



TECHNICAL INFORMATION

BEMER-3000 Therapy

**BIO - ELEKTRO -
MAGNETIC
ENERGY -
REGULATION**

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FOR BIOENERGETICS

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Bioelectricity and electromagnetic interaction – the basis of life

As the turn of the century approaches, a biotechnological revolution in the field of physiology is looming. The fundamental importance of electromagnetic forces on living systems is becoming more and more apparent. Regarding the organism as a complex self-regulating system with its own communication and control mechanisms leads to a deeper understanding not only of life but also to a completely new understanding of therapy applications.

Life can be defined as metabolism, growth and reproduction all in one and ascribed to electromagnetic interactions by, amongst others, e.g. balancing the hydration and electrolytic constitution of the body, or 'pumping' ions to and from the cell membrane even against different levels of concentration (active metabolism).

Communication with the outside world, the activity and coordination of internal organs, the transmission of information as well as the contraction of muscles, including those of the heart (ECG) are accomplished by electrical excitations (NS). Similarly, the sophisticated nerve activity and functional capacity of the brain is based on bioelectricity (EEG).

Examples of fundamental research on bioelectromagnetic interaction

Bone Growth:

First indications on beneficial electromotive effects on the healing and growth of bones were reported in 1957 by two Japanese researchers Fakuda and Jasuda, and independently from them by the American scientists, Basset and Becker. By putting and releasing pressure on bones they were able to record tiny negative and vice versa positive potentials. Consequently they proposed that underlying piezo-electric effects control the bone's morphological structure ¹.

Controlling Growth and Healing Processes

Of course, growth can simply be related to cell differentiation and multiplication processes. But the cell's interindividual organisation to form membranes, tissues, organs and finally the living organism remains still an open question. Becker wired into the question: How does the DNS know that it needs to create muscles here, bones there, and all the other remaining organs and structures, in the right relationship to one another? His studies focussed on the limb regeneration processes of the salamander, a vertebrate which can totally regenerate a lost limb. He stated and proved that smallest electric fields control growth and healing processes² (*thus disproving the so far common assumption that dedifferentiation of cells do not exist*).

Cell Communication

In 1975 the physician Rush, revealed evidence that cell communication may be accomplished by electromagnetic signals. Amongst others, electromagnetic signals may act both as transmitter as well as promotor for cell replication. Such findings led a German physician to the provocative hypothesis that cell communication relies on receiving and sending of so-called (bio-)photons (light quanta) ³.

In 1994 an internationally renowned scientific journal reported that specific protein syntheses are related to body exercises. It was stated that each motion, that is, each muscle activity and hence the underlying bioelectric processes in the nerve and muscle tissues, measurable as action potentials, activate so-called 'bioelectric gene switches', which in turn induce a functionally specific protein synthesis. With a lack of movement, the generation of these 'regeneration proteins' is poor and turns out in a deterioration of the regenerative capacity.

Gas Exchange – Function of the Blood

Gas exchange plays a basic role in the metabolism of sophisticated living organisms. In the 50's the Nobel Prize winner Pauling studied the bioelectro-magnetic characteristics of the blood, in particular those of the hemoglobin. Presumably initiated by these studies a German scientist, Stemme, tempted in the 80's to correlate electromagnetic fields with the respiratory function of the blood.

In the meantime due to more than 6,000 publications and over 360 dissertations it can be stated as proved that **correctly dosed pulsed bioelectromagnetic fields induce physiological effects in living systems!**

The importance of nerve and muscle potentials for the metabolism

The correlation between motion and metabolism has been known for a long time. When an arm is immobilised due to fracture, it normally loses a considerable amount of muscle mass. The loss of muscle mass however can be reduced by even exercising the remaining healthy arm. Due to the nerve pathways crossing at the brain, at least the nerve action potential of the movement of the healthy arm seems to be transmitted to the immobilised arm thus keeping the metabolism as it should be. These findings are supported by numerous further studies. They even reveal that motion not only promotes muscle growth, but also strengthens organs and the immune system.

Due to these findings the electromagnetic interaction of nerves and muscles can be seen to be requisite for normal cell metabolism. The health of tissue structures thus obviously depends on a well balanced supply with electromagnetic energy.

Since, due to given lifestyle, civilized human and animal beings suffer from a chronic lack of motion, and therefore from the respective electromagnetic energy supply, it seems promising to compensate such energy deficits to a certain degree by suitable applied electromagnetic energy, e.g. via electromagnetic fields.

The Influence of the Geomagnetic Field

Living things not only utilise the body's own electromagnetic fields, they also require external fields in order to keep the metabolism working. For example, the importance of the magnetic field of the earth on life has been clearly demonstrated in manned space travel. Life seems possible without gravitation, but not without the magnetic field of the earth. (Astronauts e.g. have successfully been treated with electromagnetic fields during their sojourns in space (Kafka, pers com 1998). Assigned by the NASA, the American scientists Halpern and Vandyk carried out experiments on mice. In an experimentally created environment free of magnetic fields these mice died after a period of a few weeks. However, being subjected from time to time to the magnetic field of the earth they remained alive for a correspondingly longer time.

Magnetic Field Therapy Rediscovered

Research into the effects of pulsed electromagnetic fields on humans was reinvestigated since the 1960's, predominantly in USA, Russia, Japan, Italy, England and Bulgaria. In 1978 the American Food & Drug Administration (FDA) officially authorized the application of a therapy concerned with bone healing using special forms of electromagnetic fields.

A variation of such a therapy, the so-called Kraus-Lechner Coil Application, developed at the Technical University of Munich, rendered good results not only for the healing of bones, but also for the healing of osteoporosis and, as a preventative method against slackening of endoprotheses. In some cases, even bone tumours receded when exposed to electromagnetic fields.

The spectrum of indications for implementation of electromagnetic fields has been expanded over the subsequent years.

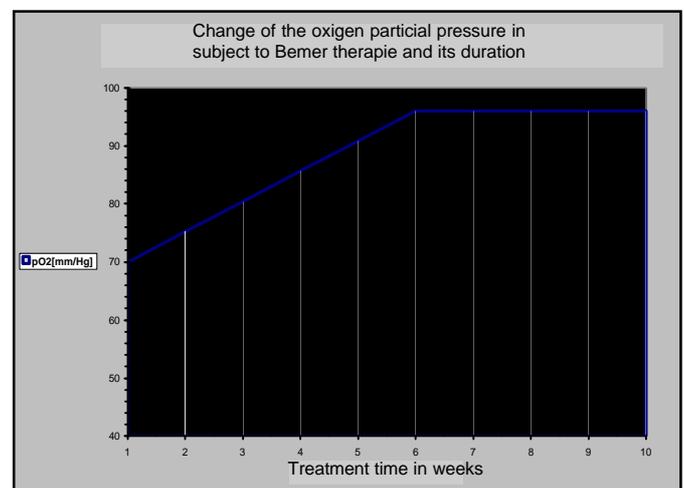
The therapeutic results were primarily adducted to magnetically induced vehicular functions during the reciprocal transformation of magnetic to electrical energy. In the meantime it is generally accepted that regulatory and regenerating processes of the whole organism can be stimulated and influenced by various methods. Stemme proposed that the circulation of the blood, oxygen partial pressure, oxygen saturation and oxygen utilisation may be enhanced by special kinds of electromagnetic fields.

