

INTEGRATIVE MENTAL HEALTH CARE: FROM THEORY TO PRACTICE, PART 1

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Integrative approaches will lead to more accurate and different understandings of mental illness. Beneficial responses to complementary and alternative therapies provide important clues about the phenomenal nature of the human body in space-time and disparate biological, informational, and energetic factors associated with normal and abnormal psychological functioning. The conceptual framework of contemporary Western psychiatry includes multiple theoretical viewpoints, and there is no single *best* explanatory model of mental illness. Future theories of mental illness causation will not depend exclusively on empirical verification of strictly biological processes but will take into account both classically described biological processes and non-classical models, including complexity theory, resulting in more complete explanations of the characteristics and causes of symptoms and mechanisms of action that result in beneficial responses to treatments. Part 1 of this article exam-

ines the limitations of the theory and contemporary clinical methods employed in Western psychiatry and discusses implications of emerging paradigms in physics and the biological sciences for the future of psychiatry. In part 2, a practical methodology for planning integrative assessment and treatment strategies in mental health care is proposed. Using this methodology the integrative management of moderate and severe psychiatric symptoms is reviewed in detail. As the conceptual framework of Western medicine evolves toward an increasingly integrative perspective, novel understandings of complex relationships between biological, informational, and energetic processes associated with normal psychological functioning and mental illness will lead to more effective integrative assessment and treatment strategies addressing the causes or meanings of symptoms at multiple hierarchic levels of body-brain-mind. (*Altern Ther Health Med.* 2007;13(6):50-56.)

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It is likely that the causes of mental illness will not be completely explainable on the basis of current theories in Western biomedicine and psychology. Advances in research methods and conventional biomedicine will confirm some theories of the causes of mental illness and refute others. Emerging paradigms will shape future biomedical assessment and treatment approaches, resulting in a sophisticated integrative model of mental healthcare.

A paradigm, or "way of knowing," is a framework within which observations or measurements can be obtained regarding the properties of phenomena. Materialism is presently the dominant philosophical perspective of Western science, and by extension, the paradigm that informs biomedicine; however, Western

psychiatry embraces a dual perspective that includes both materialism and phenomenology. All paradigms are evolving structures influenced by new research findings and emerging theories. Historical changes in the paradigm of orthodox Western biomedicine have yielded novel theories of illness with commensurate advances in clinical approaches. In medicine, the value of a paradigm is a function of its capacity to provide a conceptual framework that contributes to understandings of phenomena associated with health and illness. A paradigm is practically useful if clinical methods derived from it lead to more accurate or deeper understandings of the causes or meanings of illness and, by extension, more effective treatments and improved outcomes. The outcome of the application of a specific clinical approach to a particular illness therefore reflects the capacity of the paradigm of the parent system of medicine to adequately explain the causes or meanings of that illness. In this context, it is of interest that many approaches employed in non-Western systems of medicine are effective in spite of the absence of a confirmed mechanism of action or a paradigm that can be described in empirical terms. Such non-conventional approaches provide important clues about the nature of the human body in space-time, including biological, energetic, and informational factors associated with health and illness.

DISPARATE SYSTEMS OF MEDICINE USE DIFFERENT "WAYS OF KNOWING"

The conceptual framework of contemporary Western psychiatry subsumes multiple theoretical viewpoints, and a single best explanatory model of mental illness has not yet been put forward. Disparate psychodynamic, genetic, endocrinologic, and neurobiological models of mental illness causation reflect diverse theoretical perspectives, ideologies, and clinical training requirements of mental health professionals. Until now, a single explanatory model of psychopathology has not been established as more valid or inclusive than other models. Mental illness is regarded as a consequence of complex interactions of dynamic biological, psychological, and social factors that cannot be described adequately in the language of a single theory. Some would contend that complexity theory and other emerging ideas in physics, information science, and the life sciences ultimately will provide an adequate explanatory model of the complex causes of mental illness; however, systems of medicine that do not rely strictly on empirical observations or reproducible outcomes frequently include clinical approaches that are beneficial for a range of illnesses. Thus, there is not a necessary correlation between a formal requirement of empirical verification of a postulated mechanism of action or measurable outcomes and the clinical utility of a particular approach. Examples of this include acupuncture, massage, meditation, qigong, and mindfulness training.

