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An Integrative Paradigm for Mental Health Care

Ideas and Methods Shaping the Future

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James H. Lake
Center for Integrative Medicine
University of Arizona College of Medicine
Tucson, AZ, USA

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The greater the ignorance the greater the dogmatism.

—Sir William Osler MD

Believe nothing, no matter where you read it, or who said it, no matter if I have said it, unless it agrees with your own reason and your own common sense.

—The Buddha

For Nicole

This book is dedicated to thousands of patients I have had the privilege to work with over my career. You have been my greatest teachers. May you find a path to relief from suffering. This book is also dedicated to young mental health professionals everywhere who are just starting their careers, already aware of the limitations of the orthodox view, and looking for a better way. You will be the architects of "new medicine." May your convictions remain strong and may your vision be clear.

Foreword

When it comes to mental health, modern medicine has painted itself into a rather awkward corner. It has done this by focusing so exclusively on the physical aspects of our mental and behavioral health issues that it has devalued and, in some cases, denied adequate treatment for humankind's emotional and social dimensions.

This devaluation of the mind and emotions has a number of unfortunate consequences. First, the treatment of mental illness itself is inadequate. A recent Harris Poll showed, for example, that depression and anxiety, which are some of the most prevalent conditions in the country, are rarely addressed in primary care—where they usually present (Devitt, 2018). Only a third of primary care providers have even discussed mental health issues with their patients. Therapeutic approaches that do not involve physical manipulation of the brain such as psychotherapy or cognitive behavioral therapy (CBT) are often restricted or even denied, whereas drug treatments will be paid for even beyond the period for which they have been shown to be effective. Proven self-care and complementary approaches are almost completely neglected. For example, the military patient population that I work with suffers from high rates of post-traumatic stress disorder (PTSD). But the only approved approaches for PTSD are medications and professionally supervised trauma exposure therapy. This is despite multiple non-drug and self-care approaches that have been shown to be effective in this condition, such as acupuncture and meditation (Engel et al., 2014; Hollifield, Sinclair-Lian, Warner, & Hammerschlag, 2007; Lake, 2015; Nidich et al., 2018).

A second consequence of this denial of the social and emotional dimensions of a human being is our failure to recognize the importance of mental treatments for physical conditions. Stress management training and support is not routinely provided for conditions such as cardiovascular disease, diabetes, chronic pain, or cancer even when they are known to be of value. In addition, the major impact of early childhood traumas and adverse experiences is largely neglected even when they perpetuate both physical and mental illness over decades of life.

A third consequence of our failure to recognize the importance of the social and emotional as well as the mental and spiritual dimensions of the human being is a

neglect of the behavioral and social determinants of health. Even if a patient does not have a diagnosable mental illness, behavioral components are a major aspect of their ability to get well and stay well. This neglect occurs even though the behavioral and social determinants contribute to 80% of population health and behavioral health embedded in primary care has been repeatedly proven to reduce costs, improve outcomes, and increase satisfaction with care (Jonas, 2018).

The public also suffers from these myths about mental health being derived only from the physical dimensions of a human being. Phrases such as "it's all in your head" or "my disease is real" result from a stigma around mental and emotional experiences as being "not real." This results in patients not seeking out mental health care even when it's available. Nearly 75% of depression is seen in primary care, for example, but often presents as another condition or is missed. Patients will refuse to go to a mental health clinic or see a psychiatrist because of this stigma or disbelief in the value and importance of treating their mind and emotions.

The fundamental neglect of the mental and emotional dimensions of a human being leads to multiple problems in our health care system including lack of access to mental health services, neglect of proven self-care, and non-pharmacological approaches to health, both mental and physical. These approaches become sidelined by using terms such as "complementary and alternative medicine (CAM)," meaning optional and on the sidelines, or "nothing but placebo," meaning "not real" when they are, in fact, at the core of healing.

Dr. James Lake is a psychiatrist who has for many decades been filling these gaps. And with this book, *An Integrative Paradigm for Mental Health Care: Ideas and Methods Shaping the Future*, he continues to do so in a most eloquent way. As one of the founders of the American Psychiatric Association's caucus on complementary and integrative medicine, Dr. Lake has influenced the professional dialogue on the importance of the social and emotional dimensions of human life for health and well-being. He has been a staff psychiatrist serving our veterans and so is well-versed on what happens on the front lines of health care when we either neglect or fail to provide whole-person mental health care.

This book starts where we all must if we are to provide solutions to the challenges just described. It first lays out the conceptual foundations and methods for a more integrative paradigm in mental health care. Once this is explained, it then proceeds to provide practical tools for addressing those challenges. It is grounded in science yet easily accessible. Based on years of practice and research, the writing is elegant, balanced, evidence-based, and easy to understand both for professionals and the public.

Readers should know, however, that before this book, Dr. Lake has written a most comprehensive and practical set of guides to mental health care for the public, thus opening access to effective integrative and self-care treatments for mental and emotional conditions globally. His writing is always grounded in good science and research providing readers with clear direction on what works and does not work.

It is my hope that this work will be read and used widely by patients, their caregivers, and providers. It is only by reclaiming care for the whole person—mind, body, and spirit—that medicine will save itself. Thank you Dr. Lake for holding a

vision of health care for whole persons in the form of integrative mental health care and for providing us with practical concepts and methods to help make it happen in everyday life.

Wayne B. Jonas
Samueli Integrative Health Programs
Alexandria, VA, USA
Office of Alternative Medicine,
National Institutes of Health
Bethesda, MD, USA

References

Devitt, M. (2018, November 7). *Survey takes hard look at physician-patient conversations*. Retrieved from https://www.aafp.org/news/practice-professional-issues/20181107doc-patientcomms.html

Engel, C. C., Cordova, E. H., Benedek, D. M., Liu, X., Gore, K. L., Goertz, C., et al. (2014). Randomized effectiveness trial of a brief course of acupuncture for post-traumatic stress disorder. *Medical Care*, *52*, S57–S64.

Hollifield, M., Sinclair-Lian, N., Warner, T. D., & Hammerschlag, R. (2007). Acupuncture for posttraumatic stress disorder: A randomized controlled pilot trial. *The Journal of Nervous and Mental Disease*, *195*(6), 504–513.

Jonas, W. (2018). *How healing works: Get well and stay well using your hidden power to heal*. Lorena Jones Books.

Lake, J. (2015). The integrative management of PTSD: A review of conventional and CAM approaches used to prevent and treat PTSD with emphasis on military personnel. *Advances in Integrative Medicine, 2*, 13–23.

Nidich, S., Mills, P. J., Rainforth, M., Heppner, P., Schneider, R. H., Rosenthal, N. E., et al. (2018). Non-trauma-focused meditation versus exposure therapy in veterans with post-traumatic stress disorder: A randomised controlled trial. *The Lancet Psychiatry, 5*(12), 975–986.

Preface

Psychiatry as presently conceptualized and practiced fails to adequately address the core causes and meanings of mental illness. The reasons for this are complex and include the following:

- Current scientific theories do not adequately explain the causes of mental illness.
- Available mainstream treatments often fail to alleviate symptoms of mental illness.
- Academic and government institutions that promulgate psychiatry are, with few exceptions, conservative in ideology and resist new ideas.
- Postgraduate training programs in psychiatry are narrowly focused on psychopharmacology and do not cover non-pharmacologic interventions and non--allopathic models of mental illness causation.
- The pharmaceutical industry heavily influences ideology and clinical practices in academic institutions, the American Psychiatric Association (APA), and among psychiatrists broadly. As a result, non-pharmacologic interventions are marginalized in academic institutions, APA-sponsored conferences, and professional journals.

