William A. Tiller, Stanford University

TOWARDS UNDERSTANDING LIVING BIO-MAGNETOPHOTOELECTROCHEMICAL SYSTEMS

We all know what constitutes a chemical system and perhaps how thermodynamics and reaction kinetics govern both the types of changes that can take place and how rapidly they will occur. Some of us even know how to incorporate electric field effects in order to convert a chemical potential into an electrochemical potential but then things start to get fuzzy for us and it is difficult to grasp the "larger" picture; to see how to incorporate photonic and magnetic effects into a purely physical picture; to see how to expand the purely physical description in order to include the effects of emotion, mind and spirit and to see what differentiates a dead bio-system from a live bio-system. Since this larger perspective is important for us to appreciate, even though our cognitive systems presently limit most of us to an awareness of only the physical band of reality, in this lecture I will sketch how these higher bands of reality can produce forces that drive the physical processes in our bodies. I will show how the subtle energies of these higher dimensional domains produce correlates that can be measured in the physical domain and thus try to move us beyond today's purely physical medical model to one more appropriate for future medical therapeutics.

ABSTRACT FOR DR. JOHNSON NOT AVAILABLE

Randoll U. G.[1], Scheller A.[2] Hennig F.F.[1]
[1] Department of Traumatology, University of Erlangen/Nuremberg, Krankenhausstrasse 12, 91054 Erlangen
[2] Leonardis Fachklinik, Albstraße 9, 70806 Kornwestheim

Results of Dynamic Diagnostics - Consequences for the Treatment of Chronic Diseases

Abstract

Corresponding to the insight gained from this viewpoint (Cell-Matrix and Cells - Field and Rhythm-Structures of Life), the apt objective is to identify such bodily-intrinsic organizers and use them therapeutically. This therapeutic goal, therefore, is to regenerate and stabilize the basic autonomic rhythm of the organism and/or to change the amplitude and frequency values of the nutritional-flow density at the locality of the body's cells (the cell matrix) in such a manner as to exclude an existence of deterministic chaos.

Circulation of blood is sustained by the heart and the peripheral muscles. By microcirculation through terminal vessels it feeds the connective tissue which is in close contact with the nervous- and lymphatic system.
The metabolism of every cell of the human body runs via the connective tissue. That means the transport of oxygen and other nutrients as well as the products of metabolism.
This flowing equilibrium, which sustains cellife, must be able to adapt to the required extend of performance. In this several control processes work together in a complex cybernetic system, for instance the pH- and temperature regulation. If backups in any direction in this supply and transport occur, unspecified functional or structural disorders will result which effect the muscles, bones, vessels and nerves.
Ultimately, all bodily structures which recognize electromagnetic, chemical, or mechanical rhythms are to be considered organizers of that organism.
On the example of the skeletal musculature, viewed as a neuromyogenous, rhythmic structure (and, with 40 % of the entire bodily mass, the largest organ of the body as well), the mode of action of matrix-rhythm therapy is first theoretically developed, then introduced in actual application.

MRT is understood as the mechanical coupling of specific vibrations to the neuromuscular system under modulation of amplitude and frequency. Neighboring structures such as bones and inner organs are stimulated as well to equalize functional defects.
This new approach for matrix therapy has meanwhile found application in pro-sports and in clinical therapy of the most varied diseases of the nervous-, vessel-, and motion system.
Different clinical cases will be demonstrated.

Supported by: - Society for Biological Cancer Defense, Heidelberg
- Merz +Co.GmbH & Co., Frankfurt am Main
- CMRT, Berlin

Randoll U. G.[1], Scheller A.[2] Hennig F.F.[1]
[1] Department of Traumatology, University of Erlangen/Nuremberg, Krankenhausstrasse 12, 91054 Erlangen
[2] Leonardis Fachklinik, Albstraße 9, 70806 Kornwestheim

Cell-Matrix and Cells - Field and Rhythm-Structures of Life

Abstract
This study applies recent concepts from the fields of cybernetics, synergetics, and non-linear thermodynamics of irreversible processes to bioscientific problems in medicine. These concepts proceed on the presumption of the existence of universal space-time structures.
Within the field of medicine, this above all allows previously-neglected temporal structures to regain their original significance. Rhythmic, temporal processes in the realms of substance-concentration and enzymatic activity influence the physiological events occurring within the body in an organizational manner. When such time-based sequences undergo chaotic mutation, they lose these organizing properties.

Each cell of a human body gains its vitality by its characteristic environment. This cell milieu is partly discernible through biochemical and biophysical parameters (osmolarity, acid-base content, dielectric properties, degree of ionization of particular ions, susceptibility, temperature). Stimuli, especially change the pH of the environment demonstrate threshold effects like reversible and non-reversible changes of intercellular and intracellular morphology. Microscopically normal cell-growth as well as cellular threshold reactions in response to and as a result of molecular biophysical and biochemical processes which proceed according to non-linear dynamics have been recorded on-line.

