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# 31 Holistic Electromagnetic Therapy

## *The Seqex Approach*

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### CONTENTS

Electromagnetism and Life .....	349
Abraham Liboff, Studying the Relationship Between ELF and Biology in Depth: The Ion Cyclotron Resonance-Like Effect and Preliminary Clinical Use .....	349
The Italian Way to Implement Liboff's Discoveries and Vision.....	350
Seqex: A Bridge Between Official and Nonconventional Medicine.....	350
The Seqex Paradox: High Effectiveness Versus Limited Scientific Knowledge.....	351
The Future: From Medical Device to Well-Being Facilitator .....	352
References.....	353

### ELECTROMAGNETISM AND LIFE

Over the past 70 years, biology and physics have dramatically converged and medicine has benefited from this on both the diagnostic and therapeutic levels. Medical physics, or the application of the concepts, theories, and methods of physics to patient care, is the result of this type of “cross-contamination.” An increasing number of patients over the years have enjoyed improved wellbeing and health on the strength of new discoveries and applications. Medical physics is currently applied within a number of medical specialties, both as a diagnostic and interventional tool, with examples including radiology and medical imaging, radiation oncology, and nuclear medicine. Furthermore, a number of physical agents (ionizing and nonionizing electromagnetic radiation, laser light, static electric and magnetic fields, ultrasound, gamma rays, radio frequencies, etc.) are commonly used in official medicine at hospitals and private clinics. Finally, over the last couple of decades and within the framework of the so-called *Epi-biochemical/genetic approach* to medicine, a new field of scientific interest and research has developed. This considers the interactions between extremely low frequency electromagnetic fields (ELF-EMF) and biological matter in order to restore, maintain, and improve health.

The idea that there is an electrical basis for life and health is not new and dates back at least to the middle of the nineteenth century, when the American Electro-Therapeutic Association organized a series of conferences on the clinical use of electricity and electrical devices for the treatment of hysterical pain syndrome. Various energy emitting instruments were used by over 10,000 physicians in the US to treat neurological, emotional, and physical disorders. In Europe, a limited number of medical doctors and researchers made efforts to prove the effectiveness, on both clinical and scientific grounds, of electric and magnetic forces. However,

they faced fierce opposition from distinguished members of official medicine, who argued that science would continue to consider a radically new phenomenon as an anomaly, until it was explained within a suitable theory. Then, at the beginning of the twentieth century, the 1910 *Flexner Report on Medical Education*, initiated by the American Medical Association, defined these approaches as abuses in medical practice and banned them from official recognized use. This situation, restricting electromagnetic therapies within the confines of unofficial medicine, remained largely unchanged until the end of the 1900s. However, over the last two decades there has been a strong revival of interest in this area of medicine, resulting from both a wider and greater depth of knowledge in nanoscience, nanotechnology, and molecular biology, and improved digital and communication facilities available to an increasing number of users thanks to new information communication technologies and the internet. Seqex® was designed, developed, and implemented within this rapidly changing environment.

### ABRAHAM LIBOFF, STUDYING THE RELATIONSHIP BETWEEN ELF AND BIOLOGY IN DEPTH: THE ION CYCLOTRON RESONANCE-LIKE EFFECT AND PRELIMINARY CLINICAL USE

Professor Abraham R. Liboff was the American scientist who paved the way for a wider acceptance by the medical community of the so-called electromagnetic paradigm in biology and medicine, and deserves recognition for his studies on the relationship between ELF and biological systems, or bioelectromagnetism.<sup>1,2,3</sup> After years of speculation and research, Liboff reached “the inevitable conclusion that living organisms react to imbalances produced by quasi-systemic electric changes, while also striving for their own wellbeing either by

generating electromagnetic fields (EMF) or through exposure to exogenous EMFs of extremely low frequency and intensity (ELF). These waves, acting in association with the geomagnetic field, induce a physical response on a cellular level, in a phenomenon known as Ion Cyclotron Resonance (ICR).<sup>24</sup>

While traditional physiology considers bioelectromagnetic interaction to be a kind of stimulation or facilitation of biochemical processes (i.e., increased blood level of serotonin or calcium binding proteins), Liboff introduces the concept that a living system is an electromagnetic system as such, able to respond to electrical and magnetic stimuli according to the principles of physics. Furthermore, Liboff defines living organisms (vegetable and animal) as electromagnetic entities, casting doubts on the granitic conviction shared by the medical scientific community that all vital events (on the physiological, pathological, and therapeutic levels) can be explained in terms of molecular biology. Liboff also clearly perceives how difficult it will be to convince such a medical community who are unaware of the opportunities offered by ELM therapy.