Although growing numbers of psychiatrists and other mental health care providers dispute the model and methods of contemporary psychiatry, our shared concerns have not resulted in a call to action within the APA, academia, or government agencies. A large grassroots movement has nevertheless emerged in industrialized countries in response to what is widely regarded as a growing crisis in mental health care. But there is a disconnect between a highly vocal popular movement to reform mental health care and psychiatrists in positions of leadership in the APA and academia that shape the policies and practices of psychiatry.

Proponents of the status quo argue that despite the inadequacies of psychiatry, the current dominant paradigm and mainstream practices are arguably better than the alternative: endorsement by Western medicine of novel theories and clinical practices that fall under the heading of complementary and alternative medicine (CAM). While it is true that many CAM modalities are not substantiated by

compelling research evidence, the same limitation applies to many conventional modalities including widely used psychotropic medications and psychotherapies. In fact, many CAM modalities have been investigated in sophisticated Western-style research studies and have been shown to be safe and effective treatments for specific psychiatric disorders. *The real bottleneck delaying progress in psychiatry toward a more eclectic, more effective paradigm is not the absence of evidence for CAM but strong negative biases in biomedical psychiatry against non-pharmacologic modalities based on an entrenched ideology that equates the practice of psychiatry to prescribing psychotropic medications.* Growing numbers of psychiatrists and other mental health professionals who find the status quo unacceptable are educating themselves about a variety of non-pharmacologic treatment choices and recommending these to their patients. However, mental health care practitioners who want to learn about CAM may encounter problems when trying to find reliable, up-to-date information on a particular modality. Finally, practitioners who know where to find reliable information may not have a systematic approach for developing a well-thought-out care plan addressing the unique symptoms, preferences, and circumstances of each patient.

The absence of a clinical methodology for integrating disparate Western medical and CAM modalities into a coherent whole is delaying progress in psychiatry toward a more effective, safer, and broader set of clinical practices. This book is offered as a conceptual framework for solving practical problems in integrative mental health care. It covers resources and methods that will help mental health practitioners find reliable information on CAM and know how to use it in day-to--day clinical encounters. The book is not a compendium of research findings on CAM though select CAM modalities are mentioned as examples. The reader seeking comprehensive reviews of research findings on CAM is referred to the appendix for valuable resources.

My principal goal in writing this book was to address the gap between what mental health care providers, patients, and the public *want* and what the conventional model of care and institutions that perpetuate the current dogma *permit. The book is not an attack on mainstream psychiatry nor is it intended as a wholesale endorsement of CAM. I've tried to chart a "middle way" between Western medicine and CAM keeping in mind advantages and limitations of different domains of medical knowledge and clinical practice.* I believe that a critique of mental health care as currently conceptualized and practiced is a legitimate and necessary prologue to *reconceptualizing* and *reinvigorating* this important domain of knowledge and praxis in light of promising new ideas and emerging research findings. I hope this book will provide a useful framework for dialog and debate on urgently needed changes in the way mental health providers practice, the way institutions and the academy interpret and use information, and, most of all, the way patients receive care.

I would not continue to do the hard work of psychiatry were I not optimistic about the future of my trade. I anticipate many exciting changes on the horizon and a brighter future for psychiatry for the benefit of all who suffer from mental illness. Collectively, these changes will become the *foundations for a new psychiatry*. In the coming decades—well before the end of the century—Western medicine will

undoubtedly evolve into a more complete paradigm that will embrace advanced technologies along with insights from the world's great healing traditions. Based on an analysis of current trends, I believe it is inevitable that advances in the basic sciences, artificial intelligence, and neurotechnologies will transform the clinical therapeutics and practice of psychiatry resulting in more effective, safer, and more compassionate "whole-person" mental health care.

Wayne Jonas, M.D., a pioneer in integrative medicine and former Director of the Office of Alternative Medicine, National Institutes of Health, graciously agreed to provide the foreword in which he makes an urgent call for renewed emphasis on the social, emotional, mental and spiritual dimensions of the human being.

The book is divided into two parts. Part I discusses the conceptual foundations of integrative mental health care. The first chapter reviews circumstances that have led to the current crisis in psychiatry in the USA and globally. Other chapters discuss philosophical problems, evolving paradigms and their impact on mental health care, and models of consciousness. Part II is on methodology and clinical applications. Topics covered include the evaluation and use of evidence in integrative mental health care, history-taking, assessment, formulation, and treatment planning. Chapter 9 discusses important clinical considerations when managing complex cases involving high comorbidity. The final chapter is an analysis of trends that are affecting mental health care and a forecast of where medicine and psychiatry are heading.

The book has three appendices. Appendix A provides a list of valuable online resources and books on integrative mental health care. Updates and links to important new web resources and books will be added on an ongoing basis. Appendix B contains blank evidence tables and algorithms that can be downloaded from a companion website created for this book www.IntegrativeMentalHealthPlan.com. Appendix C describes software that is being created by the author to assist practitioners in planning and implementing all phases of integrative mental health care. The software projects are based on the methodology developed in this book.

Tucson, AZ, USA James H. Lake

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Part I
Foundations

Chapter 1
Meeting the Challenges of Mental Illness Through Integrative Mental Health Care

"The person who takes medicine must recover twice, once from the disease and once from the medicine"

—Sir William Osler, MD

Contents

Limitations of Conventional Mental Health Care

Mental health care in its present form is at a critical juncture. Many individuals diagnosed with severe psychiatric disorders depend on medications to function and be productive members of society. However, after decades of research and billions of dollars of industry funding, the evidence supporting widely used pharmacologic treatments of major depressive disorder, bipolar disorder, schizophrenia, and other psychiatric disorders is not compelling (Denys & de Haan, 2008; Fournier et al., 2010; Hartling et al., 2012; Herrmann, Chau, Kircanski, & Lanctôt, 2011; Kelley, 2010; Kirsch et al., 2008; Stafford et al., 2015; Thase, 2007; Velligan et al., 2009). Determinations of the safety and efficacy of psychotropic medications are usually based on the results of short-term clinical trials lasting 6 weeks. The Food and Drug Administration (FDA) does not study the long-term efficacy and cost-effectiveness of psychotropic medications. Since many widely used psychotropic drugs are used for maintenance treatment, the effectiveness of these drugs in clinical

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practice is largely unknown. Poor treatment outcomes owing to limited efficacy of antidepressants, mood stabilizers, antipsychotics, and other psychotropic medications result in long-term impaired functioning, work absenteeism, and losses in productivity (Barbato, 1998; Barnes, Bloom, & Nahin, 2008; Beck et al., 2011; John M. Eisenberg Center for Clinical Decisions and Communications Science, 2016; Laxman, Lovibond, & Hassan, 2008). Medications are approved by the FDA for specific purposes and are also prescribed for the so-called "off-label" use. Drug manufacturers may not legally promote off-label uses of psychotropic drugs, but such usage is very common. No government agency is charged with evaluating off-label uses for FDA-approved medications. Many serotonin-selective reuptake inhibitors (SSRI) are used for off-label indications despite limited or no evidence supporting their effectiveness for these purposes (Frank, Conti, & Goldman, 2005).

In addition to concerns about efficacy, many psychotropic medications cause serious adverse effects, including weight gain, increased risk of diabetes and heart disease, neurologic disorders, and sudden cardiac death (Henderson, 2008). Metabolic syndrome associated with weight gain and increased risk of diabetes and coronary artery disease is a well-documented adverse effect of antipsychotics and other widely prescribed psychotropic agents.