At the beginning of the 90's König of the Technical University of Munich and Warnke of the University of Saarland introduced an apparatus, by which they were able to induce special physiological effects by applying special pulsed weak electromagnetic fields. The effects resulted in an improvement of the circulation of blood, an enlarged oxygen partial pressure and an activation of metabolic processes⁷.

Michaelis (Euro-Institute for Bioenergetic Medicine in Dornbirn/Austria) was able to prove that the oxygen partial pressure significantly influences the duration of therapy when performed with special intensity shaped electromagnetic fields.

Note : Despite the existence of numerous encouraging studies and successful therapeutic and prophylactic applications of pulsed electromagnetic fields during the last 30 years and beneficial applications of electromagnetic fields in manned space travel, and moreover, magnetic field therapy is listed in the Hufeland Directory of Natural Healing Methods, up to this day, the therapeutic application of electromagnetic fields is still not a component of college study obligations in medicine.

In the meantime, electromagnetic field therapy has gained considerable attention in the area of complementary and sport medicine. At the congress of doctors for experience medicine and the congress of doctors for natural healing processes, this therapy was mentioned in many of the lectures as a recognized method.



Several sport doctor associations have incorporated magnetic field therapy in their official educational training programs.

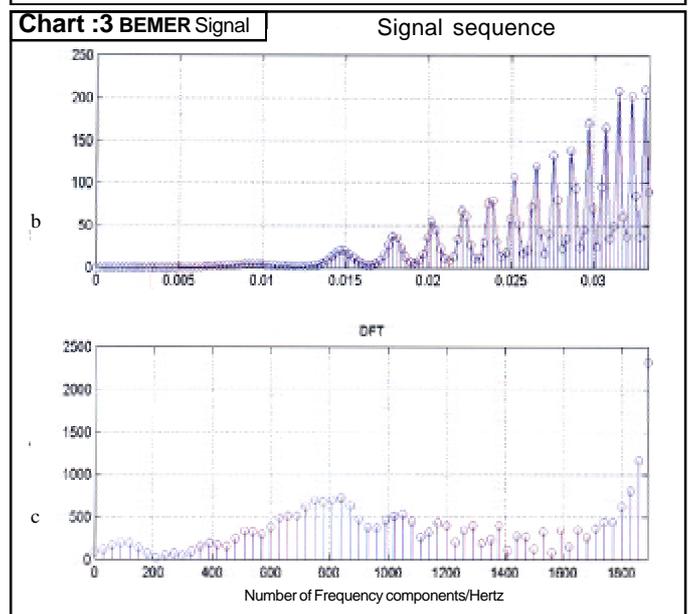
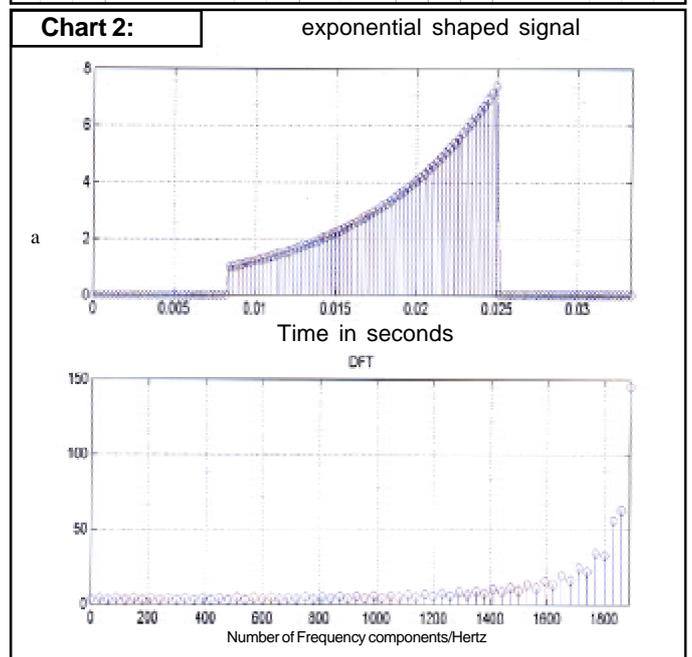
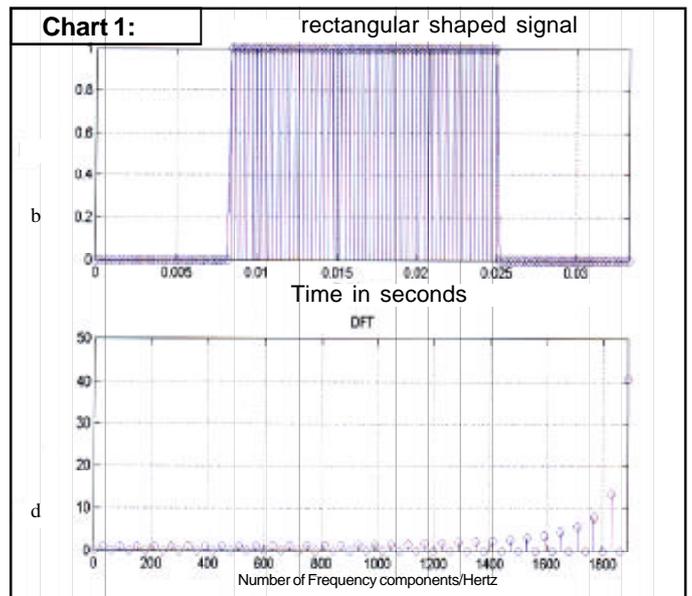
BEMER Therapy – the latest in state of the art scientific research

In his extensive systematic studies on the biological–therapeutical effects of electromagnetic fields Kafka (*EMPHYSACE*), has proven that the effects of such therapies are not merely based on pulse intensity, frequency and duration, but especially on the shapes of the puls as they are related to their time dependent changes in field strength on the one side and the mass, volume and charge of the influenced submolecular interactions on the other.

With a succession of specially formed impulses (frequency of the base pulse approx 30/sec) an electromagnetic stimulus signal was developed, which distinguished itself from conventional (e.g. rectangular or exponential shaped) signals by a wide frequency spectrum (see Time-Frequency Fourier analyses, Charts 1 – 3). Above all, this newly developed impulse form rendered an convincing improvement in the circulation of the blood and oxygen supply both being important criteria for enhancing metabolic processes. The underlying mathematical algorithm, the “**BEMER-Formula**”, is meanwhile protected by patent regulations ⁸.

The complex physiological reactions of the body to the **BEMER** signal are, amongst others, most probably based on highly sensitive neurovegetative explosive reinforcement processes of the connective tissue. Some of the body reactions might be induced by the release of signal molecules like nitrogen monoxide, which, like nitroglycerine, acts as a vasodilatator as well as a neurotransmitter. (*Three scientists were awarded the Nobel Prize for Medicine in December 1998 for their discovery of the nitrogen monoxide system with its far-reaching diagnostic and therapeutic significance*).

