FOR SCIENTIFIC RESEARCH

E1/9

PAPIMI®

PAP ION MAGNETIC INDUCTOR

PRESENTATION

Magnetotherapeutic Device

CE 0044

TÜV NORD CERT GmbH ISO 9001/ISO 13485

Aug 2010

APPROVALS

CE 0044

93/42 EEC Annex II

EN ISO 9001 : 2008

EN ISO 13485 : 2003

CAN/CSA ISO 13485/2003

The device have passed successfully all

IEC 60601-1 and IEC 60601-1-2 (EMC) tests

GOSSTANDART MEDICAL CERTIFICATE for the Russian Federation and CIS Countries

Approval # 0767E2003 S.S.A. Secretariat of Health, Mexico.

World patents:

PCT **WO 1994/01176** - 23 National Patents

with classification A61N2/00 - Magnetotherapy Medical Device.

PCT **WO 2005/1496 A1** - 31 National Patents

with classification G01R 33/28 - Nuclear Magnetic Resonance Generator Device.

Greek patents OBI : 1001784, 1004895.

USA patent: # 5,556,418

Former approval # 1321/94 Department of Industry & Energy

Former approval # 168,403 Medical Devices Bureau, Health Protection Branch Canada,

Medical Approval pending USA

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TÜV NORD

EG-Zertifikat / *EC-Certificate*

gem. 93/42/EWG Anhang II / *acc. 93/42/EEC Annex II*

Reg.-Nr. / *Reg.-No.* 44 232 06 334946-001

Hiermit wird bescheinigt, dass die Firma / *This certifies, that the company*

Electrodynamics Manufacturing L.t.d. – Pulse Dynamics
26 Markopoulioti Street
11744 Athens
Greece

für die Produkte / die Kategorie / *for the products / product category*
(Liste der Produkte siehe Anlage 1 / *List of products see annex 1*)

Elektromagnetische therapeutische Impulsgeneratoren

Electromagnetic therapeutic Impulse Generators

ein Qualitätssicherungssystem für die Auslegung, die Fertigung und die Endkontrolle der genannten Produkte nach Maßgabe des Anhang II Abschnitt 3 der Richtlinie 93/42/EWG anwendet. Zusätzlich zur CE-Kennzeichnung muss die Kennnummer der Benannten Stelle angebracht werden. Die Gültigkeit dieses Zertifikats beruht auf der Aufrechterhaltung des Qualitätssicherungssystems in Übereinstimmung mit den Anforderungen der Richtlinie und seiner Überwachung durch die Benannte Stelle gem. Anhang II Abschnitt 5. Das Zertifikat ist unter keinen Umständen übertragbar.

has established a quality system for design, production and final testing acc. to the requirements of Annex II section 3 of the directive 93/42/EEC. Additional to the CE-marking the notification number of the Notified Body has to be affixed. The validity of this certificate is based on the maintenance of the quality system in accordance with the requirements of the directive and its surveillance by the Notified Body according Annex II section 5. The certificate may not be transferred under any circumstances.

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Notified Body ID. No. 0044

Aktenzeichen / *File reference*	Ausstellungsdatum / *Date of issue*	Bericht Nr. / *Report No.*
2.4-1123/05	2009-10-16 / ed. 2	09 232 374727

Akkreditiert durch / *Accredited by*
ZLG; ZLG-ZQ-967.94.09
ZLS: ZLS-ZQ-346/07

Gültigkeit / *Validity*
von / from 2009-10-17
bis / until 2012-10-16

Michael Hartweg
Zertifizierungsstelle für Medizinprodukte
Certification body for medical devices

Certificate of Directive 93/42 EEC - CE 0044 -

TÜV NORD

Zertifikat / *Certificate*

gem. / acc. EN ISO 13485:2003 + AC:2007

Reg.-Nr. / *Reg.-No.* 44 221 06 334946-001

Hiermit wird bescheinigt, dass die Firma / *This certifies, that the company*

Electrodynamics Manufacturing L.t.d. – Puls Dynamics
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ein Qualitätsmanagementsystem nach der Norm EN ISO 13485:2003 + AC:2007 / DIN EN ISO 13485:2007 - Medizinprodukte - Qualitätsmanagementsysteme - Anforderungen für regulatorische Zwecke - eingeführt hat und aufrechterhält. Dieses Zertifikat stellt nicht den erforderlichen Nachweis zur Anbringung der CE-Kennzeichnung dar.

has established and maintains a quality management system that meets the requirements of EN ISO 13485:2003 + AC:2007 / DIN EN ISO 13485:2007 - Medical devices - Quality management systems - Requirements for regulatory purposes. This certificate is not an authorisation to affix the CE mark.

Geltungsbereich / *Scope*

Entwicklung, Herstellung und Vertrieb von elektromagnetischen therapeutischen Impulsgeneratoren

Design, manufacturing and distribution of electromagnetic therapeutic impulse generators

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Aktenzeichen / *File reference*	Ausstellungsdatum / *Date of issue*	Bericht Nr. / *Report No.*
2.4-1123/05	2009-10-16 / ed. 2	09 232 374727

Akkreditiert durch Zentralstelle der Länder für Gesundheitsschutz bei Arzneimitteln und Medizinprodukten
ZLG-ZQ-967.94.09-46

Gültigkeit / *Validity*
von / from 2009-10-17
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Michael Hartweg
Zertifizierungsstelle für Medizinprodukte
Certification body for medical devices

Certificate of ISO 13485:2003

TÜV USA
Member of TÜV NORD Group

Certificate

acc. to CAN/CSA ISO 13485:2003

Medical Devices - Quality Management Systems - Requirements for Regulatory Purposes

Certificate Registration No.: 09-0027

TUV-USA, Inc. hereby certifies that the quality management system of the company mentioned below is in conformance with CAN/CSA ISO 13485:2003 for Medical Devices-Quality Management Systems-Requirements for Regulatory Purposes.

Electrodynamics Manufacturing Ltd.
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11744 Athens
Greece

Additional sites covered by QM System:

Pulse Dynamics
61 Lagoumitzi Street, 11744 Athens, Greece
Design, manufacturing and distribution activities

Scope:

Design, manufacturing and distribution of electromagnetic therapeutic impulse generators [12-415]

TUV-USA, Inc., 215 Main Street, Suite 3, Salem, NH 03079
☎ 001-603-870-8023

OMDAS Recognized Registrar

Effective date
2009-10-15 / ed. 1

Expiry date
2012-10-14

Jennifer Bromm
Medical Products Manager

Certificate of CAN/CSA ISO 13485:2003

TÜV NORD

ZERTIFIKAT

für das Managementsystem nach
EN ISO 9001 : 2008

Der Nachweis der regelwerkskonformen Anwendung wurde erbracht und wird gemäß TÜV NORD CERT-Verfahren bescheinigt für

Electrodynamics Manufacturing L.t.d.
26 Markopoulioti Street
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Griechenland

Geltungsbereich

Entwicklung, Herstellung und Vertrieb von elektromagnetischen therapeutischen Impulsgeneratoren

Zertifikat-Registrier-Nr. 44 100 066844
Auditbericht-Nr. 3505 4378

Gültig bis 2012-10-16
Erstzertifizierung 2006

Zertifizierstelle der TÜV NORD CERT GmbH

Essen, 2009-10-17

Diese Zertifizierung wurde gemäß TÜV NORD CERT-Verfahren zur Auditierung und Zertifizierung durchgeführt und wird regelmäßig überwacht.

TÜV NORD CERT GmbH Langemarckstraße 20 45141 Essen www.tuev-nord-cert.de

IAF

TGA-ZM-07-06-02

Certificate of ISO 9001:2008

CONTENTS

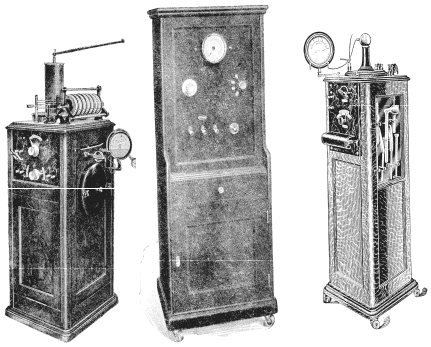
SHORT DESCRIPTION OF THE PAPIMI™ DEVICE

The PAPIMI™ Device belongs to the same category as the Electrotherapeutic devices of Tesla and D'Arsonval, which were very popular in every hospital and medical center for almost half a century, because of the amazing results they were achieving since the beginning of this century.

Subsequently, these devices were named (short wave) “Diathermy” Devices - those intended for deep heating, as well as “Electro-surgical Diathermies”- those intended for surgical needs.

The modern scientific term for these devices is Pulsed Electro Magnetic Field (PEMF) Generators. Also, Pulsed Coagulators and Pulsed Lasers, which have now begun to re-enter the field of Physical Medicine, may be placed in the same category.

Formally, the PAPIMI™ device may be defined as a Short Wave “Diathermy” Device intended for short time (pulsed) deep heating, as the original, standard and classical (Spark) Diathermy Devices were intended to be. However, the PAPIMI™ Device is the technological result of the study, comparison, and research of the entire latest experience in combination with the latest relevant technology and scientific knowledge.



D’Arsonval and Tesla (Diathermy) Devices of the period of 1900 - 1940

The PAPIMI™ has been compared with all corresponding modern devices at the Health Restoration Center, the National Pain Institute, the International Pain Research Center, and many other Research Centers at the area of Los Angeles, San Diego, North Mexico, Canada and Europe. The PAP-IMI™ was found to surpass all the other corresponding devices by being a factor of one hundred to one thousand times faster and more efficient.

The superiority of the PAPIMI™ is due to its unique pulses that are faster and higher, (10,000 to 100,000 faster and higher) than other PEMF devices. However, the supplied thermal energy of the pulses is negligible to the thermal energy supplied by the corresponding devices. The PAPIMI™ pulses are of far shorter duration. These results in negligible heat energy being

distributed, avoiding thermoplexy and thermal damages. Meanwhile the phenomenon of biological synthesis takes place, depending upon bio-energizing the internal degrees of freedom of molecules.

The difference in the PAPIMI™' results, as well as the superiority of the speed of its results, compared to the corresponding devices, is theoretically due to the advanced characteristics of the pulses. The choice of these characteristics are based on the following hypothesis of Professor PT Pappas:

"The more the Electromagnetic Pulses are instantaneously higher, of shorter duration, and of less overall power, then, the more activation of the internal degrees of freedom of molecules occurs. These are factors of biosynthesis: the less the dissipated heat produced (which is a factor of bio-destruction) the greater the biological beneficial results.

The activation of the external degrees of freedom of molecules is expressed as heat and it is registered as temperature by the conventional thermometers. This activation initiates chemical activity that leads to destruction of macromolecules - as the phenomenon of hyper-heating, thermal fission, thermal destruction, pyrolysis, burning, melting, vaporization, and other forms of matter destruction. We may also realize the ability of heat for destruction by the fact that adequately high temperature may break down all bonds of matter without exception.

On the contrary, the activation of the internal degrees of freedom is not registered by conventional thermometers, however, bio-energy distributed among the internal degrees of freedom of molecules accelerates chemical activity that leads to the composition of long molecules, i.e., to the Muller phenomenon, to the composition of chlorophyll and biological functions of living matter or living cells."

We may state that; in general, the energy among the external degrees of freedom corresponds to heat energy – leading to destruction, or death. And Bio-energy distributed among the internal degrees of freedom of molecules, in general, correspond to the Bio-energy of a system – leading to construction of life.

HOW THE PAPIMI™ DEVICE WORKS

The magnetic field, contrary to the electric or electromagnetic one, penetrates freely almost everywhere. When the probe of the device exposes a tissue, its magnetic field spreads and penetrates into this tissue, like the natural magnetic field of the earth, which does not receive any resistance. The penetrating magnetic field changes rapidly. It develops and disappears abruptly. From Faraday's law of induction, we know that a disappearing magnetic field leaves in its place a cyclic electric field. In this way, deep in the tissue, electric fields are developing from the penetration and extinction of the magnetic field. Those induced electric fields would have been impossible to deeply penetrate tissue from outside with any other conventional way, because the conductive surface of a tissue (according to Gauss's Law) constitutes a shield, known as "Faraday's Cage." Furthermore, an electrical field does not penetrate deeply into a tissue, because of the known epidermic phenomenon, or "Skin Effect." Therefore, the only possible way for the penetration of electromagnetic bio-energy into a tissue seems to be the use and the patented principle of the PAP-IMI™ device.

What is the particularity of the PAP-IMI™ device's pulses compared to the pulses of a common diathermy?

The specific pulses have an active part, significantly shorter, and a resting period substantially longer than any device of its kind. In this way, the supplied energy is negligibly low, and therefore the rising heat of the exposed tissues is negligibly low (contrary to a common diathermy). At the same time, the power and the intensity of each pulse can be greatly increased, as the active time of each pulse is reduced.

The PAP-IMI™ pulses, with the increased instant intensity, activate the internal degrees of freedom of molecules, and they might even cause a Nuclear Bio-Resonance and Bio-Excitation. While the short duration pulses and their limited energy per unit time, do not contribute to the increase of the motional energy (heat energy) that would have led to molecular decomposition. In this way, the pulses are ideal for accelerating the formation of complex molecules, for which the activation of internal degrees of freedom of matter, and particularly, the Bio-excitation of Nuclear components is required.

The Biological Nuclear Reaction of the French Researcher Louis C. Kervran:

$$_{11}Na^{23} + \text{Electrical Energy} + {}_{8}O^{16} = {}_{19}K^{39}$$

implies that Sodium plus Oxygen plus (Magnetic) Energy, nuclearly transmutes into Potassium.

However, this process is known in Biology as the Sodium and Potassium Pump, which is wrongly assumed to be an exchange and not a nuclear transmutation. It is wrongly assumed that **Potassium *continuously*** enters in to the cells and **Sodium *continuously*** comes out of the cells. These are obviously

two impossible processes!

This nuclear process is accomplished with a no heat mode, in a no rate of thermal decomposition. This is the most important, and at the same time, the most commonly found phenomenon of Nuclear Fusion in Biology.

Therefore the PAP-IMI™ device is a device with the potential to supply Nuclear Bio-energy, because of its ability to provide Bio-energy to the internal degrees of freedom of matter, based on simple scientific principles of basic importance for life's phenomenon.

