

Questionable Methods of Cancer Management: Electronic Devices

After careful study of the literature and other information available to it, the American Cancer Society has found no evidence that treatment with the devices mentioned in this review results in objective benefit in the treatment of cancer in human beings. Lacking such evidence, the American Cancer Society strongly urges individuals with cancer not to seek treatment with such devices.

Magnetism and Electronics

Magnetism has fascinated people since the discovery of "lodestones" (rocks of naturally occurring magnetite). Ancient philosophers ascribed marvelous qualities to lodestones because of their ability to attract iron, then the strongest metal known. Magnets were the focus of the studies of early scientists such as Michael Faraday, who laid the foundation of modern electronics. Electronics is a branch of physics that deals with the emission, behavior, and effects of electrons. Electronic devices include a wide variety of instruments that function within the electromagnetic spectrum, which itself includes cosmic rays, gamma rays, x-rays, light waves (ultraviolet, visible, and infrared), radio waves (including radar and television), microwaves, electrical waves, and others.

Electronics in Health and Disease

Medical research is ongoing on both the potential benefits and possible harmful effects of electromagnetism. Some scientists are probing the possible role of bioelectronics in cell communication. Others are researching the value of electronics in the prevention or treatment of

cancer. The possible harmful effects of electromagnetic fields produced by power lines, appliances, electric blankets, broadcasting, ELF (extremely low frequency) output devices, and so forth are also being studied. Among the questions being probed is whether exposure to electromagnetic fields increases cancer risk. Clearly, medical scientists are not ignoring electronics in their search for improved methods in the prevention, diagnosis, or treatment of cancer. Established technologies using electronics in cancer medicine include radiation therapy, magnetic resonance imaging, diagnostic x-rays, diathermy, and proton-beam therapy.

Electronics and Pseudomedicine

Electronics has also caught the attention of the purveyors of pseudomedicine. Some promoters appear to have been well-meaning people fooled by the appearance of benefits that were really only the placebo effect.

One of the earliest recorded controlled experiments revealed the potential for this deception by comparing the treatment response of an electronic device, called "Metallic Tractors," with the response to an imitation device that could not possibly have any real benefit. The principal behind the operation of Metallic Tractors was based on the discovery by Luigi Galvani that two dissimilar metals placed on the skin produce an electrical current between them that can be sufficient to cause muscular contraction. Elisha Perkins, MD, of Connecticut obtained the first US patent ever issued for his Metallic Tractors, which consisted

of separate brass and iron rods that he alleged could treat disease by "Galvanism" or "Animal Electricity." Dr. Perkins' son, Benjamin, brought the Metallic Tractors to England, where many attested to their value.

In 1799, John Haygarth, MD, designed a controlled test in which he treated five patients suffering from rheumatic pain with wooden tractors disguised to resemble the metallic versions. Four of the five patients experienced relief with the fictitious tractors. One patient reported a warming sensation in his knee, an ability to walk much better, and pain relief lasting nine hours. Another patient reported tingling sensations lasting two hours when the wooden tractors were applied. The next day the same five were treated with metallic tractors with nearly identical results. As a result of this experiment, Haygarth stated: "This method of discovering the truth distinctly proves to what a surprising degree mere fancy deceives the patient himself; and if the experiment had been tried with Metallic Tractors only, they might, and most probably would have deceived even medical observers."¹

Haygarth's caveat is as true today as when written nearly two centuries ago. Patients and medical observers alike can be deceived by uncontrolled clinical results. This is particularly true with neoplastic diseases. Psychological responses, such as those described, coupled with unclear symptoms, remissions, and unpredictable survival, can be deceiving.

Metaphysical Appeal

Electronic devices have strong appeal to those who adhere to philosophies that incorporate "Vitalism"—the belief that a metaphysical "Life Force" is the ultimate determinant of health and disease. Vitalism is expressed in various ways within different belief systems. In Hindu Ayurvedic Medicine it is "prana"; in Chinese Medicine it is "chi" or "Qi"; in American Indian Medicine it is

"orenda"; in homeopathy it is the "Vital Force"; in chiropractic it is the "Innate Intelligence"; and in Scientology it is the "Thetan." Some view the Life Force as the elusive soul or spirit found in the beliefs of many religions, while others believe that it is the mechanism of extrasensory perception (ESP) and related paranormal phenomena yet to be scientifically proven to exist. Some Vitalists claim that the well-known electrical patterns found in electrocardiograms, electroencephalograms, and electromyograms are expressions of the Life Force that scientists have quantified, but failed to fully understand.