Enormous psychological, social, and occupational costs are associated with depressed mood, which is the leading cause of disability in the USA for individuals aged 15–44 with annual losses in productivity in excess of $31 billion (Kessler, 2012). Suicide is one of the most common causes of preventable death among adolescents and young adults. Between 10 and 20 million depressed individuals attempt suicide every year, and approximately 1 million complete suicide. In 2016, the World Health Organization declared depression to be the leading cause of disability worldwide (Nguyen & Davis, 2017). On average, it takes almost 10 years to obtain treatment after symptoms of depressed mood begin, and more than two-thirds of depressed individuals never receive adequate care (Depression Fact Sheet, WHO, 2017).

More than 85% of the world's population lives in 153 low- and middle-income countries (Demyttenaere et al., 2004). Poverty is linked to a higher burden of mental illness, with variables such as education, food insecurity, housing, social class, socioeconomic status, and financial stress exhibiting a strong association (Lund et al., 2010). Most of these countries allocate scarce financial resources to mental health care needs and have grossly inadequate professional mental health services. In developed countries, elderly individuals, minorities, low-income groups, uninsured persons, and residents of rural areas are less likely to receive adequate mental health care, and most people with severe mental health problems receive either no treatment or inadequate treatment for their disorders (Mental Health Action Plan, WHO, 2013). A comprehensive survey of European Union member countries found that 38.2% (approximately 165 million people) met criteria for a psychiatric disorder, with fewer than one-third receiving any treatment at all (Wittchen et al., 2011). Disorders of the brain, including psychiatric disorders, were found to be the largest contributor to the all-cause morbidity burden as measured by disability-adjusted life years. Demographic changes have resulted in more people living longer with the

result that an increasing percent of the global population is inflicted with many chronic medical or psychiatric disorders (Mental Health Action Plan, WHO, 2013). The increase in life expectancy has led to increasing complexity and comorbidity of health-related problems in all world regions. It has been estimated that mental illness will *continue to be* the leading cause of mortality and morbidity globally (Mathers & Loncar, 2006).

In the USA the gap between mental health care needs and available resources is becoming ever wider in suburban, semirural, and rural areas. This is related to the fact that many psychiatrists are nearing the age of retirement. Combined with increasing vacancies in psychiatry residency training programs, the staffing pipeline for psychiatrists is shrinking (Hawryluk, 2016).

In response to shared global concerns over the crisis in mental health care, in 2012 the World Health Organization published "Mental Health Action Plan 2013–2020" (Mental Health Action Plan, WHO, 2013) and set forth four major objectives:

- More effective leadership and governance for mental health.
- The provision of comprehensive, integrated mental health and social care services in community-based settings.
- Implementation of strategies for promotion and prevention.
- Strengthened information systems, evidence, and research.

The Gap Between Conventional Mental Health Care and CAM

In many countries the principal role of psychiatrists and family physicians is to prescribe and "manage" medications addressing a range of medical and mental health problems. The majority of non-pharmacologic modalities are regarded as *complementary and alternative* (CAM) therapies and are frequently dismissed as invalid by allopathically trained physicians before an objective appraisal of research evidence is undertaken. In kind, many CAM practitioners actively discourage their patients to reject pharmaceuticals and other allopathic treatments and to accept *only* those treatments recommended by them. The situation becomes more complicated in mental health care because the majority of non-medically trained clinicians including psychologists, family therapists and social workers offer psychotherapy and advice on lifestyle while referring patients to psychiatrists for "medication management" consultations only when symptoms fail to respond to psychotherapy or lifestyle changes.

The current Western medical model of mental health care is limited in its capacity to alleviate the root causes of suffering because its theoretical foundations and clinical methods address only some of the complex causes and meanings of mental illness. This problem is directly related to incomplete understanding of the causes of mental illness which has led to unsubstantiated hypotheses and a multiplicity of

therapies that do not adequately explain or alleviate the root biological *causes* or social, psychological or spiritual *meanings* of symptoms (Wright & Potter, 2003). Among psychiatrists, the dominant view is an extension of contemporary allopathic medicine, which equates mental health problems to functional abnormalities at the level of discrete neurotransmitters. According to the dogma, successful "treatment" entails "correcting" a presumed neurochemical abnormality with the goal of restoring to normal a corresponding dysregulation in cognitive, emotional, or behavioral functioning.

While psychiatrists often use cognitive-behavioral approaches or "talk" therapies directed at changing maladaptive interpersonal dynamics, depth psychological approaches examining existential or spiritual themes are typically regarded as incidental to "more serious" psychotherapeutic or pharmacological treatments informed by the dominant allopathic paradigm. Agreeing on a "most relevant" theory or a "most appropriate" treatment is even more problematic for psychologists for whom numerous theories of symptom formation have yielded disparate and frequently contradictory explanations of the underlying meanings of psychopathology. Because of the multiplicity of theories and clinical practices that comprise psychology and psychiatry there is no theory-neutral method for evaluating the relative merits and weaknesses of disparate treatments. Subsequently, consensus is lacking on the "most appropriate" or "best" conceptual framework or practical clinical methods when approaching a specific mental health problem. In addressing this dilemma Wilber has systematically reviewed psychological theories of mind–body and has proposed guidelines for the creation of an "integral psychology" that takes into account core psychological and spiritual features of many leading theories of mind–body (Wilber, 2000). An important goal of Wilber's work is the elaboration of a series of integrative psychotherapeutic strategies that are ideally suited for specific symptoms of mind–body, psychological, or spiritual distress.

The divergent perspectives of mental health care providers reflect differences in training, financial interests, and values of conventionally trained physicians, psychotherapists, and CAM practitioners that may result in treatment delays, inappropriate or inadequate patient care, and poor outcomes. Increasing numbers of individuals who seek care for a mental health problem consult with more than one conventionally trained or CAM practitioner and receive widely differing treatment advice. While patients are actively seeking information and advice from a range of providers, limited or no dialog takes place between physicians and other conventionally trained mental health providers and CAM practitioners. This becomes problematic when patients receive contradictory advice resulting in misdiagnoses, *missed* diagnoses, delays in starting potentially beneficial treatment, or treatment combinations that are potentially unsafe. Many patients who do not benefit from a particular allopathic, CAM, or psychotherapy approach eventually seek other kinds of treatment. The process of moving from a conventionally trained provider to a CAM practitioner is frequently based on limited or unreliable information about the efficacy or safety of different treatment approaches.

Growing Acceptance of CAM by the Public, Patients, and Practitioners

Growing acceptance of CAM is the result of both scientific advances and social trends. Conventional allopathic medicine is being influenced by increasing openness in Western culture to non-Western healing traditions in the context of accumulating research evidence for many CAM modalities and growing demands for more personalized care from medical practitioners—often difficult to achieve during brief appointments in managed care settings. These issues have led increasing numbers of individuals who see conventionally trained practitioners to seek concurrent treatment from CAM practitioners, including Chinese medical practitioners, naturopathic doctors, herbalists, chiropractors, homeopathic physicians, energy healers and others (Barnes et al., 2008). Approximately 72 million US adults used CAM in 2002, representing about one in three adults (Tindle, Davis, Phillips, & Eisenberg, 2005). If prayer is included in this analysis almost two-thirds of US adults use CAM therapies (Barnes et al., 2008). A systematic review of 51 studies based on 49 surveys conducted in 15 countries showed that CAM therapies are widely used in all world regions (Harris, Cooper, Relton, & Thomas, 2012). 52% of adults in Australia, 38% of adults in the USA, and 41% of adults in the UK (Harris et al., 2012; Posadzki, Watson, Alotaibi, & Ernst, 2013) used at least one CAM modality during the previous 12-month period. CAM is also widely used in European Union countries however use rates are difficult to estimate because of the poor quality of many surveys (Eardley et al., 2012).