See or click for details " The Equation of life"

MAGNETOTHERAPEUTIC USES OF THE PAPIMI™ DEVICE

Observations, in a great number of patients and animals in the Papanikolaou National Anticancer Institute, the IKA Papdimitriou Hospital in Melisia, Athens, Greece, The Health Restoration Center, The National Pain Research Institute (U.S.A) and in many other centers in the area of Los Angeles, San Diego, North Mexico, Canada and Europe, have shown that the PAP-IMI™ device has significant therapeutic results with a unique speed and efficacy, not found in other conventional therapeutic methods.

The results of the Magnetotherapeutic uses of PAPIMI™ device as described in the Medical Bibliography are as follows :

- Sports injuries
- Arthritis
- All cases of inflammations, painful ones or not (with immediate disappearance of swelling)
- Tendonitis
- Musculoskeletal Pains
- Sprains
- Ultra fast of normal rehabilitation of bone fractures
- Ultra fast healing of atonic, chronic or acute ulcers
- The quickest method of rehabilitation of burns, and reduction of scarring and pain
- The strongest anti-swelling and anti-inflammation way for all kinds of swelling and inflammation.
- Lumbago, sciatica, cervical syndrome
- Arthrolysis
- Pains, inflammations and edema of cancer origin
- Osteoarthritis

- Ultra fast healing of skin lesions (serious sports traumas, scratches, incisions, burns etc.)
- Ultra fast and effective anti-inflammatory and anti-swelling use, almost for every cause (for example Scleroderma, Hemorrhoids, Cancer, etc.)
- Increase of the permeability of the cellular membrane, facilitating metabolism and entry-exit of ions in the cell (oxygen, drug, nutrient delivery to the cell)
- Increase of endocellular and biological activity, strengthening and reviving the organism
- Revival of neural tissue and superior neural cells
- Enhancement of the immune system

The PAPIMI™ device is the result of the study, comparison and research of the entire past experience in combination with all the relevant technology and scientific knowledge. The PAP IMI™ device is far ahead of all other relevant devices.

HOW TO APPLY THE PAPIMI™ DEVICE

Application is made with a flexible probe either over clothing or directly touching the skin.

APPLICATION OF THE PAPIMI™ DEVICE IN PLANTS

The PAPIMI™ device has unbelievable results in the growth of plants and seeds. These results are replicable and significant, and have been researched by the Agriculture University of Athens. In addition there did not appear any genetic anomalies, toxicity or harm in the exposed plants, on the contrary, it proved to be very effective in speeding up the growth of plants, even under unfavorable conditions that did not surpass the expected mainsail growth of the plants. The Papanikolau Institute of the Saint Savva Hospital has also found related results in small animals, for three years in succession. The small animals grew up and multiplied to serial generations, without genetic or other anomalies.

The Agriculture University of Athens is continuing the research on practical applications with the PAPIMI™ device in the growth of plants and seeds. The most elaborate cooperation are related dissertations of the Educational and Technologic Institute of Piraeus.

Below we show some photos of experiments on seeds and plants growing, using PAPIMI™ device exposures. Each experiment lasts from about 5 minutes to 1 hour.

The labeled pots have been exposed with the PAPIMI™.

The difference between the exposed plants, compared to the non-exposed twin plants, is striking.

Finally, the difference between the exposed and the non-exposed twin plants seems minimized, and at first glance, they look almost the same.

However, notice the new clones of the second generation that have started to grow from the plants exposed with the PAPIMI™ device.

*** ****** ***

Exposing plants and seeds with the PAPIMI™ device.


Experiment with maize seedlings.

Half of the maize seeds were exposed for 40 minutes with the PAPIMI™ device before their planting, while the other half were not.

The photo shows two grown maize seedlings, one of the exposed seeds and one of the non-exposed. You can notice the considerably thicker body and three new leaves of the exposed seedling, compared to the non-exposed twin seedling, which has two leaves.




Treating water with the PAPIMI™ device.

Notice: ***This is an earlier introduction written in the years 1990-97 and without the connection to nuclear transmutation, however, all the conclusions are still valid and consistent.***

THE PAP
ION MAGNETIC INDUCTOR
DEVICE[1]

The **PAP I**on **M**agnetic **I**nduction (**PAPIMI™**) device is an Advanced Device, based on Electromagnetic Bioenergy. It is a second generation device initiated by the PEC - IDD, a DC Magnetic Impulse early generator by Pappas, et al., based on **Direct Current Unipolar Pulses**.

The present PAPIMI™ Device is an Ultra Fast, Short duration and Athermic Bipolar Magnetic and Induced Electrical Impulse Generator, exclusively protected by the OBI 1001784, the USA patent 5,556,418, and the World Wide PCT patent PCT/US93, owned by P.T. PAPPAS, Ph.D.
Former Approvals: Medical Devices Bureau, Health Protection Branch of Canada, file # 168,403; EN 60601 approval for pulsed diathermy, Ministry of Industry, Energy and Technology of Greece, file # 1321/94. The device has also been granted a research protocol for AIDS applications by the National Organization of Drugs of Greece. The PAPIMI™ Device fully complies with CE and FCC regulations when operated inside an EMI proof enclosure, room or cabinet.

The largest category, close to the unique **PAPIMI™** Pulsed High Peak Electromagnetic Energy Device (PEMF), is the Pulsed Microwave Devices, Pulsed Shortwave devices, Pulsed Diathermy devices etc. However, the present device is absolutely unique in this classification, producing the fastest and strongest pulses. It appears side effect free since its introduction in 1988.

The device has been tested and performs as expected. It is a special inductor which produces short duration, complex, fast rising, bipolar magnetic pulses which induce an alternating electrical field of high peak (instant) voltage which produces high peak (instant) electric current (depending on the substance) or induces ions in various substances. In our long experience the parameters of those pulses are the most suitable ones to produce high **Bioenergy** and at the same time the least heat in tissue. We call this effect the "**Subdiathermic effect**". We understand and define **Bioenergy** for the first time explicitly as the **activation of the internal degrees** of molecules of **Biomatter**. Bioenergy as an activation of internal degrees of molecules is distinct from **heat** energy which is the **activation mainly of the external degrees**. The main difference of Bioenergy to Heat Energy is Bioenergy appears to cause synthesis or composition, leading to complex structures of bio-molecules. On the contrary, heat causes decomposition or destruction of complex bio-molecules -**Diathermic** effect.

Due to its working principle and its heavy duty technology simulating lightning, most of its components are not found in industrial technology. They are mostly custom and hand made components. At the same time extra care is given to safety, high insulated parts, specially low resistance and specially low impedance conductors. It is based on a custom made thyratron tube and a charge bank operating at a very high voltage, simulating a natural micro-lightning, which transforms the high tension into high current magnetic bursts in the form of very strong and very fast magnetic pulses, modulated according to the Pappas' patented method. It is non radiative, producing a low impedance and low average induction voltage output of the order of 18 volts across a 30 cm loop by remote senseless action, without contact or any form of material transfer.

The **I**on **M**agnetic **I**nduction device falls into the category of Bioenergetic PEMF Devices. However, the present device does not compare to any other known device due to its special and uncommon technology capable of producing the sharp complex magnetic pulses, several orders of magnitude faster than any other known Device and is uniquely modulated by an excited gaseous plasma, thus producing enhanced Bioenergy.

The device is hypothesized to posses the ability to enhance and thus normalize the low transmembrane potential of certain cells by inducing through cell membranes the necessary ions, according to the suggestions Bjorn E.W. Nordenstrom and the principles of the Nobel Laureate Albert Szent-Gyorgyi who as early as 1941 established that structured proteins behave like solid state semiconductors or rectifiers. In recent years it has been determined that the cell membranes, having a characteristic of non-linear impedance, rectify an alternating voltage (in this case caused by the electrical impulses induced by the strong-time-varying bipolar magnetic pulses). Thus, the particular magnetic pulses enhance the transmembrane potential of the cell and its biological activities quickly and effectively.

According to the results of the studies by Szent-Gyorgyi, Cone, and others, a young and healthy cell has a transmembrane potential of the order of 70 millivolts. An aged cell or ill cell has a transmembrane potential considerably lower, as low as 50 millivolts. However, a cancer tumor cell has a transmembrane potential as low as 15 millivolts. A cancer cell is a cell in biochemical malfunction, which reflects as an electrical difficulty. At the same time, cells with low transmembrane potential are in an inflammatory state, are the sources of the pain signals which normally cause the sense of strong pain. The transmembrane potential is the measure of the internal Energy or the Bioenergy of a cell, (similar to the potential of an ordinary battery which is the measure of its energy). This energy wich is represented in the electrical potential of the cell membrane powers the sodium-potassium pump[1] of the cell, which in turn is responsible for the ion concentration of the cell and the maintenance of the proper transmembrane potential. Therefore, transmembrane potential and sodium-potassium pump[1] of the cell is like a <catch 22> situation for the cell, from which the cell cannot escape, when the electrical potential is below a critical level, unless an external electrical potential or some electrical charge energy is induced into it.

* The **PAP I**on **M**agnetic **Induction** device is designed to induce and thus to restore the missing ionic charge, in order for the cell to overcome this catch 22 situation as it was described before. Using the familiar wording of physical chemistry, we may describe this phenomenon as follows: The cell is driven into more energetic internal states, i.e., to higher energy for its internal degrees of freedom states and ATP composition, thus the sum of the biochemical energetic reactions of the cell, or in other words, the Bioenergy of the cell is normally increased.

* With an abundance of this sort of internal energy (Bioenergy), the cell easily overcomes this sort of electrical difficulty, and then, it is expected to be able to continue, and to maintain by itself the balance of the ionic concentration, the balance of transmembrane potential and the effective function of the sodium-potassium pump[1], thanks to the Ion Magnetic Induction device, which induces, with this specific modulation, the initial energy and ionic charge to it and thus restores its electrical energy flow balance. A number of other important aspects an of the PAP IMI™ Athermic and Bioenergetic pulses have come up during the several years of continuous investigations which can be stated with the following general hypotheses:

* The **PAPIMI™** pulses seem to provide the necessary form and type of energy (to the internal degrees of the molecules) without the damaging heat (vibration and rotational energy to the external degrees) to promote (or trigger) endothermic biochemical reactions and may allow particular atoms to move and participate in latent complex chemical reactions, which would not otherwise have occurred due to lack of proper energy. Thus, it initiates (or catalyzes) dormant or slowly proceeding chemical reactions, or speeds up chemical synthetic activity from the slow happening main stream biological functions of a system, to form complex structures without the irreversible destructive and disorganizing effect of heat.

The **PAPIMI™** seem to offer internal energy lowering the general entropy of a system. It acts as stimulus and bio-energy to the natural anabolic functions of a living system and therefore appears to induce creation of order out of disorder, decreasing the entropy of the system, i.e., helping disorders to restore via the intelligent action of the living system and the action of Bioenergy.

* Another great number of phenomena seem to be related to an apparent increased porosity of the cell membrane or to a form of moderate electroporation4, as it is known in literature. Electroporation is a general term used for the increase of the cell membrane porosity and for the cell's enhanced ability to exchange materials with the environment under the effect of sharp electrical pulses. Prolonged pulse exposures seem to be possible to rupture weak cell membranes, such as cancer cell membranes, or to extinguish microorganisms with thin or no membrane.

* This might probably explain how the ultra fast pulses seem to extinguish degenerate cells, microorganisms, degenerate conditions, disorders, and the repairing mechanisms of the human and animal body, so impressively.

pump[1] = nuclear transmutation

Updated March 2003

STATISTICS FOR RESEARCH SUMMARY

The Ion Magnetic Induction device for moderate exposures is primarily theorized to provide a state of high quality low calorie (bio)energy, or high order athermic energy, activating internal degrees to increase cellular internal activity and membrane porosity, to restore or increase cell transmembrane potential to normal, supplying order into a disordered system - Biosynthesis.

Typical exposures for serious cases are recommended at:

Ratings: Power selection at 4, Pulse repetition rate at 1 to 3 pulses per second (pps) or 60 to 180 pulses per minute (ppm). Settings 1-3 pps or (60 to 180 ppm) - Subdiathermic range - give maximum power out per pulse with the least average heating, provide the maximum internal molecular degree excitation with the least external molecular excitation, i.e., provide the least thermal excitation.

Duration: Two to three times per week (every other or third day) for 5 to 10 minute applications per location for a few weeks or more, depending on the case and response. Exposure's stimulation seems to be evident for as long as 48 to 52 hours.

Maximum length of exposure: Up to six months of regular and continuous use, and up to three years of irregular or periodic use, have been tried.

Side Effects: No side effects have been noted to date, even in extreme cases of long exposure to continuous applications up to an hour per day for several days at full power. Similarly, no side effects have been observed for assistants or operators, operating the device for as long as four years

Adverse effects: (Based on reports by Dr Bruce Frome 8/25/1993, 9/14/1993).

After intensive use of the device, benefits could be maintained by receiving periodic treatment. A rebound effect might be observed if exposures stop abruptly. Blood pressure may be lowered 10-20% due to small vessel persistent dilation after exposure and it should be taken into account whenever it is unwanted or contraindicated. Lowering blood pressure is restored within 10 to 30 minutes after exposure.

A hyperesthesia type effect has also been observed similar probably to the observed. Also, a hyperesthesia type pain has also been observed following exposures, whenever peripheral nerve damage or injury is present - herpes zoster, genital herpes, post herpetic pain, osteopathic pain, peripheral neuropathies etc, exposures may decrease or increase pain; both cases have been observed.

Right after surgery or accident caused wounds (within 12 hours), exposures may cause bleeding to the wound due to the local excess blood supply.

Theoretically treatments are counter indicated whenever suppression of immune system is considered necessary, i.e., for autoimmune diseases. However, certain serious autoimmune diseases treated gave no conclusive results.

Serious cancer patients with extended massive tumors may risk an assumed toxic shock from excessive tumor-cell lysis and necrosis resulting from unduly prolonged treatment sessions on one sight. A few such cases have been reported with high fever, extended urination, shaking for one or two hours after four hours from an intense treatment of over half hour directly on a cancer sight. Such serious cases should be attempted under intense medical control with dosages progressively increasing, starting with a minimum exposure of five minutes on the sight and monitoring the result. Exposure increments to 30 min have to be decided on the previous results and the patient tolerance.

Important notice: The above side effects are limited strictly for the Subdiathermic range, 2 to 3 pps.