Kirlian Photography

Kirlian photography (a.k.a., coronal discharge photography) is sometimes employed by promoters of vitalism to picture the Life Force allegedly being influenced by a device. Kirlian photography involves connecting a person to a high-voltage tesla coil and completing the electrical circuit at the finger tips, which are placed on a conducting pressure plate under which photographic paper has been placed. The resulting picture of finger tips surrounded by a corona (or "aura") is often misrepresented as a picture of the individual's energy force. In fact the energy has been supplied by a tesla coil. The size and shape of the corona is interpreted, in a manner similar to tea leaf reading, as an indicator of a patient's health. This too is false. Studies show that the amount of contact pressure and the moisture level on the skin (i.e., less moisture causes greater coronas) are the significant variables affecting coronal sizes and shapes.^{2,3} Kirlian photography is not a reliable indicator of any health measurement.

Medical Dowsing

Radiesthesia (a.k.a., "the sensitive radiance"), the notion that the vitalistic Life Force produces a resonance that can be discerned by "sensitives" (people pos-

sessing a "sixth sense"), forms the basis for medical dowsing. Sensitives are alleged to be able to discern Life Force resonances emanated by a sample of a patient's tissue or fluids (e.g., spot of blood, lock of hair, fingernail clippings, saliva, urine, etc.) or a personal object (e.g., picture, article of clothing or jewelry, etc.) by employing pendulums, dowsing rods, or electronic devices. Many of the electronic (a.k.a., "black box") devices that Vitalists employ make no sense in their wiring schemes. To outsiders this appears to be clear evidence of deliberate fraud, but devotees say: "The blood spot means nothing, in itself; it simply serves to help tune the radiesthetist's mind to his patient's broadcasts." If he is sufficiently sensitive, he does not even need its help.⁴

Although speculations about the metaphysical aspects of life may be intriguing, responsible health care providers and regulatory authorities do not engage in philosophical disputes about issues that transcend medical science. They only concern themselves with questions regarding the safety and efficacy of various procedures in cancer diagnosis and treatment.

Consumer Protection Law

The manufacture and distribution of medical devices are regulated by the United States Food, Drug, and Cosmetic Act (FDCA), which is enforced by the Food and Drug Administration (FDA). Promoters of electronic devices may claim that a device can identify the presence and location of cancer; relieve symptoms of cancer, such as pain or loss of appetite; or cure cancer. However, claims are sometimes indirect. Rather than claiming that a device is useful for cancer, promoters may allege that a device can treat the whole person, enhance the immune system, heal the "energy body," or something else other than the direct treatment of cancer. Nevertheless, if the ultimate effect of the device is to

prevent, diagnose, prescribe for, treat, or cure any disease, the device is regarded as a medical device and is subject to all regulatory laws and statutes. Any device becomes a medical device if medical claims are made for it.

The FDCA defines a medical device in section 201 (h) as follows: "... an instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent, or other similar or related article ... which is ... intended for use in the diagnosis of disease ... , or in the cure, mitigation, treatment, or prevention of disease, in man ... or intended to affect the structure or any function of the body of man ... which does not achieve any of its principal intended purposes through chemical action ... and which is not dependent upon being metabolized for the achievement of any of its principal intended purposes."

The FDA's ability to protect consumers from the purveyors of fraudulent and unproven medical devices was strengthened with the passage of the 1976 Medical Devices Amendment to the FDCA. Federal law requires that a device be properly labeled with the information necessary for its safe and effective use. Moreover, the manufacturer must be prepared to substantiate any claims made for a device. Diagnostic and therapeutic devices require premarket approval or must be found to be "substantially equivalent" to currently marketed devices through premarket notification before they may be distributed in interstate commerce. Devices that have not met these requirements may be declared "misbranded" and can be banned or seized. The FDA may enjoin and/or prosecute manufacturers or distributors of such devices, recall devices, or use any other remedy under the Safe Medical Device Act of 1990 (SMDA).

The SMDA was enacted to supplement and to give greater impact to the 1976 Medical Device Amendment to the FDCA. The reporting of incidents and

the tracking requirements of certain devices that are implanted, life-sustaining, or life-supporting have been strengthened. Manufacturers, importers, and distributors must now report removals and corrections, as well as conduct postmarket surveillance on high-risk devices. To protect the public health, the SMDA gives officials authority to use civil penalties, initiate recalls where appropriate, and suspend and withdraw premarketing approvals.