The limitations of conventional Western medical treatments have led to growing openness to CAM among conventionally trained medical practitioners and researchers (Kurtz et al., 2004; Shoaib & Khaliq 2017). Physicians' attitudes toward CAM are complex, vary between countries and world regions and are difficult to estimate. In the EU countries over 300,000 registered CAM providers including both non-medical and medical practitioners provide a variety of CAM services including acupuncture, herbal medicines, naturopathy and other modalities (von Ammon et al., 2012). A systematic review of surveys of UK physicians on CAM use found that 39% refer patients to CAM and 46% recommend CAM (Posadzki, Alotaibi, & Ernst, 2012). Many physicians are trained in one or more CAM approach and incorporate it in their medical practice however some physicians who use non-allopathic approaches have little or no formal training in CAM raising issues of medical ethics, professional competence and education requirements of physicians (Posadzki et al., 2012). In Australia a large percentage of MDs trained as general practitioners are knowledgeable in CAM and treat patients using a range of non-pharmacologic therapies (Pirotta et al., 2010). Physicians' attitudes toward CAM have been studied for over two decades. A comprehensive literature review of findings of 25 physician surveys conducted in the USA between 1982 and 1995 found that approximately half of US physicians believe that acupuncture, chiropractic and homeopathy rest on valid medical principles, and frequently refer patients to CAM practitioners for these therapies (Astin, Marie, Pelletier, Hansen, & Haskell, 1998).

The authors found that for medical and mental health problems 43% of conventionally trained physicians refer patients to acupuncturists; 40% refer to chiropractors; and 21% refer to massage therapists. Twenty-six percent of US doctors surveyed believed that homeopathy is beneficial and refer patients to homeopaths or prescribe homeopathic remedies themselves. In contrast to those findings, a small survey of a random sample of California physicians conducted several years afterward found that while most physicians were interested in learning more about CAM, the majority discouraged CAM use because they were not knowledgeable enough about the safety or efficacy of CAM (Milden & Stokols, 2004). The above trends suggest that allopathic medicine in industrialized countries is rapidly moving toward a more eclectic paradigm in response to shifting practice patterns among conventionally trained physicians and growing public interest in CAM.

Survey findings consistently show that individuals who report a mental health problem are significantly more likely to use CAM therapies compared to the general population (De Jonge et al., 2017; Unutzer et al., 2000; Unützer et al., 2002). Over 138,000 individuals (ages 18–100) in 25 countries who participated in 28 surveys administered by the World Health Organization were asked about contact with CAM providers during the previous year (De Jonge et al., 2017). Overall 3.6% of persons who reported any mental disorder consulted a CAM practitioner compared to 5% of individuals with a mental health problem who resided in high income countries. Individuals with more severe psychiatric disorders were more likely to consult a CAM practitioner. For example, 14% of those diagnosed with a severe mood disorder; 16% diagnosed with a severe anxiety disorder and over 22% of those diagnosed with a severe behavioral disorder consulted a CAM practitioner for advice. These findings are consistent with earlier population surveys showing that most individuals who have mental health problems use prescription psychotropic medications and CAM concurrently (Eisenberg et al., 1998; Unutzer et al., 2000) and individuals complaining of more severe symptoms are more likely to combine allopathic and CAM modalities (Kessler et al., 2001).

Large numbers of children and adolescents also use CAM to treat mental health problems. Findings of the 2007 National Health Interview Survey were analyzed for a sample of over 5000 youth aged 7–17 who reported ADHD, anxiety or depressed mood in the past 12 months (Kemper, Gardiner, & Birdee, 2013). Almost one third who reported a mental health problem used at least one CAM therapy compared to less than 12% of age-matched individuals with a mental health problem. Natural supplements and mind–body approaches were the most widely used CAM therapies. Youth who were more likely to use CAM came from higher socioeconomic backgrounds, had chronic health problems, were taking prescription medications, or could not afford professional counseling.

One-third of individuals who report a history of generalized anxiety, mood swings, or psychosis use CAM approaches to treat their symptoms (Unutzer et al., 2000). A national telephone survey of over 3000 women found that over half of women complaining of depressed mood used CAM to treat their symptoms (Wu et al., 2007). Factors associated with higher CAM use in this population included being single, working, having self-perceived poor health, preferring more “natural”

therapies, and previous disappointing or unpleasant experiences with conventional allopathic treatments.

In the USA the rate of CAM use to treat mental health concerns is much higher than the global average. The 2007 National Health Interview Survey found that 37% of US adults reported one or more neuropsychiatric symptoms and accounted for $14.8 billion in out-of-pocket expenditures on CAM services or treatments (Purohit et al., 2015). Individuals who reported one or more neuropsychiatric symptoms had a disproportionately higher demand for CAM compared to individuals who reported no mental health problems. Individuals with moderately severe mental health problems also use CAM modalities and use rates are related to ethnicity and other demographic factors. A data set analyzed from the 2012 National Health Interview Survey (NHIS) found that approximately 40% of US adults across all ethnic groups diagnosed with a moderately severe mental health problem used CAM during the previous 12-month period (Rhee, Evans, McAlpine, & Johnson, 2017). In contrast, only 32% of adults who reported no mental health problems used CAM. Differences in CAM use by ethnicity ranged from 24% of African-Americans compared to 45% of Asians and almost 50% of other ethnic groups. Being female, younger, having completed college, residing in the Western part of the USA, being employed, and having functional limitations were predictive of relatively greater CAM use.

Out-of-pocket expenditures on CAM are growing in parallel with increased CAM use. In 2007, the last year for which data are available, $13.9 billion in out-of-pocket expenditures for CAM services in the USA were made by roughly 30 million adults ages 18 and older (Davis & Weeks, 2012). Of these, roughly seven million adults (one quarter of those surveyed) accounted for 70% of total expenditures.

Conventional Mental Health Care Training Is Becoming More Eclectic

Training opportunities in conventional mental health care such as psychiatry residency training programs and MA or PhD psychology programs includes limited coverage of CAM. Similarly, most CAM training programs offer limited or no opportunities for learning about or training in Western medicine. An exception is naturopathic medicine which involves rigorous study of the same “basic sciences” required in allopathic medical education. After completing formal training, many family physicians and psychiatrists seek out continuing education and mentorship opportunities in areas such as mind–body medicine, including mindfulness-based stress reduction, pain medicine, palliative care, biofeedback, or hypnotherapy, while others procure training in acupuncture or the prescribing of nutraceuticals (i.e., purified pharmaceutical grade botanicals and other natural product supplements). Because of their eclectic focus it is likely that residency training programs in family medicine and psychiatry will increasingly emphasize integrative mental health care by including validated CAM approaches in their curricula.

Integrative Mental Health Care Offers Clinical and Cost Advantages over Conventional Care

Integrative health care has become the de facto standard of care in USA and other industrialized countries because of rapidly growing acceptance of CAM by conventionally trained physicians and the increasing use of CAM in the general public. In this context of increasing acceptance, CAM therapies and prescription medications are frequently used together despite the absence of evidence for the safety or efficacy of particular combinations. This is an important safety concern because of potentially adverse interactions that may result when natural product supplements are combined with pharmaceuticals. In fact, while some natural product supplements have beneficial synergistic effects when combined with a particular pharmaceutical there is limited or no evidence supporting safe effective combinations of the majority of natural products and pharmaceuticals. On a practical vein, while numerous CAM therapies are widely used in combination with prescription medications however few serious safety issues have been reported.