For example: standard pulse diathermies which operate well over the subdiathermic range over 60 pps and over, counter indicate exposures to cancer tumors- see for example A Pulsed and Continuous Short-Wave Therapy, by Enraf -Nonius, ref. 32.

The Subdiathermic range has been found to be the most effective range.

Penetration Depth: Up to 25 cm at full power rate for treating serious cases.

The PAP Ion Magnetic Induction Device appears to have a number of therapeutic statistics*:

"All cancer patients should be in good and sufficient order with respect to all of their vital functions that will sustain sufficiently their metabolism with and after PAPIMI™ exposures. In this direction, vital function's sufficient restoration or enhancement is necessary prior to the fulfilment of PAPIMI™ exposures.

As a good marker for under weighted cancer patients, we consider is to start gaining weight, by an increase of intake of calories and nutrition.

The thermometer for an under weighted cancer patient should be a daily weight scale. Inability and failure to restore lost weight or further loss of weight, should place the procedure under reconsideration into a state of alert. Consultation with an expert with knowledge on nutrition and metabolism Medical Doctor should be an emergency and first priority."

Lower power doses at higher pps (pulse per second) rates (>5pps), applied locally where this pain appears, and repeating them after longer pause intervals is recommended . SURPRISING AND UNEXPECTED FAST HEALING RESULTS FOR INJURED OR DAMAGED NERVES - ASSOCIATED WITH HYPERESTHESIA PAIN - HAVE BEEN RECENTLY OBSERVED with higher pps rates >5 either at lower or higher power, according to pain tolerance, confirming this recommendation as far as the higher pps rate.(Reported by Dr Tsilimigakis)

In 21 cases, antibodies were produced after a particular vaccination only if exposures were given after the vaccination was received, etc.(According **to Dr Sam Chachoua**)

Extinguishes worms from the intestinal tract. (Reported by **Jorge Del Rio**)

Keloids, warts, etc, (Reported. by **Dr Gutstein**)

Sensation recovery on burned skin. (case of severe third degree burn of chest skin, resulted in loss of local sensation for 10 years; spectacular sensation recovery with two 20 minute treatments. (Reported. by **Dr Zimmerman**)

Improves mental retardation. (Reported by **Dr Tsilimingakis**)

Stops Gastro-hemorrhage (Reported by **Dr Eleftheriadou**)

Foreign Body reaction of the immune system: Initiates strong healthy tissue neoplasia in wound healing, under cancerous tumors, ejecting malignant tumors out and replacing them with benign tissue. (Observed and Reported by **Dr Tsilimingakis** practice, treating cancer daily for the last two years)

Bone fraction Healing: Healed long lasting incurable fraction of the cuboid bone in less than a month (Reported **Dr Zampakos**).

Improves quality of life. (Helps AIDS patients impressively it extinguishes various associated bacteria

and microorganisms. AIDS patients eliminated most of their symptoms and improved their markers, receiving maintenance treatments (recommended) at a rate of at least 20/min per two or three weeks for the last two years with constant improvement).
According to **Dr. Jacob Swilling's** opinion, who operated the device since 1990 and was the first to discover the "device AIDS effect" in 1992, which still seems correct today
"...this device has dramatic potential to inactivate viral infection and may well potentially be a device that can successfully control the HIV and AIDS problems... It is the best medication for AIDS so far known to me."

The above statement is continuously confirmed today by many centers, (**Dr Tsilimigakis**) Medically approved Research Protocol is underway (over two years) by major Hospital (IKA).

Important notice:

The above effects were observed close to or within the Subdiathermic range, 1 to 3 pps (pulses per second) or 60 to 180 ppm (pulses per minute). This range provides maximum power with the least heating effect.

Modern pulse diathermies based on electronic tubes or transistors which also operate well over the subdiathermic range over 60 pps or 3600 ppm and even greater, as well as, continuous diathermies which provide strong heating effect, report several other counter indications including exposures to cancer tumors, see reference 32.

However, the old arc type pulsed diathermies recommend exposures to tumors, see Early Electrotherapeutic Devices. For clarifying the differences of the physiological function among all these devices, see later chapter A Historical Overview.

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*Notice:

1. Effects occur only within the reach of the effective range of the probe. The effective range varies from 5 to 15 cm, field intensity dropping very quickly with increasing distance, in particular, inversely with the third power of distance.

2. The above list is not finalized and the statistics so far are not the result of complete clinical studies. Some of these discoveries are based on a limited number of observations. However, they have been recorded so far from at least a number of cases in an apparent decisive and consistent way. They were recorded as they were reported and they are not classified or categorized yet. Report repetition may appear.

3. Rates and doses referred above are those which were applied in the particular cases. Different posology may be more appropriate in different cases. Precise rates and doses are generally not yet established.

4. See "Guide to Electroporation and Electrofusion", by D.C. Chang, B.M. Chassy, J.A. Saunders, A.E. Sowers, Academic Press, San Diego, 1992.

FOR IMMEDIATE INVESTIGATION

(The following topics have been suggested in 1993 by IPRI to NIH after two years experience with five PAP-IMI™ Devices, and they are indicative and not exclusive today)

* **Acute and chronic bladder infections**

"The effect of PAP-IMI™ Device, a high peak power, low energy, non-invasive Pulsed Electromagnetic Device on patients with **acute and chronic bladder infections**."

Infections of the bladder are far more common in women than men and most often results from a bacterial infection or venereal disease.

There is anecdotal evidence that high peak power electromagnetic pulses are able to eliminate many types of bladder infections.

The PAP-IMI™-300 is an advanced electrotherapeutic device that produces ultra high peak power very low energy magnetic pulses modulated by an air plasma that, by remote action induces a high peak alternating electrical current, disperses electric charges or ionic concentrations inside biological tissue. Therefore, the device is useful for causing ionic discharging in biological tissues. In particular, it is hypothesized that, it may increase the transmembrane potential and porosity of cells. Thus, it may increase cellular activity and efficiency which, in turn, may cause beneficial effects in affected tissues.

This study is to show to what extend the PAP-IMI™-300 device can eliminate the symptoms of acute or chronic cystitis. Urine cultures should be used to determine the effectiveness of this treatment.

* **Ischemic, diabetic or varicose ulcers**

"The effect of **PAP IMI™ 300** Device, a high peak power, low energy, non-invasive Pulsed Electromagnetic Device on patients with **ischemic, diabetic or varicose ulcers after failure of all conventional therapeutic measures**."

Ischemic, diabetic and varicose ulcers are a tremendous problem as they occur in patients who are debilitated in one form or another. These present problems in wound healing caused mainly by a compromise in blood supply to the affected area. If neglected these ulcers can become infected and gangrene resulting in amputation may be the outcome.

There is anecdotal evidence that high peak power electromagnetic pulses are able to improve the healing of these ulcers by increasing the blood supply, stimulating the formation of granulation tissue and preventing secondary infection.

This study is to show to what extend the PAP-IMI™-300 device may improve the rate of healing of chronic skin ulceration. Accurate measurements of the diameter of the ulcer should be used to determine the effectiveness of the treatment.

* **Non-healing decubitus ulcers**

"The effect of **PAP IMI™ 300** Device, a high peak power, low energy, non-invasive Pulsed

Electromagnetic Device on patients with **non-healing decubitus ulcers after failure of all conventional therapeutic measures**."

Decubitus ulcer is defined as ischemic necrosis and ulceration of tissues overlying a bony prominence that has been subjected to prolonged pressure against an external object (e.g. bed, wheelchair, cast, splint). It is most frequently seen in patients who have diminished or absent sensation, or are debilitated, emaciated, paralyzed, or are otherwise long bedridden. Tissues over the sacrum, ischia, greater trochanters, external malleoli and heels are especially susceptible. Decubitus ulcers can affect not only superficial tissues, but also muscle and bone. Because of their locations, and the type of patient they occur in, they are difficult to heal.

There is anecdotal evidence that high peak power electromagnetic pulses are able to improve the healing of these ulcers by increasing the blood supply, stimulating the formation of granulation tissue and preventing secondary infection. This treatment combined with a well-balanced diet, high in protein, and proper care of the ulcer, such as relieving the pressure, may close these lesions without the intervention of surgery.

This study is to show to what extend the PAP-IMI™-300 device can improve the rate of healing of decubitus ulcers. Accurate measurements of the size of the ulcer should be used to determine the effects of this treatment.

*** Recurrent genital herpes, psoriasis and other recurrent inflammatory skin conditions**

"The effect of **PAP IMI™ 300** Device, a high peak power, low energy, non-invasive Pulsed Electromagnetic Device on patients with **recurrent genital herpes, psoriasis and other recurrent inflammatory skin conditions after failure of all conventional therapeutic measures**."

There are many skin conditions of known and unknown causes that present therapy has either little success in treating or the side effects of the treatment outweigh the severity of the primary condition. Such diseases include genital herpes, psoriasis, erythema multiform, pemphigus and other recurrent inflammatory skin conditions.

There is anecdotal evidence that high peak power electromagnetic pulses are able to improve or cure some, if not all, of these conditions.

This study is to show to what extend the **PAP IMI™ 300** device can control these conditions.

* **Painful and edematous hemorrhoids**

"The effect of **PAP IMI™ 300** Device, a high peak power, low energy, non-invasive Pulsed Electromagnetic Device on patients with **painful and edematous hemorrhoids**."

External and internal hemorrhoids occur universally in children and adults. External hemorrhoids (perianal hematomas) usually are thrombosed and often ulcerate. They are almost always extremely painful conditions. Internal hemorrhoids are often asymptomatic but when they enter the second degree of their development they start bleeding. Third degree internal hemorrhoids prolapse and thus become edematous and can undergo strangulation, thrombosis or ulceration which can lead to excruciating pain.

There is anecdotal evidence that high peak power electromagnetic pulses are able to eliminate the edema and inflammation of the hemorrhoids and thus help the healing process.

This study is to show to what extend the **PAP IMI™ 300** device can eliminate the pain and swelling of external and internal hemorrhoids.

* **Opportunistic infections in patients infected with the Human Immunodeficiency Virus**

"The effect of **PAP IMI™ 300** Device, a high peak power, low energy, non-invasive Pulsed Electromagnetic Device on **opportunistic infections in patients infected with the Human Immunodeficiency Virus**."

Treatment of Acquired Immune Deficiency Syndrome (AIDS) remains a major medical problem. AIDS is a complex progressive chronic debilitating disease resulting from contraction of the retrovirus, Human Immunodeficiency Virus (HIV). The CD4+ T-lymphocyte is the primary target for HIV infection because of the affinity of the virus for the CD4 surface marker. The CD4+ T-lymphocyte coordinates a number of important immunological functions, and a loss of these functions results in progressive impairment of the immune response and increased susceptibility to infections. Studies of the natural history of HIV infections have documented a wide spectrum of disease manifestations, ranging from asymptomatic infection to life-threatening conditions characterized by severe immunodeficiency, serious opportunistic infections, and cancers. Other studies have shown a strong association between the development of life-threatening opportunistic illnesses and the absolute number (per microliter of blood) or percentage of CD4+ T-lymphocytes. As the number of CD4+ T-lymphocytes decreases, the risk and severity of opportunistic illnesses increases.

Anecdotal data has shown that, in vitro, the AIDS viruses in a blood sample will lose their infectious capability after being subjected to an electrical current. Repeated exposures to electrical current appears to leave blood virtually free of HIV, as well as hepatitis. It is also suggested that opportunistic infections such as Kaposi's sarcoma and many other forms of cancer, pneumonia and diarrhea can be controlled or improved through changing the membrane potential and porosity of a cell.

This study is to show the effects of ultra high peak power very low energy modulated electromagnetic exposure on opportunistic infections associated with AIDS, especially the effects on Kaposi's sarcoma and Pneumocystis Carinii Pneumonia (PCP).

* **Helper T-cell counts in patients infected with the Human Immunodeficiency Virus**

"The effect of **PAP IMI™ 300** Device, a high peak power, low energy, non-invasive, Pulsed Electromagnetic Device on **helper T-cell counts in patients infected with the Human Immunodeficiency Virus after failure of all conventional therapeutic measures**."

Treatment of Acquired Immune Deficiency Syndrome (AIDS) remains a major medical problem. AIDS is a complex progressive chronic debilitating disease resulting from contraction of the retrovirus, Human Immunodeficiency Virus (HIV). The CD4+ T-lymphocyte is the primary target for HIV infection because of the affinity of the virus for the CD4 surface marker. The CD4+ T-lymphocyte coordinates a number of important immunological functions, and a loss of these functions results in progressive impairment of the immune response and increased susceptibility to infections. Studies of the natural history of HIV infections have documented a wide spectrum of disease manifestations, ranging from asymptomatic infection to life-threatening conditions characterized by severe immunodeficiency, serious opportunistic infections, and cancers. Other studies have shown a strong association between the development of life-threatening opportunistic illnesses and the absolute number (per microliter of blood) or percentage of CD4+ T-lymphocytes. As the number of CD4+ T-lymphocytes decreases, the risk and severity of opportunistic illnesses increases.

Measures of CD4+ T-lymphocytes are used to guide clinical and therapeutic management of HIV-

infected persons. Anti microbial prophylaxis and antiretroviral therapies have been shown to be most effective within certain levels of immune dysfunction. As a result, antiretroviral therapies have been shown to be most effective within certain levels of immune dysfunction. as a result, antiretroviral therapy should be considered for all persons with CD4+ T-lymphocytes of less than 500/:L, and prophylaxis against Pneumocystis Carinii Pneumonia (PCP), the most common serious opportunistic infection diagnosed in men and women with AIDS, is recommended for all persons with CD4+ T-lymphocyte counts of less than 200/:L and for persons who have had prior episodes of PCP. Because of these recommendations, CD4+ T-lymphocyte determinations are an integral part of medical management of HIV-infected persons in the United States.

Anecdotal data has shown that, in vitro, the AIDS viruses in a blood sample will lose their infectious capability after being subjected to an electric current.

This study is designed to show improvement in the helper T-cell count in patients with AIDS. Measurements of helper and suppressor T-cells, P-24 antigen levels and PCR viral DNA studies should be used as parameters to determine improvement in these patients.

* **Chronic diarrhea in patients infected with the Human Immunodeficiency Virus**

"The effect of **PAP IMI™ 300** Device, a high peak power, low energy, non-invasive Pulsed Electromagnetic Device on **chronic diarrhea in patients infected with the Human Immunodeficiency Virus after failure of all conventional therapeutic measures**."