BIOMEDICAL AND NON-CONVENTIONAL MENTAL HEALTHCARE—TWO EVOLVING PARADIGMS

Increasingly rigorous assessment and treatment approaches in biomedical psychiatry probably will emerge from advances in biomedicine, including functional brain imaging, immunology, and molecular genetics. However, future theories of mental illness causation will not depend exclusively on empirical verification of strictly biological processes but will take into account both classically described biological processes and non-classical physical phenomena, with the goal of providing more adequate explanations of the causes of symptoms and responses to treatments.

A Critique of Contemporary Western Psychiatry

Conventional Western medicine regards only certain kinds of information as legitimate evidence of the causes of illness and, by extension, legitimate evidence of the effects of a particular treatment addressing those causes. In contemporary Western psychiatric diagnosis, only information about hypothesized psychodynamic states and neuropharmacological processes is considered relevant to the understanding of mental illness. Postulated neurobiological and psychodynamic factors regarded as "causes" of psychiatric symptoms are more difficult to observe and characterize in empirical terms than discrete biological factors that are believed to cause medical illness. In spite of ambiguous findings, contemporary Western psychiatry to date stands firm in the view that biological and psychological factors ultimately "cause" neurotransmitter dysregulations in the brain that manifest as specific psychiatric symptoms.

Because Western psychiatry embodies disparate explanatory models, it is possible to approach the same anxious patient using cognitive-behavioral techniques to "re-frame" the sources of her anxiety; encourage the regular use of guided imagery, deep breathing, or yoga; and simultaneously prescribe a selective serotonin reuptake inhibitor (SSRI) addressing a central neurochemical dysregulation presumed to be the "cause" of her anxious state.

In the absence of an agreed-on explanatory model of psychopathology, therapies employed in contemporary Western psychiatry claim to be "a-theoretical." Thus, Western psychiatry is not a single conceptual framework or paradigm because it does not rest on a coherent body of theories and clinical methods. Rather, Western psychiatry can be regarded as an eclectic collection of disparate conventions that remain in widespread use largely on the basis of consensus among academic psychiatrists. Although there is a presumption of rigor and objectivity in conventional biomedical psychiatric diagnosis, the process of formulating diagnostic criteria for psychiatric "disorders" is neither rigorous nor objective.

An emerging alternative to the methodology used in the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)* ranks symptom severity on a continuum from "normal" to "disturbed," avoiding the need for classification of unique symptom patterns into discrete presumed "disorders" that may not correspond to accurate clinical descriptions of mental illness and therefore lack construct validity.¹ Epidemiologic studies reveal considerable variation over time in core symptoms among individuals diagnosed with a particular psychiatric "disorder," as well as significant inter-individual variation in symptom type and severity for individuals diagnosed with the same "disorder."² These findings suggest that conventional biomedical psychiatric classification is conceptually flawed and imply that the methodology used to construct "disorders" and the diagnostic criteria in current use do not accurately or adequately reflect the complex dynamic causes or meanings of cognitive, affective, and behavioral symptoms. A future, more adequate schema for arriving at a diagnosis in psychiatry will probably consider "core symptoms" in the context of internal and external factors that are highly variable over time, unique for each patient, and highly variable among patients who report similar symptoms.² Findings of 2 large prospective longitudinal studies show that symptoms reported by individuals diagnosed with major depressive disorder, panic disorder, and social anxiety disorder (and other anxiety disorders) lack stability over time.^{3,4} On the basis of these findings, a more correct way to think about mental illness may involve descriptions of changing patterns of core symptoms over time along several axes. Along these lines it has been suggested that "core symptoms" may correspond to certain "core psychopathological processes" at one or more dynamic levels of psychological, neurobiological, informational, and possibly energetic functioning.^{2,5} Recent studies show that specific genes regulate activity in brain circuits associated with particular psychiatric symptoms and that the neurobiological and genetic basis of a particular cognitive or affective symptom is probably the same across disparate DSM-IV disorders that share the same symptom.^{6,7} These findings are consistent with the core symptom model of

mental illness and the observation that the same drug often is an effective treatment of a particular symptom regardless of the “disorder” in which it occurs.

In the day-to-day practice of mental healthcare, many perspectives can be used in parallel because their underlying assumptions are not regarded as mutually exclusive. For example, many patients who take psychotropic medications are concurrently in psychotherapy and regard both approaches as legitimate and effective. At present there is no consensus on a “best” conceptual approach to mental healthcare, and disparate treatment approaches are based on different biological or psychodynamic theories.