The technical conversion of these signals was carried out with the **BEMER 3000** device. **BEMER 3000** is a certified medicinal technical device representing the latest state of the art in scientific research.



Scientific proof of the physiological therapeutic efficacy of the BEMER 3000

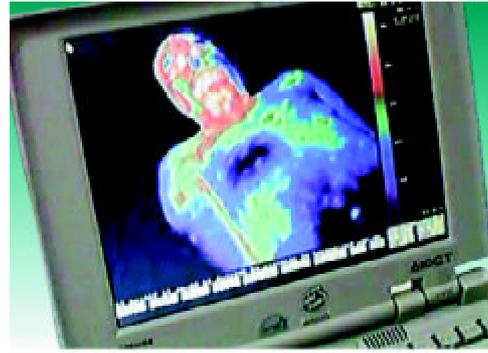
Proof of vasodilatatory effects

Performed by: Kafka Wolf A, EMPHYSPACE, Germany

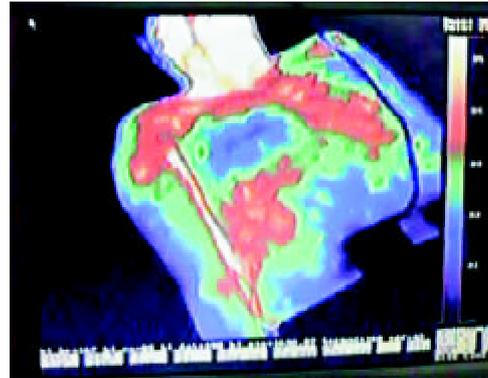
Method: Computer thermography

Results:

The experiments resulted in significantly increased heat radiation of the body of the test persons under the influence of the BEMER signals. This heat radiation corresponded to increased temperatures of the outer skin of approx 3-4°C. This could be an outward sign of the vasodilatation of the blood vessels and the physical body reaction to the elektromagnetic field. Heat transfer through elektromagnetic fields can be discounted due to energy calculations. Even the coils remain visibly cold, as shown in the photos. These results could also be reproduced in animal trials, thus discounting placebo effects.



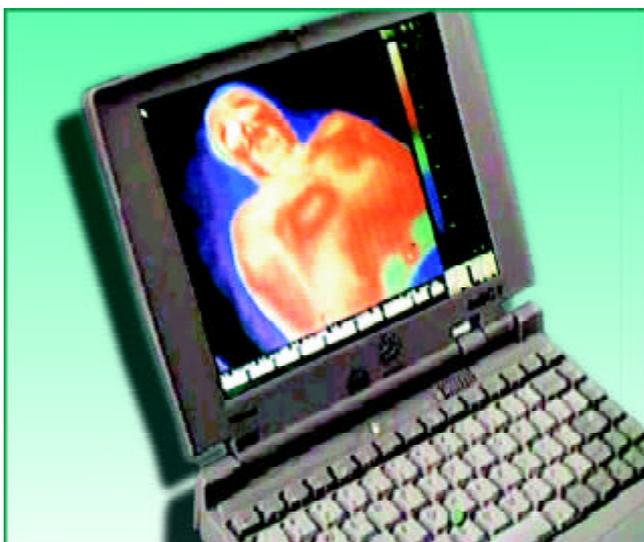
Before BEMER application



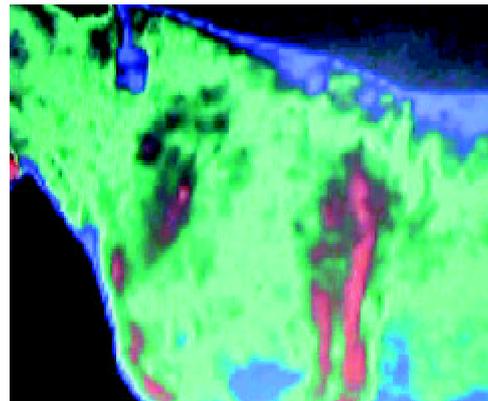
After 2 minutes of BEMER application with the Intensive Applicator at level 10, on both human and horse.



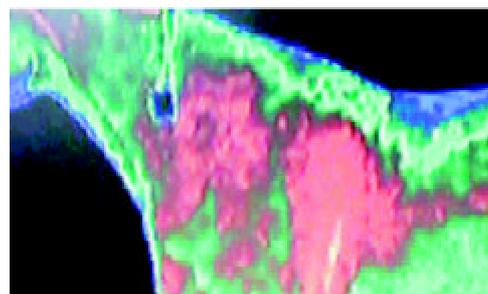
Before application



Application of the coil mat after 8 min



After 1 minute



After 4 minutes

Proof of the physiological efficacy of pulsed electromagnetic fields on the human organism using the “BEMER 3000”

Performed by: Michaelis Horst, Euro-Institute for Bioenergetic Medicine, Dornbirn, Austria

The following parameters were investigated:

- the relative capillary volume of the blood and its variability below a test point;
- the relative proportion of oxygenated blood volume and its variability;
- the degree of deoxygenation and its variability.

Method: Non invasive Remission Photoplethysmography (NIRP)

Test 1:

Reference values of the above parameters were performed at rest and under the influence of electromagnetic fields generated by the BEMER 3000. The same experimentees were also subjected to various intensities.

Results:

The above parameters are significantly altered after stimulation with the electromagnetic fields generated by the BEMER 3000. The changes are dependent upon the current initial position and general health status of the patient, as well as the intensity applied (see protocols 1-3 on page 7/15, recordings were taken continuously, with an average result per minute being depicted in a test column).

Test 2:

Studies were performed as blind trials. The experimentees were firstly measured at rest. Then a device, audible and visible by the experimentees was turned on, but did not generate electromagnetic fields (i.e. a placebo). Subsequently the BEMER 3000 device was activated without the experimentee's knowledge. These tests showed that significant changes were gained only when the experimentees were stimulated with the electromagnetic field (see recording protocols 4 and 5, also 6 and 7, on Page 8/15).

In total there were performed 45 tests with experimentees, strongly varying in the symptoms of their diseases all of which led to similar results.

Results:

The trials in average resulted in an improvement of the microcirculation of the blood in the range by about 40%, under the influence of the BEMER signal. In comparison, there were no enduring improvements to the circulation of the blood at rest, in part to a maximum of 4%. An improvement of up to 9% was measured in the placebo tests. Similar results were achieved in the readings for oxygen saturation of the blood below the test point. Under the influence of the BEMER signal an increase of approx 20% was achieved (refer to legends). At rest only normal respiratory related changes were observed. Under placebo the span ranged from an increase of up to 9%, to a decrease of 8%. Improvements of the measured values endured even after switching off the electromagnetic field, especially an increased oxygen saturation

could still be measured after some hours.

