

SIX PILLARS OF ENERGY MEDICINE: CLINICAL STRENGTHS OF A COMPLEMENTARY PARADIGM

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The current status of energy medicine and its increasing challenge to the biochemical paradigm that has dominated conventional medicine are reviewed. Although energy medicine represents only a small fraction of 1% of the \$2.2 trillion healthcare industry, 6 properties of energy medicine give it strengths that could augment conventional health care models. These include the ways energy medicine (1) can address biological processes at their energetic foundations (reach), (2) regulates biological processes with precision, speed, and flexibility (efficiency), (3) fosters health and prevents illness with interventions that can be readily, economi-

cally, and noninvasively applied (practicality), (4) includes methods that can be used on an at-home, self-help basis, fostering a stronger patient-practitioner partnership in the healing process (patient empowerment), (5) adopts non-linear concepts consistent with distant healing, the healing impact of prayer, and the role of intention in healing (quantum compatibility), and (6) strengthens the integration of body, mind, and spirit, leading not only to a focus on healing, but to achieving greater well-being, peace, and passion for life (holistic orientation). (*Altern Ther Health Med.* 2008;14(1):44-54.)

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We are now in the process of revising the past century's biochemical concept, under which all major life processes are chemical in nature, to one that proposes that such processes are electromagnetic in nature.

—Robert O. Becker, MD¹

While energy medicine^{2,3} is still a microdot on the health care landscape in terms of use, public recognition, and the economic resources allocated to its development, Norman Shealy, MD, the founding president of the American Holistic Medical Association, has predicted based on striking clinical and emerging scientific findings that “energy medicine is the future of medicine.”⁴ Energy medicine is based on the supposition that illness results from disturbances in the body's energies and energy fields and can be addressed via interventions into those energies and energy fields.⁵ It is 1 of 5 domains of “complementary and alternative medicine” identified by the National Institutes of Health (NIH), with others including biologically based practices (eg, the ingestion of herbs, vitamins, minerals, and amino acids), manipulative and body-based practices (eg, chiropractic, osteopathy, massage, rolfing, reflexology), and mind-body medicine (eg, hypnosis, visual imagery, medita-

tion, biofeedback).⁶ The NIH also recognizes “whole medical systems,” which may incorporate elements of the above, such as traditional Chinese medicine, Ayurvedic medicine, naturopathy, homeopathy, and various indigenous healing traditions.

Strategies for restoring and maintaining the health of the body's energies by stimulating specific “energy points” have been passed along the generations in China and other parts of the world for at least 5000 years. A body that had been mummified in a snow-bound mountainous region along the border between Austria and Italy around 3000 BC had tattoos on exactly the points that are indicated in traditional Chinese medicine for treating the kind of lumbar spine arthritis revealed by an x-ray analysis of the body (9 of the 15 markings were along a meridian or energy pathway that is used in treating back pain, including one on the precise point that is considered the “master point” for back pain). Forensic analysis also revealed that the body's intestines had been rife with whipworm eggs, and indeed, some of the other markings were on points that are traditionally used for treating stomach upset.⁷ Similar tattoos have been found on mummified bodies in other regions, ranging from South America to Siberia.

As contemporary clinical experience and scientific investigation lend increasing credibility to the concepts and procedures used in energy medicine and at the same time public discontent with and concern about the dangers and costs of conventional medicine grow at a discomfiting rate,⁸ 6 areas are emerging where energy medicine might augment and in some ways supersede conventional medical practices. After examining the fundamental natural mechanism underlying energy medicine—the decisive impact of the body's energies and “organizing fields” on gene expression and cell activity—these 6 areas are outlined and discussed.

GENES, CELLS, AND FIELDS

More than the genetic coding inherited from one's parents, it is the moment-by-moment expression of the genes that most impacts health.^{9,10} The basic role of a gene—instructing its cell to produce a particular protein or other molecule—is well understood.¹¹ Each cell, in fact, undergoes some 100 000 chemical reactions per second, many of them governed by the expression of the genes in its nucleus. What is not understood, however, is how these chemical reactions are coordinated with the actions of the body's other trillions of cells. As Lynn McTaggart asks, "If all these genes are working together like some unimaginably big orchestra, who or what is the conductor?"^{12(p49)} The answer that is emerging from observations documented by scientists from a range of disciplines,¹³ though still not widely accepted, is that organizing fields direct biochemical processes as decisively as a magnetic field aligns metal filings. Organs operate in a harmony that cannot be accounted for by the actions of chemical messengers. The brain, heart, and lungs are in such electromagnetic accord, for instance, that when there is an electromagnetic change in one, the others change simultaneously in phase.¹⁴ Coordinating 100 000 chemical reactions per second in each of up to 100 trillion cells is also a task of a different order than can be explained by mechanisms such as cells sending chemical messengers to other cells.

The way the body's unimaginably complex processes are coordinated is one of the most fundamental questions in biology, and the biochemical paradigm simply does not yield plausible answers. Instead, the properties that are attributed to genes "go far beyond their known chemical roles."^{15(p158)} For instance, although the chromosomes and genes in the nucleus of every cell are identical, the appropriate instructions for a kidney are somehow elicited when the gene is in a kidney cell and for a liver when it is in a liver cell. In fact, when primitive, undifferentiated tissue cells from a salamander were grafted near the tail, they grew into another tail; when grafted near the hind leg, they grew into another leg.¹⁶ What chemical process told these genes what was required? Genes give their instructions as if they are amply informed about what is occurring all over the body and about what is needed from them in relationship to the entire system. Who, indeed, is the conductor?

Though Western medicine has identified molecules that initiate gene expression (inducers) and DNA sequences that activate the synthesis of RNA (promoters), it does not offer plausible explanations for the agencies that coordinate such processes across the body. No one has identified chemical mechanisms that inform the gene about the state of the whole organism. Seeking other explanations, scientists from a spectrum of disciplines—including biologists,¹⁵ physicists,¹⁷ neurologists,¹⁸ and anesthesiologists¹⁹—have postulated the idea of a "field" where biological information is essentially "broadcast" to genes, neurons, and other governing mechanisms.

The concept that energy fields impact physical development keeps reemerging within biology.^{15,20-22} In the 1930s Harold Burr, a neuroanatomist at the Yale School of Medicine, measured the electrical field around an unfertilized salamander egg and found that it was shaped like a mature salamander,²³ as if the blueprint

for the adult were already there in the egg's energy field. The electrical axis that would later align with the brain and spinal cord was already there in the unfertilized egg, as measured by a vacuum-tube voltmeter with extremely sensitive, non-distorting, silver/silver-chloride electrodes to detect microvolt differentials—a device that contemporary engineers view as having been strikingly sophisticated.²⁴ Burr went on to find electrical fields surrounding numerous organisms, from moulds to plants to frogs to humans, and he was able to describe electrical patterns that distinguished health from illness. He demonstrated not only correspondences between specific pathologies and electrical characteristics of related organs but that physical illness is *preceded* by changes in an organism's electromagnetic field.²⁵ The implications of this finding for healthcare are just beginning to be appreciated, and they challenge the field of energy medicine to innovate new approaches for preventing illness.