Research findings in the neurosciences, genetics, pharmacology, and functional brain imaging support claims that particular conscious “states”—including symptoms of mental illness—correspond to specific neurobiological processes involving normal activity or dysregulation of particular neurotransmitters or discrete neural circuits. The evidence to date suggests that indirect relationships probably exist between dysregulation at complex levels of brain function or structure and disparate cognitive, affective, or behavioral symptoms. This popular model is constrained, however, by the fact that contemporary research methods have elucidated brain functioning at only the most basic levels of particular neurotransmitters, single neurons, or discrete neuronal circuits in non-human animal models. The daunting structural and functional complexity of the brain and constraints on the kinds of questions that can be answered by research in the basic sciences have slowed efforts to explore basic mechanisms of brain functioning associated with “normal” mental and emotional life as well as mental “illness.” Significant advances in neuroscience research, genetics, and functional brain imaging are taking place at a rapid rate, and the hypothesis that dysregulation of serotonin-producing neurons is the central etiologic factor in depression, anxiety, or other mental illnesses has not been confirmed. It is unclear whether postulated causal relationships between discrete neuropharmacological or neurophysiological substrates and discrete abnormal states of consciousness can be verified using the current methodologies and technologies of Western science. The contemporary Western scientific model of complex structural and functional relationships between cellular, synaptic, and modular levels of brain organization suggest that simple correspondences between dysregulation of a discrete neurotransmitter or neuronal circuit and a particular normal or abnormal mental state is naïve and probably also misleading.

Popular Acceptance of the Neurotransmitter Theory Has Delayed Efforts to Explore Non-classical Paradigms

The paucity of debate over competing explanatory models of mental illness is sustained by the widely shared belief that the neurotransmitter theory provides a valid and adequate explanatory model of mental illness causation. The widely shared belief in Western medicine that psychopathology is caused by dysfunction at the level of a particular neurotransmitter system implicitly relegates other explanatory models to a lower order of priority and is probably interfering with progress in mental health research in general.

Non-orthodox Paradigms Are Contributing to the Understanding of Mental Illness

Basic research in physics, chemistry, and the life sciences has led to alternative explanatory models of the kinds of phenomena that make up the natural world. Some postulated phenomena will eventually be confirmed and correlated with mechanisms underlying illness and healing, and by extension, with efficacy claims of certain non-conventional treatment approaches. The existence of other postulated phenomena eventually will be refuted by empirical findings of a future science. Emerging paradigms in physics offer fundamentally new perspectives about the nature of space-time and causality.

Complex Systems Theory Distinguishes Conventional Biomedicine From Integrative Medicine

Implicit in the reductionist view of Western psychiatry is the assumption that a specific biological treatment will adequately address and correct a discrete underlying cause of that symptom. The complex system model stands in contrast to this naïve linear view.⁸ In the framework of complexity theory, any illness can be described as a symptom pattern and is an emergent property of multiple hierarchically related causes, conditions, or meanings. This model more adequately embraces the dynamic complexity of brain functioning and suggests that relevant information about possible causes or conditions associated with a particular symptom pattern at different levels in a dynamic system may be obtained by disparate assessment approaches. This model also suggests that it is reasonable to consider disparate treatment approaches addressing disparate biological, psychological, informational, or energetic causes or conditions of symptoms. Practical clinical differences in assessment and treatment approaches used in disparate systems of medicine reflect differences between the assumptions of those systems. The complex systems model assumes that dynamic non-linear relationships exist between multiple hierarchically nested conditions and dynamic emergent properties of the system that are experienced and reported as symptoms.⁹ In some cases, in the management of infectious diseases, for example, specific symptoms are correlated with an identifiable viral or bacterial infection, and the linear biomedical model probably provides an accurate description of symptom formation and thus an adequate basis for clinical treatment planning. In other cases, including symptoms regarded as mental illness, the causes, conditions, or meanings of a symptom or symptom pattern probably vary considerably. Even when conventional biomedicine yields clinically useful information, it is reasonable to approach mental illness within the framework of complex systems theory and to regard neurotransmitter dysregulation as part of a complex dynamic system that includes disparate psychological, biological, informational, and energetic factors. When a “primary cause” of a particular symptom is probable based on history or assessment findings, this does not necessarily determine the most effective treatment because of the likelihood that multiple causal factors operate at disparate hierarchical levels. Following this logic it is reasonable to consider integrative approaches that address a specific symptom or symptom pattern