From a cybernetic, control-technical aspect, chronic illnesses are discussed as conditions of decompensated regulatory mechanisms which occur subsequent to threshold-value reactions at micro levels. They are the consequences of phasic transition due to processes of adaptation to a chronically altered milieu or function, the ultimate result of which is the loss of temporal-rhythmic organization, i.e. chaotic mutation of cellular dynamics. Thus, chronic diseases are "dynamic diseases".
The question is, if these artificial effects represent disregulations, or adaptations to a disturbed environment, we can really find in chronic diseases like tumor or osteoporosis.

Supported by: - Society for Biological Cancer Defense, Heidelberg
- Merz +Co.GmbH & Co., Frankfurt am Main
- CMRT, Berlin

Professor Dr. med. D.G.S. Thilo-Korner
EURO-MED-CLINIC

Environmental, infection and heavy metal analysis in over 300 patients

Goal/objectives:
Data from over 300 outpatients on environmental (PCP, PCB, HCB, HCH), infections (salmonella; shigella, yersinia, candida) and heavy metal (aluminum, selenium, copper, zinc, lead) analysis are presented in order to demonstrate the distributions of the multifactorial load on the basic regulation system.

Conclusions:
Standard blood analysis may induce misjudgement in the finding of the causes in chronic diseases. Reducing the multifactorial load to the basic regulation system with e.g. phytotherapeutics and other remedies it may reduce the progression into chronic diseases.

Sherry A. Rogers, M.D.
Northeast Center for Environmental Medicine

THE CAUSES AND CURES OF BREAST CANCER

Breast cancer has reached epidemic proportions, affecting 1 in 9 women, with 300,000 new cases each year. The causes are multi-factorial, and can include anything from a solo dose of a chemical, pesticides that mimic estrogens, genetic predisposition, nutrient status, dietary factors such as fat and vegetable content, and more. The current treatment consists of chemotherapy, radiation, surgery, and bone marrow transplants. The problem is that all of these are expensive and serve to lower the already compromised nutrient status, and can initiate cancer themselves. For example, tamoxifen, used in thousands of women in over 133 randomized trials over the world, has been declared by the World Health Organization as a carcinogen. There is no guaranteed cure.

Prevention has included phytochemicals, diet, environmental controls and nutritients. Redifferentiation or regressionof cancers has been accomplished with nutrients, diets, environmental controls, a dedicated spirituality, detoxification procedures, and phytochemicals as well as compounds synthesized by the body. The interesting thing is that many of these modalities also play a role in aiding the functions of the xenobiotic detoxification pathways. Many autobiographies detail success with these modalities (Frahm, Austin, Greenfield, Nussbaum, Faid, Day) and case reports in the scientific literature (Carter, Folkers).

It seems logical to collate all of this information in order to orchestrate a non-toxic treatment plan for those who would like to explore this route.

References (for over 1,000 references pertaining to statements and concepts here):

*Rogers SA, DEPRESSION CURED AT LAST, Sand Key Publishing, Box 40101, Sarasota FL, 34242, 1-800-846-6687
*Rogers SA, HEALTH LETTER, ibid
*Rogers SA, WELLNESS AGAINST ALL ODDS, ibid
*Rogers SA, THE CURE IS IN THE KITCHEN, ibid

Theodore R. Simon, MD, Advanced Metabolic Imaging/North Dallas; Cynthia Fincher, PhD, Regent University; E. H. Harrell, PhD, University of North Texas; William J. Rea, MD, Environmental Health Center at Dallas; Alfred Johnson, DO, Environmental Health Center at Dallas; Gerald Ross, MD, Environmental Health Center at Dallas; and David C. Hickey, MD, Advanced Metabolic Imaging/North Dallas.

BRAIN SPECT AND NEUROTOXICITY

Objective measures were tested for the pattern of neurotoxicity seen in single photon emission computed tomography (SPECT) of the brain using HMPaO as a functional tracer. Blinded analysis of 56 examinations of normal control subjects and patients with toxic reactions were performed. The patients include Gulf War Veterans and those specifically exposed to organic solvents, pesticides, or petroleum. These findings addressed the four cardinal signs of the neurotoxic pattern: mismatch between the early and late phase images; redistribution to the soft tissues; salt and pepper appearing inhomogeneity of tracer distribution in the cerebral cortex; and temporal asymmetry. In addition to accuracy, sensitivity, and specificity; the analysis used receiver operator characteristic curves to gauge the certainty and relative contributions of the pattern components. Objective lobar tracer activity data were also used to establish indices nearly independent of operator intervention. These measures are also useful in systematizing a longitudinal evaluation of a patient through therapeutic regimens.