To introduce his paradigm, Liboff classifies three main groups of EMF, according to the intensity of currents generated by the different devices:

- Disruptive (electroshock and transcranial high speed magnetic stimulation rTMS)
- Coarse (devices for restoring lost or disrupted physiological conditions, like pacemakers)
- Imperceptible (very low intensity and frequency electric/electromagnetic stimulation, so low that detection is very difficult and impossible to relate to known physiological events).

The Seqex<sup>®</sup> device belongs to the latter group.

### THE ITALIAN WAY TO IMPLEMENT LIBOFF'S DISCOVERIES AND VISION

In 1987, the first medical application of ELF-EMF, to treat bony nonunions, was approved by the US Food and Drug Administration (FDA), and a few years later, a second medical application was approved to assist spinal fusion.

The medical devices proposed by Liboff were applied locally over the dysfunctional areas. A different type of ELF-EMF treatment was developed in Italy by a group of physicists and biologists convened by Valerio Dallago in the late 1990s. As a financial manager with personal experience of the utility of an EMF device, Valerio was attracted by Liboff's discoveries. His personal views embraced a truly holistic approach to understanding (and ultimately treating) symptoms and diseases using nonconventional approaches, and he decided to invest in this area of knowledge. The group designed and produced a device that was genuinely holistic, using ion cyclotron resonance magnetic fields to treat not just localized body areas, but the entire body. Dallago called his type of treatment endogenous ion cyclotron resonance, extending Liboff's proposal that it was reasonable



**FIGURE 31.1** Abraham Liboff and Valerio Dallago test extremely low frequency electromagnetic fields on Seqex.

to assume that all living things must naturally have intrinsic biological ICR properties. The technical development of Dallago's device (subsequently called the *Seqex*<sup>®</sup> device) is now coordinated by the engineer Claudio Poggi, and regards this intrinsic ICR property as a shared, whole body property. According to this concept, externally applied ICR signals can help restore wellbeing (Figure 31.1).

Q1

How can the degree of wellbeing be measured quantitatively? Dallago and Poggi very cleverly made use of total body bio-impedance, a readily measurable quantity commonly used to assess a number of health indicators. Poggi noted that body impedance changes after whole body application of ICR signals, and further, that these changes can be beneficial for the patient. An individual's bioimpedance value is thus referred to as that person's wellness factor. On a molecular basis, it is hardly surprising that ICR magnetic frequencies alter total body impedance, as this impedance includes both resistive and capacitive components. The more important capacitive reactance of the body is mainly due to the double lipid layers of the trillions of cells that constitute the body, and there is general agreement that the site of ICR interaction is most likely at the cell membrane.

In practice, the wellness factor is measured first, and a computer is used to determine which ICR magnetic frequencies are required to adjust this factor, and then these signals are applied. The patient lies horizontally on a bedroll containing sewn-in internal coils designed to produce vertical AC magnetic fields over the entire length of the body. The impedance is measured with a pair of electrodes attached to a wrist and an ankle. Following the test, the personalized treatment profile is stored on a smart card for use in further treatment sessions.

### SEQEX: A BRIDGE BETWEEN OFFICIAL AND NONCONVENTIONAL MEDICINE

The history of medicine has reached a critical turning point. The Western medical paradigm with its reductionist, illness-centered focus, is no longer capable of providing an adequate

response to modern patients, who are ever more intent not only on eliminating symptoms but rather on achieving a state of health definable as global wellbeing. A paradigm shift is thus required, a transition from the reductionist model to the holistic view of complementary medicines.

Seqex<sup>®</sup>, as an instrument for “total body” treatment with consistent information, satisfies this requirement, shifting the attention from an individual illness to the patient. It achieves this by applying two important principles:

1. The postulation that everything is information and so any treatment is in reality information given to the organism
2. The path of innovation in the field of biophysics: starting from studies conducted at the end of the 1900s on the interaction of ELF-EMF with biological tissue, the Seqex<sup>®</sup> team has developed a non-invasive treatment method that permits the entire organism, rather than just a part of the same, to receive and therefore respond to ICR information.

There is an obvious shift from pharmaceutical-information targeted on a specific molecule (with the known side effects) to EM information that induces the organism towards a biological and physiological restoration of the state prior to alteration by illness.