in different, possibly synergistic ways. A corollary view is that although a particular symptom or illness (ie, symptom pattern) may have one or few "primary" causes, the patient's unique biochemical, genetic, social, psychological, and possibly also energetic constitution imply that similar symptoms in different individuals are probably associated with unique causes. The situation becomes more complex when one considers that in the same individual the psychological, biological, informational, and possibly energetic cause(s) of the same symptom pattern may fluctuate over time in relationship to dynamic internal and external factors. In conventional biomedical psychiatry it is acknowledged that persisting mental and emotional symptoms in the same individual are associated with varying levels of activity in neurotransmitters and receptors; however, reasons for such variability remain unclear. It follows from this observation that a particular assessment or treatment approach that is appropriate for a particular symptom pattern at one time in the life of a particular patient may be inappropriate for another individual with a similar complaint or for the same individual reporting similar symptoms at a future time. Starting from the viewpoint of complex systems theory and assuming that symptoms of mental illness are probably associated with multiple causes, using 2 or more assessment approaches may characterize more adequately and accurately disparate causes or conditions associated with those symptoms. Subsequently, an appropriate integrative treatment plan will address multiple causes or conditions of symptoms identified from history and assessment. Different approaches to causal modeling of complex variables that are believed to operate in some non-conventional healing approaches include path analysis and the analysis of latent variables.¹⁰ The latter approach has been used to assess quality of life in psychotic patients.¹¹

Western Medicine and Non-conventional Systems of Medicine Embrace Different Models of "Energy" and Information

Disparate systems of medicine postulate the existence and involvement of different forms of energy and information in health, illness, and healing. Some conventional and non-conventional assessment approaches rely on the accurate characterization of classically described kinds of energy or information that constitute postulated causes of a particular illness. Conventional Western medicine posits that health and illness can be adequately characterized in terms of classical models of energy and information. In conventional Western psychiatry normal brain functioning is characterized by complex bio-magnetic and electrical activity that can be measured using functional brain imaging techniques, including functional magnetic resonance imaging (fMRI), magneto-electroencephalography (MEEG), and quantitative electroencephalography (QEEG). Emerging research findings suggest that particular energetic patterns of brain function may correlate with certain mental illnesses; however, it is frequently difficult to determine whether such energetic "abnormalities" are the causes or effects of pathology. Electrical currents and pulsed electromagnetic fields are conventionally used treatments in Western psychiatry. Both conventional energy therapies probably have immediate effects on the biomagnetic properties

of brain functioning in addition to long-term modulatory effects on neurochemical and biomagnetic activity of brain circuits associated with the regulation of mood and behavior.

Like Western medicine, many non-conventional treatment approaches are based on classical forms of energy, including electromagnetic energy and sound. Examples include functional medicine, EEG biofeedback, patterned sounds, full-spectrum bright light exposure, micro-current brain stimulation, and dim light exposure at selected narrow wavelengths. Treatment approaches based on classically accepted forms of energy probably have both direct energetic effects and indirect informational effects that are beneficial for restoring health or preventing illness. In contrast, treatments based on emerging non-classical models of energy or information, including quantum mechanics, quantum information, and quantum field theory, may have both direct and so-called subtle effects on brain functioning and physiology in general.^{12,13} Functional medicine is an important emerging model that views health and illness in relationship to informational changes in complex intercellular communication processes. Functional medicine rests on conventional biomedical understandings of pathophysiology in the context of assumptions of biochemical and genetic individuality.¹⁴ According to this model, health and illness result from interactions between the unique genetic constitution of the individual and disparate internal and external factors, including infection, trauma, lifestyle, diet, and environmental influences that can modify genetic expression and alter intercellular communication manifesting as complex physical or mental illnesses. Disparate molecules serve as cellular mediators, including neuropeptides, steroids, inflammatory mediators, and neurotransmitters. Assessment approaches identify informational changes in intercellular communication associated with symptom formation, and effective treatments modify the informational basis of illness, taking into account complex interactions between mediators and different cell types.