Treatment of Acquired Immune Deficiency Syndrome (AIDS) remains a major medical problem. AIDS is a complex progressive chronic debilitating disease resulting from contraction of the retrovirus, Human Immunodeficiency Virus (HIV).

Diarrhea, caused by the cryptococcus organism, is a tremendous problem in patients suffering from AIDS, and further adds to their debilitation.

Anecdotal data has shown that, in vitro, the AIDS viruses in a blood sample will lose their infectious capability after being subjected to electromagnetic energy. Repeated exposure appears to leave blood virtually free of HIV, as well as hepatitis. It is also suggested that opportunistic infections such cryptococcus enteritis and colitis, which leads to the diarrhea, can be controlled or improved through changing the membrane potential of a cell, restoring the reduced transmembrane potential and porosity of an unhealthy cell.

This study is to demonstrate the effect of high peak power electrical pulses on AIDS patients suffering from intractable diarrhea.

* **Hypoxemia resulting from acute and chronic pulmonary disease**

"The effect of **PAP IMI™ 300** Device, a high peak power, low energy, non-invasive Pulsed Electromagnetic Energy Device on patients with **hypoxemia resulting from acute and chronic pulmonary disease and after failure of all conventional therapeutic measures**."

In both acute and chronic pulmonary disease the symptoms of Adult Respiratory Distress Syndrome (ARDS) may occur. Briefly, what occurs is that plasma and blood leak into the interstitial and intra-alveolar spaces. Alveolar flooding and edema result and surfactant activity is reduced leading to atelectasis. Interstitial and bronchoalveolar inflammation then develops with proliferation of epithelial and interstitial cells and an increase in edema. In the chronic phase severe interstitial fibrosis may occur

leading to low lung compliance. Associated bronchospasm will further increase the hypoxia that develops.

There is anecdotal evidence that high peak power electromagnetic pulses can reduce intrapulmonary edema as well as reduce involuntary muscle spasm and thus reduce bronchospasm. By these mechanisms the hypoxia is relieved.

This study is to establish to what extend the **PAP IMI™ 300** device is effective in the treatment of hypoxia due to ARDS. Measurements of blood gases before, during and after treatment should be used as parameters for showing improvement in these patients.

* **Pelvic pain due to cancer, endometriosis or other painful pelvic disorders after failure of all conventional therapeutic measures.**

"The effect of a **PAP IMI™ 300** Device, a high peak power, low energy, non-invasive Pulsed Electromagnetic Device on patients with **pelvic pain due to cancer, endometriosis or other painful pelvic disorders after failure of all conventional therapeutic measures."**

Pelvic pain is a common complaint. Its nature and intensity may fluctuate, and its cause is often obscure. Pelvic pain may originate in genital or extragenital organs. In some cases no pathology can be demonstrated. Causes include dysmenorrhea, endometriosis, cancer, direct irritation of nerves, etc.

There is anecdotal evidence that high peak power electromagnetic pulses is able to eliminate pelvic pain either due to smooth muscle spasm or inflammatory conditions.

This study is to establish to what extend the PAP-IMI™-300 device is effective in eliminating or improve pelvic pain due to multiple causes. Pelvic pain should be gauged subjectively by using standard visual analog, category and numerical scales.

TECHNICAL SPECIFICATIONS : PAP-IMI™ / NMI

Input Voltage:	230/120 VAC, 50/60 Hz
Fuse:	8/16 amps, Slow burn
Input Power:	1.5 KW max
Output Power:	Complex-Pulsed Induction Magnetic Field, as per oscillogram, with continuously decaying intensity during each complex-pulse, instantaneous initial peak 10000 ampere-turns max, corresponding to 125 gauss, modulated by atmospheric plasma oscillations, PAP method
Total Duration of each Complex–pulse:	10 µs, Peak duration < 1 µs, repetitive 500 ms at 2 pps
Energy per Complex – pulse:	High Selection: 54 Joules max, Low or Normal selection = 2/3 of High selection
Average field power:	54 Joules per pulse x pps at high; 54 x pps watts.
Frequency:	Continuous Fourier Harmonic components from 0.3 MHz to 250 MHz
Probe Induced Voltage:	Effective or Average voltage 18 volts along the perimeter of the loop within 8 cm distance
Induction Probe:	Closed induction coil, 14-16 cm dia., local field[1], and non-radiative[2]
Effective Penetration:	Within 15 cm at full power, diminishing proportionally to the third power of distance
Power Scale:	Two positions, Low or Normal, High
PPS Control:	Pulses per second rate adjustable by automatic electronic control.
Timer and Pulse selector:	Time: 9.5 min max and/or pulses 1 to about 3000 total.
Locks:	Optional and Earlier models only: Cover lock, electric circuit lock for preventing unauthorized use
Counter:	Pulse Count, time count
Main switch:	Self lighted
Sleep – wake up Starter/Stopper:	Start/Stop push buttons. Stops automatically after timer command, after pressing stop, power failure and malfunction of the device (newer models). Operating lamp: Red indicator lamp.
Ventilation:	Small quantity of O_3 ozone and ventilation outlet to outside of

	the building
Weight:	Approximately 80 Kgr.
Dimensions:	118 X 50 X 46
Operating room:	Doubly shielded: Inside safety dielectric shield, Outside EMI Screen shields
Device shielding:	Triple shielded: External safety Dielectric shield box, Double Internal EMI metal shield box, fire and explosion proof.
Special Controls and Safety Features:	Over Voltage Detector and Shut off Mechanism; Leakage current Detector and Shut off Mechanism. Heated control and Over heated Thermal Shut off Mechanism.
Regulations:	The device compiles with the CE and FCC regulations when operated inside an EMI proof enclosure, room or cabinet.

1 Power drops off proportionally to the **third** power of distance. This defines a non-radiative local field.

[2] Reminder: Radiation fields drop off proportionally to the **second** power of distance.

PULSED E/M ENERGY DEVICES SUMMARY

DEVICE	Num of pulses per sec	Frequency	Average Energy/sec or average Equivalent Heat/sec out	Instant or Peak E/M Power out	Active Pulse Time (APT) or Total Pulse Duration/s or Duty Cycle. *** Compression* =1/APT	Parameters within range anticipating to initiate Electroporation
PAP-IMI™-600 (USA,EU) Canada, EU, USA IRB Approved Manufacturer's Characterization: Instant High Pulse Magnetic Generator or Pulsed E/M Field (PEMF) Generator	1.5 - 5/s	Continuous Fourier Harmonics 0.3 to 250 MHz, Plasma Born by Natural Air. Radar pulsed technology	120 Joules/s or Watts	Approximately, Or in the order of 750,000,000 Watts	APT 0.0000001% *** Compression = 6,000,000	YES
DIAPULSE (USA) FDA approved, Manufacture's Characterization: High Peak Pulsed E/M Energy	80 - 600/s	27 MHz fixed by FCC convention. Old radio tube technology	38 Joules/s or Watts	. 975 Watts	APT .0.52 - 3.9% *** Compression = .192.3 - 25.6	NO
MAGNATHERM (USA) FDA approved, Manufacture's Characterization: Pulsed Diathermy	700 - 7000/s	27 MHz fixed by FCC convention. Old radio tube technology	665 Joules/s or Watts	. 1,000 Watts	APT =30 - 75% *** Compression = 3.33 - 1.33	NO
ZIMMER (EU) FDA approved, Manufacturer's Characterization: Pulsed Diathermy		27 MHz fixed by FCC convention. Solid state tech.	150 Joules/s or Watts	. 250 Watts	APT . 60% *** Compression =	NO

					1.66	
CURAPULS 403 (EU) Manufacture's Characterization: Pulsed Short Wave Therapy	26 - 400/s	27 MHz fixed by FCC convention. Solid state tech.	32 Joules/s or Watts	. 200 Watts	. 1 - 16% *** Compression = 100 - 6.25	NO

*Note: Compression also signifies the relaxation time with respect to active time. Exam.:Comp.=100,000 also means that the relaxation time is 100,000 bigger than the active time.

The compression ratio also corresponds to the *crest factor* known for the Electrosurgical Diathermies in the coagulation mode with typical values 5 to 10.

HIGH POWER, LOW CALORIES PULSES

The **PAP IMI™** Device produces magnetic pulses which generate (or induce) electric pulses inside biological matter with instantaneous peak values in the order of 1,000 volts/cm or less and with an average thermal equivalent value of less than 1 volt/cm.

This device was initially designed to increase transmembrane potential of cells after studying all biochemical and electrical parameters of eukariotic cells. The conclusion was that the eukariotic cell membrane may allow instantly and selectively the passage of an electrical charge on a particular ion by a mechanism that is not fully understood, but the permanent dielectric strength of a eukariotic cell membrane or its potential to insulate electricity is much higher than atmospheric air. Besides, the thickness of the cell membrane is extremely small in the range of some 10 Angstroms. This signifies that the cell membrane can stand 0.1 volts over a really microscopic barrier. The strength of the electric field is defined in Physics as volts divided by distance v/m. The corresponding strength of the field that is stopped by the membrane is thus . 0.1 Volts /100 Angstroms = $0.1/10x10^{-10}$=10,000,000 Volts/meter. This means a cell membrane can stand over ten million volts at a distance of one meter while an atmospheric molecule or atmospheric air can stand only one million volts at the same distance! Atmospheric air within one meter from one million volts gets ionized and breaks down - cells do not! This is an incredible dielectric strength for the cell membrane. As a comparison, it may only get directly affected after a radiation affects the air. This explains the distinction between ionizing (hazardous) radiation and non-ionizing radiation. Ionizing radiation is considered a radiation that may potentially have an immediate effect on living matter.

The **PAP IMI™** was calculated to produce a peak field, which at the closest distance is well below the ionizing-the-air limit and, besides, the duration of the peak to last less than a millionth of second - or a duration too short to cause ionization breakdown of the air.

Direct microscopic examination of in vitro cells and of animals' cells discloses no difference for the **PAP IMI™** exposed cells within the least possible distance, compared to unexposed cells.

The design was meant to assist the already known *in-and-out ion transportation* through the cell membrane, such as the circulation of Na and K ions. However, after the first design in 1988, a new technique in 1990 was becoming state of the art and really popular in biochemical literature which was called Electroporation. This technique was applying by conduct similar electrical pulses to the pulses induced by the **PAP IMI™** device. This technique is meant to assist or cause the *in-and-out the cell transportation* - proved to be a universal electrical and biological phenomenon.

Electroporation, in a recent review article in the

Journal of Cellular Biochemistry, 51:426, April 1993, is characterized by

J.C.Weaver of Harvard-MIT Division of Health Science and Technology, as:

a fascinating cell membrane phenomenon with several existing biological applications and others likely...

Electroporation is a universal non thermal biochemically mild phenomenon.

Electroporation occurs at 1,000 to 10,000 v/cm. The **PAP IMI™** produces maximum pulses less than 1,000 v/cm with an insignificant amount of heat. No side-effects have been noticed to date. The

amount of heat delivered is proportional to the total energy delivered per second. In the case of **PAP IMI™**, this amount is 40 to 60 Joules minus the dissipation loses, delivered over a big volume of the order of 30x30x30 = 27,000 cm^3 or 27 liters. This amount is significantly less compared to what other diathermies deliver. However, the instant power per pulse is relatively much higher. The higher the number of pulses, the less the maximum allowed power per pulse, or the lesser the number of pulses, the more the maximum allowed power per pulse. The present device apparently has a number of lesser effects in common with other non thermal devices or high peak pulsed electromagnetic devices or pulsed diathermies with much lower peak values of much less than 1000 Volts/cm. These lesser but common effects can not be attributed to heat. This suggests to us that the common, however less pronounced, effects observed with the other devices producing less peak power are also an Electroporation in origin phenomenon and that Electroporation is not a phenomenon that starts just at a threshold of 1,000 volts/cm, but extends to a lesser extent below this value. Probably, the first stages of Electroporation take place at down to 10 volts/cm or less, however, at a relatively lower rate. Electroporation is not fully understood and explained. Considering the above findings, we may attempt an explanation of the universal phenomenon of Electroporation with the overwhelming plethora of beneficial effects, based on very general principles of Physics and living matter.

An energy transaction is needed for the most minute change in the cosmos. If there is not an exact energy transaction, there is no change. However, not all forms of energy produce beneficial effects or organized work. Energy should be released at a controlled rate, otherwise it is destructive. An explosion is an uncontrolled energy release resulting in a catastrophe. The more the energy is controlled, the more effective and beneficial it becomes. A combustion engine is based on a controlled explosion, however, the better the controller's timing for the explosion, the better the performance of the engine. There are hundreds of examples of this sort. We may conclude that the higher the organization in the distribution of energy, the higher the benefit we may get from a certain amount energy. Thus, energy is classified as high quality or low quality energy. The worst quality of energy is heat at the same temperature as the environment. No useful work can be produced out of heat at the same temperature as the environment. One good quality of energy is electricity - particularly at high voltage.

Thermoelectricity is very low voltage electricity produced at the contact of every metal, however, it is usually so low (lower than a fraction of a volt) that it is not easy to produce useful work and most of it perishes as no practical mechanism may really produce useful work from it.

PEAK POWER PULSES	**UNIFORM HEAT FLOW**
Results	***Results***
DECREASING	***INCREASING***
ENTROPY CARRIAGE	***ENTROPY CARRIAGE***
ANABOLISM	**CATABOLISM**
PROTEIN FORMATION	**PROTEIN DEFORMATION**
ORDER	**DISORDER**
ORGANIZATION	**DISORGANIZATION**

CONSTRUCTION	**DESTRUCTION**
COMPOSITION	**DECOMPOSITION**
COMPLEXITY	**DECAY**
SYNTHESIS	**DIALYSIS**
CREATION	**DEATH**
CIVILIZATION	**CHAOS**
DISTINCT	**DEGENERATE**
DISTINGUISHED	**AVERAGE**

Organized matter increases entropy linearly with time or loses its organization as time goes by. In different words, the organization of a mechanical system naturally evaporates, unless more organization is supplied to it, i.e., unless it is maintained by some sort of external maintenance replacing the natural loss of organization. Among all the natural systems, there is a distinct system called the living system which defeats its natural loss of organization by having the ability to absorb organization from its environment at a rate higher than its natural loss of organization. This absorption of organization causes the expansion of the particular system, either population-wise or evolution-wise (evolving to a more sophisticated system, civilization or species) or both. The defeat of the natural loss of their organization is achieved by absorbing organization from the environment -usually getting the organization from other systems or simply eating other species or plants carrying inherent organization. Energy alone cannot maintain a system. Just fuel energy cannot maintain a car or any machine. Energy plus organization, for example, fat plus proteins or what is known as food, may maintain an organization or it may even advance it to a more complex one.