The perspective of integrative medicine is that combining select Western medical and CAM treatments on a case-by-case basis offers more advantages compared to any particular Western medical or CAM treatment or any single system of medicine. Representative approaches used in integrative mental health care include taking a natural product supplement or prescription medication concurrently with dietary changes, yoga or other mind–body practices, bright light therapy, exercise, music therapy, and the so-called "energy" therapies such as Reiki and Qigong.

Integrative mental health care is *not* a substitute for skillful psychotherapy. When a patient has the capacity for insight and is motivated to do psychological work that will help him or her resolve conflicts or adapt to stressful circumstances, psychotherapy should be offered together with appropriate CAM or allopathic interventions.

In both Western medicine and non-Western systems of medicine the conceptual framework used to interpret a mental health problem will lead to recommendations of particular treatments regarded as appropriate and beneficial. The same is true when helping a patient to work through dynamic issues in psychotherapy. In contrast to supportive therapy or cognitive-behavioral therapy (CBT), existential and transpersonal psychotherapies are based on a synthesis of Eastern and Western psychologies and permit insights into a broader range of psychodynamic issues compared to more conventional insight-oriented therapy (Walsh & Vaughan, 1993). These more "synthetic" approaches in psychotherapy are analogous to integrative mental health care in that they provide the patient with a broader range of interventions than are generally available through more conventional forms of psychotherapy, thus enhancing opportunities for beneficial insights and psychological or spiritual growth.

In addition to improving effectiveness of conventional Western medical treatments, integrative mental health care may result in significant cost savings. Findings from economic modeling research suggest that while incorporating CAM into treatment may initially be costly, downstream savings can be achieved when integrative

strategies yield positive long-term outcomes (Herman, Craig, & Caspi, 2005; Pelletier et al., 2010). Similarly, systematic reviews of economic modeling studies on comparative cost-effectiveness of allopathic versus CAM or integrative treatments of many health conditions (including mental illness) suggest that both CAM and integrative treatment are cost-effective, and in some cases, provide cost savings (Herman, Poindexter, Witt, & Eisenberg, 2012). Finally, higher up-front costs of integrative treatment may be potentially offset by improved work productivity and increased future Quality Adjusted Life Years (QALYs) (Herman et al., 2005).

Developing Clinical Guidelines for Integrative Mental Health Care

The implementation of CAM and integrative approaches in clinical settings is highly varied and idiosyncratic, reflecting differences in personal values and perspectives of practitioners, and disparate goals and priorities of training programs and clinics or hospitals where integrative approaches are employed. Results of a survey of integrative clinics and training programs suggest that integrative medicine is evolving into a coherent set of values and a consistent model of care delivery and clinical therapeutics, as evidenced by an increase in the peer-reviewed journal literature and a trend toward increasing numbers of affiliations between integrative centers and hospitals, health care systems, and medical and nursing schools (Horrigan, Lewis, Abrams, & Pechura, 2012). Integrative mental health care is a strongly collaborative enterprise that fosters cooperation among practitioners from disparate backgrounds and between patients and practitioners.

A 2012 survey of integrative centers found that integrative approaches are perceived as successful when used to treat both medical and mental health conditions (Horrigan et al., 2012). In all integrative care models, comprehensive clinical assessment of each patient was regarded as the crucial first step to ensure a valid diagnostic formulation. In all centers, surveyed treatment approaches were considered only after a thorough review of published research evidence supporting their use for a specific medical or psychiatric condition and taking account of risks of adverse effects, cost, and availability. It is important to note that over half of survey respondents reported that depression and anxiety were successfully treated at their clinics using integrative therapies.

Key Points

- Integrative mental health care incorporating validated CAM modalities into mainstream treatment is an emerging paradigm that may more adequately address mental illness than current models of care.
- High prevalence rates and unmet treatment needs of patients with depressed mood and other serious mental illnesses in all world regions underscore the inadequacies of currently available conventional allopathic treatments, complementary and alternative (CAM) therapies, and existing models of care.

- After decades of research and billions of dollars of industry funding, the evidence supporting widely used pharmacologic treatments of major depressive disorder, bipolar disorder, schizophrenia, and other psychiatric disorders is not compelling.
- Limited effectiveness, safety problems, and high costs of many psychotropic medications have resulted in an urgent mandate for safer, more effective, and more affordable treatments of mental illness.
- Complementary and alternative medicine (CAM) therapies are widely used to treat mental health problems however relatively few have been strongly validated by research findings.
- The current allopathic model of mental health care delivery is limited in its capacity to alleviate the root causes of suffering because its theoretical foundations and clinical methods address only some of the complex causes and meanings of mental illness.
- Conventional allopathic medicine is being influenced by increasing openness in Western culture to non-Western healing traditions in the context of accumulating research evidence for select CAM modalities and growing demands for more personalized care.
- Increasing numbers of individuals who see conventionally trained practitioners are seeking concurrent treatment by CAM practitioners.
- Individuals who report a mental health problem are significantly more likely to use CAM therapies compared to the general population, and individuals complaining of more severe symptoms are more likely to combine allopathic and CAM modalities.
- Training in conventional mental health care includes limited coverage of CAM while CAM training programs offer limited or no opportunities for learning about or training in allopathic medicine.
- CAM therapies and prescription medications are frequently combined despite the absence of evidence for the safety or efficacy of particular combinations resulting in treatment delays and potential safety concerns.
- The perspective of integrative medicine is that combining select allopathic and CAM treatments on a case-by-case basis offers more advantages compared to any particular allopathic or CAM modality or any single system of medicine.
- Integrative mental health care may result in significant cost savings.
- Implementation of CAM and integrative approaches in clinical settings is highly varied and idiosyncratic, reflecting differences in personal values and perspectives of practitioners, and disparate goals and priorities of training programs and clinics or hospitals where integrative approaches are employed.

References

Astin, J., Marie, A., Pelletier, K. I., Hansen, E., & Haskell, W. L. (1998). A review of the incorporation of complementary and alternative medicine by mainstream physicians. *Archives of Internal Medicine, 158*, 2303–2310.

Barbato, A. (1998). *Schizophrenia and public health* [Internet]. Geneva: Division of Mental Health and Prevention of Substance Abuse, World Health Organization.

Barnes, P. M., Bloom, B., & Nahin, R. L. (2008, December 10). Complementary and alternative medicine use among adults and children: United States, 2007. *National Health Statistics Reports*, (12), 1–23.

Beck, A., Crain, A. L., Solberg, L. I., Unützer, J., Glasgow, R. E., Maciosek, M. V., et al. (2011, July–August). Severity of depression and magnitude of productivity loss. *Annals of Family Medicine, 9*(4), 305–311.

Davis, M. A., & Weeks, W. B. (2012, September–October). The concentration of out-of-pocket expenditures on complementary and alternative medicine in the United States. *Alternative Therapies in Health and Medicine, 18*(5), 36–42.

De Jonge, P., Wardenaar, K. J., Hoenders, H. R., Evans-Lacko, S., Kovess-Masfety, V., Aguilar-Gaxiola, S., et al. (2017, December). Complementary and alternative medicine contacts by persons with mental disorders in 25 countries: Results from the World Mental Health Surveys. *Epidemiology and Psychiatric Sciences, 28*, 1–16.

Demyttenaere, K., Bruffaerts, R., Posada-Villa, J., Gasquet, I., Kovess, V., Lepine, J. P., et al. (2004, June 2). WHO World Mental Health Survey Consortium. Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization World Mental Health Surveys. *JAMA, 291*(21), 2581–2590.

Denys, D., & de Haan, L. (2008). [25 years antipsychotics: Back to the future?] [Article in Dutch]. *Tijdschr Psychiatr, 50*(Spec no.), 105–109.