Jacques Benveniste. Digital Biology Laboratory, 32 rue des Carnets, F-92140 Clamart

THE EMERGING DIGITAL BIOLOGY

Our current research is the sequel to earlier investigations which circumscribed what has been dubbed "the memory of water". In the first phase of our work, we observed, in collaboration with a team from the French state scientific research organisation, the CNRS, that activities associated with high dilutions but not the original molecules, could be destroyed by an alternating magnetic field. This result indicated that molecular informationwas probably electromagnetic in nature. We therefore attempted - successfully - in some hundreds of experiments, the transmission, by means of an amplifier, of specific molecular activity to water in sealed vials. We thus "transmitted" more than 30 substances, including acetylcholine, histamine, serotonin, paf-acether, bacterial endotoxins, ovalbumin, the antigenic activity of BCG, potassium cyanide, etc. We also transmitted, directly, without using water as intermediate carrier, the activities of adrenalin, forskolin and PMA to leukocytes and cell-lines. These results reveal not only the existence but the electromagnetic nature of the hitherto ignored molecular message. This message is then "memorized" by polarized water, probably a universal physiological phenomenon which facilitates the *in vivo* transmission of the molecular signal. Homeopathic practice is based upon the empirical observation of this fact. For 18 months we have been recording these specific biological activities on computer discs. When replayed to water, this digitized molecular signal has the same effect as the original molecule. The molecular signal thus becomes susceptible to recording, digitization, modification, and transmission via telephone links. These results could transform biology and medicine and, more generally, permit the real-time detection and transmission of any molecular activity. They could also explain the influence of electromagnetic fields on living matter, thus permitting preventive and reparative legislation in this controversial domain.

William J. Meggs, M.D., Ph.D. East Carolina University

CHRONIC DISEASES INDUCED BY TOXINS

A number of diseases are increasing in prevalence and incidence in contemporary societies, and chronic diseases can develop after exposure to a toxin and persist after removal from the toxin. It is of vital importance to the public health to understand and identify those diseases which may result from environmental toxins, in order to prevent the develop of these diseases. Categories of chronic diseases that can be induced by toxins include: (a) Inflammatory conditions, including atopy, collagen vascular diseases, urticaria, asthma and rhinitis, (b) psychiatric diseases including depression and schizophrenia, (c) neurological diseases including neuropsychiatric disability, Parkinson's syndrome, peripheral neuropathy, and paralysis, (d) cancer, including lung cancer, nasal cancer, leukemia, and lymphoma, (e) cardiovascular diseases, (f) and birth defects. Epidemiology of contemporary disease epidemics related to toxins will be discussed, as well as mechanisms by which toxic exposures can produce chronic inflammatory diseases.

Russell M. Jaffe, Fellow, Health Studies Collegium, Reston, VA and Director, Serammune Physicians Lab, Reston, VA.

MITOCHONDRIAL FUNCTION, CELLULAR ENERGETICS, AND ASCORBATE SALVAGE: COMMON LINKS IN CHRONIC AUTOIMMUNE DISEASE BETWEEN DETOXICATION COMPETENCE, RESPIRATORY QUOTIENT, ENERGY PRODUCTION, AND ELECTRON FLOW

Mitochondria manufacture ATP and similar energetic chemicals necessary for cellular function by transducing hydrogen ions and energetic electrons. Concomitantly, certain families of toxins are rendered less lethal and more soluble for easier, safe removal by the kidneys. This marvel of bioengineering invaded eukaryotic cells eons ago. Mitochondrial proliferation is controlled by its own DNA complement. Thus environmental toxins (xenobiotics) may selectively inhibit mitochondrial DNA enzymes or selectively oxidize or modify the basic purines and pyrimidines used to make new mitochondrial DNA. Similarly, such toxicants may competitively or non-competitively uncouple the delicate cytochrome - ubiquinone (coenzyme Q10) electron transport shuttle.

In this presentation the following classes of xenobiotics will be reviewed for their toxic and immunotoxic effects:

1. Toxic minerals: Lead, mercury, cadmium, arsenic, nickel, et. al.
2. Halogenated aliphatics: chloroform, trichlorethylene, methylene chloride, biocides et. al.
3. Cyclic and heterocyclic compounds: benzene, toluene, xylene, saponins, sterols, et. al.
4. Oxidants and related preservatives: sulfite, benzoate, nitrite, bromates et. al.
5. Pharmaceuticals: active medication and collateral ingredients (colorants, binders, et. al.).

Possible synergies of toxicants will be presented. Therapeutic insights and treatment guidelines in restoring, maintaining, and salvaging mitochondria will be included. Electron donors that can "by-pass" or circumvent a 'short circuit' in the mitochondrial electron transport chain can salvage or sustain these energy power plants during toxic times. Ascorbate, above ~ 5 mg./dl in plasma appears able to preserve mitochondria while enhancing, first, electron flow and ATP formation and, subsequently, helping restore mitochondrial order and function. This work is consistent with the recent model of self-organizing systems by Kaufman et. al. of Sante Fe Institute. Case studies will be presented to illustrate the application of this work in clinical practice.

Gerald H. Ross, M.D., Environmental Health Center - Dallas, Texas

LONG-TERM FOLLOW-UP ON ELECTROMAGNETICALLY SENSITIVE PATIENTS

While investigations continue on the prevalence and the initiating factors for electromagnetic field sensitivity, several kinds of treatment modalities have been developed that appear to be of help for these patients. Often the *frequencies of the field fluctuations* appear to be more important in the triggering of symptoms than the strength of those fields themselves.