Many established and emerging non-conventional assessment approaches postulate that illness phenomena can be more completely described in terms of non-classical forms of energy. Examples include analysis of the vascular autonomic signal (VAS), Chinese pulse diagnosis, and homeopathic constitutional assessment. Examples of non-conventional treatment approaches based on postulated non-classical forms of energy or information include acupuncture, homeopathic remedies, healing touch, qigong, and Reiki. In Chinese medicine, "qi" is a postulated elemental energy that cannot be described adequately in the language of current Western science; however, qi may have attributes that are consistent with predictions of quantum field theory.¹⁵ Quantum brain dynamics (QBD) is a formal non-classical model that invokes quantum field theory to explain certain characteristics of human consciousness that may be related to both physical and mental health. It has been suggested, for example, that healing intention operates through non-local "subtle" energetic interactions between the consciousness of the medical practitioner and the physical body or consciousness of the patient.¹⁶ In contrast, energy psychology assumes that careful training and the skillful application of specific techniques, including acupuncture, acupressure, and healing

touch, affect energetic balance and health. A recent off-shoot of energy psychology, "mind energetics," postulates that "energy" is exchanged through language and intention during therapeutic encounters and that such "energy" transforms psychological defenses in beneficial ways, manifesting in clinical improvements.¹⁷ Widespread interest in the role of spirituality and religion in mental health has resulted in increasing research in this area and the inclusion of a special V code (ie, a social or cultural issue that may be the focus of clinical attention but is not regarded as a psychiatric disorder) in the DSM-IV for religious or spiritual problems.¹⁸

Complete Understanding of "Mind-Body" Interactions Will Require a Convergence of Paradigms

In contemporary Western psychiatry there is still no consensus on the best explanatory model of mind-body interactions.¹⁹ Complete understanding of mind-body interactions probably will require a convergence of classical and non-classical paradigms.²⁰ For example, bright-light exposure therapy is known to have therapeutic effects on melatonin and neurotransmitter activity but also may affect electrical or biomagnetic activity of the brain on more subtle levels consistent with the predictions of quantum mechanics or quantum brain dynamics.¹² The human biofield is probably best described with respect to complex interactions between classical and non-classical kinds of energy and information, including electrical, magnetic, acoustic, and large-scale quantum properties of living systems.²¹ Rigorous research designs investigating so-called "energy medicine" are difficult to achieve, and the majority of studies on the effects of prayer, directed intention, acupuncture, Reiki, qigong, and other therapies based on postulated non-classical forms of energy or information are inconclusive.²²

Possible Future Pathways of Conventional Biomedicine

The materialist paradigm of conventional Western medicine probably will follow 1 of 2 possible future evolutionary pathways. Although it will not be necessary to circumvent the orthodoxy of contemporary Western medicine in order to develop a conceptual framework for integrative medicine, openness to a new way of thinking about health and illness is necessary to thoroughly examine emerging concepts of energy and information in physics, chemistry, and biology to validate novel assessment and treatment approaches. This conservative pathway does not require violations of orthodox Western scientific explanations of illness phenomena and good health but does assume that basic directions in future medical research will not be completely determined by entrenched economic, institutional, or intellectual biases. A more radical evolutionary pathway for the future of biomedicine is possible in which an increasingly eclectic framework of Western medicine will be shaped by emerging theoretical models in physics and the neurosciences as well as concepts from non-conventional systems of medicine that are currently outside of the orthodox paradigm.²³ If the conservative evolutionary pathway is followed, Western medicine will certainly continue to yield important advances, including novel assessment and treatment approaches. If, on the other hand, the more radical pathway defines the future of Western medicine,

biomedicine will gradually transform into a fundamentally different paradigm, yielding advances that are not even conceivable in the framework of current Western science. The table summarizes the implications of emerging paradigms for the evolution of conventional biomedicine.

Disparate Paradigms Yield Different Practical Approaches in Assessment and Treatment

The conceptual framework in which a system of medicine operates determines legitimate methods used to design research studies, identify illness phenomena, and interpret the causes or meanings of illness. Disparate explanatory models of illness and particular assessment and treatment approaches derived from those models reflect the kinds of information believed to be relevant to understandings of "causes" or "meanings" of symptoms.

Disparate ways of explaining health and illness embedded in disparate systems of medicine imply disparate assessment and treatment approaches. Four hierarchically related paradigms embodying different assumptions about the phenomenal nature of health and illness have been proposed: the body paradigm, the mind-body paradigm, the body-energy paradigm, and the body-spirit paradigm.²⁸ In this discussion, higher-order paradigms always embody and expand on the assumptions of lower-order paradigms.