The FDCA provides for experimental research into the value of preventive, diagnostic, and therapeutic procedures. Proponents must apply for an Investigational Device Exemption and comply with the FDA's request for reasonable evidence of safety and potential for effectiveness. Purveyors of questionable devices often claim that the cost of testing prohibits innovators from going through the FDA approval system. This complaint is unjustified because devices that show promise in properly designed early studies will obtain funding. The FDA also protects cancer patients from exploitation. Patients who volunteer to serve as subjects in experimental trials must be fully informed about the unproven nature of the procedure being tested, be warned of the risks involved, and are generally not charged a fee for the procedure.

A Compendium of Questionable Electronic Devices Purported To be Useful in the Management Of Cancer

RADIONICS DEVICES

Radionics is the name given the unsubstantiated theory that diseases can be diagnosed and treated by tuning into radio-like frequencies alleged to be emitted by pathogens or diseased body organs. Radionics theory was originated by Albert Abrams, MD, who called such alleged frequencies the "Electronic Reactions of Abrams" or ERA. Dr. Abrams devel-

oped a device he named the Oscilloclast, which supposedly detected diseases by their vibratory rates (i.e., radio frequencies) and cured people by emitting disease-destroying vibrations of the same frequencies. He set up a training school at his mansion in San Francisco, California, and began to graduate practitioners of "electronic medicine." At the height of Dr. Abrams' success, there were more than 3,500 ERA practitioners. Some were grossing \$1,000 to \$2,000 a week using ERA devices. ERA was the subject of an intense and thorough investigation by *Scientific American*, which published a series of articles exposing the fallacies of ERA, which are considered to be a landmark in the history of pseudomedicine.⁵ Dr. Abrams died of pneumonia in 1924, during the height of the *Scientific American* expose. He was unable to cure himself with his devices, just as he had failed to cure both of his wives of their cancers.

Dr. Abrams amassed a fortune, which he left to the Electronic Medical Foundation (EMF), an organization that carried on with radionics for another 30 years. In 1961, the FDA announced a criminal contempt action against EMF and its president, Fred J. Hart. Hart pleaded no contest and soon after dissolved the EMF. Hart dedicated the rest of his life to fighting consumer protection laws under the guise of freedom of choice (see the American Cancer Society statement on the National Health Federation).⁶ Many copycat radionics devices were developed in the wake of Dr. Abrams' success, and some still survive.

Radioscope

Among the more successful imitators of the Oscilloclast were the devices produced by the Electronic Instrument Company of Tiffin, Ohio: Electron-O-Rays Models 46 and 51, Auto Electronic Radioclast Model 20, Radioclasts Models 40 and P, Neurolinometer, Research Model, Quto-Electronic Instrument

Model 0-20-1 P (for diagnosis), and the Radioclast Treating Unit. Radionics practitioners often claimed the ability to detect not only the presence of cancer, but a "tendency" toward the disease. An article in the *Electronic Medical Digest* in 1952 stated: "This work has made sufficient progress that a Radioscope analysis of a patient's blood will inform the doctor whether or not the patient has cancer, internal or external, or a tendency toward cancer, long before there has been any visible disturbance of tissue. Further, such an analysis will disclose to the doctor the location of the primary lesion, as well as any secondary effects."

Although some variation may be found in how radionics devices are employed, the following account in a 1968 FDA news release⁷ is representative: "The Radioscope was represented as a 'tuning apparatus' by which the defendants asserted it is possible to distinguish the alleged characteristic 'radio frequencies' associated with different diseases. This device is a box containing dials, lights, and wires, and a slot in which may be placed a specimen carrier of filter paper bearing dried blood of the patient. Metal plates connected with the box are held by a person who is designated the 'reagent' and who is supposed to serve as a 'detector' for the radiations allegedly emanating from the blood spot. The operator of the machine strokes the abdomen of the 'reagent' with a plastic wand. If the wand 'sticks' to a particular location, that is supposed to be a manifestation of an 'electronic reaction,' and the operator allegedly can determine from this the identity, kind, location, and significance of any diseases present."

No radionics practitioner has ever made good on his or her claims by demonstrating any of the abilities that they alleged to possess.