This type of recording represents are more of qualitative values. The first column marked “B” is the reference value. In evaluating the microvascular blood compound volume a reference value of 100 was determined. For evaluating the changes in arterial oxygen saturation a reference value of 0 was set. The deviation from the reference value, depicted in percentages, is not the true oxygen saturation level, but the change in oxygen proportion below the test point. This value results in the increased blood compound volume and oxygen saturation. Only the peripheral microcirculation coefficient indicates the true value of oxygenation of the blood. The protocols 1-3 for recordings 0017 to 0024 characterise the changes under the influence of the electromagnetic fields. Recording 0025 depicts the physical reaction after switching off the magnetic field. Protocols 4-5 and 6-7 should be considered as a continuous unit. The periods of placebo and stimulation are marked.

Improvements in the fluidity of blood

Performed by: Kafka Wolf A, EMPHYSPACE

Method: Dark field microscopy

Test :

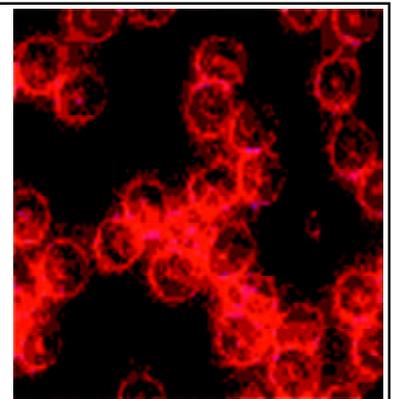
A series of experimentees were examined with serious Rolleau formation in the erythrocytes. These experimentees were treated with BEMER therapy. The changes were documented after a single treatment (see image), then after two weeks and again after four weeks.

Results:

A definite clearing of Rolleau was verified by photoplethysmographically verified improvement in the flow characteristics of the blood, as well as increased erythrocyte surface for gas exchange by darkfield microscopy. There was a corresponding improvement in circulation of the blood at microcirculatory levels, and the unbound oxygen content of the blood increased.

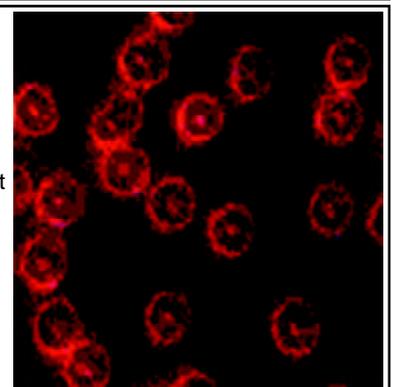
Prior to Electromagnetic Field Therapy:

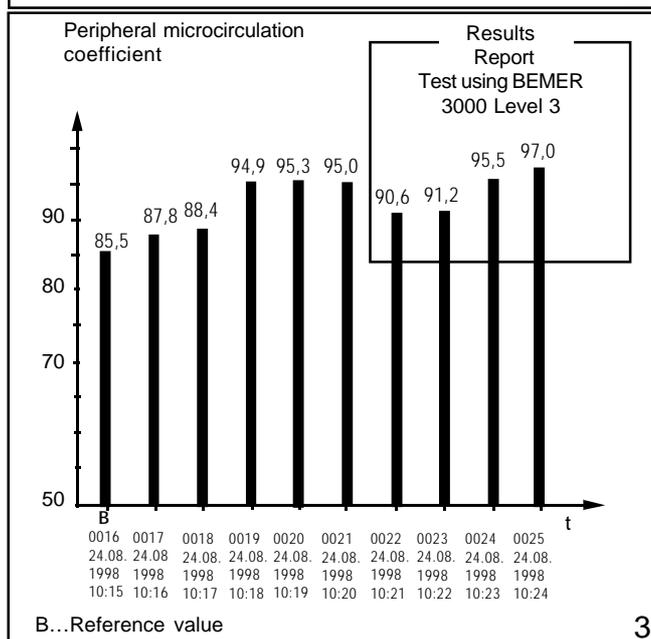
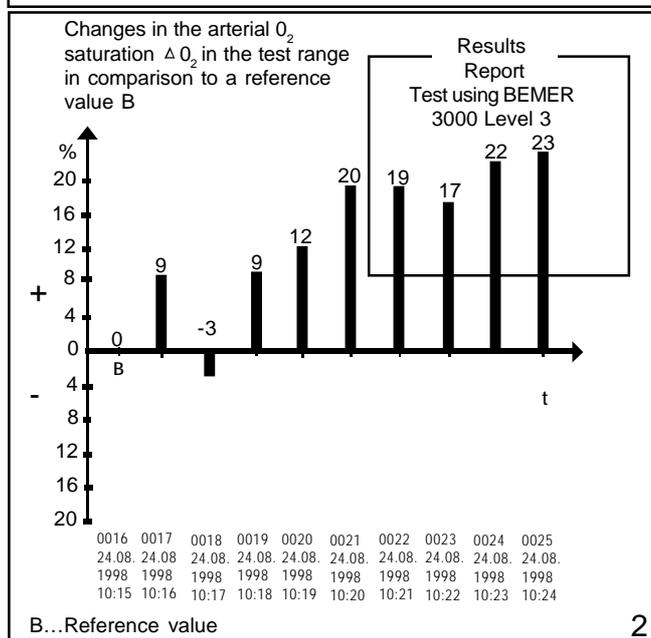
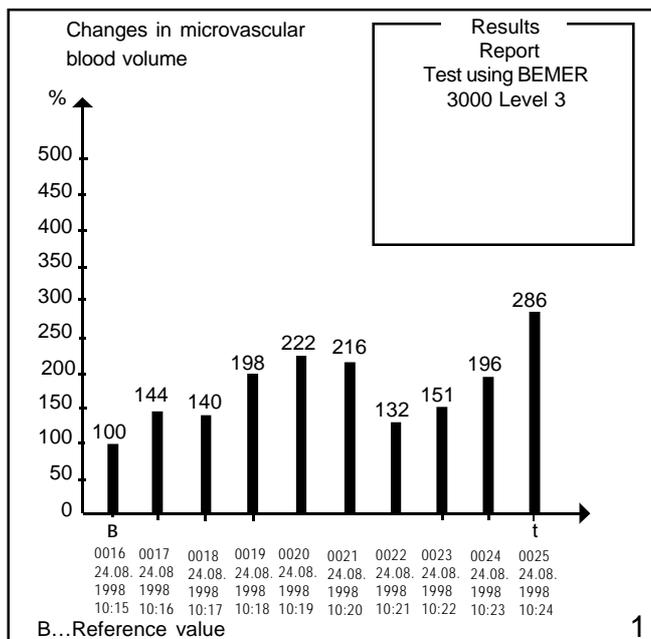
Rolleau type aggregation of erythrocytes: increased blood viscosity, reduction in the active surface, reduced oxygen exchange, increased risk of thrombosis.