Burr's original papers have been scrutinized recently from the perspective of modern advances in electrical engineering. The instruments he devised were found to be "remarkable for their time," providing readings that would be consistent with today's state-of-the-art devices and on par with the "pioneering genius [reflected in] Burr's revolutionary contributions to the scientific understanding of the organizing principles animating all life."²⁴ Burr's findings did, of course, build on the work of other scientists. Owen Frazee reported in 1909 that passing electrical currents through water containing young salamanders speeded up the regeneration of amputated limbs.²⁶ Elmer Lund at the University of Texas found, in the 1920s, that the cellular structure of the hydra, a tiny fresh-water aquatic animal, could be reorganized by applying electric current strong enough to override the organism's electromagnetic polarities, causing, for instance, a head to appear where a tail would be expected.²⁷

Additional evidence of field effects on physiological processes continues to accumulate. One of the most readily demonstrated effects of fields on biological expression, seed germination, has been reported repeatedly using a range of interventions, such as exposing the seed to music or to a healer's hands.²⁸ Pulsed magnetic stimulation (PMS) machines, or "brain pacemakers," create magnetic fields that have been effective in working with a range of disorders, from Parkinson's disease to epilepsy to depression. The theory behind this use of energy fields to influence biological processes is not at all esoteric:

A normal cell has an electrical potential of about 90 millivolts. An inflamed cell has a potential of about 120 millivolts, and a cell in a state of degeneration may drop to 30 millivolts. By entraining the electrical fields of the cells within its range to the magnetic pulses emitted by the PMS machine, cells can be brought back into a healthy range.^{29(pp67-68)}

Reviewing studies exploring the relation between electromagnetism and biology, Abraham Liboff said, "We find that this work strongly suggests an overarching explanation that is purely

field-driven.^{29(p45)} He points to the effects of both internally generated and externally applied fields. Internally generated fields can be seen, for instance, after an animal has been injured. Electrical currents connecting enormous numbers of cells are produced as part of the growth and repair mechanism, a process that clearly transcends the actions of the individual cells. These observations suggest to Liboff that an electrical field is both “intrinsically interwoven into the fabric of the system”^{29(p45)} and at the same time, this field is able to generate various currents that act upon the system to stimulate growth and repair. Liboff also cites laboratory studies showing that the field does not have to be generated from within the organism to stimulate growth or repair. When external currents are applied to an area of tissue, for instance, large numbers of cells also act in concert to initiate specific physiological processes (for better or for worse), and the well-established potential for healing from such procedures may begin to explain the therapeutic effects reported after a practitioner’s hand (which itself generates a measurable electromagnetic field) has been held in the proximity of diseased or injured tissue.³⁰ The electromagnetic fields of healers’ hands not only have been measured, they increase significantly, compared to baseline measures, when a practitioner is focused on the healing process.³¹

THE BODY’S ENERGIES

Several energy fields apparently work in concert in governing fundamental biological processes, including a biofield surrounding the body, local fields concentrated in specific areas of the body, and pathways that regulate the flow of energy within the body. These fields, interestingly, correspond with energy systems that have been described in the healing traditions of other cultures. Specifically, ancient constructs adopted into our language as the aura (biofields), the chakras (local fields), and the meridians (energy pathways) are finding empirical support in modern laboratories.

The Biofield

An energy field surrounding the body, as first measured scientifically in Burr’s laboratory, has been demonstrated in a number of subsequent research programs.^{32,33} Most commonly referred to as the “biofield,”³⁴ its electromagnetic properties have been registered using sensitive magnetometers, such as the superconducting quantum interference device (SQUID).³⁵ The biofield corresponds with older notions of a distinctive but intangible “aura” surrounding the body, seen not only in religious paintings but also described in numerous healing traditions.³⁶ Scientists investigating the biofield have suggested that it holds information about an organism and transmits this information throughout the organism in a manner that is analogous to the way a holographic plate distributes information throughout a hologram.³⁴ The biofield is comprised of an extremely weak but measurable electromagnetic field—with its own waveform, intensity, polarity, and modulation patterns—that surrounds and permeates all living systems. Consensus has not been reached, however, on whether this fully accounts for the biofield’s actions or if its electromagnetic properties are just the measurable component of

a more complex field that includes a “fifth force”³⁷ that is distinct from the 4 forces known to physics—gravity, electromagnetism, and the strong and weak quantum forces (discussed further under “Pillar 5: Quantum Compatibility”).

Some investigators conceive of the biofield as an aggregation of the combined electromagnetic fields of the body’s ions, molecules, cells, tissue, and organs, forming a “very complex standing wave,” a convergence of many electromagnetic frequencies.³⁴ This wave is believed to play a decisive role in the integration of all the body’s energy systems. Because the biofield is electromagnetically extremely weak (so much so that scientists in the past have dismissed its emissions as waste energy or “noise”), investigators have speculated that it regulates the body’s biochemistry and physiology more by conveying information than by exerting force.³⁴ Although the electrical charge of the biofield may be too weak to directly impact cellular structures, Becker found, in a surprising discovery, that tiny currents, on the order of a billionth of an ampere, were more effective than larger currents in stimulating tissue generation.³⁷ Rubik distinguishes between “structural” and “regulatory” mediation of biological events and speculates that energy interventions that create even small fluctuations in the biofield may work by sending signals to the body’s regulatory mechanisms rather than by directly acting upon the body’s physical structures.³⁴ She believes the speed and efficiency by which the biofield, with its electromagnetic and holographic properties, can distribute information may account for the rapid, holistic effects reported by energy medicine practitioners.

Local Fields

In addition to a biofield that surrounds the entire body are concentrated local energy fields within particular areas of the body. Pioneering research in the 1970s by Valerie Hunt at the University of California Los Angeles’ Energy Fields Laboratory demonstrated that specific regions of the skin produced very rapid electrical oscillations (up to 1600 cycles per second, as compared to 0-100 cycles per second in the brain, 225 in the muscles, and 250 in the heart)³⁸ and that these local energy domains corresponded with ancient descriptions of the body’s “chakras.” The chakras are vortexes of biophysical energy that are a focus in the practice of yoga and addressed in a variety of healing systems. Spectrogram analysis³⁹ and Polycontrast Interference Photography⁴⁰ reveal distinct frequency ranges or colors associated with specific chakras. In a different line of investigation, when advanced meditators consciously projected energy through a chakra, the strength of the electrical field emanating from that chakra multiplied.⁴¹ These energy fields apparently both spiral above and permeate specific areas of the body and also interact with the biofield, formulations that are consistent with the way energy medicine practitioners have described the relationship among the chakras and the aura.²

Physiological, psychological, and spiritual functions have been attributed to the chakras.² At the physiological level, the chakras envelop with their energies the organs in their proximity, influencing the health of those organs.⁴² There is some strong

anecdotal evidence that the equilibrium in a chakra's energies not only correlates with and influences the health of the organs located in the chakra's field, but that imbalances in the chakra's energies precede (and thus predict) the onset of disease.⁴⁰ At the psychological level, the chakras are believed to encode experience, with each chakra associated with a distinct developmental theme (eg, survival, creativity, identity, love, expression, deep perception, transcendence of the ego), comprising a sort of memory system that parallels neural memory, a redundancy that is perhaps akin to the redundancy found in the functioning of the right and left cerebral hemispheres. Though such an energy-memory system is foreign to Western thinking, it is taken for granted in many healing traditions and would go far toward explaining why some organ transplant donors start to exhibit the psychological characteristics of their donors.⁴³ Spiritual functions attributed to the chakras are based in the way they are believed to be attuned to metaphysical constructs such as "ancestral memories," "past lives," and "archetypes."