Depression: Fact sheet [Internet]. (2017). Geneva: World Health Organization; updated 2017 February.

Eardley, S., Bishop, F., Prescott, P., Cardini, F., Brinkhaus, B., Santos-Rey, K., et al. (2012). A systematic literature review of complementary and alternative medicine prevalence in EU. *Forschende Komplementärmedizin, 19*(Suppl. 2), 18–28.

Eisenberg, D., Davis, R., Ettner, S., Appel, S., Wilkey, S., Van Rompay, M., et al. (1998). Trends in alternative medicine use in the United States, 1990-1997: Results of a follow-up national survey. *Journal of the American Medical Association, 280*(18), 1569–1575.

Fournier, J. C., DeRubeis, R. J., Hollon, S. D., Dimidjian, S., Amsterdam, J. D., Shelton, R. C., et al. (2010, January 6). Antidepressant drug effects and depression severity: A patient-level meta-analysis. *JAMA, 303*(1), 47–53.

Frank, R., Conti, R., & Goldman, H. (2005, June). Mental health policy and psychotropic drugs. *Milbank Quarterly, 83*(2), 271–298.

Harris, P. E., Cooper, K. L., Relton, C., & Thomas, K. J. (2012, October). Prevalence of complementary and alternative medicine (CAM) use by the general population: A systematic review and update. *International Journal of Clinical Practice, 66*(10), 924–939.

Hartling, L., Abu-Setta, A. M., Dursun, S., Mousavi, S. S., Pasichnyk, D., & Newton, A. S. (2012, October 2). Antipsychotics in adults with schizophrenia: Comparative effectiveness of first-generation versus second-generation medications: A systematic review and meta-analysis. *Annals of Internal Medicine, 157*(7), 498–511.

Hawryluk, M. (2016, August 11). *Supply of psychiatrists shrinks: Lack of doctors creates access problems in U.S., Oregon* [Internet]. Bend, OR: The Bulletin.

Henderson, D. C. (2008, February). Managing weight gain and metabolic issues in patients treated with atypical antipsychotics. *The Journal of Clinical Psychiatry, 69*(2), e04.

Herman, P. M., Craig, B. M., & Caspi, O. (2005, June 2). Is complementary and alternative medicine (CAM) cost-effective? A systematic review. *BMC Complementary and Alternative Medicine, 5*, 11.

Herman, P. M., Poindexter, B. L., Witt, C. M., & Eisenberg, D. M. (2012, September 3). Are complementary therapies and integrative care cost-effective? A systematic review of economic evaluations. *BMJ Open, 2*(5), e001046.

Herrmann, N., Chau, S. A., Kircanski, I., & Lanctôt, K. L. (2011). Current and emerging drug treatment options for Alzheimer's disease: A systematic review. *Drugs, 71*(15), 2031–2065.

Horrigan, B., Lewis, S., Abrams, D., & Pechura, C. (2012, February). *Integrative medicine in America: How integrative medicine is being practiced in clinical centers across the United States*. Tucson, AZ: The Bravewell Collaborative.

John M. Eisenberg Center for Clinical Decisions and Communications Science. (2016, September 13). *Nonpharmacological versus pharmacological treatment for patients with major depressive disorder: Current state of the evidence* [Internet]. Rockville, MD: Agency for Healthcare Research and Quality.

Kelley, J. (2010, March 2). *Antidepressants: Do they "work" or don't they?* [Internet]. New York, NY: Scientific American.

Kemper, K. J., Gardiner, P., & Birdee, G. S. (2013, November–December). Use of complementary and alternative medical therapies among youth with mental health concerns. *Academic Pediatrics, 13*(6), 540–545.

Kessler, R. C. (2012, March). The costs of depression. *The Psychiatric Clinics of North America, 35*(1), 1–14.

Kessler, R., Soukup, J., Davis, R., Foster, D. F., Wilkey, S. A., Van Rompay, M. I., et al. (2001). The use of complementary and alternative therapies to treat anxiety and depression in the United States. *American Journal of Psychiatry, 158*, 289–294.

Kirsch, I., Deacon, B. J., Huedo-Medina, T. B., Scoboria, A., Moore, T. J., & Johnson, B. T. (2008). Initial severity and antidepressant benefits: A meta-analysis of data submitted to the Food and Drug Administration. *PLoS Medicine, 5*(2), e45.

Kurtz, M., Nolan, R., & Rittinger, W. (2004). Primary care physicians' attitudes and practices regarding complementary and alternative medicine. *The Journal of the American Osteopathic Association, 103*(12), 597–602.

Laxman, K. E., Lovibond, K. S., & Hassan, M. K. (2008, November). Impact of bipolar disorder in employed populations. *The American Journal of Managed Care, 14*(11), 757–764.

Lund, C., Breen, A., Flisher, A. J., Kakuma, R., Corrigall, J., Joska, J. A., et al. (2010, August). Poverty and common mental disorders in low and middle income countries: A systematic review. *Social Science & Medicine, 71*(3), 517–528.

Mathers, C., & Loncar, D. (2006). Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Medicine, 3*(11), e442.

Mental Health Action Plan 2013–2020 [Internet]. (2013). Geneva, Switzerland: World Health Organization.

Milden, S., & Stokols, D. (2004). Physicians' attitudes and practices regarding complementary and alternative medicine. *Behavioral Medicine, 30*(2), 73–82.

Nguyen, T., & Davis, K. (2017). *The state of mental health in America 2017* [Internet]. Alexandria, VA: Mental Health America.

Pelletier, K. R., Herman, P. M., Metz, R. D., & Nelson, C. F. (2010, March–April). Health and medical economics applied to integrative medicine. *Explore (NY), 6*(2), 86–99.

Pirotta, M., Kotsirilos, V., Brown, J., Adams, J., Morgan, T., & Williamson, M. (2010, December). Complementary medicine in general practice - a national survey of GP attitudes and knowledge. *Australian Family Physician, 39*(12), 946–950.

Posadzki, P., Alotaibi, A., & Ernst, E. (2012, December). Prevalence of use of complementary and alternative medicine (CAM) by physicians in the UK: A systematic review of surveys. *Clinical Medicine (London), 12*(6), 505–512.

Posadzki, P., Watson, L., Alotaibi, A., & Ernst, E., (2013, April). Prevalence of use of complementary and alternative medicine (CAM) by patients/consumers in the UK: Systematic review of surveys. *Clinical Medicine (London), 13*(2), 126–131.

Purohit, M. P., Zafonte, R. D., Sherman, L. M., Davis, R. B., Giwerc, M. Y., Shenton, M. E., et al. (2015, July). Neuropsychiatric symptoms and expenditure on complementary and alternative medicine. *The Journal of Clinical Psychiatry, 76*(7), e870–e876.

Rhee, T. G., Evans, R. L., McAlpine, D. D., & Johnson, P. J. (2017, April). Racial/ethnic differences in the use of complementary and alternative medicine in US adults with moderate mental distress. *Journal of Primary Care & Community Health, 8*(2), 43–54.

Shoaib, M., & Khaliq, M., (2017, June 27). Physicians' attitude, belief and practice of complementary and alternative medicine use. *Patient Prefer Adherence, 11*, 1091–1092.

Stafford, M. R., Mayo-Wilson, E., Loucas, C. E., James, A., Hollis, C., Birchwood, M., et al. (2015, February 11). Efficacy and safety of pharmacological and psychological interventions for the treatment of psychosis and schizophrenia in children, adolescents and young adults: A systematic review and meta-analysis. *PLoS One, 10*(2), e0117166.