These therapies represent the philosophical approaches of a wide spectrum of health disciplines, from conventional medicine to acupuncture, homeopathy, naturopathy, physical therapy, mind-body or energy medicine and many others. Some of those modalities that have been used to try to help patients at the Environmental Health Center - Dallas will be reviewed, and information presented on the long-term follow-up of selected EHC-D patients who have been identified as being EMF sensitive.

Some important interventions that have been helpful include the following:

1. The general lowering of the patient's total load, by appropriate investigations of food and chemical and other sensitivities, with appropriate environmental and dietary changes.

2. Nutritional investigation and support (for example, many EMF-sensitive patients are found to be magnesium depleted, and feel less reactive when treated with Mg).

3. Reasonable avoidance of major sources of EMF fields, like computers, power lines, motorized equipment.

4. Assessment of the strength and orientation of the static and electromagnetic fields in the patient's home and place of work.

5. Sleep with the head of the patient to magnetic north or south, not east or west.

6. Patients often feel better near a large body of water, like a lake or the ocean, or near running water like a swift-moving river or a fountain.

7. Patients should try to ground themselves each day, by means of direct contact with the earth, with their bare feet where possible.

8. Patients may be evaluated for the best EM frequencies that appear to be stabilizing, and carry water with them that has been imprinted with these frequencies. Personal battery-powered EMF generators operating at specific frequencies may also help.

9. Body field normalization and enhancement of energy flow with: a) therapeutic touch, b) acupuncture, or c) homeopathy.

Roy A Fox MD, FRCPC: NS Environmental Health Centre, Dalhousie University,

HEIGHTENED SENSITIVITY

A uniform approach to intradermal testing for all patients referred to the NSEHC has been operative for the last year. Inhalants, including dust, animal danders, pollens and mould mixes, have been tested by Serial Dilution End Point Titration. Because of the controversy surrounding testing for chemicals and foods, a double blind placebo controlled approach to provocation neutralization (PN) testing has been adopted. A panel of 26 items, which are randomly allocated and includes 4 saline controls, 13 foods and 9 chemicals has been used throughout the last year. The results thus far have led to the formulation of hypotheses concerning the etiology of chemical sensitivity and have led to the development of an algorithmic approach to testing. Further study will reveal whether this is a more accurate, time saving and cost effective approach. It is recognized that each patient is unique and that there are manifest differences in biotransformation, immunological responsiveness and other physiological processes. Nevertheless it appears likely that many patients share certain characteristics and it is postulated that 3 major groups can be identified.

1. Allergy

These patients appear to be accurate in their wheal formation and provocation of symptoms. Because whealing provides an accurate end point, fractionation to determine a neutralization point appears to be unnecessary. Allergy may be a long standing problem for these patients with recent exacerbation, often secondary to chemical exposure. They appear to respond well to desensitization techniques. The clinical picture is not dominated by chemical sensitivity.

2. Chemical Sensitivity

This is the largest group and chemical sensitivity dominates the clinical picture. Some of these patients also have classic allergies. The clinical features include upper airways dysfunction, laryngeal dysfunction, reactive airways, gastrointestinal dysfunction, interstitial cystitis, skin irritation, urticaria and vasomotor instability. The most severe cases appear to have chemically induced (non-immunological) anaphylaxis. Although many of these patients have some of the features of Toxic Brain syndrome the environmentally induced dysfunction of the other organ systems dominates the clinical picture. Patients in this group respond to a wide variety of environmental triggers but the immune dysfunction appears to be chemically mediated and non-immunological. It appears likely that there is a lowered threshold for neurogenic inflammation.

3. Heightened Sensitivity

PN is not a valid technique for these patients, and we can identify a group which appears to be in a state of heightened sensitivity. Symptoms of dysfunction can be provoked by control or test items. The dysfunction most commonly observed is nervous system with the features of environmental encephalopathy (toxic brain syndrome) and vasomotor instability. A small group, the universal reactors, also react by wheal formation to control injections. The patients in this group appear to be in a state of arousal or of lowered threshold to sensory excitation, and the universal reactors have lowered thresholds for neurogenic inflammation. Furthermore the threshold for neuronal excitation appears to fluctuate and we postulate that many factors contribute to this (Total Load). This fluctuation gives the appearance of random or chance response to whatever is being tested at the

time, thus invalidating P/N as a testing technique. If this is the case then it appears that exhaustive testing might aggravate the symptoms. Clinical experience has revealed a small group of individuals who claim to have been made worse by testing and attempted neutralization.

The nervous system abnormalities that dominate the clinical picture of those with heightened sensitivity are likely to be important in the pathogenesis of all of these types of environmental illness. The separation into groups appears to be important for purposes of testing with accuracy. A simple screening procedure with controls and test items that is appropriately blinded will allow the early recognition of those with heightened sensitivity. In the patients with classical allergies standard immunological tests are likely to be most useful, and in the remainder where chemical sensitivity dominates P/N can be used most effectively.