Energy Pathways

A third overarching energy system that seems to regulate the flow of specific energies within the body corresponds with the "energy pathways" referred to as meridians in traditional Chinese medicine and described in a variety of other healing traditions.^{44(p34)} A study published in the *Proceedings of the National Academy of Sciences* in 1998 using functional magnetic resonance imaging (fMRI) demonstrated that stimulating an acupuncture point in the toe (each acupuncture point is believed to sit on the line of and regulate the energy in a particular meridian) activated the exact areas of the brain that would be predicted by acupuncture theory, despite no known anatomical pathways connecting the toe to that brain region.⁴⁵ A special camera that registers biophotons in the spectral range of 200-800 nm shows that when stimulated, the meridians generate light along channels that are identical to the descriptions of meridians found in the texts of traditional Chinese medicine.⁴⁶ The meridians and corresponding acupuncture points also exhibit other physical characteristics such as less electromagnetic resistance,⁴⁷ enhanced ultrasound attenuation,⁴⁸ and the conduction of light,⁴⁹ infrared,⁵⁰ and microwaves.⁴⁴ However, because substantial investigation had failed to find exact physical correlates until Langevin and Yandow's recent work on the relationship of the meridians to connective tissue planes,⁵¹ the meridian concept largely has been discounted by Western science. The meridian system (14 major meridians are generally described, but they are understood as segments of a single continuous energy system) does not, for instance, correspond with known structures in the circulatory, lymphatic, or nervous systems, nor are the meridians and acupuncture points even stable in their shape, size, or location on the skin.⁵²

This, however, is exactly what would be expected if the meridian system operates as a field that is somewhat independent of the physical body it acts upon. In fact, the electrical properties of the acupuncture points can still be identified after death or on an amputated limb—where blood circulation, lymph flow,

and nerve impulses have ceased—suggesting "a completely distinct energy circulatory system interacting with the biomolecular structures but surviving their dissolution for some time."^{52(p33)} As Curtis and Hurtak propose, the meridian system may be a distinct energy system that "functions alongside the accepted blood circulatory, lymphatic, and nervous systems," capable of reading, coding, and transmitting information from one part of the body to another and providing "an underlying template for the physical body."^{52(p34)} They believe it operates on a distinct energetic spectrum whose movement is more like an energy wave than a tube or vessel. Supporting the hypothesis that this energy system impacts biological processes, abundant anecdotal and limited empirical evidence suggests that disruption in a meridian pathway precedes (and, again, thus predicts) disease in specific organs served by that meridian, and that meridians whose energies are disrupted can be treated for therapeutic benefit.⁵³

THE ELECTRICAL, ELECTROMAGNETIC, AND SUBTLE LEVELS OF THE BODY'S ENERGIES

Healing traditions across cultures and throughout history describe and work with specific energy systems that correspond with the laboratory verifications discussed previously of energies that surround the body, centers where energies converge, and pathways along which energy moves.³⁶ Many healing practitioners report sensing such energies, which they believe play a vital role in a person's health. (These healers may possess a quality analogous to synesthesia, where energies most people do not perceive are registered via their senses, most frequently visually or kinesthetically, but occasionally experienced as smells, sounds, or tastes.⁵⁴) Such reports often are corroborated by other healers who are independently recognized for the effectiveness of their methods.⁵⁵ These reports, however, also present a challenge to Western models of healing because some of the energies they describe cannot be detected by existing instrumentation. It is also a source of debate whether this is because such energies, assuming they exist, fall along the electromagnetic spectrum but operate in such minute quantities that they do not reach the necessary thresholds for mechanical detection (electrical current can be detected down to 30 quadrillionths, or 1×10^{-15} , of an ampere⁵⁶—household current, by comparison, typically carries 15-50 amperes) or whether they are of a fundamentally different nature than electromagnetic energy.^{57(pi)}

Energy takes many forms—such as kinetic, thermal, chemical, nuclear—but the energies most pertinent to energy medicine seem to involve the body's (1) electrical energies, (2) electromagnetic energies, and (3) "subtle" energies.

Electrical Energies

Electricity involves the movement of electrons and protons. Like a miniature battery, each cell in the body stores and emits electricity. Normally the outside of a living cell has a positive electrical charge, and the inside has a negative charge. But these charges may be reversed momentarily based on the action of "ion pumps" on the cell membrane that drive sodium ions and pump

potassium ions into the cell. (An ion is an atom or group of atoms that carries an electrical charge.) This is the way that neurological impulses, for example, move along nerve cells. By the time an embryo is only 4 cells in size, an electrical gradient that starts switching on specific genes can be detected.⁵⁸ Every breath, every muscle movement, and every morsel of food being digested involves electrical activity. Likewise, memories, feelings, and thoughts are encoded in patterns of tiny electrical impulses.

Electromagnetic Energies

Electromagnetic radiation is a self-propagating wave. Electromagnetic waves fall along a spectrum that extends from radio waves to microwaves to infrared light to visible light to ultraviolet light to x-rays and gamma rays. This spectrum extends in frequency from 30 Hz (30 cycles per second) all the way up to gamma waves, at a frequency of 300 EHz (300×10^{18} cycles per second). The electromagnetic spectrum can be expressed in terms of energy, wavelength, or frequency. Each is related to the others in a precise mathematical way. For instance, the energy of the wave (measured in electron-volts) is directly proportional to the frequency of the wave. Although electromagnetic energy travels as a wave (eg, light travels from the sun to the earth as a wave), it is absorbed by matter as a particle, called a photon. The precise nature of electromagnetic waves, however, is still a mystery. Photons are distributed through the traveling wave, but you can't take an electromagnetic wave apart and find the photon any more than you can take an absorbed photon apart and find the electromagnetic wave that delivered it. It was this mystery—that electromagnetic energy travels as a wave but is absorbed as a particle—that gave birth to quantum physics.

Subtle Energies

Einstein described subtle energies as energies known because of their effects, even though we do not have the instruments to detect them directly. Electromagnetism was in that category only 250 years ago. Its effects could be observed, but electromagnetism itself could not be measured. Many of the energies focused upon by energy medicine practitioners cannot move a needle on a gauge, yet they appear to impact health and vitality. Meanwhile, William Tiller and his colleagues at Stanford University have developed a device that, according to Tiller, demonstrates the existence of an energy field that is not within the electromagnetic spectrum.⁵⁹ Most interesting, Tiller's device also has shown that this subtle energy field responds to human intention.

The hypothesis that the body's major energy systems—such as its biofield, local fields, and energy pathways—operate as a spectrum that may include electrical, electromagnetic, and subtle energies in varying combinations—corresponds with a wide range of scientific data and field reports. For instance, the vortexes of biophysical energy known as the chakras in yoga tradition can be measured according to electromagnetic frequencies in the area of the body where the chakra is located.³⁸ But they also seem to contain information that a sensitive healer can “read” intuitively by becoming attuned to the subtle energies held by that chakra. There are many accounts of healers providing accurate medical diagnoses

by tuning into a person's chakra energies, sometimes even reporting in detail a traumatic memory that was closely followed by the onset of an illness and that the client is able to verify.²

Although the idea that fields carry biological and other types of information has attracted little interest within the scientific community for the most part, powerful examples have been coming into the public eye. Among the most dramatic are of heart transplant patients who, post-surgery, begin to have thoughts, memories, dreams, tastes, desires, values, manners, and other personality characteristics that they later learn correspond with those of the person whose heart now beats in their own body.⁶⁰ The following story reads more like a television drama than a documented medical case, but its source is a credible psychiatrist who was speaking to an international group of psychotherapists, and it is consistent with growing numbers of documented reports from other organ recipients.⁴³

I have a patient, an 8-year-old little girl who received the heart of a murdered 10-year-old girl. Her mother brought her to me when she started screaming at night about her dreams of the man who had murdered her donor. She said her daughter knew who it was. After several sessions, I just could not deny the reality of what this child was telling me. Her mother and I finally decided to call the police and, using the descriptions from the little girl, they found the murderer. He was easily convicted with evidence my patient provided. The time, the weapon, the place, the clothes he wore, what the little girl he killed had said to him . . . everything the little heart transplant recipient reported was completely accurate.

While conventional paradigms cannot account for these occurrences, it is the anomalies that reveal the shortcomings of a paradigm and lead to its refinement. No available explanation of the heart transplant data makes more sense than that the heart carries a field (the electrical field of the heart is about 60 times greater in amplitude than that of the brain, and its magnetic field according to some estimates is up to 5000 times stronger⁶¹) and that this field holds information about the individual.