Drown Devices

Ruth B. Drown, a chiropractor in Los Angeles before her death, was one of the

most notorious radionics practitioners. The Drown Radio Therapeutic Instrument was represented to be effective in forming "health cells," making blood counts and urinalysis, and for diagnosing and treating practically all diseases, including cancer. Dr. Drown contended that a drop of a patient's blood placed on a blotter forms crystals and these, like the crystals in early radio receiving sets, emit a wavelength from which a proper diagnosis could be made. Once the diagnosis was obtained, she claimed, the device could broadcast necessary "healing waves" and effect a cure even if the patient was thousands of miles away.

In 1963, Dr. Drown was indicted for fraud and attempted grand theft for diagnosing and treating people for non-existent diseases with worthless electric devices. She died of cancer during the course of her trial.^{8,9}

Rife Frequency Generator (a.k.a., Rife Beam Ray)

A 1986 book, *The Cancer Cure That Worked, Fifty Years of Suppression*, by Barry Lynes and John Crane, revived interest in a radionics device developed by Raymond Royal Rife of San Diego. The book, written in a style typical of conspiratorial theorists, cites names, dates, events, and places, giving the appearance of authenticity to a mixture of historical documents and speculations selectively spun into a web far too complex to permit verification by anything short of an army of investigators with unlimited resources. The authors claim that Rife successfully demonstrated his device's cancer curing ability in 1934, but that "all reports describing the cure were censored by the head of the AMA from the major medical journals."

The authors advance the theory that cancer is caused by bacteria and claim that Rife developed a powerful light microscope that could detect living microbes by the color of the auras they

emitted by their vibratory rates. The Rife Frequency Generator allegedly would generate radio frequencies of precisely the same vibratory rates as the offending bacteria and destroy them in a manner similar to an opera singer's voice breaking a crystal glass. (Note: Although sound waves can produce vibrations that will break glass, radio waves cannot destroy bacteria due to their low energy level.) It is clear from descriptions of how Rife's Frequency Generator supposedly functioned that it was simply another radionics device.

In 1991, Rife devices were being sold by a pyramid-like, multilevel marketing scheme in which users become salespeople sharing in each other's profits. The primary sales technique involved testimonials of personal benefits experienced by the user. Aside from the obvious conflict of interest in providing testimonial for a medical device that one is selling, it is unlikely that individuals can separate real from imagined benefits they subjectively feel when combining efforts to improve their physical well-being and their financial well-being. Promoters make it clear that the marketing of such devices is illegal and tell distributors to maintain secrecy because a conspiracy exists among the establishment to suppress cancer cures that work.

The World Research Foundation (WRF), a private information and referral agency that helps people locate questionable cancer remedies, actively advances the Rife Frequency Generator. Operated by Steven and LaVerne Ross, WRF sponsors conferences that provide a platform for the promoters of heterodox cancer methods and publishes *World Research News*. WRF states that it is a non-profit organization with 501 (c)(3) tax-exempt status.

The United States Psychotronics Association (USPA), located in Chicago, also advocates radionics and the Rife device. In 1990, the USPA offered a "Beginner's Radionics School," which in-

cluded instruction in the operation of "instruments, pendulums, and rub plates." According to materials promoting its 16th annual conference in 1990, the USPA was organized by the late, alleged-psychoic J.G. Gallimore. The organization's basic premise is that extrasensory perception is a natural occurrence.

Recently manufactured Rife generators include REM Super Pro, Klark Kent's "Super Science" Rife Resonator, QLF Generator, Electrospectrum, Hansen/Ilenco/Elenco, Scalar Tronix SXT-3, R.I.F.E., Crane Foundation CRF 1000/1990, Rife / Crane Instrument, and Biotron.¹⁰

Digitron (a.k.a., Spectrometer)

The digitron is a radionics device equipped with a pendulum. The device allegedly is able to diagnose cancer and transmit subtle energies that cure the disease. The pendulum supposedly answers yes or no questions from the holder that help choose which vitamins to take. Jimmy Keller, a promoter of the digitron, claimed that he could administer medication to a person from miles away by placing a photograph of the person and a medicine called Tumorex into "ports" on his digitron machine.