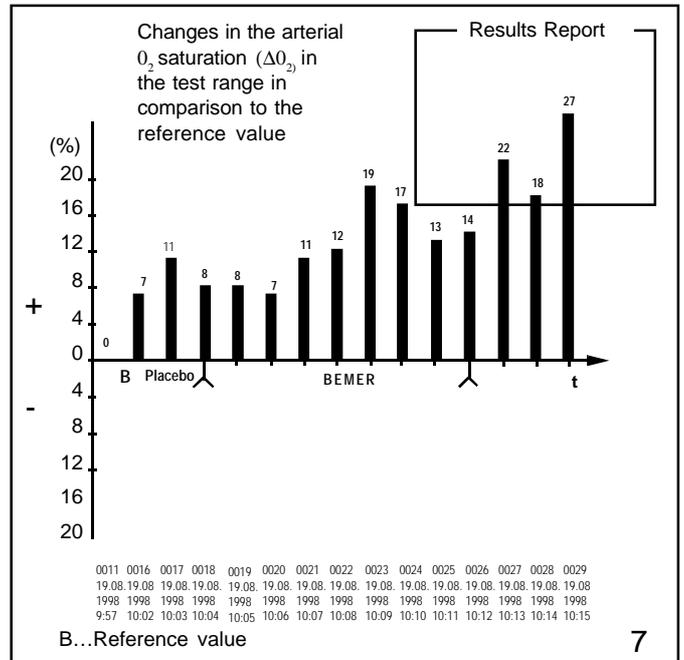
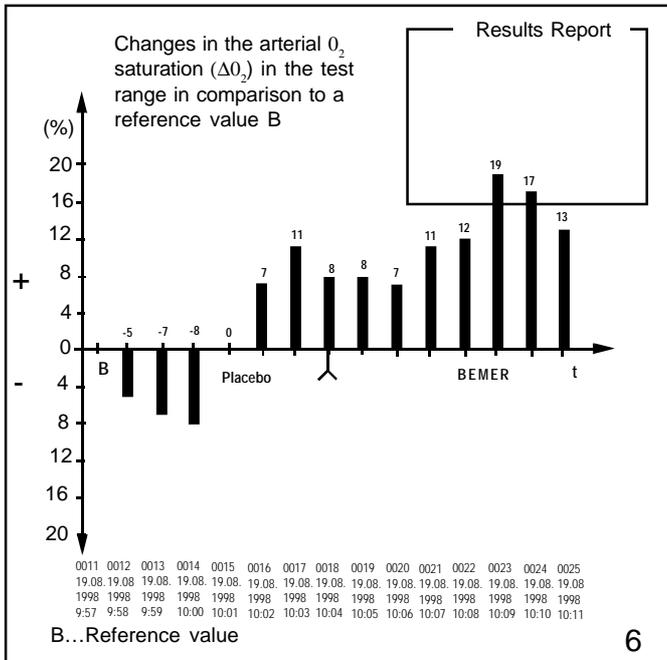
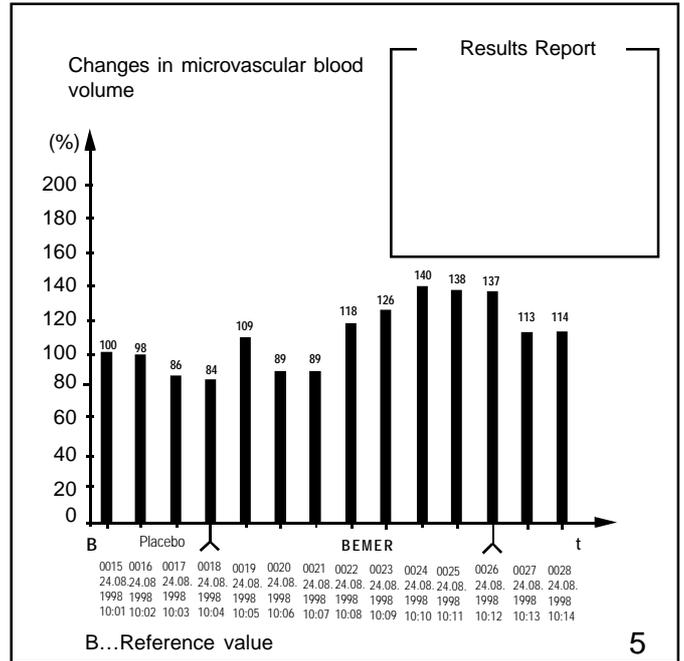
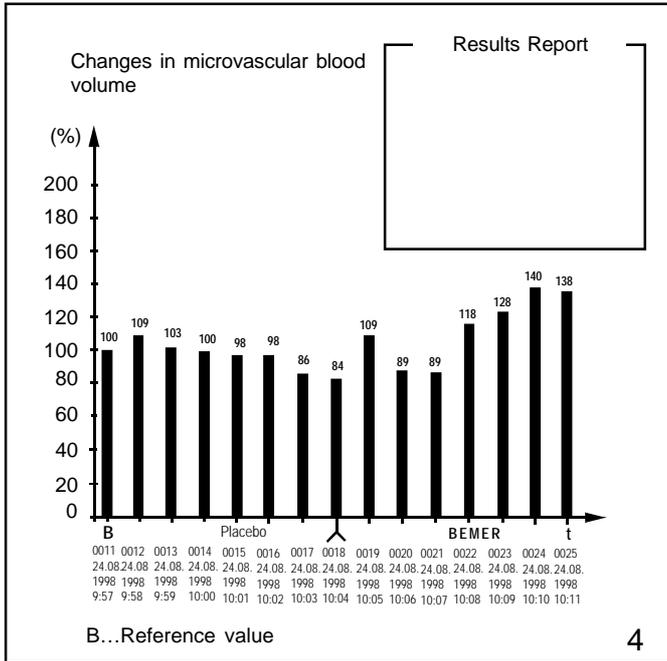


After Electromagnetic Field Therapy:

Clearing of the Rolleau aggregation: improvement in the flow characteristics of the blood. Increase in the active surface, increased oxygen exchange, reduced risk of thrombosis.







Application of low-intensity pulsed electromagnetic fields - Europe-wide medical studies

The effect of pulsed electromagnetic fields in the treatment of various symptoms

Performed by: Michaelis Horst Euro-Institute for Bioenergetic Medicine, Dornbirn / Austria ©

One of the first of these devices was implemented with an intensity below that of the magnetic field of the earth.

Summary:

Goal: Ongoing randomized pilot studies of the therapeutic effects of weak (<50 microtesla) electromagnetic fields pulsed at extremely low frequencies.

Method:

In **1159** cases the treatment comprised 2 sessions of electromagnetic **BEMER 3000** flat coils stimulations each consisting of 8 minutes daily. The intensity of the electro-magnetic field was increased each week (the intensity had a minimum of 2 up to a maximum of 30 microtesla). The treatments were performed during periods of at least 4 weeks, on average 8 weeks up to a maximum of 52 weeks (recording period March 97 to October 98). 32 disease symptoms were evaluated, with patient groups of between a minimum of 10 and maximum of 128 experimentees.

The recreation process was carried out on the basis of general medicinal diagnostics for the respective disease, and transposed onto a three stage evaluation scale: complaint free, improved and unchanged. The study was carried out as a monotherapy, in which patients who had previously been unsuccessfully treated with medication continued to take these medical products. The test was purely to prove the efficacy of pulsed electromagnetic fields in patients who had participated in the therapy. The number of cases, in which medication could be dropped after therapy and the occurrence of remission were not evaluated in this study.