SIX PILLARS OF ENERGY MEDICINE

Conventional medicine, at its foundation, focuses on the biochemistry of cells, tissue, and organs. Energy medicine, at its foundation, focuses on the fields that organize and control the growth and repair of cells, tissues, and organs, and on ways of influencing those fields. This affords energy medicine several strengths in comparison with the conventional medical model. Six of these strengths can, in fact, be thought of as the pillars that establish energy medicine as a significant development in healthcare. The table provides an overview of these 6 pillars, the premises that support them, and an example for each of how its strength might be used in a clinical situation. The following discussion focuses on each of the 6 pillars with greater detail, showing why the energy paradigm is rapidly gaining strength even among conventional healthcare practitioners.

TABLE Six Pillars of Energy Medicine

Pillar	Premise	Practice
<p>1. REACH: <i>Energy medicine (EM) can address biological processes at their energetic foundations so is able to impact the full spectrum of physical conditions.</i></p>	<p>EM optimizes the energies that surround, permeate, and support body structure (eg, cells, organs, blood, lymph) and body function (eg, immunity, respiration, cardiovascular). EM methods also influence gene expression.</p>	<p>Disturbances in the energy flow of a patient with multiple sclerosis (MS) can be corrected by holding, tapping, or massaging specific energy points, bringing about changes in the disease process rather than the symptom suppression of most MS treatments.</p>
<p>2. EFFICIENCY: <i>EM regulates biological processes with precision, speed, and flexibility.</i></p>	<p>EM techniques address systemic as well as specific disease factors, send signals that are hundreds of times faster than chemical signals, and provide instant feedback to the practitioner so interventions can be adjusted for intended outcomes.</p>	<p>Balancing and strengthening the energies that surround and permeate the heart of a post-coronary patient leads to an internal environment that better supports healing and repair.</p>
<p>3. PRACTICALITY: <i>EM fosters healing and prevents illness with methods that can be readily, economically, and noninvasively applied.</i></p>	<p>EM uses specific movements, postures, and hands-on approaches that do not require high-tech equipment and do not result in unintended side effects.</p>	<p>Assessing disturbances in the energy flow to the kidneys of a patient with renal failure allows interventions that are more flexible and precise than medication or surgery and can be used preventively, circumventing damage to a vulnerable organ.</p>
<p>4. PATIENT EMPOWERMENT: <i>EM includes methods that can be used on an at-home, self-help basis, fostering a stronger patient and practitioner partnership in the healing process.</i></p>	<p>EM procedures can be self-administered to assess systems that are out of balance, implement corrective actions, and build resilient energy patterns throughout the body.</p>	<p>Cirrhosis patients can on a daily basis use techniques that balance the energies that impact the liver and enhance its ability to heal.</p>
<p>5. QUANTUM COMPATIBILITY: <i>EM adopts non-linear concepts consistent with distant healing, the healing impact of prayer, and the role of intention in healing.</i></p>	<p>EM explores fields that influence consciousness and work over a distance (“macroscopic quantum interactions”), postulating why intention and expectation have salient outcomes, as illustrated in the placebo effect and distant healing.</p>	<p>Cancer patients can be shown how the energies of their thoughts and imagery affect their healing, and they can be taught techniques that engage the healing power of focused intention.</p>
<p>6. HOLISTIC ORIENTATION: <i>EM strengthens the integration of body, mind, and spirit, leading not only to a focus on healing, but to achieving greater well-being, peace, and passion for life.</i></p>	<p>EM is based on the principle that the body, mind, and spirit are integrally connected, and it promotes their harmonious integration.</p>	<p>Ulcerative colitis patients can be shown how psychological conflicts may exacerbate their symptoms and can be provided therapies that quickly alter the energetic foundations of those conflicts.</p>

Pillar 1: Reach

Energy medicine can address biological processes at their energetic foundations and therefore is able to impact the full spectrum of physical conditions. Not just the sum of its mechanical parts, the human body is a system of living energy. The skin discharges about 30 photons per cm² per second. Each cell emits electromagnetic radiation. Electrical signals govern every physiological process. Yet Western medicine continues to focus on the chemistry of the body with little concern for its energies or organizing fields and it offers primarily pharmaceutical and surgical interventions rather than energy treatments. Leading-edge science does not, however, support this unilateral approach. The influ-

ence of energy fields on gene expression may, in fact, prove to be at the core of energy medicine’s substantial reach in healing and preventing even elusive health conditions.

According to cell biologist Bruce Lipton, hundreds upon hundreds of scientific studies over the past 50 years have revealed that “every facet of biological regulation” is profoundly affected by the “invisible forces” of the electromagnetic spectrum. He explains that specific patterns of “electromagnetic radiation regulate DNA, RNA and protein synthesis, alter protein shape and function, and control gene regulation, cell division, cell differentiation, morphogenesis (the process by which cells assemble into organs and tissues), hormone secretion, nerve growth and function,” essentially

the fundamental processes that contribute to “the unfolding of life.” But, he laments, “though these research studies have been published in some of the most respected mainstream biomedical journals, their revolutionary findings have not been incorporated into our medical school curriculum.”^{10(p111)}

What does this disregard for the role of energy in regulating biological processes mean for contemporary medicine? It means more invasive procedures that are at the same time less able to target underlying causal mechanisms and less able to affect, with precision, the mechanisms it can influence. For instance, when electromagnetic imbalances stimulate the body to produce a chemical to restore balance, such as estrogen or progesterone, the chemical is produced in the precise quantities needed and only where needed. Energy interventions designed to produce more estrogen or progesterone produce electromagnetic signals that cause the body to create the needed hormone using its own natural mechanisms.⁶² When medications enter the bloodstream, on the other hand, their dosage is based on averages and guesswork, and they travel to and affect parts of the body that are not intended, resulting, for instance, in the disastrous increases in heart disease, strokes, and breast cancer among women who have undergone hormone replacement therapy.¹⁰ Between 100 000 and 300 000 people in the United States die each year from medications taken as prescribed, and unintended effects of medical treatment are by some estimates our leading cause of death. A team that surveyed government health statistics over the past decade concluded, “When the number one killer in a society is the health care system, then that system has no excuse except to address its own urgent shortcomings . . . beginning at its very foundations.”^{63(p33)}

The first pillar in energy medicine’s ability to address the shortcomings of contemporary healthcare strategies is in its reach, its ability to safely influence the energies that underlie all biological processes in ways the biomedical paradigm cannot. By not having a framework for proactively developing interventions that target the body’s energy fields, conventional medicine fails to cultivate methods that have potential for noninvasively influencing the control of gene expression, for identifying and preventing disease, and for intervening in macro-processes such as immune function.

Pillar 2: Efficiency

Energy interventions can regulate biological processes with precision, speed, and flexibility. Electromagnetic frequencies are 100 times more efficient than chemical signals such as hormones and neurotransmitters in relaying information within biological systems, a calculation based on research conducted in the 1970s by Oxford University biophysicist C. W. F. McClare.⁶⁴ Many of the body’s regulatory chemicals, such as hormones, travel less than a centimeter in a second, whereas an electromagnetic wave could have traveled three quarters of the distance to the moon in that time. The signals sent via acupuncture treatments have been shown to produce information at speeds several orders of magnitude greater than nerve impulses.⁴⁵ Beyond the exponentially greater speed of energy interventions, most of the information

being transferred by chemical diffusion is lost because so much of the operation is simply making and breaking chemical bonds. Lipton summarizes the benefits and costs of energy treatments: “Energy signals are 100 times more efficient and infinitely faster than physical chemical signaling. What kind of signaling would your trillion-celled community prefer? Do the math!”^{10(p112)}

Conventional medical treatments still do not take advantage of the potent ways energy can transmit information in biological systems (with some notable exceptions, such as the use of heart pacemakers, harmonic frequencies that dissolve kidney stones, PMS machines, and the use of magnets for alleviating tendonitis, facial paralysis, and optic nerve atrophy). Nonetheless, ironically, conventional medicine has had no difficulty accepting diagnostic instruments that are based on the concept of energy as information. Energy-scanning devices analyze the frequencies of the body’s chemicals, tissues, and organs. MRIs, electroencephalograms (EEGs), electrocardiograms (ECGs), electromyograms (EMGs), and computed axial tomography (CAT) scans have proven their ability to detect illness noninvasively. Healthy and unhealthy tissues have distinct electromagnetic properties that can be detected in scanned images. Lipton observes that “diseased tissue emits its own unique energy signature, which differs from the energy emitted by surrounding healthy cells,” and he goes on to suggest that there is enough scientific evidence to speculate that we will be able to tailor energy and waveforms that act as therapeutic agents “in much the same way that we now modulate chemical structures with drugs.”^{10(p119)}

Energy medicine practitioners already, often without the use of mechanical devices, purportedly identify imbalances in the body’s energies and directly intervene so the waveform patterns emitted by diseased tissue or other malfunctioning systems are modified and surrounded by energy fields that exert a therapeutic effect. To the extent that such procedures can be refined and taught, energy medicine will offer interventions that are substantially more precise than medication and more flexible and noninvasive than surgery, significantly reducing the time involved in the healing process without producing unwanted side effects.