Thus, the basic essence of life,

Is a general phenomenon, the detailed mechanics of which is not yet understood,

But for which we know that it is *defeating* its own natural <u>loss of organization</u>

by <u>taxing organization</u> from its environment.

Supplying heat with an ordinary diathermy, we provide low quality energy to the system, carrying very little or no organization to the system. Unless we have some form of control, we may destroy the system by accumulating excess heat. A higher temperature pulsed diathermy provides a higher quality of energy which may become beneficial provided the total amount of thermal energy is not provided in excess, i.e., the high temperature pulses are short enough to not result in a high accumulation of heat. From the thermodynamics point of view, for the same amount of energy, the higher and shorter in time the pulses are, the higher the power (or the organizing power) and the less entropy or disorganization they carry. Probably, it is not accidental that continuous heat (energy at the lowest organization level) decomposes proteins. However, in the presence of electrical discharges - a very high pulsed and thus organizing phenomenon - proteins are found to be composed - a phenomenon established by Stanley Miller in 1953. Photosynthesis also occurs with primarily ultra Violet light and not with infrared. Ultra violet light in comparison to infrared, having much higher frequency or shorter wavelength, is of more

wave packet or particle like character, according to Quantum Mechanics. Thus, ultra violet is more discontinuous or discreet or so to speak pulsed with respect to infrared. We may attribute to this A pulsed character of ultra violet light its ability to produce photosynthesis and thus sustain life on the planet earth.

Very high amplitude pulses should not be of concern, unless, they carry over a certain amount of energy. The amount of energy a pulse is carrying is independent of its amplitude or power. The energy of a pulse is equal to its amplitude times its duration or its power times the time it lasts.

Energy of a pulse = amplitude x duration = power x time.

One may have a low and long pulse, which may carry a lot of energy, as well as one having a very high and short pulse, which may carry less energy. A pulse may or may not be destructive. This depends on whether the total energy which it delivers is higher or lower than the amount needed for a particular change (destructive or not) to occur. If the amount of energy delivered is less than that required for a particular change, then that change (destruction) does not occur.

However, between two pulses with the same amount of energy, E_1, E_2

$$\mathbf{E_1 = h_1 x t_1 = h_2 x t_2 = E_2}$$

the most constructive one -in the sense of living matter which absorbs organization from its environment at a rate higher than it looses it- is the pulse which carriers more organization or less entropy, i.e., the higher and shorter pulse with amplitude h_1 h_2 and duration $t_1 < t_2$.

We may at this point explain why high peak power low energy electromagnetic pulses or Electroporation seems to be so fascinating and so promising new modality today.

After Note: Reading the independent writing in the recent book by

Prof. Dr. Franco Bistolfi, Radiotherapy Department, Galliera Hospitals, Genova,

Biostructures and Radiation Order Disorder, Edizioni Minerva Medica, Torino 1991,

is strongly recommended.

Appendix:

HIGH POWER LOW CALORIES PULSES

are the least Entropy Pulses, or, practically Zero Entropy Pulses.

In delivering heat energy from a source to an absorber there is an important parameter that specifies this delivery which is called the entropy. Entropy is equal to the ratio of the heat Q delivered at the temperature of the delivery T, i.e., Q/T. The importance of this parameter is discussed in every book of physics. However, there is no similar parameter in the present day physics for other energy forms, i.e., electromagnetic energy, sound energy, etc. We suggest here that for other forms of energy too, there exists a general parameter corresponding to the Entropy concept of Thermodynamics, which is the ratio of the **Paverage/ Ppeak**. We find that the inverse of this ratio, i.e., **Ppeak/Paverage** is more practical and we shall call it the Eutropy of the energy transfer or state, in distinguishing it from the concept of Entropy. Eutropy for heat will be defined as T/Q. The difference between Entropy and Eutropy is reciprocity. Entropy naturally increases, however, Eutropy decreases. Entropy corresponds to disorder. Eutropy corresponds to order. Disorder naturally increases and order decreases so do Entropy and Eutropy correspondingly.

In thermodynamics there are two fundamental quantities that of heat which is an amount of energy and that of temperature which is a state relating to heat and indicating how fast molecules vibrate or randomly move around in a confined space.

Heat is the measure of the total energy delivered. If we define the power of the energy delivered in the form of heat besides the amount of heat delivery, then we have exhausted all the parameters that specify this energy delivery. Therefore, heat is undoubtfully the amount of energy delivered and the temperature is the power of the delivery, i.e., the speed the particular amount of heat was delivered. There is an obvious dual correspondence heat to energy and temperature to power.

For a general form of Energy delivery other than heat, we may generalize the definition of entropy to:

Energy/Power.

This ratio corresponds to the ratio:

Average Power/Peak power.

If Peak power is maximum and average power is the least during a delivery, and let us assume that the delivered power transforms into heat Q, which is a probable assumption, then the instant temperature of the receiver will be maximum while the delivered heat Q will be minimum. Therefore, the ratio: Q/T in this case will be minimum when ever the ratio:

Average power/Peak power

will be minimum. We call this ratio the generalized entropy change during the general energy delivery.

However, the inverse ratio

Peak Power/Average Power

is more important, as it corresponds to concepts of order instead of disorder, to increasing gain instead of decreasing gain, etc, i.e., it is closer to man's efforts in every day life and long term civilization as well as technology. We call this ratio the Eutropy change of the general energy delivery.

Examples: Eutropy for DC current delivery is **Peak Power/Average Power = 1**. The Eutropy for alternating sinusoidal current delivery is **Peak Power/Average Power = 2**. The advantages of the alternating sine current over the direct current is described in every textbook of electricity. It is also known that the higher the voltage the less the loss in transferring electricity. It is obvious, if the sine current is changed to an alternating current with enhanced peaks then the current will stay longer at higher voltage values and the losses will become less. In this case, the Eutropy of the enhanced peak current with less losses has a value bigger than 2.

It becomes obvious in these examples that the higher quality of the delivery system is reflected to a higher Eutropy number.

OVERVIEW of ULF, ELF, LF.

Recently there has been great concern and publicity about high voltage power lines, running through the country and passing over houses, schools, and other buildings, that might cause cancer in people, living in them. However, this claim has been disputed by others and nothing has been finally proved. Whatever happens because of chronic exposure to high power lines, leaves no visible or detectable evidence to the plants and animals under them.

We shall try here to shed some light from another point of view to the general issue of how electricity might have adverse or beneficial effects. First, we would like to distinguish two main categories of electromagnetic fields. With the term *"field"*, we mean the area of space upon which electricity exercises its influence without making physical contact with the subjects.

In the first category are the constant fields, i.e., fields which do not change polarity with time (SF) or that change their polarity very slowly (ULF, ELF, LF). Such a field is the natural geoelectric field, which is a strong vertical electrical field everywhere during good whether conditions, due to a huge high voltage field existing over our heads of the order of billions of volts, between the ground and the ionosphere, some 50 Km above us. This field may quickly start reversing during bad weather conditions and cause lightning, a several Km long spark. Some 10,000 volts are needed to ignite a 1 cm long or 1/100,000 Km long spark in the atmosphere. Based on this, one may estimate for himself the magnitude of the natural high voltage in which we are constantly living. I may only say that man has never reproduced artificially any field strong enough to compare to this huge electrical field of nature.

Another field is the natural and weak magnetic field of the Earth, in the order of 1 to 2 gauss. Other such fields are man made, and they are the slowly varying or low frequency fields produced by the high power lines, the electrical wiring in our houses, or the electrical lamps next to our beds. It is not only the magnitude of the high voltage these lines carry in order to exercise their influence, but also it matters how far we are from them, as the influence drops very quickly with distance. For example, one may get a higher exposure, sleeping next to an electric lamp than the exposure of the high power lines over his house, particularly if the wiring in his house is not well neutralized or he is using long fluorescent lamps which technically form unbalanced electrical loops, producing much stronger fields around them.

In the second category are the fast varying or high frequency electromagnetic fields, HF, VHF, UHF, MW. Such fields are the natural coming to earth of radio waves from deep space and the sun; the natural lightning field; the various man made radio and television waves; the various man made non

radiative fields, such as the diathermy fields, fast pulsating fields, the **PAPIMI™** field, the automobile and motorcycle spark plug field, the electric motors (sparking) field, particularly the electric train heavy motor (sparking) field, the electrosurgery field, etc., exposing almost all civilians, technicians, surgeons and patients of this planet.

Finally, we may include in this category the heat fields, infrared, light, ultra violet, x rays, and gamma rays. However, the latter fields have been examined extensively elsewhere and we shall not include them in the present small analysis.

The question is to what extent these fields are harmful or beneficial?. Taking into account their enormous daily exposure to life, since life appeared, they can not be very harmful, otherwise they would not have allowed life to develop or would have extinguished life on earth by now. On the other hand, taking into account that life is exclusively dependent on the electromagnetic field in the form of light, we may categorically say that some of them are beneficial and necessary for the existence of life.

Having stated the two main categories, we would like to distinguish the reason for separating them. From a physical point of view there is only a general way to see how these fields produce their influences. They affect living matter by setting various internal motions to the electrical charges and to the ions of this matter, i.e., inducing an electrical current to the living matter, either DC or AC, either a tiny one, or a considerable one. Therefore, we have to examine the general effects of electrical currents to answer our general question. There are two main effects of electrical current into matter: electrolysis and the heat or energy effect.

We should consider here the heat effect, as a special low subcategory of high order energy effects of electricity which particularly concerns the **PAPIMI™** effect. The heat effect is produced whenever a substantial electrical current goes through a medium organic or non organic. It is known as the Joule heat effect of electricity familiar almost to every body. It may be beneficial or destructive, depending whether the current is weak and moderate or it is strong and over a limit.

The other effect associated with the electrical current is electrolysis. Electrolysis is a general term used in physics and chemistry to indicate the phenomenon of chemical decomposition and chemical transportation caused by electrical current into certain substances called electrolytes, no matter how weak or strong the electrical current is, provided its potential (vis. its pressure on the exposed electrolytes) is over a limit of a few volts. Electrolysis is caused by constant polarity electrical current, or slowly varying electrical current like ULF, ELF, LF. Higher frequencies like HF, VHF, UHF, do not cause electrolysis, due to the fast varying polarity of the field, causing a back and forth electrical motion which is self-neutralized. Uncontrolled and extensive electrolysis in living matter might be harmful, toxic, and even fatal. It is the main cause of death by electrocution.

Very weak electrolysis is theoretically possible to be caused by all ULF, ELF and LF fields, if they are strong enough over a certain limit to surpass the so called electrolytic potential of the electrolytes in the substance under exposure. Steady polarity fields are not expected to cause electrolysis, because they induce no motion to electrical charges or ions. Similarly, ULF fields cause less induction effect, i.e., less ULF current induced with a particular ULF strength, but ULF current is more effective for electrolysis. Therefore, there is a peculiar trade that tiny or weak electrolysis may be caused better somewhere between strong ULF and LF fields under chronic exposures. However, it is questionable whether such weak and slow electrolysis by strong LF fields may not be taken care of by the defense

systems of the living matter, taking in to account that some particular LF are naturally existing in the earth-ionosphere cavity (known as the Schumann oscillations) since life appeared.

HF fields are widely known to cause heat. Heat is a random motion into all directions of the molecules with no particular order. Heat or disordered motion is random kinetic energy in the atomic and molecular level. Providing heat over a certain limit one may destruct a system. Therefore strong uniform HF fields may be destructive by causing excess heat. However, among the stated HF fields of radio, television, outer space, motors, automobile spark plug fields, etc., none may cause substantial localized heating to be of any concern, other than the continuous diathermies and Electrosurgical diathermies, inside the proximity of their effective range.

Energy is supposed to be conserved, i.e., not to be created from nothing, nor to vanish to nothing. We may not be concerned for the degree of the accuracy of this low here. However, energy is self-transformed from one form to another. Doing so, it is like coming down hill or coming down a non-reversible ladder. Somehow energy self-transforms into a lower rank each time, until it reaches uniform heat that may not self-transform any more. However, no energy transformation is equivalent to still death for the system. This is expressed in physics by stating that the energy of a closed system is conserved, but the system increases its entropy each time its energy transforms. The system becomes inert when its entropy maximizes. We may express the same thing using different words, which will make easier to understand this mechanism. The energy of a closed system is conserved. Its energy transforms from one form to another, but the system loses some structure each time its energy is transformed. The system will be become inert when it will loose all its structure. A closed system will undergo more transformations and will last longer its functions, before it ends to a still randomly uniform collection of objects, the higher its initial structure stands or how much initial structured energy the system contains, before this energy degrades into uniform heat with no possibility of farther transformation.

HF fields may provide not only heat which is a special form of energy, but generally energy at a higher structure or a higher order energy, as stated previously. Supplying high structured energy to a closed system reverses its degradation. Or by doing so, one may maintain the system from its natural disorder and degradation. HF fields may provide higher order energy compared to heat energy, provided their are modulated. Fortunately, most of the man made radio, television, and radar waves permeating all cities, are modulated. Particularly, these waves might be very beneficial providing substantial ordering into biological systems, if they are modulated in a particular way.

Modulated HF, the beneficial effect.

Where Science missed the point... some seventy years ago.

Pulsed Electrosurgical Diathermy, the unknown tool in every surgeons hands.

Pulsed Laser Surgery - what is the key of modern technology.

DEMYSTIFICATION OF THE MYSTIC DEVICES

Nature usually proves to be more simple than suspected, no matter how well it hides most of its secrets, if one can see *"far and near"* enough. Established knowledge aims as a general practice to retain its limitations, and tries to prevent any new entrance in its premises for the fear of altering its status. Scientific integrity and discipline dictate making public scientific knowledge and its underlying simplicity, in an attempt to prevent scientific prejudice and confusion, advancing truth and benefit to science and society.

There is a thrill in the alternative medicine for a number of miraculous devices which have received a tremendous opposition by the medical society. In six years of research, personally, I came to know one by one of these devices. Incredible scenarios have been played around these devices. Ignorance of both sides, inventors and established science dominated in a tremendous conflict in the name of public interest and health. Relevant literature one can find in numerous related publications.