A fundamental and inescapable aspect remains ongoing dialogue and comparison with allopathic medicine. Seqex<sup>®</sup> does not aim to substitute pharmacology but to functionally integrate it, providing an additional valid instrument for doctors who today are called on in their clinical practice to apply the axiom that equates energy and material as faces of the same medallion. Dialogue with clinicians is essential to improve and incentivize this approach to integrated medicine, ever more in demand from patients.

The use of EFM instruments in medicine is widespread today, having by now become a transverse approach in various branches of medicine. There are nevertheless three substantial differences between the most widely used machines and the operating principle of Seqex<sup>®</sup>:

- The use by Seqex<sup>®</sup> of an analogue rather than digital signal, and so more similar to the biological *language*
- The use of ELF-EMF (0.1–0.8 G<sub>r</sub> rather than much wider fields) on the entire person and not only on an area of interest
- Application in the field is preceded by an impedimetric test designed to personalize the individual treatment by identifying the most appropriate waveform, frequency, and intensity for the patient.

These differences make it possible to use Seqex<sup>®</sup> without problems, even at home under medical supervision or outside of medical contexts (Seqex Fam<sup>®</sup>), increasing patient compliance to treatment. Furthermore, the analogue signal stimulates a more natural response (translating into variable

response times depending on the state of health of the patient), and therefore, a biological response that is likely to be more enduring and effective.

## THE SEQEX PARADOX: HIGH EFFECTIVENESS VERSUS LIMITED SCIENTIFIC KNOWLEDGE

To date, there are few published studies regarding the use of Seqex<sup>®</sup>; however, among these, two can be considered particularly important:

1. The study by Vallesi et al. on hematic oxidative balancing achieved using the ELF-EMF generated by Seqex<sup>®</sup>,<sup>5</sup> which demonstrated a statistically significant reduction in malondialdehyde (MDA), this being a marker of the peroxide state of biological tissues (resulting from degradation of plasmatic membranes), caused by endogenous or exogenous stress, following exposure to hydrogen peroxide
2. The study by Rossi et al. regarding the reduction in oxidative stress in cancer patients obtained using the ELF-EMF fields generated by Seqex<sup>®</sup>,<sup>6</sup> that demonstrated how the reduction in oxidative stress resulted in reduced myelosuppression from chemotherapy (see Table 31.1).

Q2

A study is currently under approval regarding the effectiveness of treatment of headaches with IRC at the University of Milan.

Alongside these studies, there are various case reports and unpublished studies. Among the latter, worthy of note is a case of infantile ulcerated haemangioma treated with Seqex<sup>®</sup> by Covi et al.<sup>7</sup> The patient was a baby girl born at term by eutocic birth on June 28, 2012 and diagnosed on day 10 of life with infantile hemangioma, complicated by ulceration and infection, which extended over the subsequent days to a part of the tongue and gums.

On day 15 of life, antibiotic and antifungal therapy was initiated, but without achieving improvement. On day 21, therapy was initiated with propranolol at a dosage of 2 mg/kg/day to stop the growth of the hemangioma and reduce the widespread ulceration, with the hope of achieving positive results over the next 2 months.

On July 27, 2012, treatment with Seqex<sup>®</sup> was initiated. After 10 days of therapy with Seqex<sup>®</sup> and following a dermatological consultation on August 7, 2012, propranolol therapy was suspended because of the initial encouraging results.

The patient demonstrated constant improvement, first with resolution of ulceration, and then regeneration of healthy tissue. After a few days of therapy, appetite improved and normal eating habits resumed. After 40 days, the ulcer appeared to have completely disappeared, with regeneration estimated to be around 90%. The parents reported a significant improvement in sleep rhythms, good appetite, and a lively active child. This report describes a unique case of its type and demonstrates the enormous therapeutic potential of IRC.