Pillar 3: Practicality

Energy medicine fosters healing and prevents illness with interventions that can be readily, economically, and noninvasively applied. The ability to sense and correct energy imbalances historically has been tied to survival. Tribal people could detect whether the energies of a recently encountered plant were noxious before ingesting it. Indigenous medicine is oriented toward keeping the body healthy by keeping its energies flowing and in harmony. As the Nobel prize-winning biochemist Albert Szent-Györgyi observed, “In every culture and in every medical tradition before ours, healing was accomplished by moving energy.”⁶⁵ In traditional Chinese medicine, you keep the body healthy by keeping the energy fields that support it healthy. Because disturbed energies lead to corresponding disturbances in the physical body (somewhat like the way the energy field carried by a salamander embryo is the blueprint for the adult), maintaining healthy energies is seen as the path for maintaining health

and preventing illness. In some provinces of ancient China, in fact, you paid the physician when you were healthy. If you got sick, the physician would work hard to try to cure your illness, but you did not have to pay because the physician had failed to keep your energy field healthy enough to prevent the illness.

Norman Shealy and Dawson Church have identified 4 ways that energy can be systematically introduced into the healing process.⁶⁶ The first is a form of energy that is generated mechanically, such as the spark produced by pressing the button on a gas grill's lighter. Called piezoelectricity (derived from the Greek word *piezein*, which means "to squeeze or press"), it is based on the way that pressure placed on certain materials is converted into electricity. Current can be generated by placing pressure on crystalline structures, which include the bones, tendons, and collagen. This, in fact, is the basis of acupuncture, acupressure, and the massaging or tapping of energy points, and the piezoelectrical energy that is produced can be conducted through the body's connective tissue.⁶⁷ A second way that energy can be used in healing is by surrounding tissue with an electromagnetic field. When a healer's hands or a magnetic device are held over a part of the body, the energy within the tissue can, at least in theory, be brought back into alignment and balance. A third approach is to actually send electrical impulses through the body, as is accomplished with heart pacemakers and PMS machines.⁶⁷ A final approach, which is highly speculative yet necessary to explain oddities such as distance healing⁶⁸ and other non-local effects, involves "macrolevel quantum fields."⁶⁹

While a range of interventions using electrical devices, magnets, crystals, needles, aromas, and ingested substances are used in energy medicine, the tool used by the largest number of practitioners for intentionally moving and harmonizing the body's energies and fields is the human hand. Many of the interventions found in the field's standard texts and manuals^{2,70-72} are, in fact, hands-on approaches designed to bring balance and harmony to the body's energy fields. A practitioner can tap, massage, pinch, twist, or connect specific energy points on the skin. Because everyone's hands carry a measurable electromagnetic charge, specific areas of the body can be surrounded with the hands to produce a field effect, or the hands can be used to move and align the body's energies by tracing specific energy pathways along the skin.

Other noninvasive and readily accessible interventions include the use of specific postures and movements that have beneficial effects on the body's energy system. Such noninvasive treatments might routinely be considered in healthcare settings, in accord with the principle that the least invasive measure likely to cure an illness should be the first applied.⁷³ These low-tech procedures are not only readily available and easily added to the practitioner's treatment repertoire with a modicum of education, their preventive and noninvasive qualities mean that they may be highly cost-effective compared to conventional medicine.

Pillar 4: Patient Empowerment

Energy medicine includes methods that can be used on an at-home, self-help basis, fostering a stronger patient-practitioner partner-

ship in the healing process. Energy medicine uses the term "energy" in 2 senses. Energy is the medicine, and energy is also the patient. You heal the body by activating its natural healing energies (energy as the "medicine"), and you also heal the body by restoring energies that have become weak, disturbed, or out of balance (energy as the "patient"). People can be shown a variety of exercises or postures that are designed for specific energy effects in both senses. They can self-administer techniques that activate their inner healer in a generic manner and that also bring balance to specific energy systems that are needing attention.

Energy medicine typically is delivered in any of 3 contexts: (1) as an independent system for addressing physical problems, (2) as a complement to other approaches to healthcare, and (3) as a set of procedures for self-care and self-help. Using energy medicine as a self-care approach, individuals can learn to assess whether certain key energy systems are out of balance, to implement corrective procedures, and to build resilient energy patterns for the prevention of illness. Although traditional medicine may recommend exercise, a healthy diet, stress reduction, and other common-sense steps for better health, its core procedures are medication, radiation, and surgery, and these must be administered by a healthcare professional. On the other hand, energy medicine, which recognizes energy as a vital, living, moving force in each individual, lends itself to being self-administered. It is inherently democratic. The body's healing energies are free, everyone's birthright. Energy medicine teaches people to marshal these energies to counter illness and enhance health.

Pillar 5: Quantum Compatibility

Energy medicine adopts non-linear concepts consistent with distant healing, the healing impact of prayer, and the role of intention in healing. A great incongruity in Western medicine is that its core paradigm is a century behind the paradigm used by modern physics. Einstein's piercing formula showing that energy and matter are interchangeable was published in 1905. More than a scientific technicality, this discovery revealed that a Newtonian physics that focuses on the mechanics of life gives us only a glimpse into a larger story. The darkest implications of the discovery that energy and matter are interchangeable burst into our collective psyche on August 6, 1945, when the tale of Prometheus, who stole fire from the gods, became the terrifying mythic dilemma of an unwitting humanity that suddenly possessed the power to destroy itself. But the realization that the billiard ball-like atoms of a century ago are really composed of packets of energy—unique in their distribution of positive and negative charges, spin rate, and vibrational pattern³—is also about to revolutionize some of our most cherished Promethean inventions, such as televisions, cell phones, and computers, all originally based on electromagnetic effects.

As scientists are able to peer more deeply into the unimaginably minuscule building blocks of nature, such as quarks, baryons, and mesons, some are speculating that at its base, matter may not be made of particles at all—it may be more like strings of vibrating energy.⁷⁴ The physical body itself is continually

vibrating and resonating with other energies in the environment. Though Western medicine has developed few interventions that are based in the recognition that energy is at the foundation of, or at least intimately intertwined with, physical matter, scientists from many other disciplines are working within this perspective. They are, for example, recognizing the potential explanatory power of fields that are “totally unlike any of those presently known”^{1(p17)} in the ways they hold and transmit information, display quantum properties such as non-local influence, and interact with consciousness. Although nature’s strong and weak quantum forces are understood to have their effects only in the subatomic world, hypothesized fields whose actions on biological systems work at a distance through “macroscopic quantum interactions” have been formulated.^{69,75}