One should not be misled that each described device below is a masterpiece of a possible high technology, but each device constitutes an effort under usually difficult circumstances towards a guess in an inventor's mind. Neither the information provided here may be considered sufficient to provide such enough technology to produce or reproduce these efforts.

A principle may raise a physical theory. However, a theory is not sufficient to provide applications. Applications require a technology. Technology is an art that one may combine various parameters of the physical theory. Efficiency, safety, stability, durability, and reproducibility may vary upon the choice of these parameters. A choice of these parameters may not be easy or may not be known. An optimum choice is the choice of a high technology and of mastering the principles of the technology. It is usually the product of many years effort and work of talented inventors and scientists.

Some technical or physics knowledge and understanding is assumed for reading the following.

Definitions of technical terms:

Characteristics of a radio wave or electrical oscillation are: Frequency and Amplitude.

Frequency: Is the number of changes of polarity of a radio wave or electrical oscillation. It is measured in Hz, KHz (1,000Hz), MHz (1,000,000Hz), GHz (1,000,000,000Hz). Audio Frequency (AF) is a frequency less 20 KHz, Radio Frequency (RF) is a frequency bigger than 100 KHz

Amplitude: Is the energy carried by a wave or the energy of one oscillation.

Continuous Wave (CW): Is a wave with constant amplitude.

Damping Wave (DW): Is a wave with amplitude decaying over a period of time. The ring of bell after receiving a force impulse produces a damping sound. Similarly, an electrical oscillator after receiving an electrical impulse produces a damping oscillation. DW may be considered as strongly and abruptly modulated CW. (see below modulation)

Modulation (Amplitude) (AM): Is a modification of the amplitude of a wave or oscillation.

Telecommunications, radio and television are examples of the art of modulating radio waves and broadcasting them. It is a method loading information on a plane wave or CW. Modulation is apparently a major feature in the Electrotherapeutic devices below. However, it should be remembered modulation is not a simple task. There are an infinite number of ways of modulating a CW. Every picture, every sound or any information transmitted by a radio wave is due to a different modulation process carried over time on a CW. There are another two different types of modulating radio waves: by frequency, frequency modulation (FM); and by phase, phase modulation, (PM). Modulation below refers only to AM.

Pulse: May be considered as a severe or abrupt modulation of a radio wave or oscillation that the amplitude jumps from zero energy to maximum energy. Producing a pulse is not an easy task, as jumping from zero to a certain value of energy always takes (long) time. This transition time is very critical and characteristic of the quality of a pulse. The faster the jump, the higher the required dissipating power to cause it.

Impulse: Is a very short and strong pulse.

Electroporation: is a newly discovered phenomenon concerning the cell and its membrane. It is defined as a non-thermal biochemical mild phenomenon known to affect the porosity of the cell membrane, when the cell is exposed to electrical pulses between 1,000V/cm to 10,000V/cm. The most prominent manifestation of Electroporation is the formation of pores on the cell membrane, like craters formed from inside out.

It is reasonable to assume that the phenomenon of Electroporation is not only manifested by the formation of pores on the cell membrane, but these pores is the result of increased cellular activity and excess flow of materials through the membrane. At lower values of the pulsating electric field it is anticipated that increased cellular activity is not reaching the threshold of creating significant pores. Low energy pulses should stimulate cellular activity without forming pores at values less 1,000V/cm. On the other hand, at higher values of the pulsating electric field, higher than 1,000V/cm, weak membrane cells or organisms may burst apart.

It is important to note that Electroporation is not produced with CW fields or static fields,

but only with pulsating electric fields appropriately administered.

Administration of an electric field deep into a tissue, constitutes another technical problem as conductive surface or skin acts as a preventive Faraday cage (a phenomenon known as the skin effect) absorbing most of the time varying fields as the electric pulses are. Electroporation is performed in biological labs by commercially available Electroporators (Pulsed and RF Pulsed see Electroporators below) in vitro, i.e., to cells kept in small test tubes or in appropriate small containers. Most of the assumed *"miraculous"* devices listed below seem technically to be associated with Electrical Pulses, AM Modulation of RF, and Electroporation.

In vivo: In substances that are part of a living entity.

In vitro: In isolated substances kept in a container usually from glass.

The Early Electrotherapeutic Devices.

(The following information is taken from the manual on

"High Frequency Currents" by ***Noble M. Eberhard, MD, PhD, DCL,***

Fifth Edition, New Medicine Pub. Co, Chicago 1919).

The early Electrotherapeutic devices were based on the Leyden Jar condenser discharge. They were mainly two types that of D'Arsonval type and that of Tesla. Both types were based on the same known principle of Tesla for high voltage, damping wave (DW), radio frequency generators, however, they differ in the output circuit. The Tesla type used a step up transformer - the Tesla coil to step up the voltage out-put as high as possible, however, limiting unavoidably the associated current to very low values. The D'Arsonval type on the other hand, provides a higher current at lower voltage, incorporating a different output circuit. The D'Arsonval type became more popular.

In applications, it became standard for both types of devices to use the so called *"Oudin resonator"*. The Oudin resonator was a vacuum glass tube or a low pressure tube. This tube was connected to the output of these devices, producing corona discharges or static discharges - known as the "cold" fulguration spark which penetrated the glass and reached the patient's body.

The early Electrotherapeutic devices were made by big companies like *Thompson-Plaster X-Ray Co., Inc., Leesburg, Virginia*. They were very popular in almost every Hospital. Their applications are listed in Professor's Eberhard manual and occupy over 120 pages. The applications are presented in alphabetical order, from: Abscess, Acne Rosacea-Vulgaris, Actinomycosis, Adenitis, to Varicose Ulcers, Warts, Writer's Cramp, Wry Neck.

These devices, due to the damping nature of their oscillations, may be considered as pulsating and they are high peak power low average energy devices. They should perform on the same ideas exposed previously in this presentation and should excite intercellular activity, should increase Electroporosity of cells enhancing the in-and-out exchange of materials of the cell and eventually enhancing metabolism. The function of the Oudin low pressure tubes should be theorized to enhance the instantaneous intensity of the peak power of the oscillation, by independent corona oscillations occurring at the Oudin tube being excited by the main DW oscillations.

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The Rife Device

Royal R. Rife was born in Elkhorn Nebraska. At the age of 25 in 1913 he arrived in San Diego. For 7 years, he traveled to Europe to investigate foreign laboratories for the USA government. Zeiss, a major German optical company, were among them, where Rife learned the art to make microscopes (He had been personally trained by Carl Zeiss). It was this period he learned his mechanical skills necessary to build instruments. He was fascinated by bacteriology and microscopes. He was never really in to electronic engineering. Rife's microscopes are well known and became a thrill for their assumed magnification. Not very much is known however, about the Rifes radio frequency machines. In 1920 he had built his first microscope and had managed to get his first frequency machine which was actually a *Thompson-Plaster Electrotherapeutic device* of the D'Arsonval type, equipped with the Oudin vacuum glass tubes (information communicated privately to the author by his assistant J. Crane and later confirmed by J. Flores, also one of the assistants). The results which are listed for Rife getting were: curing cancer, extinguishing organism, viruses, etc.

In 1912, the great inventor Lee De Forest discovered the celebrated triode vacuum tube capable to amplify, and produce continuous wave oscillations(CW). Damping waves are inappropriate for transmitting the human voice, music, sound or information which we now know that is possible with the continuous waves,(CW). Damping waves by their very nature carry noise sound which interferes adversely with any other sound or information that may be attempted to be transmitted with. In 1920, eight years later, the first continuous waves CW were broadcasted, initiating a new technology for telecommunications and radio, producing new Hertzian waves - the Continuous Waves - CW. Sound, music and picture were eventually broadcasted by a CW. However, fortunate had been the CW for radio and television, nevertheless, they had been the disaster of the Electrotherapeutic Devices.

Eventually, the new technology of CW, unfortunately entered also into the structure of the early Electrotherapeutic devices which replaced the Leyden Jars and the spark gaps with triode and tetrode vacuum tubes oscillators which produced continuous or non-interrupted oscillations. Nobody seemed to want DW. DW were considered primitive, inappropriate to carry sound, music and picture. Damped oscillations and waves (DW) were past history. Everybody was fascinated with the telecommunication potentials of the new waves and nobody (other than Rife) seem to had been aware of the biological significance of the old DW waves. The new technology bringing in the new reality of the undamped waves, or the continuous waves CW, initiated the era for the radio-telecommunications, radio and television; and eventually terminated the era of the Electrotherapeutic Devices.

Telecommunications today are based exclusively on CW carriers which most of the electronic engineers seem to know very well. Rife apparently followed the trend and was soon sympathetic towards the new technology of radio tubes. He managed to get a radio tube technology CW generator. He also builded a new Oudin vacuum tube which he called the Rife Rey Tube to connect with. However, the new technology of CW Electrotherapeutic devices with uninterrupted function produced obviously heat and no exciting medical results. A new name Diathermies (Dia-thermies) characteristic of the new effect *"deep heating"* was replacing the old name characteristic of therapy by electricity -*Electrotherapeutic*, which was a name obviously no longer valid.

Apparently, Rife was not detecting with his ahead of his time microscope, the same results with the CW Generators as with the old Electrotherapeutic DW devices. Rife quickly understood the cause for not having results was the non-interrupted CW waves. He decided to chop the CW and simulate them with the old Electrotherapeutic devices damping waves, DW. Rife was ahead of his time for a second time, first to realize the significance of DW for biology and medicine. The later Rife Generators were CW Radio frequency generators using modern radio tube technology modulated or chopped by another amplifier at an audio frequency to simulate a DW. It was this audio frequencies and not the CW Radio frequencies that Rife was investigating and claimed to be responsible for the many results he was seeing

(see The Cancer Cure that worked by Barry Lynes, Marcus Books, Ontario, 1989).

What happened with the new technology CW Electrotherapeutic devices or the CW Diathermies (using their new names) replacing the old DW Electrotherapeutic devices. Obviously, they had no results Professor Eberhard was teaching at the Department of Electrotherapy of the Chicago Medicine of College. Hospitals start not using the modern CW Diathermies any more to the same extend and purposes they were using the old DW Electrotherapeutic Devices.

The Rife modulated RF generators were the first modern devices to simulate the function of the old Electrotherapeutic Devices.

The Crane Device

John Crane, assistant of Rife went one step ahead, perhaps too far. He assumed that the audio frequency produced all the biological and medical results. He thought the presence of the CW carrier was not necessary. He produced an audio frequency generator the "Model CFR-1000" (out of his Crane Foundation for Rife Technologies) which was a solid stage programmable amplifier of the type Rife used to modulate his CW generator. Crane recorded in video exploding bacteria by his audio frequencies.

At one stage the Crane generators were identified as the Rife generators and became very popular. They were modified audio generators which one could buy ready made from Radio Shack (adding an amplification stage to it). Author's close examination of the Crane device, assumed to be a Rife generator, revealed that this device was a modern electroporator capable bursting microorganisms in vitro, i.e., at very small distances of the order of a fraction of a mm (millimeter) on a piece of glass under the microscope. The Crane output less than 60 volts (maximum voltage that can be afforded when brought in contact to the human body) may only burst microorganism at distances no bigger than a fraction of mm. The Crane device may be theorized that does not perform in vivo, i.e. on a human body or animal. The arrangement of Crane (shown by Crane to the author) was identical to an electroporator arrangement given in page 12, "Guide to Electroporation and Electrofusion" Academic Press, 1992.

Crane, the man who spent three years imprisonment for his activities, should be considered as the first man to perform in vitro Electroporation at a time that science ignored one of the most promising coming branches of biology and medicine. The story of Crane is a drama of an old Greek tragedy played by modern science.

The Lakhovsky Device

George Lakhovsky, a Russian engineer, established himself in France, became a French citizen and was awarded the red ribbon of the Legion of Honor for his technical service during the First World War. He died in New York in 1942 at the age of 73. Lakhovsky was associated to Professor D'Arsonval who developed the first electrotherapeutic devices -see above the first electrotherapeutic devices. D'Arsonval one of the greatest scientists of our age presented communications of George Lakhovsky to the Paris Academie des Sciences and sponsored Lakhovsky's major work *"The Secret of Life"* published by Heinemann Medical Books Ltd in 1935.

The George Lakhovsky device is a complex multi-wave Electrotherapeutic device with several DW oscillators on it. It is described in the Lakhovsky's USA Patent of 1941, 2,351,055: *"This invention relates generally to electric devices excited with impulses and more particularly to multiple wave length conducting and/or producing means"*.

Lakhovsky refers wrongly his device as a continues wave oscillator in his book *"The Secret of Life"* and should not be considered literally his devices so. Clearly, the Lakhovsky device described in his patents is a non continuous wave multiple radio frequency generator and particular a DW generator, having several resonant antennas attached to it, which are expected to tune in a DW mode after receiving an electric pulse or impulse. Apparently, Lakhovsky never adopted the new technology of Lee de Forest's radio tubes of his era as Rife did. Lakhovsky missed the comparison and inefficiency of CW with respect to DW. Unfortunately, for Lakhovsky the important difference and superiority of damped waves with respect to continuous waves remained unnoticed in all his otherwise correct and brilliant work, though in his applications he was using the right waves.

One may expects merits for the Lakhovsky device, due to its pulsed character and DW oscillations, as in the old Electrotherapeutic devices. However, the expected power of the Lakhovsky devices should be expected technically weaker compared to Priore's and Dotto's devices. The device may be theorized to stimulate intercellular activity, to mildly increase Electroporosity of cells, enhancing somehow the in-and-out exchange materials of the cell and eventually to increase some metabolism. The inventor claimed treating and curing cancer and many other degenerative diseases.

The Priore Device

Antoine Priore graduated from a school of electricity in Trieste, Italy and became a radar operator in Italian Navy. *"During this period he observed what to him was an exciting anomaly: some oranges left in the room filled with electrical bric-a-brac had fallen into an assemblage where they seemed to have been preserved in the same fresh state they had enjoyed when bought off a fruit stand. Other oranges in the room, bought at the same time, were rotten and putrid. Stunned by his observation, Priore dreamed through out the war of one day working out an electrical means of conserving foods in their fresh state based on what was a new, and wholly unexplained, principle. Newton's apple had become Priore's orange"*. We should note that a radar broadcast consists of a highly modulated microwave emission or as they are known the radar microwave pulses. Though, most people know about the Newton's apples, no body knows about the Priore oranges, however, Foodco a subsidiary company of Maxwell Laboratories of San Diego, California, a company engaged in food preserving seem to know much about oranges. They are developing food preserving modality based on strong electrical pulses or electroporation.