**TABLE 31.1**  
**Therapy with and without Seqex**

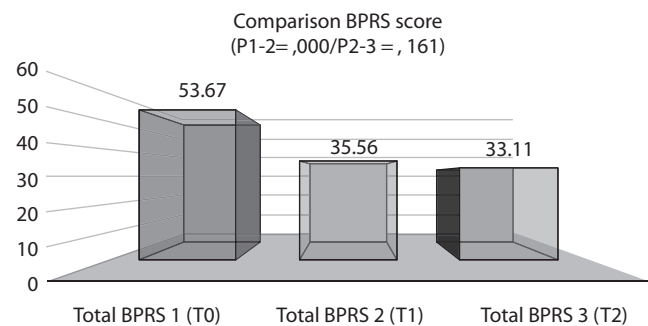
Group	Age	Sex	Stage	G-CSF(Mg) Administered	Major Hb Reduction (g/dl)
No. 1	42	F	II A	1200	0.9
No. 2	44	M	III A	1500	1.8
No. 3	45	M	II A	900	0
No. 4	69	M	I A	3900	0
No. 5	38	M	III A	1200	1.5
No. 6	35	F	II A	1200	0.5
No. 7	26	F	II A	1200	0.1
No. 8	39	F	III A	1200	0
No. 9	40	F	IV A	2400	0.6
<b>Mean</b>	<b>40</b>			<b>1200</b>	<b>0.3</b>
No. 10	47	F	III A	5100	3.2
No. 11	26	F	II A	5700	0.4
No. 12	20	M	III A	3600	0
No. 13	27	F	II A	1200	1.2
No. 14	78	F	II A	7500	2.7
No. 15	26	M	III A	4800	1.4
No. 16	40	M	II A	6600	1.6
No. 17	23	F	II A	5100	0
No. 18	43	M	I A	4500	1.6
<b>Mean</b>	<b>27</b>			<b>5100</b>	<b>1.4</b>

*Note:* Patients 1–9 had supportive therapy with Seqex. Patients 10–18 in the second group did not. Age and stage are similar in the two groups. The granulocyte colony-stimulating factor (G-CSF) administered in the two groups is statistically different and is greater for those who did not receive the Seqex treatment. The group of patients not receiving the supportive treatment tended to have a larger decrease of hemoglobin, but this decrease was not statistically significant.

Another very interesting study is that of Mario Betti, an MD, specializing in psychiatry, who investigated the therapeutic potential of ICR in psychiatric pathologies.<sup>8</sup> He assessed the effects of Seqex® therapy on 33 chronic psychiatric patients resistant to pharmacological treatment (e.g., psychosis, neurotic disorders, personality disorders, adjustment disorder). Each treatment cycle involved 20 sessions of variable duration from 18 to 54 min, applying a treatment protocol of 10–50% of the potential intensity of the device and frequencies from 10 to 40 Hz. Assessments were made according to the Brief Psychiatric Rating Scale (BPRS) with T0, T1, and T2, respectively at the start, after ten sessions, and on completion of the cycle. The results demonstrated improvements in all cases, as illustrated in Figure 31.2.

The study demonstrated significant effectiveness, manifest in particular during the first half of the treatment cycle, and more specifically around the fourth session. Figure 31.3 illustrates the appreciable improvements recorded for all the patient categories.

In conclusion, the work of Betti et al. demonstrates the effectiveness of ICR for treating psychiatric disturbances, and highlights the sensitivity and responsiveness of the CNS to ELF-EMF. An integrated approach would appear to offer great potential for the treatment of patients with psychiatric disorders.



**FIGURE 31.2** Graph comparing the Brief Psychiatric Rating Scale results at times T0, T1, and T2. An improvement is demonstrated of statistical significance between T0 and T1.

Alongside these examples, it would be possible to cite dozens of other cases involving a variety of pathologies that are all equally interesting.

### THE FUTURE: FROM MEDICAL DEVICE TO WELL-BEING FACILITATOR

Within the medical-academic world there is considerable debate about the effects of ELF-EMF on the human organism. Alongside studies that demonstrate the therapeutic effectiveness<sup>9</sup> or biological potential<sup>10</sup> of ELF-EMF, a lot