At Keller's 1991 trial on charges of wire fraud, two university professors testified that Keller's process involved radionics and that they could prove that it worked. Dr. Lance Bruner, a music professor from the University of Kentucky, said that the digitron reads and transmits subtle energies from a person via a hair strand, a drop of blood, or even a photograph and can send "healing energies to that particular object." Dr. William Tiller of Stanford University said that the use of the digitron and a pendulum in the treatment of a patient is necessary to translate subconscious information that is sent to and from the patient and the device. A practitioner has the ability to

translate information on a patient and can use the digitron and pendulum to answer questions regarding the person's condition, Dr. Tiller said. He speculated about another paradigm of reality that will replace current views in a way comparable to the way in which quantum physics superseded classic Newtonian physics. Reportedly, the only data the professors offered were anecdotes from practitioners who use such devices.¹¹

One of Keller's former patients described how Keller employed the device to feign diagnosis and treatment of cancer: "Keller checks patients on a machine to see if they really do have cancer. After confirmation, he also asks a family member if they would like to be 'checked out on the machine.' . . . He then convinced my brother's wife that she too had cancer and that he could cure her with a series of injections with Tumorex. After about a week or so of injections he checks her out on the machine again and tells her that she is cured, leaving her ecstatic and believing that he is a miracle worker. . . . Keller's wondrous machine is called a 'Spectrometer.' It is about the size of a bread box, looks modern with buttons and LED displays. On one side are two leads at the ends of which is connected a piece of plastic. The machine looks as if it were made by a reputable company. . . . The patient holds the plastic and he (Keller) swings a pendulum over the area of the machine. At the same time he is punching in numbers and adjusting knobs. The patient holds the plastic and a bottle of pills as Mr. Keller swings the pendulum. He then tells you if the pills are good for you or not. Also, he tells you how 'active' your cancer is this way. Another thing about the machine: he'll take a photograph of the patient and then set it under the plastic . . . this way the patient is being treated even while he sleeps."¹²

Other names under which radionics devices have been marketed include Depolaray, Depolatron, Electron-O-Ray,

Electronic Radioclast, Gallert devices, Oscillotron, Radioclast, Auto-Electronic Radiocast Model 20, Series 800, Radioclast Model 40, Electronic Analysis Instrument Model F, Electronic Magnetic Model G, and Electrosine Galvanic Model 200.

GALVANIC DEVICES

Energy Medicine

"Energy Medicine" (a.k.a., "Vibrational Medicine") is a name more recently applied to a loosely organized field that may include radionics devices, but mainly employs galvanic devices in the diagnosis of, prescription for, and treatment of a wide variety of diseases, including cancer. Energy Medicine practitioners connect patients to one electrode of their device and probe hypothetical acupuncture points with another, thus completing a circuit. They claim to be measuring the electrical resistance of each acupuncture point. These measurements are alleged to provide an energy reading that indicates the health of the associated organ. One such device, the Dermatron, is equipped with a gauge which registers from zero to 100. A reading of 50 is theorized to indicate "normal." High readings are alleged to be indicative of "irritation" or "inflammation," while low readings indicate "degeneration." The machine is also used to determine "homeopathic" prescriptions for the disorders detected.

Galvanic devices measure the amount of electrical resistance on the skin. Such readings are medically useless because they are dramatically affected by such variables as skin moisture and the amount of pressure with which the probes are applied. A study of one device found that it produced readings of its own by delivering low-voltage input to the probe site when held in place for about five seconds.¹³ Galvanic devices have proven to be of no value in the diagnosis or treatment of cancer.

Ellis Micro-Dynameter.

The Ellis Micro-Dynameter is a galvanometer that is purported to measure the current generated by applying two electrodes of dissimilar metals to various parts of the human body. Proponents claimed that the device "is adequate and effective for diagnosing practically all disease conditions (including cancer) as well as the health status in man" and that it "measures the results of treatment; showing what is actually going on deep down in the tissues of the body; acts as an aid to more accurate disease analysis; acts as a precision instrument for new clinical measurements; measures nerve and tissue changes; gives a reading over a diseased area proportional to the extent of the disease, which thus can be mathematically diagnosed; locates within the human body the cause of disease; provides the ability to restore at least 80 percent of previously unhelped cases to health by following its indications."¹⁴

In 1961, the Federal District Court at Chicago issued an injunction stopping further distribution of the Ellis Micro-Dynameter and its literature. The court ruled: "The Micro-Dynameter is not safe for use even in the hands of a licensed practitioner. . . . A device whose labeling claims it to be an aid in diagnosing as many diseases as this, when in fact it is not, is unsafe for use no matter who uses it."¹⁵

Despite the court's injunction, Ellis Micro-Dynameters have been found in use by chiropractors as recently as 1990. An investigation of cancer quackery in the Chicago area by WBBM-TV in 1984 reported that a chiropractor was using one of these devices to diagnose and treat cancer in violation of the federal court injunction against the device.