The device Priore developed simulated powerful radar pulses modulated by three series of frequencies one subsonic 0.5 to 2 Hz, one audio 300 to 900 Hz and one High to VHF radio frequency 16 to 300 MHz. The Priore device could be theorized to excite intercellular activity, to increase Electroporosity of cells enhancing the in-and-out exchange materials of the cell and eventually increase metabolism. Probably, intense exposure may cause the more evident effects of Electroporation, i.e., create bigger pore on the cell membrane, even bursting weak cell membranes or weak organism's membranes, i.e., may necrotize cancer cells by bursting the weak cancer cell membrane, kill microorganism as it was reported in numerous papers to the French Academy of Science. Info: Priore's french patent 1,342,772;

"*AIDS, Biological warfare"* by T.E. Bearden, Tesla Book Company, Greenville, Texas, 1988.

The Dotto Ring

Gianni A. Dotto was born in Venice, son of a prominent engineer who was the designer of two hydro-electric generating plants on both the American and Canadian sides of Niagara falls. His father was an Italian Marquis from a family directly descended from Galileo. Dotto had been trained as paratrooper, American fighter pilot and had become the head of the racing team of Alfa-Romeo, designer of racing cars and Professor at the University of Milan. He had two PhD's, one in Mechanical Engineering and one in Nuclear Physics from University of Milan, a degree in Electrical Engineering from the Wayne University of Detroit and became a prolific inventor having numerous Italian and American patents.

The Dotto ring was powered with a peculiar thermoelectric metal junction producing both a carrier oscillation and a modulation, in a way that is not known in Physics textbooks. The figure of 30,000 Amperes given by Dotto, though a considerable high current, matches with his claim of producing a moderate intense magnetic field for the particular size of his ring (confirmed by the Author's own calculations). Also his independent emphasis for having his oscillations modulated or shaped with high energy excursions agree with the general trend in all relevant devices. This underlying coincidence of modulating an electromagnetic wave should be scientifically convincing that there is a substantial truth in the mysterious and allegedly miraculous Dotto ring. The effective mechanism and results of the Dotto ring probably should be theorized the same as that of Priore device.

The Rapsomanikis Device

Evans Rapsomanikis was graduated from the Athens Technical University as an Electrical Engineer.

He had been senior research scientists and director in numerous of top secret projects of Lockheed - such as Antisubmarine, Warfare, Guidance systems, and others for about 30 years. He developed the Satellite Guidance System L1011, now used with commercial jet airlines. He engaged himself to his Device and project after retiring from Lockheed.

Rapsomanikis has not made public the details of his technology. However, it is the authors understanding based on descriptions of various patients treated with the Rapsomanikis devices that Evans was using contact electrodes on the skin as a TENS device and also had the genius idea to use a perpendicular magnetic field to guide deep enough the electrical pulses into the body. Remember, fast current pulses administer by contact to the skin will stay on the skin by the skin effect. Similarly, an electric pulse will not penetrate the skin, because, physics by the principle of Gauss, teaches inside a hollow or solid conductor - the skin - the electrical field is zero (in effect the skin is a Faraday cage). Rapsomanikis genius innovation is a magnetic field which he uses as a guider or carrier for his electrical pulses. The inventor claimed treating cancer, AIDS and degenerative diseases.

Pulsed Electrosurgical Diathermies.

These devices are the modern solid state descendants of the Tesla and D'Arsonval Devices. (see description in the table list).

Similar results as those reported for the Diapulse, apparent results for the PAP-IMI™, or the Early Electrotherapeutic devices, are reported in french manuals, i.e., increase of vision, hearing, etc.

Electrosurgical Diathermies, as the most used tool in operating rooms, are the best example proving that CW and DW have different biological effects as we claim here. Electrosurgical Diathermy comes in to two main modes under the same energy. As a continues mode CW - cut mode and as a pulsed mode - coagulation mode. Electrosurgical Diathermy is an undisputable example proving that structured (pulsed) energy is different than the same amount of plain energy.

Applications of Electrosurgical diathermies are enormous and can be found in manuals not restricted by the regulations of FDA.

Pulsed Laser Surgery.

Surgery Laser Devices have also two modes, a cut mode and coagulation mode analogous to the Electrosurgical Devices. The coag mode is a pulsed thin beam laser light, i.e., a chopped or modulated laser beam. Literally it is a high peak power low average electromagnetic energy in the form of laser light. The cut mode is a continuous mode laser beam or a blend of continuous mode and a pulsed mode to smooth the continuous mode destructive power. Laser surgery follows the same principle as every other device listed above with a different carrier, a laser beam - which is coherent electromagnetic energy in the light frequency, instead of radio oscillation or wave - which is also coherent electromagnetic energy. (Note 1: Both radio waves and laser waves are coherent radiations with only one difference - frequency; Note 2: Ordinary light is a non-coherent mixture of frequencies). So here, we have a general profound phenomenon manifested with different carrier oscillations, independent of their frequencies, and primarily dependent on the shaping of their amplitude or their modulation, i.e. dependent on the structure of their energy release.

Below we list the indications

taken from Professors's Eberhard's book.

Notice: These indications should not be considered the same for the **PAP IMI™** devices,

or the two technologies are not identical. There are a number of serious differences.

We give two examples, in most cases the **PAP IMI™** units tried for asthma and hemorrhoids gave impressive results, however, Eberhards finding for the same cases are not strong.

On the other hand, certain other indications have never been tested or tried for the **PAP IMI™** devices. For those cases tried with the **PAP IMI™** units, see the beginning of this presentation.

The table below,

as the rest of similar tables below

are given for comparison and scientific research only

1. Eberhard’s Indication’s:

Abscess prevention : low vacuum tube theoretically indicated if already exists: high vacuum tube indicated

Acne Rosacea (Red Nose) indicated

Acne Vulgaris (Pimples) highly indicated

Actinomycosis (Ray Fungus) indicated

Adenitis, Cervical (Tuberculosis of Glands) indicated (only in combination with the X-ray)

Adhesions indicated

Albuminuria (Nephritis; Bright,s Disease) neutral

Alcoholism neutral

Alopecia (Loss of hair) highly indicated

Amenorrhea neutral

Anemia and Chlorosis indicated

Aneurism negative

Appendicitis, Catarrhal negative

Arteriosclerosis and High Blood Pressure indicated

Articular Rheumatism negative

Asthenopia indicated

Asthma indicated (a cure should not be expected)

Ataxia neutral

Atonic Dilation of the Stomach indicated

Atrophic Rhinitis (Ozena) indicated

Atrophy of the Optic Nerve indicated

Baldness (Alopecia) highly indicated

Barber=s Itch (Sycosis) neutral

Bladder Disease (Cystitis) highly indicated

Bladder, Papilloma of indicated

Blepharitis indicated

Blindness from Intra-Ocular Haemorrhage indicated

Blood Pressure indicated

Boils (Furuneulosis) indicated

Brachial Neuritis indicated (but must be used judiciously)

Brain Fag indicated

Bronchial Asthma indicated (a cure should not be expected)

Bronchitis indicated

Callouses indicated

Cancer neutral

Canities (Gray Hair) indicated

Carbuncle indicated

Carcinoma neutral

Cataract indicated (may be useful / in the early stages)

Catarrh of Bladder (Cystitis) highly indicated

Catarrh of Bowels (Colitis, Enteritis) indicated

Catarrh of Nose (Nasal Catarrh, Ozena) indicated

Cararrh of Womb (Endometritis, Cervicitis) highly indicated

Cellulitis indicated

Cerebral Haemorrhage indicated

Cervical Adenitis (Tuberculosis of Glands) indicated (only in combination with the X-ray)

Cervicitis highly indicated

Chancroid indicated

Chilblains indicated

Chloasma (Moles, Moth Patches, Etc) indicated

Chlorosis indicated

Chorea indicated

Chronic Ulcers indicated

Chronic Rheumatism highly indicated

Cicatrices (Scars) indicated

Cold Extremities highly indicated

Colitis indicated

Conjunctivitis indicated

Constripation indicated (not the best treatment)

Convalescence indicated

Corneal Opacity indicated

Corns (Callouses) indicated

Coryza indicated

Cystitis highly indicated

Dandruff indicated

Deafness indicated (improvement)

Diabetes indicated (improvement/ cure: in some cases)

Diarrhea neutral

Drug Addictions indicated (not the best treatment)

Dupuytren=s Contraction indicated

Dyspepsia indicated

Earache indicated

Ear Diseases (Catarrhal Deafness, Tinnitus Aurium, Chronic meddle ear affections) indicated

Eczema indicated

Enlarged Prostate (Prostatic Diseases) highly indicated

Endometritis highly indicated

Enteritis neutral (may be indicated)

Epididymitis indicated

Epilepsy neutral

Epithelioma indicated (after the glands have become involved, cure greatly lessened)

Erosions of the Cervix Uteri indicated

Exophthalmic Goitre indicated

Eye Diseases indicated (see appropriate headings)

Favus indicated

Fissure (Anal) indicated

Flabby Breasts indicated

Frontal Sinusitis indicated (in most cases)

Furunculosis indicated

Gastritis indicated

Genito-urinary Diseases indicated

Glaucoma indicated

Gleet indicated

Goitre indicated (50% of cases cured)

Gonorrhea indicated

Gout indicated

Gray Hair indicated

Grippe (Influenza) highly indicated

Hair, Falling highly indicated

Hay Fever (Periodic Hyperesthetic Rhinitis) indicated

Headaches: frontal or congestive indicated

toxic or reflex only temporary relief

Heart Disease indicated

Hemorrhoids neutral (relief but not cure)

Herpes Zoster (Shingles) indicated

High Blood Pressure (Hypertension) indicated

Hyperesthetic Rhinitis (Hay Fever) indicated

Hypertension indicated

Hypotension (Low Blood Pressure) indicated

Impetigo indicated

Impotence indicated

Incontinence of Urine (Enuresis) indicated

Infantile Paralysis (Anterior Poliomyelitis) indicated

Influenza (Grippe) highly indicated

Insomnia (Sleeplessness) indicated

Intestinal Indigestion indicated

Intra-ocular Hemorrhages indicated

Iritis indicated

Keloid indicated

Laryngitis indicated

Leucorrhea indicated

Lichen Planus indicated

Leukemia neutral

Lichen Rubra indicated

Lithemia (Gout) indicated

Locomotor Ataxia neutral

Low Blood Pressure (Hypotension) indicated

Lumbago highly indicated

Lupus indicated (in connection with the X-ray)

Mastoiditis (Mastoid absess) neutral

Menopause highly indicated

Menorrhagia (Metrorrhagia) indicated

Metrorrhagia indicated

Migraine indicated (temporary relief)

Moles, Moth Patches, Etc. indicated

Molluscum Contagiosum indicated

Muscular Rheumatism (Rheumatism) highly indicated

Myxedema indicated

Nasal Catarrh indicated

Nasal Diseases indicated (in many cases)

Nephritis (Albuminuria) neutral

Nervous Debility (Neurasthenia) indicated

Neurasthenia indicated

Neuralgia indicated

Neuritis indicated (but must be used judiciously)

Obesity indicated

Opacity of Cornea (Corneal Opacity) indicated

Orchitis indicated

Otitis indicated

Ozena indicated

Papilloma indicated

Paralysis indicated

Paralysis Agitans indicated

Paralysis, Infantile indicated

Paralysis of the ocular muscles indicated

Paralysis of Sphincter Ani indicated (improvement)

Pelvic Abcess indicated

Pelvic Adhesions indicated

Pelvic Exudates indicated

Periostitis indicated

Pharyngitis indicated

Phlebitis indicated

Piles (Hemorrhoids) neutral (relief but not cure)

Pityriasis indicated

Pleurisy indicated

Pneumonia indicated (ozonizing the air of the room is essential)

Post-fracture Conditions indicated

Post-operative Conditions indicated

Proctitis indicated

Prolapse of Rectum indicated

Prostatic Diseases highly indicated

Pruritus (Itching) indicated (often temporaty relief)

Pruritus ani indicated

Pruritus vulvae indicated

Psoriasis indicated

Purpura rheumatica indicated

Pyorrhea alveolaris (Rigg,s Desease) indicated

Pyosalpinx indicated (in some cases)

Raynaud's Disease neutral

Rectal Diseases indicated (see appropriate headings)

Renal Calculus indicated

Retinitis indicated

Rheumatism indicated (muscular and chronic articular)

Rhinitis (Atrophic) (Ozena) indicated

Rigg,s Disease (Pyorrhea alveolaris) indicated

Ring-worm (Tinea) indicated (X-ray)

Rodent Ulcer indicated

Scars (Cicatrices) indicated

Sciatica indicated

Seborrhea indicated

Seminal Emissions indicated

Sinusitis indicated (in most cases)

Skin Diseases highly indicated

Sore Throat (Pharyngitis, Laryngitis) indicated

Sprains indicated

Sterility indicated

Stiff Neck (Torticollis, Rheumatism) indicated

Stricture of the Urethra indicated (does not cure all cases)

Sub-involution indicated

Suppuration indicated (improvement)

Sycosis neutral

Synovitis indicated

Tabes Dorsalis (Locomotor Ataxia) neutral

Throat Diseases indicated

Tie Douloureaux indicated

Tinea indicated (X-ray)

Tinnitus Aurium indicated

Tonsillitis negative (indicated only in connection with the usual methods)

Tonsillotomy indicated (only by reports)

Torticollis indicated

Trachoma indicated

Tuberculosis of Glands indicated (only in combination with the X-ray)

Tuberculosis of the Peritoneum indicated

Tuberculosis (Pulmonary) indicated

Ulcers (Chronic Ulcers) indicated

Urethritis indicated

Uric Acid Conditions highly indicated

Urticaria (Hives) indicated

Uterine Diseases highly indicated (cervicitis, endometritis, etc)

Vaginitis indicated

Varicocele neutral

Varicose Ulcers indicated

Warts indicated

Writer,s Cramp indicated

Wry Neck (Torticollis) indicated

2. The Fischer Diathermy Therapy book, published by H.G.Fischer, CO., Chicago, 1925, 1927

(B. H. G. Fischer Diathermy Machine, H. G. Fischer Co., Inc., 2323-37 Wabansia Avenue

(company address in 1927) Chicago, IL), recommended using Fischer spark-type diathermies

to treat the following maladies:

Table 2.