Conventional biomedicine operates within the body paradigm and in some cases the mind-body paradigm. Disparate non-conventional systems of medicine operate within all 4 paradigms. Whereas certain non-conventional assessment or treatment modalities are based on materialist assumptions about the nature of phenomenal reality that are congruent with the body paradigm, others embrace the dualist assumptions implicit in the mind-body, body-energy, or body-spirit paradigms. Some modalities employed in both conventional and non-conventional systems of medicine fall under the body or mind-body paradigms; however, at present, only non-conventional approaches fall under the body-energy and body-spirit paradigms. Disparate kinds of modalities corresponding to the 4 paradigms can be described as follows.

Conventional and non-conventional biological methods (body paradigm) are based on biological inputs to the system that may be "subtle" or "gross," depending on the technique employed. Subtle biological therapies include aromatherapy, essential oil massage, and others. Herbal medicines and other natural substances, including omega-3 fatty acids, minerals, vitamins, amino acids, and amino acid precursors, provide therapeutic benefits through "gross" biological or pharmacological effects. The body paradigm suggests that a mechanistic overlap exists between conventional and non-conventional biological treatments. For example, SAmE (s-adenosyl methionine) and conventional antidepressants probably have similar beneficial effects on neurotransmitters associated with depressed mood.

Somatic and mind-body methods (mind-body paradigm) achieve therapeutic results by acting directly on the physical body or the mind-body. Beneficial physiological or psychological effects are achieved without the requirement of exogenous biological, energetic, or informational inputs. Examples of established somatic

TABLE Implications of Emerging Paradigms for Conventional Biomedicine

Paradigm	Relevance to claims of non-conventional systems of medicine	Implications for Western medicine if integrated into orthodox paradigm	Comments
Functional medicine	Internal and external factors affect biological mediators including neuropeptides, neurotransmitters, and inflammatory molecules that influence the patient's unique biological constitution at level of inter-cellular communication.	Functional medicine is an integrative model that takes into account relationships between symptoms and complex dynamic interactions at the molecular and cellular levels. This model broadens and deepens conventional Western medicine.	Postulated dynamic relationships between individual genetic factors and biological mediators are consistent with psychoneuroimmunology. Putative mechanisms are difficult to confirm (using available means) for many physical, emotional, and mental symptom patterns.
Mind-body medicine	Chronic stress results in dysregulation of hormones, immunologic functioning, and neurotransmitters that manifest as mental and emotional symptoms. ²⁴	Increasing integration of mind-body practices with conventional treatments will probably result in significant improvements in patient autonomy, improved outcomes, and reduced mental healthcare costs.	Extensive research has confirmed the medical and mental health benefits of meditation, mindfulness training, yoga, and other mind-body practices.
Electromagnetic body	Normal and pathological states of complex living systems can be described in terms of electromagnetic fields. ²⁵	Interpreting aspects of health and illness in relationship to interactions between electromagnetic fields (including both endogenous and external fields) and conventional molecular, genetic, and cellular processes will deepen understandings of the causes of disease.	Existing conventional treatments use electromagnetic energy to disrupt (electroconvulsive therapy and repetitive transcranial magnetic stimulation) brain electromagnetic activity. Emerging non-conventional therapies, including micro-current stimulation and electroencephalogram biofeedback, operate at more subtle levels.
Non-classical forms of energy or information including quantum mechanics (QM), quantum information, and quantum field theory (QFT)	Therapeutic benefits of acupuncture, homeopathy, and possibly energy healing may be mediated through non-classical forms of energy or information consistent with QM, QFT or other models. ^{12,21}	Acceptance of non-local influences in health and illness would fundamentally change theories and methods in contemporary Western biomedicine.	Demonstrated to operate at the scale of subatomic particles. Speculation about "coherent" large-scale phenomena on scale of molecules or coordinated "groups" of cells, including neurons. Impossible to design experiment that can verify or falsify claimed effects using available technology.
Zero-point energy	Useful "information" is potentially available in space-time regions described as "empty" in Newtonian mechanics.	Development of concepts and techniques to "harness" Zero-point energy may be consistent with body-spirit paradigm and may provide conceptual basis for emerging assessment and treatment approaches in energy medicine.	The existence of zero-point energy has not been demonstrated and remains purely theoretical at present. There are no existing means to verify or refute claims made by this model. This model may be consistent with putative "subtle energy" modalities, including qigong, healing touch, homeopathy, and non-local effects of intention.
Models of anomalous conscious states or "psi"	Various models of psi argue that special states of consciousness are associated with "accessing" or "transmitting" information outside of normal space-time constraints.	Validation of psi influences on complex living systems may help explain claims of energy assessment and treatment methods and the putative role of "intention" or prayer in healing.	Poorly understood subjective variables interfere with attempts to replicate psi protocols in general, and in studies on illness or therapeutic effects in particular. Current Western research methods are unable to falsify psi models or validate specific claims of effects on illness.
Holographic universe	Bohm's theory of implicate order, ²⁶ later modified by Pribram in his "holographic brain theory," implies that complex living structures are "embedded" in N-dimensional space-time manifolds, permitting apparent non-local influences between 2 or more brains, including possibly state changes corresponding to pathogenesis of certain illnesses or specific improvements in health. ²⁷	This model has been discussed extensively in the context of its implications for understandings of physical-energetic-informational processes that take place in the universe. Acceptance of this paradigm by Western medicine would lead to novel models of illness "causation" and treatment "effects" in the context of contemporary theories of N-dimensional space-time, while avoiding metaphysical arguments of non-local influences.	Like zero-point energy and most psi models, claims of the holographic universe model cannot be verified or refuted within contemporary science. It remains an interesting speculative model that may be congruent with emerging understandings of N-dimensional space-time permeating complex structures.