Results:

The **BEMER** application rendered the following scaled values: **Complaint free 61%; improved 24% and unchanged 15%.**

Note:

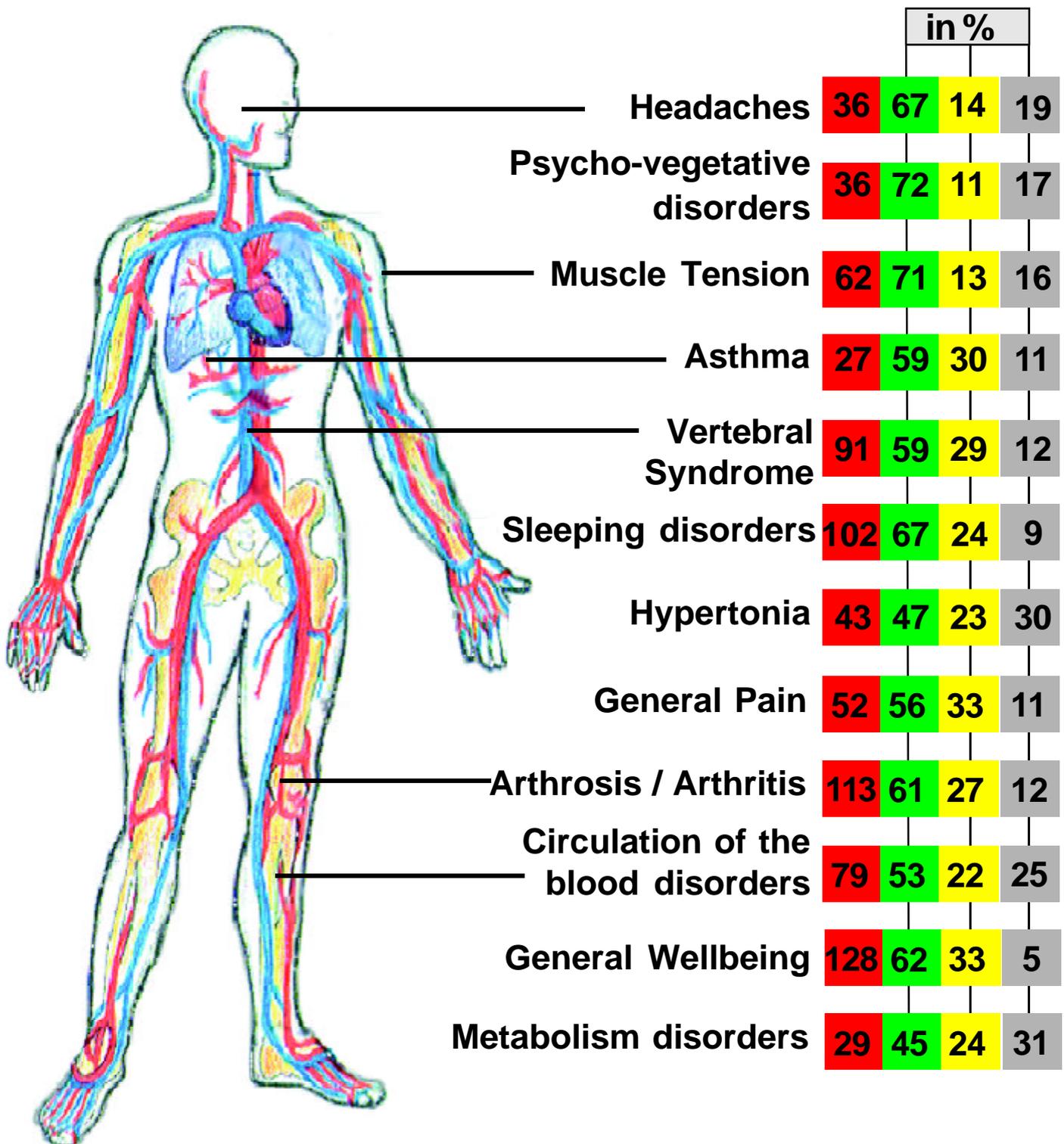
*There was no conclusive spread of results across all the various diseases. In the evaluation of 'complaint free' results, these varied from minimal 10% with MS (not depicted) to a maximum of 84% for wound healing (only patients with wound healing problems). In some kinds of diseases, which were initially graded as 'unchanged', a considerable beneficial effect has however been proven after a prolonged **BEMER** therapy.*

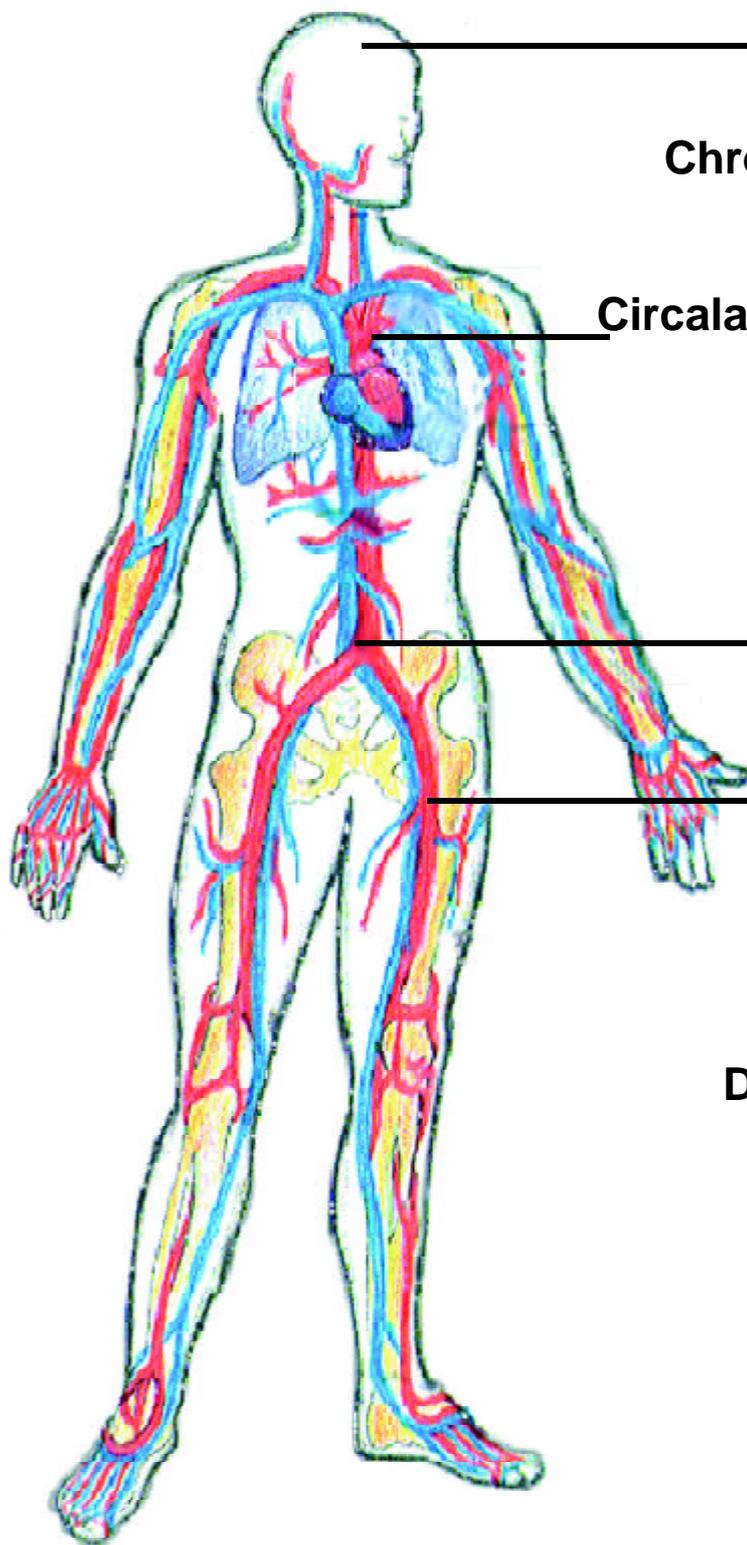
Conclusions:

The positive results observed for a multitude of symptoms indicate that the applied impulses and intensities of electromagnetic fields reveal the **BEMER** system as a very promising and effective therapeutical application to promote recovering from illnesses stemming from the widest range of origin. No side effects were established. Due to this the efficacy of the **BEMER** system would render promisingly similar results if it would be applied in large scaled randomized and placebo controlled doubleblind clinical studies.

Refer to
Graphs
on Pages
10/15 and
11/15

Number of patients **Complaint free** **Improved** **Unchanged**





| | in % | | | |
|------------------------------------|------|----|----|----|
| Depression | 22 | 73 | 4 | 23 |
| Migraine | 18 | 72 | 22 | 6 |
| Chronic tiredness syndrome | 19 | 47 | 47 | 6 |
| Circulatory disorders (functional) | 23 | 70 | 9 | 21 |
| Hypotonia | 19 | 74 | 21 | 5 |
| Sciatica | 24 | 67 | 21 | 12 |
| Osteoporosis | 25 | 40 | 40 | 20 |
| Swelling | 25 | 68 | 24 | 8 |
| Dermatological disorders | 23 | 66 | 17 | 17 |
| Neuralgia | 19 | 63 | 16 | 21 |
| Rheumatism | 20 | 65 | 35 | 0 |
| Wound healing / Scar build up | 19 | 84 | 5 | 11 |

Treatment of orthopaedic symptoms with the BEMER 3000 Intensive Applicator

Performed by: **Dr Hans Hartling, Passau**

90 Patients were evaluated in the period from 10.11.98 to 20.04.99

Programs used: **P1 to P4**

| | |
|--|-----------|
| For neck problems, such as cervico-brachialgia | P1 |
| For lumbalgia and lumbo-sciatica | P2 |
| For swellings | P3 |
| For all other cases | P4 |

The treatment was performed in blocks of ten, one per day, five times a week, with the exception of weekends.

The evaluation concentrated on the degree of influence on pain, in which the pain was divided into three categories as follows:

- Pain at rest**
- Pressure pain**
- Pain under stress or exertion**

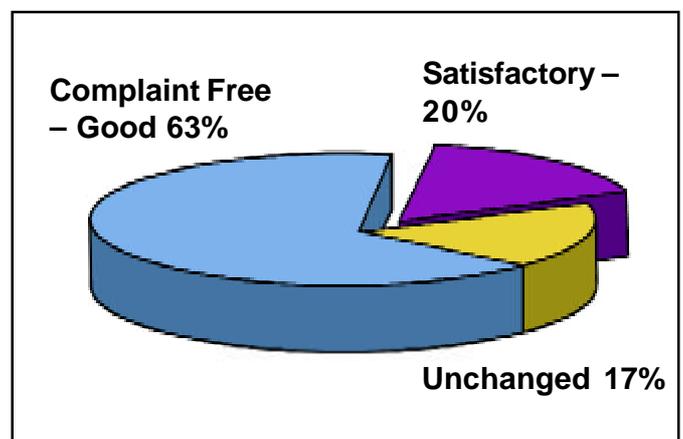
An improvement in the function was naturally associated with the reduction in pain. Possible localised joint changes, such as swelling, bruising, etc were taken into account, also the option of parallel therapy. On occasion, parallel treatment was carried out with application of the intensive applicator and a gel (for example Gabrilen-Gel). These sessions are indicated in the individual charts with a "G" (not depicted). There was however no mentionable difference in the evaluation compared with just sole treatment using the applicator. The assessment shows the individual diagnostic groups (Arthrosis, Arthritis, Epicondylitis, PHS, Gonarthrosis, etc) and a graphic summary of the treatment results.

Due to the low number of patients the representation is sofar of limited significance. The ongoing study will however render more conclusive results in some further six month.

On account of the above mentioned very promising results, which are well above all other conventional methods of treatment in the field of orthopedics, one can be assured that the success of the **BEMER** therapy is by no means to be stopped.

Overall Assessment

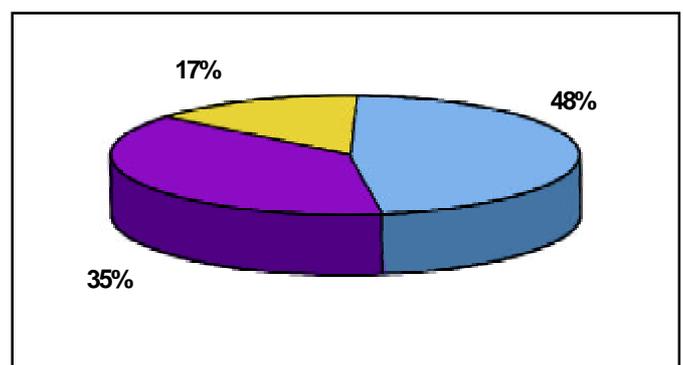
| | |
|------------------------------|-----------|
| Total No. | 90 |
| Complaint Free – Good | 57 |
| Satisfactory | 18 |
| Unchanged | 15 |



Assessment

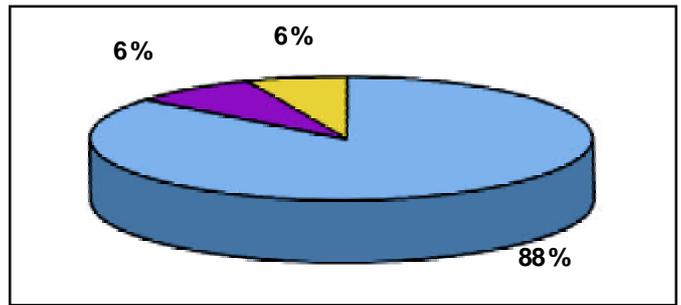
Diverse Symptoms (Arthrosis, Arthritis, etc)

| | |
|------------------------------|-----------|
| Complaint Free – Good | 11 |
| Satisfactory | 8 |
| Unchanged | 4 |