Thase, M. E. (2007, December). STEP-BD and bipolar depression: What have we learned? *Current Psychiatry Reports, 9*(6), 497–503.

Tindle, H. A., Davis, R. B., Phillips, R. S., & Eisenberg, D. M. (2005). Trends in use of complementary and alternative medicine by U.S. Adults: 1997-2002. *Alternative Therapies in Health and Medicine, 11*(1), 42–49.

Unützer, J., Katon, W., Callahan, C. M., Williams, J. W., Jr., Hunkeler, E., Harpole, L., et al. (2002, December 11). IMPACT Investigators. Collaborative care management of late-life depression in the primary care setting: A randomized controlled trial. *JAMA, 288*(22), 2836–2845.

Unutzer, J., Klap, R., Sturm, R., Young, A. S., Marmon, T., Shatkin, J., et al. (2000). Mental disorders and the use of alternative medicine: Results from a national survey. *American Journal of Psychiatry, 157*, 1851–1857.

Velligan, D. I., Weiden, P. J., Sajatovic, M., Scott, J., Carpenter, D., Ross, R., et al. (2009). Expert Consensus Panel on Adherence Problems in Serious and Persistent Mental Illness. The expert consensus guideline series: Adherence problems in patients with serious and persistent mental illness. *Journal of Clinical Psychiatry, 70*(Suppl 4), 1–46.

von Ammon, K., Frei-Erb, M., Cardini, F., Daig, U., Dragan, S., Hegyi, G., et al. (2012). Complementary and alternative medicine provision in Europe—First results approaching reality in an unclear field of practices. *Forschende Komplementärmedizin, 19*(Suppl 2), 37–43.

Walsh, R., & Vaughan, F. (Eds.). (1993). *The quest for wholeness: Transpersonal therapies (section 7) in: Paths beyond ego: The transpersonal vision*. New York, NY: Jeremy P. Tarcher/ Putnam.

Wilber, K. (2000). *Integral psychology: Consciousness, spirit, psychology, therapy*. Boston, MA: Shambhala Publications.

Wittchen, H. U., Jacobi, F., Rehm, J., Gustavsson, A., Svensson, M., Jönsson, B., et al. (2011, September). The size and burden of mental disorders and other disorders of the brain in Europe 2010. *European Neuropsychopharmacology, 21*(9), 655–679.

Wright, J., & Potter, P. (2003). *Psyche and Soma: Physicians and metaphysicians on the mind-body problem from antiquity to enlightenment*. Oxford: Clarendon Press.

Wu, P., Fuller, C., Liu, X., Lee, H. C., Fan, B., Hoven, C. W., et al. (2007, March). Use of complementary and alternative medicine among women with depression: Results of a national survey *Psychiatric Services, 58*(3), 349–56.

Chapter 2
Philosophical Problems

"Doubt everything. Find your own light."

—The Buddha

Contents

Western and Non-Western Systems of Medicine Rest on Different Philosophical Assumptions

The perspectives of science and Western medicine stand in contrast to those of other ways of knowing because of disparate metaphysical assumptions about the nature of reality, causality, and time that can be traced to the cultural and philosophical roots of Western civilization. Science interprets phenomenal reality as interactions between physical entities in a world that is *knowable*. Assumptions about primary categories of existence and the nature of time led to empirical methodologies aimed at demonstrating relationships between certain material states (causes) and other material states (effects). The philosophical perspective that a discoverable objective reality exists in the world is called realism. This ancient philosophical perspective eventually led to the invention of formal scientific method based on observation and measurement. Realism continued to evolve with the work of Karl Popper, who argued that a hypothesis can never be finally confirmed because only one contradictory finding is sufficient to falsify its claims. This position asserts that objective

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reality exists but cannot be verified or unambiguously described. Lakatos extended Popper's thesis by adding the concept of heuristics and their influence on method in science. In *Against Method,* Feyerabend argued that scientific method does not have a privileged position in the universe of possible approaches for investigating phenomena and should be viewed as *not more legitimate* than other epistemologies. Feyerabend's anarchist position can be regarded as an extremely radical kind of relativism. Most Western-trained scientists subscribe to a kind of naive realism, that is, a shared belief that the objective reality of phenomena can be confirmed through research.

In contrast to science, Asian systems of medicine postulate primary categories of existence in relationship to fundamental energetic principles. Non-Western concepts of time are nonlinear; thus, causality is not constrained by material processes interacting in simple linear ways. Rather, material states are interpreted as secondary manifestations of energy states. Implicit in these assumptions is the corollary assumption that "energy states" are reportable as *subjective experiences* (i.e., by a patient) and are *knowable and observable* by a skilled practitioner. The result is that criteria used to establish the existence of a *disorder* in non-Western systems of medicine are regarded by Western medicine as entirely subjective. From the perspectives of Chinese medicine, Ayurveda, Tibetan medicine, and other non-Western systems of medicine, *energetic* states are accepted as factual a priori. *Because primary material causes are assumed to not exist, there is no need for a methodology that reduces phenomena to primary material causes.* The result is that most studies on non-Western treatments are done by Western-trained scientists who rely on conventional biomedical criteria to identify discrete biological mechanisms of non-Western modalities, while ignoring postulated "energetic" phenomena in health and illness.

The dictum that the causes of illness are empirically verifiable by current science rests on the assumption that illness-related phenomena are reducible to known properties of matter and energy. Science claims that only *real* phenomena (i.e., phenomena that have objective existence) can have causal roles, and phenomena can be determined to be real only when their existence and properties are verifiable using established empirical methods. However, empirical methods used in science are those approaches used to investigate phenomena *already presumed to be real* because they are *knowable* on the basis of agreed on scientific criteria. The result is a circularity: phenomena are verifiable using an empirical methodology that is *capable of verifying only those phenomena* that are *a priori* assumed to be real in the first place. This view—called *scientism*—is essentially a metaphysical argument in that it claims that contemporary science is capable of explaining all phenomena based on metaphysical assumptions about kinds of phenomena that can have existence. Scientism limits the *practice of science* to the investigation of hypotheses that are congruent with current science, and directs inquiry away from phenomena that do not fit into the contemporary scientific worldview.

Science and Western Medicine Are Based on Prescientific Premises

At the end of the sixteenth century Francis Bacon introduced a conceptual framework that evolved into what became known as *scientific method.* Scientific method provides skilled investigators with objective information about natural phenomena based on observation and analysis. Bacon's original thesis and its modern form rest on metaphysical assumptions that often go unstated (Boss, 1994):

> Every science is…necessarily and always based on prescientific premises. These constitute a fundamental structure that not merely sets forth in advance which inquiries are possible and which are not, but furthermore determines the very character of the science and the extent to which its results will be significant. It sets the goals for the science and establishes the procedures guaranteeing correct practical application of theory.

Prescientific premises are conceptually *before* science, determine how science works and kinds of questions science can ask. All methodologies employed in science and medicine ultimately rest on prescientific assumptions about phenomena that can exist, their properties and relationships. Thus, no methodology can be completely objective or value-neutral.

Biological psychiatry claims to be nondualist arguing that normal and abnormal mental functions or "states" of consciousness are reducible to known neurobiological mechanisms. In contrast, various schools of psychoanalysis or psychotherapy rely on metaphysical assumptions about ego, id, unconscious, subconscious, or other presumed primary functions of consciousness corresponding to normal or abnormal mental states, and claim that mental functions cannot be reduced to discrete neurobiological mechanisms. Psychoanalysis and most psychological explanations rest on dualist assumptions about a physical "brain" and a non-physical "mind" that may not be explicitly stated. Biomedical psychiatry avoids philosophical problems inherent in dualism by claiming that all mental functions are reducible to knowable (i.e., if not known *presently*) neurobiological processes.

