent stress and top-level sport represent factors which can lead to depressed HRV in the long-term. A well-balanced lifestyle, contentment, a high level of well-being, moderate endurance training and also measures to promote regeneration can all lead to long-term increase in HRV.
In the short term HRV is particularly affected by acute (physical and emotional) stress. But HRV can also be clearly influenced in the short-term by mental factors (joy, anxiety, fear, surprise, in short, feelings triggered by the brain's limbic system). Additional factors which affect HRV are endogenous (breathing, blood pressure, body temperature, hormonal status), exogenic (body position, food intake, consumption of tea, coffee, alcohol, cigarettes, etc.) and constitutional in nature (body weight, fat/muscle ratio).

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In summary, HRV is an excellent method of assessing bioregulation such that it is ideal for use in demonstrating the effectiveness of inhaling energised air.

Inhaling energised air – alternative method of bioregulating ground substance?
The supply to and removal of materials from the ground substance can apparently be improved by purifying and harmonising it and, above all, by activating regulating mechanisms. In the case of chronic disease and dysfunction, end products of metabolism are increasingly deposited in the stroma (extracellular matrix). Many naturopathic methods, and therapy by inhaling energised air in particular, aim to release and remove these via improved venous and lymphatic flow.
This involves briefly raising oxygen in the ambient air from the ground state to a higher energy level (singlet state) through the action of light of specific wavelengths in the presence of a selected special photosensitiser.
This higher oxygen energy level lasts “only” for fractions of a second until the energy released when it reverts to ground state is delivered to the surrounding water which is inhaled together with “normal” atmospheric oxygen in the ambient air.
The further stages of energised air inhalation have not yet been fully researched. Appropriate studies at universities and higher education institutions are currently ongoing. Based on numerous individual accounts (by those affected), case studies (by therapists) and initial preliminary results from clinical trials, it appears assured, however, that crucial processes are taking place especially in the mitochondria (the cells’ aerobic power plants) and in the stroma (extracellular matrix). These relate to five areas in particular (increase in blood circulation, greater O_2 utilisation, improvement in the immune system, activation of protein synthesis and stabilisation of the oxidative balance). There is also evidence of two far-reaching metabolic processes as detailed elsewhere (inactivation of NADPH oxidase, increase in 2,3-diphosphoglycerate).
Past experience and findings so far all reveal that energised air inhalation is a complex method of therapy which, by harmonising basic regulation in the extracellular matrix, leads to improved oxygen supply and greater O_2 utilisation in the mitochondria, thereby activating the cells’ own energy production (ATP) and also helps regulate cell metabolism throughout the whole body. Used preventively and curatively as a holistic and universally applicable method, energised air inhalation activates and supports essential bioregulatory processes. Energised air inhalation therapy accompanies and supports clinical treatment methods and conventional medical interventions especially in therapy and rehabilitation.

Effect of inhaling energised air on HRV:

I. „Bericht über eine zweiteilige, kontrollierte Studie mittels Herzraten-Variabilitäts-Messungen (HRV) bezüglich der Wirksamkeit der Airnergy+-Sauerstoff-Therapie“ [“Report on a two-part controlled study on the effectiveness of Airnergy+ oxygen therapy by measuring heart rate variability (HRV)“]
(Dr. U. Knop, CoMed 12/2003, p. 71-75)

Method: n_1 = 15 (7 female, 8 male; aged 15 – 45); n_2 = 5 (3 male, 2 female)
Parameters: s_pO_2 (oxygen saturation), GU (function of basal metabolism of tissue, HRV

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Results: HRV: improved by 44 percent on average following activated air inhalation (still 33 percent even after deducting 11% normal development at rest) = highly significant; s_pO_2: no change; GU: significant drop

Discussion: immediate response by the autonomic nervous system in terms of improvement, increased efficiency by extending the regulation range and spread; improved metabolic processes; basic health stabilised and made more adaptable.

II. "Airnergy Report" (Dr. N.Eccles, Chiron Clinic, London, 2004)

Method: pilot study; 6 subjects (2 of whom asthmatics); short observation period (4 applications of 20 mins each)

Parameters: red and white blood count (morphology and activity), HRV (function and adaptability of autonomic nervous system), lung function (PEF = peak expiratory flow, FEV_1 = forced expiratory volume in one second, FVC = forced vital capacity, subjective effects

Results: significant improvement in HRV ($p < 0.04$)
over 20 percent increase in PEF
remarkable regression in erythrocyte roll formation
tendency to increased white blood count activity
subjective increase in well-being

Discussion: clear influence on various regulatory systems in terms of activating the autonomic nervous system, increasing energy levels and extending the regulatory range of the body.