Adhesions

Adenitis, Cervical

Albuminuria

Amenorrhea

Anemia, Secondary

Analgesia

Aneurysm

Angina Pectoris

Angioneurotic Edema

Ankylosis, Fibrous

Arterio-sclerosis

Arthritis

Atony

Bronchitis, Acute and Chronic

Buboes

Bursitis

Cancer (Cauliflower

epithelioma, Skin Cancer)

Catarrh, Nasal

Cellulitis

Cerebral Hyperemia

Cervicitis, Uteri

Cervix, Stenosis of

Chancroid

Cholecystitis

Coccygodynia

Colic, Gallstone

Conjunctivitis

Coryza

Cystitis, Acute & Chronic

Duodenal Ulcer

Earache

Treatment of Ears & Eyes

Treatment of the Nose

Endometritis

Epididymitis

fissure in Ano

Fistula in Ano

Fractures

Gall Stone Colic

Gangrene

Gonorrhea

Gynecology (inflammatory

diseases of the pelvis)

Headache

Hemorrhoids

Hip Joint Disease

Hyperemia, Cerebral

Hypertension

Intercostal Neuralgia

Iritis, Acute or Chronic

Keloid

Knee Joint Injuries

Laryngitis

Lumbago

Leukocythemia

Leukorrhea

Lymphadenitis

Menopause, Neurotic

symptoms of

Menstruation, Irregular

Migraine

Myocarditis

Myositis

Nerve Injuries, Peripheral

Neuralgia

Neuritis

Neuritis, Brachial

Onychia

Orchitis

Osteomyelitis

Otitis Media

Ovarian Neuralgia

Ovaritis

Ozena

Periostitis

Pharyngitis

Pleurisy

Pneumonia

Proctitis

Rhinitis

Sacro-Iliac Arthritis

Salpingitis

Scars

Sciatica

Sinus Infection

Skin Blemishes, Benign:

(Moles, Warts, Boils,

Papillomata, Sebaceous

cysts, Spider nebus,

Small angiomata,

Telangiectases, Localized

skin infections)

Sprains

Supra-Orbital Neuralgia

Tic Douloureux

Tonsils

Torticollis, Acute

Tuberculosis, of the Hip

Tuberculosis, Pulmonary

Tuberculous Glands

Tuberculous Osteomyelitis

Turbinates, Hypertrophied

Ulcer, Duodenal

Urethritis

Vaginismus

Vaginitis

Varicose Ulcers

Varicose Veins

Vesiculitis, Seminal

Below, are some quotes taken from the book

3. Short Wave Diathermy by Tibor de Cholnoky (New York: Columbia University Press, 1937):

Bacteria:

"Tribute should be paid to the numerous experiments of Haase and Schliephake and others, for their investigation of the effect of short waves on bacteria. They found that shortwave exposures kill bacteria at a lower temperature than does the hot-water bath. This might indicate, they believe, that there is, in addition to the heat effect, another effect as yet undetermined, inherent in the short-wave field, though they warn against drawing conclusions prematurely." (p. 29)

Reference to: Haase, W. and E. Schliephake, "Verusche uber den Einfluss kurzer elektrischer Wellen auf das Wachstum von Bakterien."

Bietr. z. klin. Chir., 60 (1931), 133-58.

In vitro experiments conducted on:

Staphylococci, Streptococci, Bacillus Coli, Tubercle Bacillus, had some positive results, others were resistant to treatment.

Viruses (early consideration of immune system stimulation):

"Carpenter and Page pointed out that the increased heat generated in the body by short waves, established an environment that is in general unfavorable to the development of the virus. The heat ncreases the rate of those chemical processes which are concerned with the general defense mechanism of the body against the infectious agents." (p. 37)

Reference to:

Carpenter, C. M. and A. B. Page, "The production of fever in man by short radio waves."

Science, 71 (1930), 450-52.

The book ***Short Wave Diathermy*** by Cholnoky also gives information on following conditions that were treated using pulsed spark-type diathermies being used at that time.

These are listed in Table 3 below.

Table 3.

Infectious Diseases:

The Common Cold

Pneumonia

Pulmonary Tuberculosis

Erysipelas (pre gangrenous condition)

Erysipeloid (infective dermatitis)

Actinomycosis (infects soft tissues & bone of lower jaw)

Allergic Diseases

Bronchial Asthma

Metabolic Diseases:

Gout

Obesity

Diabetes Mellitus

Disorders of the Endocrine Function

Disease of the Respiratory Tract:

Laryngitis

Bronchitis

Bronchiectasis

Emphysema

Pleurisy

Empyema

Abscess of the Lung

Pulmonary Gangrene

The Oral Cavity:

Dental structures: dental granulomas, parodontitis

Tonsillitis

Spasm of the Esophagus

The Stomach:

Gastritis

Peptic ulcer

Gastric neuroses

The Intestines:

Tuberculous colitis

Chronic appendicitis

Abdominal adhesions

Spastic colitis

Perityphlitis

Peritonitis

The Biliary Passages:

Cholecystitis

Cirrhosis of the liver

Hepatitis

The Urinary Tract:

Cystitis (tuberculous)

Puelitis

Nephritis

Perirenal Abscess

The Female Genital Tract:

Pelvic Inflammation and Infections:

Old Adnexal Tuberculosis

Acute salpingitis

Adnexal tumors

Peritonitis

Gonococcal adnexitis

Adnexal swelling due to infection following miscarriage or pregnancy

Chronic adnexitis

Metro endometritis

Bartholin's Gland Abscess

Dysmenorrhea

The Male Genito-Urinary Tract:

Gonorrheal Urethritis

Epididymitis

Diseases of the Prostate

Tuberculous disease of the testicles, bladder, and kidney

Diseases of the Circulatory system:

Angina pectoris

Myocarditis

Arteriosclerosis

Diabetic gangrene

Raynaud's disease

Syphilitic endarteritis

Senile gangrene

Moist gangrene

Thrombo-angiitis obliterans

Tuberculous adenitis

Noncontagious parotitis

Diseases of the Locomotor System:

The Muscular System:

Myalgia

Lumbago

Spastic contractures

Rheumatism, etc.

Tendovaginitis

Bursitis

The Bones:

Periostitis

Osteomyelitis

The joints:

Arthritis

Gonorrheal arthritis

Traumatic arthritis

Atrophic arthritis

Hypertrophic arthritis

Tuberculosis

Traumatic injuries:

Hematoma, Sprain, Lesions, Lacerations

Diseases of the Nervous System:

Neurosyphilis

Neuritides

Neuralgia of the Lumbosacral Plexus

Trigeminal, Brachial, Exipital, and Intercostal Neuralgias

Polyneuritis

Migraine

Parkinson's Disease

Epilepsy

Hiccup

Urinary Incontinence of Nervous Origin

(due to multiple sclerosis, syphilis, traumatic hematomyelia, enuresis

nocturna)

Neuroma (e.g., amputation neuroma)

Diseases of the Skin:

Furuncle

Carbuncle

Axillary Sweat-gland Infection and Abscess

Phlegmon

Streptococcus

Eczema (chronic ulcers, lupus)

Acne vulgaris

Pruritus

Diseases of the Head:

Sinusitis (acute and chronic)

Empyema of the antra, adjacent, and ethmoid sinuses

Diseases of the Eye:

Atrophy of the optic nerve

Corneal ulcer

Orbital phlegmons

Iridocyclitis, tuberculous lesions, inflammatory disorders, and palsies of

the ocular muscles

Diseases of the Ear:

Otitis media

Mastoiditis

Mastitis

Malignant Diseases

Table 4.

The conditions listed in Table 4 were taken from the book

4. "Diathermy" by E. P. Cumberbatch (Baltimore: William Wood, 1937).

Chronic arthritis: Infective spondylitis

Degenerative spondylitis

Fibrositis

Coccydynia

Metatarsalgia (Morton's Disease)

Diseases of the Nervous System: Paralysis Agitans

Diseases of the Alimentary System: Mucous Colitis, Peritoneal Adhesions

Note that the effects of **PAP IMI™** treatment have not yet been established on many of the conditions listed in the above tables.

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APPENDIX

ELECTROTHERAPEUTIC DEVICES SUMMARY

	Carrier	Modulation	Power	Oudin type low pressure tube to enhance Electroporation	Possible Effect	Remarks
Early Electrotherapeutic	Tesla or D'Arsonval Type DW, RF	DW RF Pulse Modulation, repeated at several Hz.	High Peak Power Very Low Average Power, High Voltage	Yes	Anticipated Electroporation in Vivo, relevant effects	Considered unorthodox, once popular in every hospital
Rife first device	As above Thompson-Plaster Standard Electrotherapeutic Device	DW RF Pulse Modulation, repeated at several Hz.	High Peak Power Very Low Average Power, High Voltage	Yes	Anticipated Electroporation in Vivo, relevant effects	as above
Rife later devices	CW Radio Transmitter at 40 MHz, info:Mark Simpson	Modulated with particular audio frequencies, i.e., 727 Hz in bursts of 4 times/s, info: Mark Simpson	High Peak Power Low Average Moderate High Voltage	Yes	Anticipated Electroporation in Vivo, relevant effects	Considered unorthodox, they are the modern continuation of the early Electrotherapeutic devices
Lakhovsky	DW Oscillator with multiwave frequency elements	Pulse Modulated. (Pulses generating multi oscillations on tuned length elements). Info: USA Pat. 1,962,565; 2,351,055	High Peak Power Low Average Moderate High Voltage	No	Anticipated Electroporation in Vivo and relevant effects	Considered unorthodox. It could be a version of the old Electrotherapeutic Devices
Crane	Low Voltage Audio Generator	Rife's modulating frequencies without the Radio Frequency carrier.	Relatively Low Peak and Average power, Low voltage	No	Anticipated Electroporation only in Vitro. Actually the operating principle of the device is a standard in vitro weak electroporator, now approved and commercially available.	Considered unorthodox. Device arranged to burst bacteria in vitro is identical to an electroporator arrangement, page 12, "Guide to Electroporation and Electrofusion" Academic Press, 1992.

Priore	Microwave Generator at cm to 80cm range	Triply modulated at 0.5-2 Hz, at 300-900 Hz, and at 16-300 MHz (corresponding 1m to 18m wavelength), info: French Patent 1,342,772, 1963	Very High Peak Power, High Average, Very High Voltage	Yes	Anticipated Electroporation in Vivo, relevant effects	Considered unorthodox. Device is what could be expected to be a microwave version of the old Electrotherapeutic Devices, and what could be a powerful pulsed microwave diathermy, or what could be a powerful modern Electrosurgical Diathermies in coagulation and fulguration mode.
Hyperthermia™	915 MHz microwaves	Pulsed Modulation	High Peak Power, Lower Average.	No	Assumed to treat cancer by heat and by increasing cancer cell porosity making it venerable to chemo therapy.	FDA approved for adjunctive to chemotherapy treatment of cancer. Device's function and assumed (approved) effects however, strongly remind Electroporation similar to the previous devices.
Dotto	RF Generator, produced by a peculiar thermionic couple, oscillating at 100 KHz (1974) or 1.8 MHz (1972).	Self modulated with 10 KHz, info: Dotto's USA Patent 3,839,771, 1974 or with 100 KHz (using the 1.8 MHz carrier, info: Dotto's testimony 8 Feb. 1972, Notary Public Montgomery County, Ohio).	High Intense Peak Electric and Magnetic Field	No	Anticipated Electroporation in Vivo, relevant effects	Considered unorthodox. It could be a modern Electrotherapeutic Device or powerful modern pulsed Diathermy.
Modern Electrosurgical Diathermies	RF Generator Typical 500 KHz	They come in three types or in one unit with three modes, two Modulation modes and Non-Modulation mode	Note: The key difference modulation versus non modulation	No	Note: Chopping the power or sending the power in pulses, the device produces opposite biological effects.	Considered orthodox. They are modern continuation of the early Electrotherapeutic devices. They are commonly used today in standard operating rooms. The same old principle is not yet appreciated.
Electrosurgical Diathermies Cut Mode	RF Generator Typical 500 KHz manufactures (Valleylab Boulder Co. manual) consider frequencies up to 4 MHz make no difference	Non-Modulated	Uniform Power	No	No, Highly Destructive	
Electrosurgical Diathermies	RF Generator	Modulated with 20 KHz	Peak Power, the same average	No	Yes, plus strong Electrofusion	

Coagulation mode	Typical 500 KHz manufactures (Valleylab Boulder Co. manual) consider frequencies up to 4 MHz make no difference	typical.	power as above			
Electrosurgical Diathermies Fulguration mode	as above	as above	as above	The way it is applied simulates the old Oudin tube function	same as above plus hemostasis	
Laser Surgery	Coherent light	Coag mode: Pulse Modulated in the order of 0.3 to several Hz Cut mode: Continuous or a mixture of Coag mode and Cut mode.	High Peak Power in the order of 1 MW, low average power or CW Power 4 W, Info: Stern AGSPA Manual	No	Yes, Electrofusion	Laser in pulsed mode may be considered the continuation of the old Electrotherapeutic Devices and using coherent light as carrier.
DC Electroporators	Electric field	Pulses 1000 to 10000 Volts/cm	High Peak power	No	Electroporation in vitro	Approved and Orthodox. Major modality in modern biological laboratories
CW Diathermies	27 MHz set by FCC	Non	Uniform output 30-150 watts	No	Deep Heater with no other major effects	Considered orthodox, FDA approved.
Rapsomanikis	External Magnetic Field to guide electrical current	Electric Current Pulses	Low power, low voltage electrical contact	No	Anticipated Electroporation in Vivo, and relevant effects	Considered unorthodox, banned by FDA
TENS	Electrical Contact	Electric Pulses, limited to surface microcurrent	Very low power limited mainly on the surface	No	Skin Surface Nerve stimulation	FDA approved. However, device is similar to Crane's and other micropower electronic stimulators
Pulsed Heaters	Hot Air 57 C	Pulses 50 msec long at 5 sec intervals.	High Peak Heat in the order of 100 watts	No	Production of opioids, significant analgetic effects	FDA approved as a 510K, Class II, equivalent to a diathermy !