Galvanic devices are not illegal unless they are marketed with unsubstantiated medical claims. Devices that have been abused in health care include the Dermatron, Vega, Interro, Hubbard

E-Meter, Accupath 1000, Electro-Acuscope 80, Roscher Probe, and Qi Gong Machine.

LOW-VOLTAGE CURRENT TREATMENT DEVICES

At some questionable clinics, practitioners treat cancer by passing low-level electrical currents through tumors. Although applications of low-level electrical currents have some established usefulness in medicine (e.g., helping mend disconnected bone fractures) and there has been some scientific experimentation in the use of this procedure in cancer treatment, there is insufficient evidence that the procedure is safe and effective for cancer therapy. Therefore, any such treatment should be considered experimental at this time. Legitimate experimental programs are registered with the FDA and follow established guidelines cited previously in this review.

NEUROLINOMETER AND RADIOCLAST TREATING UNIT

The Neurolinometer was housed in a black suitcase-type container. According to an FDA report,¹⁶ the device consisted of "a monopolar electrode, a power supply, and a single stage amplifier connected to a wire mesh below a bakelite plate. In use, a metal disk attached to a handle is passed up and down over the spine. It was claimed that the device was capable of detecting 'nerve impingements' alleged to be indicative of disease conditions elsewhere in the body (i.e., chiropractic 'subluxation' theory). The operator of the device rubs his fingers over the plate, and is supposed to detect a 'stickiness' when the disk passes over a bad spot along the spine. The trouble spots are then treated by various methods. Among them was the Radioclast Treating Unit. The Radioclast Treating Unit was equipped with a panel containing six control knobs, a meter and four electrode connections. Two sets of elec-

trodes were supplied for use with the device, namely, (1) two electronic electrodes which furnished a low-voltage, low frequency current to the body; and, (2) two magnetic electrodes which set up a magnetic field in the portion of the body between the electrodes. The electronic electrodes applied a 7.2 cycles-per-second electrical current to the body. The magnetic electrodes produced a weak varying magnetic field. These devices were manufactured by Electronic Instrument, Inc., of Tiffin, Ohio. These devices were permanently banned by a U.S. District Court injunction in April, 1962."

UNNAMED BLACK BOX DEVICES

Low-level output electrical devices are sometimes homemade contraptions bearing no particular name. For instance, a self-styled naturopath in Idaho pretended to diagnose cancer by the Reams Test, an unfounded method that analyzes saliva and/or urine samples. Many of his diagnoses and prescriptions were done through the mail. After making a false diagnosis of cancer, the naturopath claimed to be able to cure the disease with a black box device, which patients leased for \$50 a month. Patients were instructed to send a new saliva sample weekly (and \$5) so the naturopath could monitor their progress.

An examination of the device revealed that the electrical switch merely activated a red indicator light to show that the device was "on." One strand of the electrical cord was clipped permitting only a barely detectable amount of current to reach the treatment pad made of a piece of common window screen. Pin settings, which patients were instructed to adjust for treatment based upon the results of an analysis of their saliva samples, weren't connected to anything and could not possibly have been used to alter the device's output. The device had no specific name but was referred to as a

low-voltage treatment device. The naturopath was convicted of practicing medicine without a license following an investigation of his activities in 1980. The National Council Against Health Fraud has received complaints that he was still operating illegally as recently as September 1991.

Gary Young, a self-styled "naturopath" and operator of the Rosarita Beach Clinic, which had locations in California and Mexico, employed a crude device that allegedly cured cancer by passing low levels of current through tumors. Young was filmed rendering this treatment to a woman with a grapefruit-sized tumor on her breast by a KCRA-TV news team from Sacramento, California, in 1988. Young also promoted a technique, he called Oscillation Frequency Stimulation Infusion, for the treatment of cancer in which a sample of blood was withdrawn from a cancer patient, exposed to 500 volts of electricity, and infused back into the patient's body. In 1988, state food and drug authorities in California obtained an injunction against Young and his associate from "making any statements concerning the capability of 'Oscillation Frequency Stimulation Infusion' treatment to dissolve cancerous tumors."¹⁷

MAGNETIC DEVICES

Magnets have been promoted as pain relievers (including cancer-related pain) and cancer remedies. The FDA has prosecuted a number of cases involving magnetic devices promoted for the relief of pain. Devices involved in these cases include a tiny, permanent magnet on an adhesive bandage called Acu-Dot¹⁸; the Inductoscope¹⁹; magnetic bracelets alleged to provide a longer and more active life, relieve arthritis, and inhibit bacterial growth²⁰; and the Magnetic Ray Belt.²¹ There is no scientific evidence that permanent magnets have a beneficial effect upon any form of cancer or that they will relieve pain beyond a placebo effect.