III. „Neue Strategien zur Förderung regenerativer Prozesse [New strategies for fostering regenerative processes]" (Dr. R. Briant, CoMed 5/2006, p.88-89)

Method: empirical study conducted in own practice; pre/post-operative in oral surgical field

Parameters: HRV (HR = heart rate, adaptation coefficients SDNN and CV, SI = stress index: sympathetic nerve activity, RMSSD: parasympathetic nerve activity)

Results: heart rate falls immediately, sympathetic tone declines, parasympathetic tone increases

Discussion: dramatic improvement in cell energy supply through flooding with free valence energy, cell regeneration immediately deployed, recovery times for oral surgery reduced by about 50 percent

Consequence: deployed in oral surgery for the purposes of "gentle implantology"

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IV. „Die Active Air® - Inhalationstherapie : Die autonomen Regulierungsmechanismen unter Verwendung der Analyse der Herz-Raten-Variabilität [Active air® inhalation therapy: autonomic regulatory mechanisms using heart rate variability analysis]“ (Dr. M. Kucera, translation from Explore! 2,16/2007)

Method: n = 37 (aged 23 – 83, 21 female, 16 male, various disorders: CHD 21 x, hypertonia 17 x, diabetes mellitus II 14 x, diabetes mellitus I 1 x, COPD 1 x, Crohn's disease 2 x, glaucoma 1 x, chronic fatigue syndrome 1 x, rheumatic polyarthritis 2 x, bronchial asthma 2 x)

Parameters: HR, SDNN (overall activity of regulatory systems), RMSSD (parasympathetic nerve activity), SI (activity of sympathetic system), HF % (activity of parasympathetic system), LF % (activity of vasomotor centre), TP (total performance of all the spectral components of the regulatory systems)

Results: significant increase in HRV (RMSSD: p = < 0.001; SDNN: p = < 0.01)
significant drop in sympathetic activity (SI: p = < 0.001)
significant rise in total performance (TP: p = < 0.001)

Discussion: significant decline in stress levels throughout the whole body, significant growth in metabolic and energy reserves, considerable increase in efficiency of autonomic nervous system, harmonisation of autonomic regulatory systems

V. „Wirkungen aktivierter Wassermoleküle in der Atemluft auf die HRV in Ruhe [Action of activated water molecules in inhaled air on resting HRV]“, (Prof. K. Hottenrott, S. Müller, M. Steiner, Halle-Wittenberg University, Dtsch. Zschr. Sportmed. 1,60/2009, p. 30

Method: n = 40 (aged 21 – 31, healthy sports students; randomised placebo-controlled double blind study; semirecumbent position; total measuring time 41 mins; 3 measurement points: MZP 1(10 mins relaxation), MZP 2 (breathing phase with the Profi Well Plus system), MZP 3 (10 mins rest)

Parameters: HR, LF, HF, CSI (cardiac stress index)

Results: significant difference in mean readings between test and placebo group (HR: p = < 0.001; LF: p = < 0.01; HF: p = 0.008; LF/HF: p = < 0.019)
significant changes between MZP 2 and MZP 3 for LF (p = 0.011), HF (p = 0.006) , LF/HF (p = 0.026)
Significant changes in HR between MZP 1 / MZP 2 (p = < 0.001) and between MZP 1 / MZP 3 (p = 0.015)

Discussion: marked improvement in HRV, especially drop in HR and sympathetic activity accompanied by increase in activity of

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parasympathetic system, marked fall in stress index of cardiovascular system, economising of cardiac activity.

The authors describe results of the study as revealing the following changes:

- HRV ↑ (highly significant = ss) (n = 15)
- HRV ↑ (ss) (n = 6)
- HR ↓ (n.a.) (n.a.)
  sympathetic tone ↓ (n.a.) (n.a.)
  parasympathetic tone ↓ (n.a.) (n.a.)
- HRV ↑ (RMSSD ss, SDNN ss) (n = 37)
  sympathetic tone ↓ (SI ss) (n = 37)
  total performance (TP ss) (n = 37)
- HRV ↑ (ss) (n = 40)
  HR ↓ (ss) (n = 40)
  LF ↑ (ss) (n = 40)
  HF ↓ (ss) (n = 40)

The results obtained by the five authors can be summarised as follows:

Participants: n = 98 (study III: n.a.), healthy subjects and patients with various disorders,

Results:

- Improvement in HRV (drop in heart rate, rise in LF, drop in HF, rise in TP)
- Reduction in impulses of the sympathetic nervous system
- Increase in parasympathetic tone

Statistical significance: all data are statistically highly significant

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In discussions the 5 authors reach the following conclusions:

- immediate response by the autonomic nervous system towards improvement
- increased efficiency by extending the regulatory range and spread
- improvement in metabolic processes
- basic health stabilised and made more adaptable

- clear influence on various regulatory systems in terms of activating autonomic nervous system
- increase in energy levels
- extension of the body's regulatory range

- dramatic improvement in cell energy supply by flooding with free valence energy
- cell regeneration immediately deployed
- recovery times reduced (for oral surgery) by approx. 50%

- significant drop in stress levels for whole body
- significant growth in metabolic and energy reserves
- significant increase in efficiency of the autonomic nervous system.
- harmonisation of the autonomic regulatory systems

- marked improvement in HRV
- clear drop in heart rate
- evident decline in sympathetic activity
- evident increase in parasympathetic activity
- clear reduction in stress index of cardiovascular system
- economising in cardiac activity

Summarising and compressing the conclusions reached by the five authors produces the following key statements:

- **improvement in heart rate variability (**drop in heart rate, reduction in HF = high frequency, increase in LF = low frequency**)**
- **improvement and harmonisation of vegetative autonomic nervous system (** reduction in sympathetic tone, increase in parasympathetic tone**)**
- **increase in body's regulatory range**
- **improvement in metabolic processes (**increase in energy levels, growth in energy reserves, accelerated cell regeneration, reduced recovery times, economising in cardiac activity)
- **reduced stress in cardiovascular system and in whole body**
- **basic health stabilised**

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