Such fields might parsimoniously explain, for instance, the beneficial effects of prayer and distant healing that have been widely observed and documented⁷⁶ as well as the role of intention, placebo effect, and other psychological factors in health and healing. The impact of human intention on physical systems within and beyond the body of the person holding the intention is another anomaly that simultaneously reveals a shortcoming of the conventional medical paradigm and highlights a strength of the energy medicine paradigm. In a classic example, experimental subjects, after being instructed in how to use visualization to inhibit the breakdown of red blood cells in a test tube located in a different room achieved statistically significant results in their efforts to slow the rate of cell deterioration.⁷⁷ Experiments demonstrating the role of intention on physical and social processes range from focused thoughts affecting seed germination²⁸ to highly significant reductions in crime rates after groups of meditators were deployed to troubled neighborhoods.⁷⁸

Pillar 6: Holistic Orientation

Energy medicine strengthens the integration of body, mind, and spirit, leading not only to a focus on healing but to achieving greater well-being, peace, and passion for life. An essential difference between energy medicine and conventional medicine involves the concepts of diagnosis and treatment. Energy medicine is concerned with the person as an integrated energetic system, impacting body, mind, and spirit. “Diagnosis” focuses on disruptions and imbalances in the body’s energy system. For instance, there is some evidence that, with cancer, the energies tend to be disorganized and lacking in coherence, whereas with multiple sclerosis, they tend to be so highly ordered as to lack flexibility.⁷⁹ “Treatment” is not of the disease or its symptoms per se. Rather, it is designed to correct such energetic imbalances. Symptoms provide clues for determining the nature of the imbalances and a measure of whether the treatment is succeeding, but they are not the primary focus. For instance, where conventional medicine treats kidney disease by focusing on the organ itself (thus leaving medication and surgery as the most obvious choices), in energy medicine, the treatment focuses on the energy systems that affect the kidneys.

Such energies are not necessarily limited to the kidneys. They are often systemic, running throughout the body. Energy medicine, in fact, offers many methods that instantaneously

affect the entire body. The mechanism by which it is possible for energy interventions to have this “holistic” influence is the body’s connective tissue, which is, for many healers, thought of as a communication medium.³ According to Church, “Every organ of your body is encased within the body’s largest organ, which functions as a liquid crystal semiconductor” that processes information by being able “to store energy, amplify signals, filter information, and to move information in one direction but not in another.”^{29(pp137-138)} With the connective tissue acting as a giant liquid crystal electrical semiconductor, energy interventions can simultaneously be brought to every cell of the body.

This whole-body effect carries significant advantages. For instance, as discussed earlier, when medications meant to correct chemical imbalances in a specific area of the body move through the bloodstream, they often inadvertently upset chemical balances in untargeted organs and systems. When energy interventions are applied, on the other hand, they are conducted through the connective tissue, so the information is simultaneously received throughout the body. This allows the energies that have been introduced to be coordinated with the body’s entire energy system, resulting in harmonious self-regulation. Serious side effects from responsible hands-on energy interventions are, in fact, rarely if ever seen, with the most frequently reported difficulties involving too much energy being moved too quickly for a physically unstable person to readily accommodate.

Not only do energy medicine interventions allow for rapid signaling activity throughout the body that, according to their practitioners, is clinically safe, energy medicine is also holistic in its ability to bridge body, mind, and spirit. The influence of the mind on the body’s health is well-established. In a 35-year longitudinal study, people with a pessimistic explanatory style were at greater risk for physical illness than individuals with an optimistic explanatory style.⁸⁰ The power of thought on biological processes is decisive and direct. Focused intention can literally wind or unwind the tightness of DNA strands, leading to speculation that DNA acts as an “antenna” attuned to fields and thought processes that ultimately influence the expression of specific genes.⁸¹ Energy medicine and energy psychology (a specialty within energy medicine in the sense that psychiatry is a specialty within conventional medicine) provide methods that attempt to directly influence the energies that are involved in psychological processes.

Using this approach, it is possible to address emotional problems in ways that promote robust psychological functioning.⁸² This positions energy therapy as an unusually direct and powerful method for working with the principles being generated within behavioral medicine and health psychology.⁸³ In addition, many of the ancient traditions being revisited via energy medicine were spiritual disciplines as well as healing modalities, and some practitioners speculate that the energies they invoke are a bridge into the world of spirit.⁸⁴ Meanwhile, medical systems based in the biomedical paradigm have to struggle against the paradigm itself to incorporate the decisive findings and health implications regarding the impact of consciousness, intention, and subtle energies on physical processes.

CONCLUSIONS AND FUTURE RESEARCH

Many ancient healing practices that conceptualize “energy” as a critical component in their actions—from acupuncture to meditation to yoga to qigong—are, according to Kim Jobst, editor of the *Journal of Alternative and Complementary Medicine*, “withstanding the test of time and emerging into the realms of biomedicine because, not only does anecdote testify to the practices’ benefits to patients . . . emerging technology can demonstrate objective effectiveness according to the . . . criteria for what constitutes scientific evidence.”^{85(pp1-2)} Research evidence demonstrating the efficacy of acupuncture,⁸⁶ acupressure,⁸⁷ therapeutic touch,³⁰ healing touch,⁸⁸ Reiki,⁷² qigong,⁸⁹ intentional healing,⁹⁰ and other forms of energy medicine⁹¹ exists, but their clash with conventional medicine’s paradigm has, to a large degree, prevented these modalities from being integrated into mainstream healthcare. The 6 pillars discussed in this article beckon healthcare providers to consider facilitating such integration.

Although subtle energies and organizing fields still for the most part elude contemporary scientific instrumentation, the clinical outcomes of interventions by practitioners who believe they are working with those energies and fields can be measured. In addition to the studies supporting each of the specific energy medicine modalities cited above, examples focused on energy medicine interventions with specified health conditions include improvement in the symptoms of fibromyalgia following qigong therapy⁹²; improvement in health-related quality of life measures in cancer patients undergoing radiation therapy who underwent healing touch treatments⁹³; increased strength, balance, and flexibility in adults with cardiovascular disease risk factors following tai chi⁹⁴; and improved cardiovascular function following acupressure.⁹⁵

Experiments also could be devised to test each of the 6 pillars. Empirical demonstration of their strengths would be a timely contribution given the seemingly plausible claims of energy medicine practitioners regarding the potential benefits of integrating energy interventions into mainstream practice. The following research questions, 1 for each of the 6 pillars, are formulated to encourage such studies:

1. What are the effects of twice-weekly energy medicine treatments on gene expression as measured by “gene chips,”⁹⁶ as well as the disease course, with patients diagnosed with multiple sclerosis as compared with matched patients receiving conventional treatment only? (Pillar 1, reach)

2. Do energy medicine treatments before and after surgery significantly enhance recovery and reduce recovery time in comparison with matched patients who do not receive energy medicine treatments? (Pillar 2, efficiency)

3. Does offering a randomly selected group of employees of a company daily 20-minute energy balancing sessions affect job performance, baseline lab test health indicators, and medical service use over a 2-year period compared with randomly selected employees who are offered a daily 20-minute calisthenics program and another group of employees with no special treatment? (Pillar 3, practicality)

4. Does introducing an at-home energy-balancing regimen

to cancer patients receiving radiation treatment reduce side effects in comparison with matched patients not using such methods? (Pillar 4, patient empowerment)

5. Can the waveform patterns associated with diseased tissue be modified through the use of distant healing, and do the modified waveform patterns correspond with subsequent tissue repair? (Pillar 5, quantum compatibility)

6. Do energy interventions that focus on psychological conflicts in patients with cardiovascular disease lead to more rapid improvement according to physical markers than matched controls who do not receive such treatment? (Pillar 6, holistic orientation)

Even as energy medicine practitioners continue to operate largely outside of conventional medical institutions (though the routine use of interventions such as Reiki, healing touch, and therapeutic touch is seen in growing numbers of hospitals and the American Academy of Medical Acupuncture has more than 1600 physicians in its membership), each of these experiments could readily be conducted and would shed light on the strengths, limitations, and comparative value of an energy medicine approach. The 6 pillars outlined in this article have been demonstrated in many practice settings as being operational, relevant, and available for implementation. The discipline is still establishing its strengths and range of application, but enough is already known to conclude that conventional healthcare practice could be substantially strengthened by embracing energy medicine.