Super Magnets

In 1991, the International Medical Research Center, Inc., of Murrieta, California, agreed to pay \$40,000 in fines and court costs and to stop selling permanent magnet devices as medical aids. The company had placed a billboard at the intersection of two interstate highways declaring "Curing Cancer with Super Magnets?" Promotional literature featured the owner, Don Vierstra, and a cancer patient, Sandy Morgenstern, RN, on the cover and contained the claim that Morgenstern had "experienced recovery and remission from her cancer with the supermagnet." In fact Morgenstern died of her disease by the time Vierstra came to trial. Vierstra was prosecuted under a California law that forbids the marketing and use of unapproved devices for cancer treatment.²²

Electromagnetic Devices

The primary difference between permanent magnets and electromagnetic devices is that the latter need a power source to activate their magnetism. One of the most infamous of the electromagnetic devices was the I-ON-A-CO, marketed in 1926 in California by entrepreneur Gaylord Wilshire, for whom Los Angeles' main street is named. The I-ON-A-CO was a circular electromagnet covered with leather that resembled a horse collar. Wilshire's Iona Company advertised the device as "a simple and effective method of using magnetism for the cure of human ailments." One advertisement stated: "All you have to do is to place over your shoulders the Wilshire Ring or I-ON-A-CO. That's all. You may then light a cigaret (sic) and read your newspaper for ten or fifteen minutes. Meanwhile, its magnetic force is permeating your body and effecting the cure. You see nothing, you feel nothing. But listen my friends, often patients at the first treatment, like Lazarus, arise well

and whole . . . the I-ON-A-CO cuts a new pathway to the cure of disease."²³

The I-ON-A-CO became a fad and inspired a national controversy from 1926 to 1927.

The Better Business Bureau began warning the public about the dubious nature of the I-ON-A-CO promotions. Wilshire published the *Ionaco News*, which was heavily loaded with testimonials from satisfied customers. Investigations revealed that many of the testimonials were faked. In time, dissatisfied customers also made their voices heard, exposing the true nature of the bogus device. By the summer of 1927, the fad was over. Wilshire died in September 1927 at the age of 66. Numerous electromagnetic devices have been promoted as cure-alls (including cancer), but none has ever been proved of value.

NEGATIVE ION GENERATORS

Negative ion generators (NIGs) are electronic devices used in electronics manufacturing to create "clean rooms." In such applications, negatively charged ions attach themselves to minute dust particles causing them to cling to the walls.

In 1976, Imola Faye Wilson and her son John Gilbert Wilson were found guilty of fraud in California for a scheme in which they sold devices called the Acelatron (a.k.a., Solarama Board). The pair claimed that the device was an NIG and that the device would cure cancer if it was placed between the mattress and box springs during sleep. They also claimed that the device would prevent cancer if food was placed on it before eating. All of these claims were false. Not only are NIGs worthless for the prevention or cure of cancer, a test of the device found that it did not even generate negative ions.²⁴ The FDA states that "no health claims can be suggested or implied for any negative ion generator without pre-market approval by the agency."²⁵

COLOR AND LIGHT TREATMENT DEVICES

Ultraviolet, visible, and infrared light occupy a portion of the electromagnetic spectrum. The visible light spectrum may be separated into the familiar colors of the rainbow through the use of a prism. The rainbow spectrum is often used by Vitalists to portray the Life Force. This phenomenon also forms the basis of a variety of approaches to Energy Medicine. Colored-light Therapy (a.k.a., "chromatherapy") is founded upon the notion that shining colored light upon the body may have a beneficial effect upon cancer. It appears to be based upon an ancient notion that "like cures like." Red light is alleged to benefit the blood, yellow light the liver, and so forth. There is no scientific evidence that shining colored lights on the body will produce any biologic benefits.