The state of heightened sensitivity seems to affect all levels of the nervous system and all aspects of an individual's make up. It is unlikely that there is a single lesion that will account for such a change, and these observations lead to the suggestion that there are widespread changes within the nervous system. Aldous Huxley proposed that the main function of the brain is to act as a reducing valve, allowing consciousness to focus on limited data essential for survival. He explored the loss of the reducing valve effect by the use of psychoactive substances, usually at very low concentrations. It is likely that in chemical sensitivity there are major changes in the nervous system including the loss of the reducing valve effect. There is increased input from the special senses and from the peripheral receptors of the sensory nervous system with their lowered thresholds. This constant excitation leads to an overloaded situation, a state of arousal or imbalance of the excitatory and inhibitory neurotransmitters. If this is so then early identification would limit further testing which might aggravate the condition and would allow therapy to be more appropriately directed. It is clear why the environmental medical approach with environmental clean up, clean water, clean, whole food and avoidance of all stressors has helped so many. A clearer identification of the heightened sensitivity group should allow a further improvement in therapy and an avoidance of approaches that are costly and in the long run ineffective. Protecting the unshielded consciousness by limiting the excitation of the nervous system appears to be an important consideration in the holistic treatment of these patients.

ABSTRACT FOR DR. ROYAL NOT AVAILABLE

Mikio Miyata,M.D.
Toshiya Tomioka,M.D., Nagafumi Hatono,M.D., Hiroyuki Nishimoto,M.D., Tatsuto Namba,M.D., Satoshi Ishikawa,M.D.
Department of Ophthalmology, School of Medicine, Kitasato University
1-15-1 Kitasato
Sagamihara, Kanagawa 228
Japan

Shigekazu Uga,Ph.D.
Department of Orthoptics and Visual Science,
School of Allied Health Sciences, Kitasato University
1-15-1 Kitasato
Sagamihara, Kanagawa 228
Japan

Effects of electromagnetic waves on mice lens

Introduction: We proposed previously that the electromagnetic waves(EMW) induced the corneal epithelial injury. To examine the effects of EMW on eyes in detail, we have investigated the contents of various substances in lens from mice after the long term exposure to low frequency EMW.
Methods: Male BALB/c mice were exposed to 100kHz of EMW for 1,2,3 and 6 months. After exposure, lens were taken out surgically from the eye balls and the contents of sodium, potassium and calcium were measured with atomic absorption analyzer. According to Saxena's protocol, the content of glutathion was also measured.
Results: 2 months' exposure increased the contents of sodium but 6 months'exposure did not. The content of potassium did not change after exposure. The level of calcium decreased after 1 to 2 months' exposure but it increased after 3 to 6 months' exposure. Glutathion was reduced significantly after 6 months' exposure. Histologically, the Bow structure was disorganized. In the anterior cortex, the degenerating and swelling fibers were observed.
Discussion: These results suggest that EMW affects the metabolism of lens. The alteration of the metabolic state may lead to cataract development. The protection of eyes from EMW will be considered to be one of the prevention of the disease in future.

G. Markarov. Hospital 83, P.O.B. 53, Moscow 115598, Russia.

APPLICATION OF MAGNETIC FIELD /MF/ IN MEDICINE IN RUSSIA

Introduction: Millions patients had undergone MF-therapy in Russia during long time.

Objective: To give review of clinical application of MF in Russia, to discuss mechanisms of MF effects, sanitary and hygienic aspects of MF using.

Materials, methods: It was presented tens years of experiences in application of MF-therapy in Russia. Special attention was allotted to biotropic parameters of MF/1/. The optimizing MF doses in the treatment of different diseases were shown. It was stated the dependence of choosing of MF parameters / intensity, gradient, vector, wave form, exposure / upon stage and activity of diseases of patients with different pathology / cardiac, rheumatic, vessel disoders etc /. Much of magneto- and magnetolaser-therapy devices were used in the treatment: "Magnetizer", "Bimp", "Mag-30", "Lama", "Isel-Victoria".

Results, discussions: The use of MF in the treatment complexes, showed the decrease of activity of pathology processes in different patients.The high effectiveness of MF therapy was noted in sport, extremal medicine. The dependence of MF dosing upon nosology, stage, activity of disease was established. It was shown the effectiveness of low intensity MF application /1-10 mTl/ in sub acute processes,19-40 mTl in chronic processes of illness.The positive haemodynamic,rheologic changes were stated under the MF-therapy. Free radical, biochemical reactions regulation were noted under MF effect in patients. The using vortical MF in cancer patients showed the regulation of lipid peroxidation under the MF effect.

Conclusion: MF-therapy is using in Russia very widely and increase the effectiveness of drug therapy of the treatment complex in patients. The use MF in oncology patients is studied.

Reference: Jukov B. " Non-ionization radiation in flebology". Book.Russia,1985, p.14-34.

Nancy A. Didriksen, Ph.D., Health Psychology/Behavioral Medicine Associates, Richardson, Texas; Ernest H. Harrell, Ph.D., University of North Texas, Denton, Texas; Joel R. Butler, Ph.D., Environmental Health Psychologists, Dewey, Oklahoma.

NEUROCOGNITIVE RELATIONSHIPS BETWEEN A COMPREHENSIVE NEUROPSYCHOLOGICAL BATTERY AND A NEUROPSYCHOLOGICAL TEST DEVELOPED ON CHEMICALLY SENSITIVE PATIENTS.