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REFERENCES

1. Becker RO. Exploring new horizons in electromedicine. *J Altern Complement Med.* 2004;10(1):17-18.
2. Eden DW, Feinstein D. *Energy Medicine: Balance and Vitalize Your Body's Energies for Optimal Health.* New York: Penguin; 1998.
3. Oschman J. *Energy Medicine: The Scientific Basis.* New York: Harcourt; 2000.
4. Shealy N. Acceptance speech upon receipt of the Alyce and Elmer Green Award for Excellence. 8th Annual Conference of the International Society for the Study of Subtle Energies and Energy Medicine; June 20, 1998; Boulder, CO.
5. National Center for Complementary and Alternative Medicine. Energy medicine: an overview. Bethesda, MD: NCCAM; 2007. Available at: <http://nccam.nih.gov/health/backgrounds/energymed.htm>. Accessed September 10, 2007.
6. National Center for Complementary and Alternative Medicine. What is complementary and alternative medicine? Bethesda, MD: NCCAM; 2007. Available at: <http://nccam.nih.gov/health/whatiscam>. Accessed September 10, 2007.
7. Dorfer L, Moser M, Bahr F, et al. A medical report from the stone age? *Lancet.* 1999;354(9183):1023-1025.
8. Starfield B. Is US health really the best in the world? *JAMA.* 2000;284(4):483-485.
9. Rossi EL. *The Psychobiology of Gene Expression.* New York: Norton; 2002.
10. Lipton BH. *The Biology of Belief: Unleashing the Power of Consciousness, Matter and Miracles.* Santa Rosa, CA: Elite; 2005.
11. Pennisi E. Behind the scenes of gene expression. *Science.* 2001;293(5532):1064-1067.
12. McTaggart L. *The Field: The Quest for the Secret Force of the Universe.* New York: HarperCollins; 2003.
13. Feinstein D. At play in the fields of the mind: personal myths as fields of information. *J Human Psychol.* 1998;38(3):71-109.
14. Liboff AR. Toward an electromagnetic paradigm for biology and medicine. *J Altern Complement Med.* 2004;10(1):41-47.
15. Sheldrake R. *The Presence of the Past: Morphic Resonance and the Memory of Nature.* New York: Random House; 1988.
16. Becker RO. *Cross Currents: The Perils of Electropollution, the Promise of Electromedicine.* New York: Penguin; 1990:56.
17. Tiller WA. What are subtle energies? *J Sci Explor.* 1993;7(3):293-304.
18. Libet B. A testable field theory of mind-brain interaction. *J Consciousness Stud.* 1994;1(1):119-126.