and mind-body therapies include massage, craniosacral therapy, exercise, meditation, guided imagery, yoga, and stress-reduction techniques. Treatment approaches in this paradigm also operate according to biological principles described in the body paradigm.

Conventional energy or information methods (body-energy paradigm) employ forms of energy or information validated by current Western science that are directed at the body-brain and are empirically verified (or verifiable) as causally related to a clinically useful indicator of illness or a desired outcome. Treatment effectiveness is ascribed to direct or indirect effects of classically accepted forms of energy or information (ie, a postulated “mechanisms of action”) on the biological “causes” of symptoms. Because of known relationships between certain kinds of energy or information and certain biological effects, some energy-information modalities and some biological treatments probably share common underlying mechanisms of action. For example, bright-light exposure indirectly results in changes in brain serotonin levels comparable to the effects of certain conventional and non-conventional biological treatments of depressed mood. Representative energy-information modalities that have been validated by Western science include electro-convulsive therapy (ECT), trans-cranial magnetic stimulation (TMS), EEG-biofeedback, other kinds of biofeedback using sound or light, vagal nerve stimulation (VNS), and bright-light exposure. Assessment and treatment approaches in this paradigm operate in ways that are consistent with both the mind-body and body paradigms.

Approaches based on postulated forms of energy or information (contains elements of body-energy and body-spirit paradigm) are based on beliefs that body-mind-spirit can be described in terms of postulated “subtle” energies which have not been verified by Western science. The body-spirit paradigm and approaches that rely on hypothesized non-classical forms of energy or information raise important unresolved ontological and epistemological questions about the nature of phenomenal reality, valid ways of knowing about phenomena, and by extension, the functional characteristics of the body and brain in space and time. Postulated effects of “subtle” energies rest on presumed relationships between classically described biological functions of the body-brain and postulated energetic or spiritual attributes of human beings. Established and emerging subtle energy approaches in current use include prayer, shamanic healing, directed intention, Reiki, qigong, and possibly also homeopathy. Putative subtle biological or energetic influences of homeopathic remedies may be related to changes in bio-magnetic or quantum field dynamics. Methods within the body-spirit paradigm also operate at the levels of body-energy, mind-body, and body.

Advances in all 4 paradigms will permit commensurate progress in clinical approaches used to assess and treat mental illness, resulting in improved outcomes in mental healthcare and medicine in general. An important conceptual goal of effective integrative medical planning is to achieve a synthesis of paradigms containing interpretive models that accurately identify core causes, conditions, or meanings associated with symptoms at different hierarchic levels in the complex body-mind-energy-spirit complex. This “multi-

dimensional” understanding of biological, somatic, energetic, informational, and possibly spiritual processes associated with illness will result in effective integrative treatment approaches addressing complex “causes” or meanings of symptoms at disparate structural or functional levels. Information obtained from history, assessment findings, and responses to treatment will provide the clinician with useful clues for constructing an integrative treatment plan that more completely and accurately addresses the complex causes and conditions associated with symptoms of mental illness. In its future, more integrative form, Western medicine will yield explanatory models of illness capable of addressing both the empirical and metaphysical assumptions of contemporary Western science and non-conventional systems of medicine.

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