The purpose of this study was to determine the utility of a brief but comprehensive neuropsychological screening instrument to be used in identifying and defining deficits and problems in brain function--particularly those which interfere with daily living or treatment progress. An extended purpose was to measure the accuracy of test results by correlational technique which would show the extent of agreement between the screening instrument and a widely used comprehensive neuropsychological test battery with high reliability and validity.

The subjects were 16 individuals with a confirmed diagnosis of multiple chemical sensitivity. The procedure was to administer the Halstead-Reitan Battery (HRB) and the Harrell-Butler Comprehensive Neuropsychological Screen (H-B CNS) to all subjects under standardized conditions. The General Neuropsychological Deficit Scale (GNDS), the global measure of brain dysfunction, of the HRB was correlated with the Harrell-Butler CNS global score. This statistical analysis demonstrated high and consistent agreement between the findings of the Halstead-Reitan Battery and the Harrell-Butler Screen.

The H-B CNS was developed and standardized on a population of chemically sensitive patients. Since these patients typically show some neurocognitive deficits, it appears useful to identify the extent of such deficits and problem behaviors, as well as to define the specific content or kind of neurocognitive dysfunction. Therefore, a reliable screening instrument should be helpful in the treatment of patients, as well as determining the necessity of a referral for a more comprehensive neuropsychological assessment or for neurological studies.

Kenneth J. McLeod, Ph.D.
Musculo-Skeletal Research Laboratory
Department of Orthopaedics, Physiology & Biophysics
State University of New York at Stony Brook

ELECTROMAGNETIC FIELD INTERACTIONS WITH LIVING TISSUE: MECHANISMS AND APPLICATIONS

The living organism is a self assembled entity which relies on electro-chemical processes to direct its organization and maintenance. As such, it should be expected that electric fields, either arising endogenously or induced exogenously, will alter the characteristics of tissue development, adaptation and healing. Indeed, there is abundant *in vivo* and *in vitro* evidence to support this presumption. Perhaps the best established and most consistent examples of low level, low frequency electromagnetic field effects on biological tissues are their influence on bone fracture healing, bone adaptation, and bone cell activity.

Over the last decade much of our research effort has been directed toward understanding how low frequency EMFs are capable of such profound influences on bone tissue. Our work has led to the principal observation that the response of bone tissue to EMF is actually to the electric field which is induced within the tissue, and not the imposed magnetic fields. Nonetheless, the magnitude of induced electric fields capable of significantly affecting bone tissue is remarkably small. Field intensities of only one microvolt per centimeter, one hundred times smaller than the fields generated by the contracting heart (EKG), and at least ten times smaller than fields associated with the electrical activity of the brain (EEG), can both inhibit bone resorption (osteoporosis) as well as stimulate new bone formation. Importantly, *in vitro* studies confirm this remarkable sensitivity of skeletal cells to their electrical environment, and suggest that the mechanism of electric field interaction with the cells is through the cell adhesion process.

By elucidating the physical mechanisms through which electric field effects occur in biological tissues, the specific tissues and conditions where these effects will be most pronounced can be identified. In so doing, the beneficial effects can be productively utilized, and any potentially detrimental effects mitigated.

Susan F. Franks, Ph.D., University of North Texas Health Science Center, Fort Worth, Texas; Ernest H. Harrell, Ph.D., University of North Texas, Denton, Texas; Joel R. Butler, Ph.D., Environmental Health Psychologists, Dewey, Oklahoma.

CHEMICAL SENSITIVITY: ENHANCEMENT OF DIAGNOSTIC CRITERIA BY MULTIVARIATE-CLUSTER ANALYSIS.

The goal of this study was to enhance the diagnostic criteria for defining environmental illness as a unique syndrome. A group of 250 patients of various diagnostic groups (systemic lupus erythematosus, multiple sclerosis, psychiatric illness, and presumptive environmental illness) were assessed using an objective assessment technique Clinical/Environmental Differentials Analysis (CEDA) for self-reported symptoms. Data from the CEDA were analyzed using multivariate statistical techniques to group subjects based on distinct clusters of symptoms. Base-rates of the defining symptom cluster for environmental illness was compared to a matched cohort of normative subjects to establish its distinctiveness as a unique syndrome within the population.

The ability of this symptom cluster to discriminate environmental illness from other diagnostic groups was validated using discriminant analysis techniques.

Results suggest the application of similar statistical techniques for analyzing other objective (e.g., laboratory) data obtained on these patients to provide more comprehensive diagnostic criteria for defining environmental illness.

William A. Tiller, Stanford University

SOME PHYSICAL DOMAIN CORRELATES OF SUBTLE ENERGY ACTIONS

This lecture is mainly a slide-show providing robust correlates of subtle energy events manifesting in the physical band of reality. Three experiments will be briefly touched upon in the time available:

(1) The first experiment utilized a man who exhibited the remarkable ability to "sensitize" a standard Kodak camera so that regular film and regular processing would reveal totally unexpected phenomena e.g., a dual camera experiment (one unsensitized and one sensitized), with both cameras fastened to a single tripod and with a single shutter release, showed partially transparent humans through which one could see objects on the wall behind them, etc.