19. Hameroff S. Quantum coherence in microtubules. *J Consciousness Stud.* 1994;1(1):91-118.
20. Dreitsch H. Studies on mechanisms of development [in German]. *Zeitschrift für Zoology.* 1891;53:160-178.
21. Weiss P. *Principles of Development.* New York: Holt; 1939.
22. Gurwitsch AG. *The Theory of the Biological Field [in Russian].* Moscow: Sovetskaya Nauka Publishing House; 1944.
23. Burr HS. *The Fields of Life.* New York: Ballantine; 1972.
24. Matthews RE. Harold Burr's biofields: measuring the electromagnetics of life. The Energy Medicine Handout Bank. Available at: http://www.energymed.org/hbank/handouts/harold_burr_biofields.htm. Accessed September 10, 2007.
25. Burr HS, Northrup FSC. The electro-dynamic theory of life. *Q Rev Biol.* 1935;10:322-333.
26. Frazee OE. The effect of electrical stimulation upon the rate of regeneration in *Rana pipiens* and *Amblystoma jeffersonianum*. *J Exp Zool.* 1909;7:457.
27. Lund EJ. *Bioelectric Fields and Growth.* Austin: The University of Texas Press; 1947.
28. Creath K, Schwartz GE. Measuring effects of music, noise, and healing energy using a seed germination bioassay. *J Altern Complement Med.* 2004;10(1):113-122.
29. Church D. *The Genie in Your Genes: Epigenetic Medicine and the New Biology of Intention.* Santa Rosa, CA: Elite; 2007.
30. Winstead-Fry P, Kijek J. An integrative review and meta-analysis of therapeutic touch research. *Altern Ther Health Med.* 1999;5(6):58-67.
31. Conner MH. Oscillation of amplitude as measured by an extra low magnetic field meter as a physical measure of intentionality. Poster presented at: Toward a Science of Consciousness 2006; April 4-8 2006; Tucson, AZ.
32. Hintz KI, Yount GI, Kadar I, Schwartz G, Hammerschlag R, Lin S. Bioenergy definitions and research guidelines. *Altern Ther Health Med.* 2003;9(3 Suppl):A13-A30.
33. Zhang CI. Electromagnetic body versus chemical body. *Network.* 2003;81:7-10.
34. Rubik B. The biofield hypothesis: its biophysical basis and role in medicine. *J Altern Complement Med.* 2002;8(6):703-717.
35. Clarke J, Braginski AI, eds. *The SQUID Handbook: Applications of SQUIDS and SQUID Systems.* Vol. 2. New York: Wiley; 2006.
36. Collinge W. *Subtle Energy: Awakening to the Unseen Forces in Our Lives.* New York: Warner Books; 1998.
37. Becker RO, Spadaro JA, Marino AA. Clinical experiences with low intensity direct current stimulation of bone growth. *Clin Orthop Relat Res.* 1977 May;(124):75-83.
38. Hunt V. Electronic evidence of auras, chakras in UCLA study. *Brain/Mind Bulletin.* 1978;3(9):1-2.
39. Lee RH. Quantifying subtle energies through physical vibration. Paper presented at: 16th Annual Conference of the International Society for the Study of Subtle Energies and Energy Medicine; June 22-28, 2006; Boulder, CO.
40. Oldfield H. The human energy field and the invisible universe. Paper presented at: 16th Annual Conference of the International Society for the Study of Subtle Energies and Energy Medicine; June 22-28, 2006; Boulder, CO.
41. Motoyama H, Brown R. *Science and the Evolution of Consciousness: Chakras, Ki, and PSI.* Brookline, MA: Autumn Press; 1978.
42. Leskowitz R. Energy medicine 101: subtle anatomy and physiology. *Integr Med Clin J.* 2006;5(4):30-34.
43. Pearsall P. *The Heart's Code: Tapping the Wisdom and Power of Our Heart Energy.* New York: Broadway Books; 1998.
44. Hu XL, ed. *Modern Scientific Research in Acupuncture Channels and Collaterals in Traditional Chinese Medicine [in Chinese].* Beijing: People's Hygiene Publishing House; 1990.
45. Cho ZH, Chung SC, Jones JP, et al. New findings of the correlation between acupoints and corresponding brain cortices using functional MRI. *Proc Natl Acad Sci U S A.* 1998;95(5):2670-2673.
46. Schlebusch KP, Maric-Oehler W, Popp FA. Biophotonics in the infrared spectral range reveal acupuncture meridian structure of the body. *J Altern Complement Med.* 2005;11(1):171-173.
47. Ahn AC, Wu J, Badger GJ, Hammerschlag R, Langevin HM. Electrical impedance along connective tissue planes associated with acupuncture meridians. *BMC Complement Altern Med.* 2005 May 9;5:10.
48. Jones JP, Bae YK. Ultrasonic visualization and stimulation of classical oriental acupuncture points. *Med Acupunct.* 2004;15(2):24-26.
49. Yan Z, Chi Y, Wang P. Studies on the luminescence of channels in rats. *J Trad Chinese Med.* 1992;4:283-287.
50. Wang P, Hu X, Wu B. Displaying of the infrared radiant track long meridians on the back of the human body [in Chinese]. *Chen Tzu Yen Chiu Acupuncture Research.* 1993;18(2):90-93,89.
51. Langevin HM, Yandow JA. Relationship of acupuncture points and meridians to connective tissue planes. *Anat Rec.* 2002;269(6):257-265.
52. Curtis BD, Hurtak JJ. Consciousness and quantum information processing: uncovering the foundation for a medicine of light. *J Altern Complement Med.* 2004; 10(1):27-39.
53. Motoyama H. *Measurements of Ki Energy, Diagnosis and Treatments.* Tokyo: Human Science Press; 1998.
54. Eden D, Feinstein D. Ways of seeing subtle energy. The Energy Medicine Handout Bank. Available at: http://www.energymed.org/hbank/handouts/ways_of_seeing.htm. Accessed September 10, 2007.
55. Hunt VV. *Infinite Mind: The Science of Human Vibrations.* Malibu, CA: Malibu Publishing; 1995.
56. Tucker J. *Techniques for Accurate Nanotech Electrical Measurements.* Cleveland: Keithley Instruments; 2005.
57. Srinivasan TM. The intricacies of subtle energy. *Subtle Energies Energy Med.* 2004;15(3):i-iv.
58. Rutenberg J, Cheng SM, Levin M. Early embryonic expression of ion channels and pumps in chick and xenopus development. *Dev Dyn.* 2002;225(1):469-484.
59. Tiller WA. *Psychoenergetic Science: A Second Copernican-Scale Revolution.* Walnut Creek, CA: Pavior; 2007.
60. Sylvia C. *A Change of Heart: A Memoir.* New York: Grand Central Publishing; 1998.
61. McCraty R. The energetic heart: bioelectromagnetic communication within and between people. In: Rosch PJ, Markov MS, eds. *Clinical Applications of Bioelectromagnetic Medicine.* New York: Marcel Dekker; 2004:541-562.
62. Eden D. *Energy Medicine for Women.* New York: Penguin; in press.
63. Null G, Dean C, Feldman M, Rasio D, Smith D. *Death by Medicine.* New York: Nutrition Institute of America; 2003.
64. McClare CW. Resonance in bioenergetics. *Ann NY Acad Sci.* 1974 Feb 18;227:74-97.
65. Szent-Gyorgyi A. *Introduction to a Submolecular Biology.* New York: Academic Press, 1960:135.
66. Shealy CN, Church D. *Soul Medicine: Awakening Your Inner Blueprint for Abundant Health and Energy.* Santa Rosa, CA: Elite; 2006.
67. Fitzgerald PB, Brown TL, Marston NA, Daskalakis ZJ, de Castella A, Kulkarni J. Transcranial magnetic stimulation in the treatment of depression: a double-blind, placebo-controlled trial. *Arch Gen Psychiatry.* 2003;60(10):1002-1008.
68. Astin JA, Harkness E, Ernst E. The efficacy of "distant healing": a systematic review of randomized trials. *Ann Intern Med.* 2000;132(11):903-910.
69. Rein G. Bioinformation within the biofield: beyond bioelectromagnetics. *J Altern Complement Med.* 2004;10(1):59-68.
70. Brennan BA. *Hands of Light: A Guide to Healing Through the Human Energy Field.* New York: Bantam; 1993.
71. Krieger DK. *The Therapeutic Touch: How to Use Your Hands to Help or to Heal.* New York: Fireside; 1979.
72. Miles P. *Reiki: A Comprehensive Guide.* New York: Penguin; 2006.
73. Eden D, Feinstein D. Energy medicine: uses in medical settings. Energy Medicine Handout Bank. Available at: http://www.energymed.org/hbank/handouts/ener-med_in_medical_set.htm. Accessed September 10, 2007.
74. Greene B. *The Elegant Universe: Superstrings, Hidden Dimensions, and the Quest for the Ultimate Theory.* New York: Norton; 2003.
75. Hyland M. Extended Network Generalized Entanglement Theory: therapeutic mechanisms, empirical predictions, and investigations. *J Altern Complement Med.* 2003;9(6):919-936.
76. Radin D. *Entangled Minds: Extrasensory Experiences in a Quantum Reality.* New York: Paraview Pocket Books; 2006.
77. Braud WG. Distant mental influence of rate of hemolysis of human red blood cells. *J Am Soc Psychical Res.* 1990;84:1-24.
78. Dillbeck MC, Cavanaugh KL, Glenn T, Orme-Johnson DW, Mittlefehldt V. Consciousness as a field: the Transcendental Meditation and TM-Sidhi program and changes in social indicators. *J Mind Behav.* 1987;8(1):67-104.
79. Cohen S, Popp FA. Biophoton emission of the human body. *J Photochem Photobiol B.* 1997;40(2):187-189.
80. Peterson C, Seligman ME, Vaillant GE. Pessimistic explanatory style is a risk factor for physical illness: a thirty-five-year longitudinal study. *J Pers Soc Psychol.* 1988;55(1):23-27.
81. McCraty R, Atkinson M, Tomasino D. Modulation of DNA conformation by heart-focused intention. Boulder Creek, CA: HeartMath Research Center; Institute of HeartMath; 2003. Available at: http://www.heartmath.org/research/research-intuition/Modulation_of_DNA.pdf. Accessed September 10, 2007.
82. Feinstein D, Eden D, Craig G. *The Promise of Energy Psychology: Revolutionary Tools for Dramatic Personal Change.* New York: Penguin; 2005.
83. Cohen LM, McChargue DE, Collins FL, eds. *The Health Psychology Handbook: Practical Issues for the Behavioral Medicine Specialist.* Thousand Oaks, CA: Sage Publications; 2003.
84. Raheem A. *Soul Return: Integrating Body, Psyche and Spirit.* Lower Lake, CA: Aslan Publishing; 1991.
85. Jobst KA. Science and healing: from bioelectromagnetics to the medicine of light. *J Altern Complement Med.* 2004;10(1):1-3.
86. No authors listed. NIH Consensus Conference. Acupuncture. *JAMA.* 1998;280(17):1518-1524.
87. Natural Standard, Harvard Medical School. Complementary and alternative medicine: acupuncture, shiatsu, tuina. Aetna IntelHealth. Available at: <http://www.intelhealth.com/IH/ihtIH/WSIH/W000/8513/34968/358869.html?d=dmContent>. Accessed September 10, 2007.
88. Eschiti VS. Healing Touch: a low-tech intervention in high-tech settings. *Dimens Crit Care Nurs.* 2007;26(1):9-14.
89. Sancier KM. Search for medical applications of qigong with the Qigong Database. *J Altern Complement Med.* 2001;7(1):93-95.
90. Benor D. *Spiritual Healing: Scientific Validation of A Healing Revolution.* Southfield, MI: Vision Publications; 2000.
91. Oshman J. *Energy Medicine in Therapeutics and Human Performance.* New York: Elsevier; 2003.
92. Chen KW, Hassett AL, Hou F, Staller J, Lichtbroun AS. A pilot study of external qigong therapy for patients with fibromyalgia. *J Altern Complement Med.* 2006;12(9):851-856.
93. Cook CA, Guerrero JF, Slater VE. Healing touch and quality of life in women receiving radiation treatment for cancer: a randomized controlled trial. *Altern Ther Health Med.* 2004;10(3):34-41.
94. Taylor-Piliae RE, Haskell WL, Stotts NA, Froelicher ES. Improvement in balance, strength, and flexibility after 12 weeks of Tai chi exercise in ethnic Chinese adults with cardiovascular disease risk factors. *Altern Ther Health Med.* 2006;12(2):50-58.
95. Felhender D, Lisander B. Effects of non-invasive stimulation of acupoints on the cardiovascular system. *Complement Ther Med.* 1999;7(4):231-234.
96. Shoemaker DD, Schadt EE, Armour CD, et al. Experimental annotation of the human genome using microarray technology. *Nature.* 2001;409(6822):922-927.