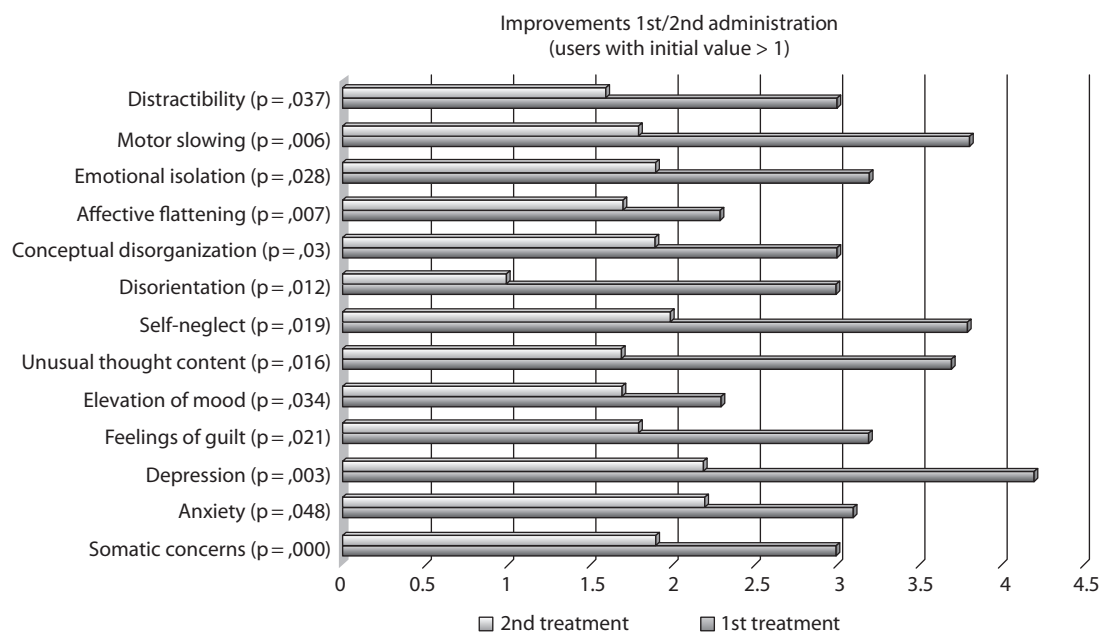


FIGURE 31.3 Improvements in the items assessed by patients.

of attention is directed towards understanding if, how, and when ELF-EMF are involved in the pathogenesis of diseases, for example, in tumors. While there are studies that have linked certain forms of ELF-EMF with particular types of cancer in specific individuals,<sup>11</sup> it needs to be noted that the same researchers are unable to provide a definitive answer to this question, and this remains more of a hypothesis than a certainty. It is also important to underline that many of the studies considered in the cited meta-analysis involved experiments that bore no resemblance to the therapeutic use of ELF-EMF (for example, Loscher and others used DMBA to induce breast cancer in mice, utilizing 50 Hz, 0.2–1 mT, 10 mT, 50 mT, and 100 mT magnetic fields to irradiate mice 24 h a day for 13 weeks!). Thus, it is very important to consider the methods applied in ELF-EMF studies in order to avoid either alarmism or the risk of raising false expectations.

REFERENCES

1. Liboff AR. Geomagnetic cyclotron resonance in living things. *J Biol Phys* 1985;13(4):99–102.
2. Thomas JR, Schrot J, Liboff AR. Low-intensity magnetic fields alter operant behavior in rats. *Bioelectromagnetics* 1986;7(4):349–57.

3. Smith SD, McLeod BR, Liboff AR, Cooksey K. Calcium cyclotron resonance and diatom motility. *Bioelectromagnetics* 1987;8:215–27.
4. Liboff AR. Electric-field ion cyclotron resonance. *Bioelectromagnetics* 1997;18(1):85–7.
5. Vallesi G, Raggi F, Rufini S et al. Effects of cyclotronic ion resonance on human metabolic processes: a clinical trial and one case report. *Electromagn Biol Med* 2007;26(4):283–8.
6. Rossi E, Corsetti MT, Sukkar S, Poggi C. Extremely low frequency electromagnetic fields prevent chemotherapy induced myelotoxicity. *Electromagn Biol Med* 2007;26(4):277–81.
7. Covi V, Tabaracci G, Magnaghi S. Revisione di un caso di emangioma infantile ulcerato trattato con Ionorisonanza Ciclotronica Seqex®. Available online from www.sibeonline.com.
8. Betti M, Di Meo MC, Picchi MPC, Saettoni M. Applicazioni della Ionorisonanza Ciclotronica in salute mentale. *Atti III Convegno Nazionale SIBE Bologna*. Nov 2010;1:41–50.
9. Pelka RB, Jaenicke C, Gruenwald J. Impulse magnetic-field therapy for migraine and other headaches: a double-blind, placebo-controlled study. *Adv Therap* 2001;18(3):101–9.
10. Ledda M, Megiorni F, Pozzi D et al. Non ionising radiation as a non chemical strategy in regenerative medicine: Ca(2+)-ICR “in vitro” effect on neuronal differentiation and tumorigenicity modulation in NT2 cells. *PLoS One* 2013;8(4):e61535.
11. Chen Q, Lang L, Wu W et al. A meta-analysis on the relationship between exposure to ELF-EMFs and the risk of female breast cancer. *PLoS One* 2013;8(7):e69272.

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