(2) The second experiment involved a special gas discharge device, about the size of a regular sandwich, that was responsive to subtle energies emitted by humans. These energies were revealed by changes in the size and number of electron avalanches crossing the gas in the device. It was found that, with an identical experimental protocol except for the intentionality of the subject, the energy could be mentally directed either into the device to cause an increase in counting rate or away from the device so that no change in counting rate occurred. No weak signal statistics were needed.

(3) Monitoring the ear potential of a healer during a 30-minute simulated healing session in a special experimental environment revealed 16 anomalously large recorded voltage surges (30-200 volts with 0.1-10 second relaxation times). Via theoretical modeling, it was found that these voltage surges were physical level correlates associated with subtle energy bursts, largely from the abdominal region of the healer. It was further found that the body can readily deliver the electric currents needed to manifest such large voltage surges.

Rollin McCraty, MA, HeartMath Research Center, Institute of HeartMath
Alan Watkins, MD, Dept. of University Medicine, Southampton General Hospital

THE AUTONOMIC ASSESSMENT REPORT

The HeartMath Research Center, based at the Institute of HeartMath (IHM) in Boulder Creek, CA, has developed a sophisticated tool for quantifying autonomic function called the Autonomic Assessment Report (AAR). The aims of the AAR are: (1) to provide physicians with a new, powerful, noninvasive test which quantifies autonomic function and balance and aids in risk stratification; (2) to offer researchers a test that can validate the effects of their interventions on autonomic function, and (3) to generate data that will allow the autonomic profiles in a number of pathological conditions to be more fully characterized. The AAR is derived from 24-hour ambulatory ECG (Holter) recordings, and is based on analysis of heart rate variability (HRV), which provides a unique window into the interactions of sympathetic and parasympathetic control of the heart. The report includes time domain, frequency domain and circadian rhythm analysis, which together constitute a comprehensive analysis of autonomic activity, balance and rhythms. Time domain measures include the mean normal-to-normal (NN) intervals during a 24-hour recording and statistical measures of the variance between NN intervals. Power spectral density analysis is used to assess how power is distributed as a function of frequency, providing a means to quantify autonomic balance at any given point in the 24-hour period, as well as to chart the circadian rhythms of the different branches of the autonomic nervous system.

Autonomic imbalances have been implicated in a wide variety of pathologies, including depression, fatigue, premenstrual syndrome, hypertension, diabetes mellitus, ischemic heart disease, coronary heart disease and environmental sensitivity. Stress and emotional states have been shown to dramatically affect autonomic function. Self-management techniques, which enable individuals to gain greater control of their mental and emotional stress and improve their sympathovagal balance, can significantly impact a wide variety of disorders in which autonomic imbalance plays a role. Clinical examples of HRV measures from patients with various symptoms are presented. Several examples of patients, who were able to significantly improve their autonomic balance, symptomatology and psychological well-being through training and practice in emotional management interventions, are discussed.

Professor Dr. med. D.G.S. Thilo-Korner
EURO-MED-CLINIC

The importance of the "Integrative Medicine" (IM) in the daily patient care and in chronic disease development.

Goal/objectives:
Because we do not know of alternative disease we do not need a so called "alternative" or "complementary medicine" in opposition to "university medicine". We need on medicine in which available knowledge from traditional and modern scientific medicine is integrated without dogmatic borders in the daily patient care. Therefore, I developed the concept of IM in which the daily integration is practiced.
The analysis of the ground and basic regulation system with e.g. biophysical methods will be demonstrated and integrated in the diagnosis. It will be combined with the results from various blood analysis (environmental, infections, heavy metals).

Conclusion:
Medical care and treatment consists of the integrated combination of the analysis of the biophysical, biochemical, psychological and morphological alterations in patients. Regulation blockades of the ground regulation system have to be released in order to prevent progression especially into chronic diseases.

Bertie B. Griffiths, Ph.D.
Environmental Health Center - Dallas
Director of EHC-D Analytical Laboratory

The Effect of Varied Chemicals and Electromagnetic Fields on the Cell Cycle

Ongoing research indicates that human peripheral lymphocytes will respond in vitro to multiple incitants. In the present study, peripheral lymphocytes are cultured and challenged with varied organo - chemicals and electromagnetic fields. Results will be presented as to the blastogenic response and influence(s) on the normal progression of the cell cycle as observed flowcytometrically.

Gerald H. Ross, M.D., Environmental Health Center - Dallas, Texas

THE CLINICAL PRESENTATION OF PATIENTS WITH EMF HYPERSENSITIVITY

Increasing attention is being focused on the issue of electromagnetic influences on health. For the first time in the natural history of mankind, we are surrounding ourselves with artificial, man-made EM fields, the long-term effects of which we still know very little. Indeed, the last 100 years have produced a sudden explosion of scientific breakthroughs, followed by inventions and processes that have led to a significant change in our 'electromagnetic milieu'.