Spectrochrome

Dinshah P. Ghadiali, who claimed to be the seventh son of a seventh son, invented the Spectrochrome. It is a simple device that projects the light of a 1,000 watt light bulb focused by a crude lens through colored glass slides into a glass tank of water. Ghadiali claimed that the device would cure all diseases. Spectrochrome promotions promised "no diagnosis, no drugs, no manipulation, no surgery" only "attuned color waves." The devices bore labels stating that they were "for the measurement and restoration of the human radioactive and radio-emanative equilibrium."

Directions for using the device were spelled out in Ghadiali's textbook *Spectrochrometry*. Combinations of light and colors were specific for body areas and diseases being treated. The time of treatment was determined by the phases of the moon and the dictates of astrology. Latitude and longitude of the place of treatment were determined according to "solar, lunar and terrestrial gravitation." A patient's body had to be nude and facing north.

In 1947, Ghadiali was found guilty on 12 counts of fraud, and the FDA secured a permanent injunction against the Spectrochrome in 1958.²⁶ Nevertheless, these devices continue to be found in the offices of some practitioners and the Spectrochrome device was touted by the World Research Foundation in an article appearing in the March 1991 issue of *East/West Magazine*.

Full-Spectrum Light Cancer Prevention and Treatment Devices

Widespread publicity has been given to the ability of full-spectrum fluorescent light to prevent cancer. It is also claimed that such devices are "biostimulators," capable of enhancing general health and well-being. Proponent John Ott states: "The role light plays in the cause, management and cure of cancer deserves much more study. . . . there's some indication that people who take Laetrile in Mexico and get out in the strong sunlight there are having better results than those who take Laetrile up north under artificial lights."²⁷

In his book *Health and Light*, Ott claimed to have cured a man of terminal lung cancer by having him live outdoors as much as possible and avoid artificial light sources.²⁸ In reference to an Illinois school reported to have an unusually high incidence of leukemia, Ott wrote: "A school at Niles, Illinois, had the highest rate of leukemia of any school in the country. In fact, it was five times the national average. I made a point of visiting the school and talking to the superintendent, the head maintenance man and some of the teachers who had been there since the school was built. I learned that all of the children who developed leukemia had been located in two classrooms, and that the teachers in these particular classrooms kept large curtains drawn at all times. . . . with the curtains constantly closed, it was necessary to keep the artificial lights on. After several years . . . the teachers left the school and their replace-

ments preferred to leave the curtains open and the lights off unless needed. . . . about this time there was a general replacement of the warm white fluorescent tubes and that the new tubes were cool white, which are not as strong in the orange-pink part of the spectrum. As of the time of my visit in 1964, there had been no further leukemia cases reported. . . . No explanation for the previous unusually high rate of leukemia at this school had ever been found."²⁹

Without providing any evidence or making any direct claims, Ott leaves his readers with the distinct impression that a change in the type of fluorescent light tubes made an important difference in cancer risk. Ott manufactures and sells a line of full-spectrum lights that he claims will prevent cancer. The term "full spectrum" means that Ott's lights include ultraviolet (UV) light, which is known to cause cancer. Lighting engineers generally agree that it is more desirable to eliminate UV light to reduce cancer risk.

OZONE GENERATORS

Ozone generators consist of a high-voltage transformer and a wire-wound potentiometer with a control knob that allows users to control the electric discharge that creates ozone. Some promoters of questionable cancer therapies claim that ozone increases the "total oxygen in the system" to "exert a negative

effect on the cancer cell." They say that cancer cells are anaerobic and that ozone can have as much of a negative effect upon cancer cells as chemotherapy without any negative effect upon normal cells.³⁰ Ozone is known to be irritating to the nose and throat mucous membranes of most people at 0.01 ppm, and one to 10 ppm can produce headaches, respiratory irritation, and possibly coma.³¹ There is no evidence that ozone generators are safe and effective for the treatment of cancer.

Recommendations

The theories and speculations of the proponents of electronic medicine may be interesting and imaginative, but responsible health care providers and government regulators demand that the diagnosis and treatment of cancer be based upon more than fanciful ideas. Cancer patients are advised to avoid submitting to treatment by the purveyors of discredited or unproven electronic devices. Beyond the health threats to cancer patients through delay in proper care, some electronic devices are as likely to cause harmful effects as to offer some benefit. The American Cancer Society advises that patients avoid the use of electronic devices that have failed to meet the standards of safety and efficacy required by the FDCA. CA

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