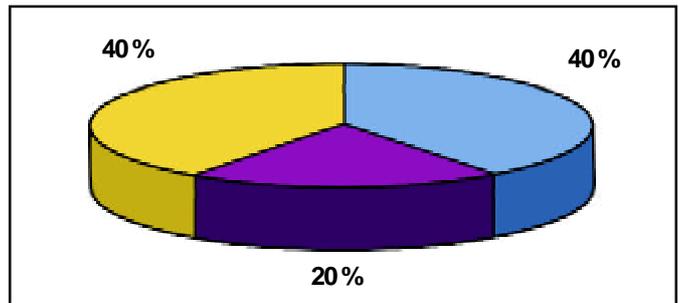
Gonarthrosis

| | |
|-----------------------|----|
| Complaint Free – Good | 14 |
| Satisfactory | 1 |
| Unchanged | 1 |



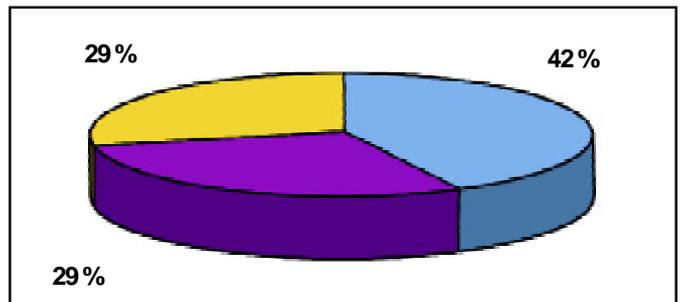
Epicondylitis

| | |
|-----------------------|---|
| Complaint Free – Good | 2 |
| Satisfactory | 1 |
| Unchanged | 2 |



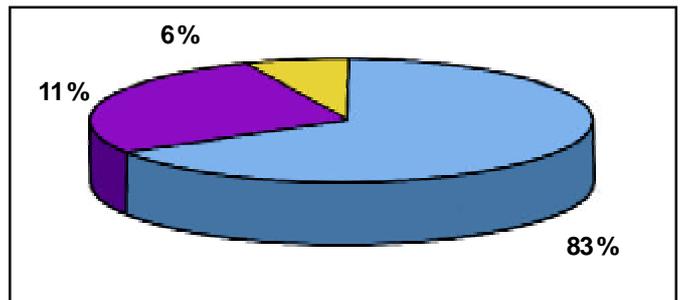
PHS

| | |
|-----------------------|---|
| Complaint Free – Good | 9 |
| Satisfactory | 6 |
| Unchanged | 6 |



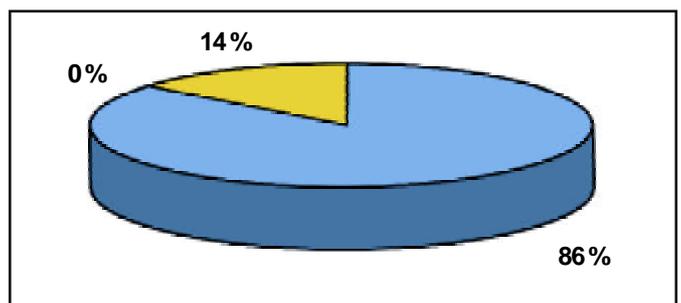
Lumbalgia – Lumbo-sciatica Cervicobrachialgia Cephalgia rad. Symptomatic ect

| | |
|-----------------------|----|
| Complaint Free – Good | 15 |
| Satisfactory | 2 |
| Unchanged | 1 |



Trauma

| | |
|-----------------------|---|
| Complaint Free – Good | 6 |
| Satisfactory | 0 |
| Unchanged | 1 |



Questions about the application of BEMER therapy in medical practice

BEMER Therapy for which diseases?

The common characteristics of maladies can be traced back to damaged and malfunctioning cell structures and thus to a considerable impairment of metabolic and energy maintenance processes. The development of the **BEMER** therapy system is precisely adjusted to this level and, therefore, meets a wide spectrum of beneficial applications. This is shown especially for general regeneration processes, arthrosis, respiratory diseases, chronic tiredness syndrome, circulation of the blood, heart circulatory diseases, susceptibility to infection, chronic headaches, migraine, fractures, wound healing, nervous exhaustion, rheumatic diseases, sport injuries, stress factors, disorders in potency, psycho-somatics, sleeping, metabolism, and tumours (see results of the Euro-Study).

What are the positive effects of BEMER therapy and where do they start ?

Beneficial energy regulating and health promoting effects refer particularly to:

- 1 Dilatations of blood arteries
- 2 Improvement in circulation of the blood, particularly micro-circulation
- 3 Increased oxygen saturation and oxygen partial pressure
- 4 Improvement in the flow characteristics of the blood combined with reducing the risk of thrombosis
- 5 Separation of ions and the resultant beneficial stimulation of the metabolism and activation of enzyme reactions

Such measurable effects normally lead to a normalisation of membrane potentials, an improvement of metabolic processes and thereby an upgraded cell energy supply and then, by these means, to increased general performance and self healing properties. Supported by a possibly increased protein synthesis the **BEMER** application thus even renders an enhanced detoxification of the body and an activation of the immune system.

How is BEMER Therapy performed?

The performance of the **BEMER** therapy needs a control device, a coil mat or an intensive coil applicator. To start a therapy session the person (or animal) lies directly on the coil mat, or the intensive coil is connected around his (its) body and a preselected and intensity level protocol is dialed at the control device.

The therapy starts, runs and ends automatically. Each session lasts between eight and twenty minutes. Generally, two sessions per day with a break of several hours in between are proposed. In practice, the intensive applicator is particularly used in treating acute injuries.

For the treatment of laborious chronic diseases it is recommended that the patient rent a home appliance for the duration of the therapy.

How long must BEMER therapy be applied?

The purpose of the therapy is to activate the body's processes by way of the aforementioned short periods of stimulation. In the course of ongoing therapeutical treatment the **BEMER** application normally improves within some weeks or month the general level of so-called life energy as it helps both to stabilise health and to increase well being and personal performance. (*Thousands of BEMER therapy applications refer to highly pleased prophylaxis*).

Are there any contra-indications?

There are absolutely no contra-indications known even in reference with metal or electronic implants due to the low field intensities (*the intensity of the BEMER 3000 magnetic field component e.g. is less than that of the earth*).

Special medical care is suggested for applications to persons with heart rhythm disorders, active implants, serious and acute psychic disorders and plus temperatures above 38.5°C. There may be some interrelated contra-indications in using the intensive applicator in the region around freshly transplantations and larger aneurysms.

Should one worry about side effects?

Side effects can be discounted when using the applied field forms and extremely low intensities. In rare cases, an overreaction by the self regulation system of the body can arise at commencement of treatment. These can, for example, be felt as considerable pain, which means individual adaptation of the therapy must be undertaken.

As a note for completeness (but not BEMER therapy related): There are a very small number of reliable reports on so-called electromagnetic hypersensitivity syndrome, in which over-sensitivity results in considerably limited tolerance to electromagnetic fields leading to stress in sensitive constitution and general metabolism.

What can BEMER therapy be combined with?

BEMER therapy can be combined with almost all methods of clinical, biological and alternative medicine. Up to now combinations seem to be favoured with the methods homeopathic, neural and oxygenic therapies, acupuncture, heat treatment and nearly all types of physiotherapy.

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