In parallel with the rise of chemical sensitivity and classical allergy, increasing numbers of patients are reporting that they suffer adverse effects from exposures to commonly encountered electromagnetic fields. Previous work about the investigation of this phenomenon has been reported by the Environmental Health Center - Dallas (EHC-D).[1]

A computerized search of the diagnostic records of the EHC-D for the three years ending November 1996, was undertaken to find the records of patients who were diagnosed by the EHC-D physicians as suffering from Electromagnetic Field (EMF) Sensitivity. This diagnosis was based on a combination of the patient history, physical examination, electrodiagnostic testing, autonomic neurological function, and other modalities.

There were 47 patients who were identified in this manner who were chosen for chart review. Four patients were found to have inadequate data or were lost to follow up, leaving 43 patients in the study group. There were 7 men and 36 women, with an average of 43.4 years (16% males, 84% females).

Symptom frequencies were examined and will be presented for the categories of: a) headache, b) fatigue, c) numbness or tingling, d) palpitations, e) muscle pain or spasm, f) confusion or change of level of consciousness, g) asthma or shortness of breath, and h) dizziness or postural imbalance, among these patients.

In addition, data was collected about the findings on several investigations, including postural testing, EMF challenge testing, intracellular minerals, hair mineral analysis, Pupillography, the presence and number of amalgam dental fillings, brain metabolic SPECT scanning, the presence of chemicals in the classes of PCBs, chlorinated pesticides, volatile aromatic, chlorinated and aliphatic solvents. Finally, data will also be presented about the electromagnetic exposure history of these patients (e.g., power lines, etc.), and the types of exposure that they identify as usually triggering symptoms.

In our experience, there is a close connection between the phenomenon of EMF sensitivity and heightened reactivity to other factors of the patient's environment, especially chemical sensitivity. Rarely do we see a patient who has EMF sensitivity, who does not also report some features of chemical sensitivity, or complex food or inhalent senstivities. In the overwhelming number of patients, neurological symptoms seem to predominate.

NOTICE
This material may be protected by Copyright Law (Title 17 U. S. Code)

Neurophysiological Effects of Flickering Light in Patients with Perceived Electrical Hypersensitivity

Monica Sandström, BSc
Eugene Lyskov, MD, PhD
André Berglund
Sviatoslav Medvedev, MD, PhD
Kjell Hansson Mild, PhD

An increasing number of people in Sweden are claiming that they are hypersensitive to electricity. These patients suffer from skin as well as neurological symptoms when they are near computer monitors, fluorescent tubes, or other electrical appliances. Provocation studies with electromagnetic fields emitted from these appliances have, with only one exception, all been negative, indicating that there are other factors in the office environment that can effect the autonomic and/or central nervous system, resulting in the symptoms reported. Flickering light is one such factor and was therefore chosen as the exposure parameter in this study. Ten patients complaining of electrical hypersensitivity and the same number of healthy voluntary control subjects were exposed to amplitude-modulated light. The sensitivity of the brain to this type of visual stimulation was tested by means of objective electrophysiological methods such as electroretinography and visual evoked potential. A higher amplitude of brain cortical responses at all frequencies of stimulation was found when comparing patients with the control subjects, whereas no differences in retinal responses were revealed.

Journal of occupational & environmental medicine

In recent years, an increasing number of people have reported subjective symptoms and physiological reactions to various types of electrical equipment, including video display terminals (VDTs), fluorescent light, household appliances, televisions, etc. A few attempts have been made to describe this group of persons with so-called electrical hypersensitivity in the literature.[1-3] The most frequent complaints are headache, eye and general fatigue, and sensory symptoms such as itching, stinging, or burning sensations in facial skin. At first, the symptoms have an intermittent character and disappear after a short-term rest away from the source of the electricity, but for some patients the symptoms become more persistent. In severe cases, people can not use VDTs or artificial light at all. They usually associate their symptoms with electromagnetic (EM) fields emitted from these appliances. These emissions are, however, rather low, and during the last 5 years the electric and magnetic fields emitted from new VDTs sold in Sweden have decreased rapidly depending on recommendations from Swedish authorities and labor unions about a reduction in the strength of the emitted fields.[4,5] In spite of this, some patients still claim that even these new low-emission VDT monitors provoke symptoms.

Fluorescent lamps placed in the ceiling hardly give any contribution to the general magnetic field in a room. If the lamp is not properly grounded, it might be a dominating

From the Department of Environmental Medicine, University of Umeå, Umeå, Sweden (Mrs Sandström); the National Institute for Working Life, Umeå, Sweden (Mrs Sandström, Mr Berglund, Dr Hansson Mild); and the Institute of the Human Brain, St Petersburg, Russia (Dr Lyskov, Dr Medvedev).

This article was presented at the Cost 244: Electromagnetic Hypersensitivity, Graz, Austria, September, 1994; and the 7th International Congress of Psychophysiology, Thessaloniki, Greece, September 1994.

Address correspondence to: Kjell Hansson Mild, PhD, National Institute for Working Life, Box 7654, S-907 13 Umeå, Sweden.

1076-2752/96/3812-0015$3.00/0

Copyright © by American College of Occupational and Environmental Medicine