The philosophical gap between Western biomedicine and non-Western systems of medicine reflects different *ways of knowing* employed in disparate paradigms. In the early twentieth century the belief that matter exists as a fundamental kind of *thing* (i.e., materialism) was severely shaken by general relativity theory and quantum mechanics. Current versions of materialism conceive of objects as "lumpy energy" according to quantum mechanics theory. There are competing interpretations of quantum mechanics none of which has been confirmed. Recent discoveries in theoretical physics suggest that multidimensional space-time "strings" may comprise the fundamental fabric of the universe providing a unifying paradigm for general relativity theory and quantum mechanics. However, there is still no consensus that any single theory provides more complete explanations of phenomenal reality than any other theory. Dual aspect models of reality such as Jung's unus mundus, Bohm's implicate order, and Velman's theory of reflexive reality attempt to go beyond the arbitrary constraints of dualist and reductionist views of reality by regarding mental and physical phenomena as parts of one underlying reality (Browne, 2017).

A consequence of the "gap" between Western biomedicine and non-Western systems of medicine is the absence of a unifying conceptual framework capable of reconciling disparate assumptions about the phenomenal basis of health and illness. Even in the absence of a unifying conceptual framework it is still possible to derive a rigorous empirical methodology for constructing practical integrative strategies incorporating both Western biomedical and CAM modalities. (See Chap. 4 for more on this point.)

Entities and Processes in Western and Non-Western Systems of Medicine

Western medicine and non-Western systems of medicine postulate the existence of two kinds of things: entities and processes. Disparate meanings assigned to these terms result in different understandings of illness and health in different systems of medicine. In other words, disparate assumptions about phenomenal reality result in *different ways of seeing and understanding* illness phenomena and commensurate differences in treatments regarded as *legitimate*.

Non-Western systems of medicine are *process-oriented* in that they assume energetic processes are primary and "physical" entities are configurations of energetic processes that take place under certain conditions. Chinese medicine posits the existence of a fundamental "energetic principle," qi. *Apparent* physical processes, including illness phenomena, are manifestations of qi. This model stands in contrast to Western biomedicine which assumes that physical processes or entities have primary existence and energetic processes are properties of relationships between physical entities or processes. The disparate perspectives of Western and non-Western medicine reflect fundamentally different metaphysical starting points. The situation becomes more complicated when keeping in mind that biomedicine and many non-Western systems of medicine conceptualize illness in terms of process or entity metaphysical assumptions, depending on the *kind of phenomenon* being examined. For example, in Western biomedicine, the subspecialty of infectious diseases rests on strictly "entity" assumptions about illness-causing pathogens. In all cases a discrete pathogen is identified or *identifiable* as the causative agent of illness. In contrast, biological psychiatry imputes numerous "process" assumptions, including interactions between psychological, social, or cultural factors and the immune and endocrine systems, that affect the body's stress responses, resulting in neurobiological changes manifesting as mental illness. Excessive psychological stress or maladaptive defense mechanisms result in persisting anxiety—an anxiety *disorder*. Personal loss sometimes leads to lasting changes in mood—major depressive *disorder*. In some cases, a medical illness can influence the course or severity of cognitive or affective symptoms but in all cases, there is a correspondence between psychological factors and discrete psychopathological states of consciousness—psychiatric *disorders*.

To further complicate matters, phenomena regarded as *processes* by one system of medicine may be regarded as *entities* by another. For example, Chinese medicine views all illness phenomena as processes related to energetic imbalances, whereas Western biomedicine and other systems of medicine construe symptoms as reflections of deleterious biological changes resulting from discrete pathological entities (e.g., dysregulations in neurotransmitters) or processes (e.g., abnormalities in metabolism or endocrine function). Integrative medicine addresses this dilemma by endorsing a *systems framework* that encompasses both assumptions, resulting in the legitimacy of disparate treatment modalities based on postulated energetic processes as well as physical–biological entities and processes. Table 2.1 summarizes differences

Table 2.1 Entity and process in Western biomedicine and non-Western systems of medicine

System of medicine	Entity	Process
Western biomedicine	An entity is a discrete object or thing that exists in Newtonian (four-dimensional) space-time Living systems are reducible to known categories of physical entities or processes that are hierarchically interrelated and can be described in terms of linear causality Dysfunction at the level of specific structures ultimately manifests as symptoms that can be empirically described	A process is a relationship between two or more entities that takes place in Newtonian (four-dimensional) space-time Certain forms of energy and information constrain all processes in living and nonliving systems No process can take place outside Newtonian space-time Processes in living systems are observable, and their characteristics are measurable, consistent, and empirically verifiable Like entities, processes are related to other processes or entities in linear ways
Some non-Western systems of medicine	There are no discrete entities; there is only *energy* or *information* Four-dimensional space-time is an artificial construct Energy and information are not constrained by the classical model of four-dimensional space-time Phenomena that are labeled entities are actually lower-order processes and manifestations of interrelationships between energy and information Symptoms of illness and effects of treatments are specific examples of process entities or manifestations of relationships between structures over time	Processes describe complex nonlinear relationships between energy or information in one of many possible space-time domains Cognitive or affective symptoms are manifestations of nonlinear processes reflecting imbalance or dysregulation of energy or information Some processes in complex living systems (including the brain) are observable using conventional empirical means Some processes in complex living systems are not observable or measurable using conventional empirical means Because of inherent nonlinearity in processes affecting health and their occurrence in many possible space-time domains, *causes* of symptoms or *effects* of treatment vary, thus there are no *standard* assessment or treatment approaches

between Western biomedicine and select non-Western systems of medicine with respect to assumptions about the roles of entities and processes in health and illness.

Evidence in Medicine

Different systems of medicine conceptualize evidence in different ways in relationship to their respective assumptions about the nature of phenomenal reality. In Chinese medicine and other Asian systems of medicine there is no requirement for an "objective" test verifying a causal relationship between treatment and response. In contrast, Western biomedicine adheres to strict objective standards of measurement and observation. Evidence in Western medicine, as in all areas of science, is inherently probabilistic. There can be no absolute confirmation or refutation that any given treatment approach *works* or does *not work*. There can only be estimates of the probability that a specific outcome takes place in *apparent response to* a specific treatment. This is related to the fact that the human body is a highly complex dynamic system, thus discrete cause–effect relationships between mechanisms entailed in *treatment* and *outcomes* can never be ascertained with certainty. Expected outcomes are estimates of the *likelihood that a specific effect will take place* when a given treatment is administered based on statistical analysis of the results of previous trials investigating the same treatment for the same illness. As more findings accumulate the relative strength of evidence supporting a given treatment may become stronger or weaker, or remain unchanged but will *never* reach the level of certainty.

In Western biomedicine, treatments regarded as most substantiated are those for which a mechanism of action has been empirically verified and consistent beneficial outcomes have been reported by trained investigators working independently. Current science regards these criteria as compelling evidence of a causal link between a discrete mechanism of action and a discrete outcome. Provisional treatments are those which fulfill some but not all criteria, and which may subsequently become more or less substantiated depending on future research findings. The same criteria can be used to rank different assessment approaches. Evidence ranking becomes more complicated when considering that changes in scientific criteria may lead to new requirements of evidence in support of a particular mechanism of action or a claimed outcome.

Understandings of evidence in disparate systems of medicine are often noncommensurate because of disparate assumptions about phenomena associated with illness. This problem is related to different views about the importance of measurement in different systems of medicine because certain phenomena regarded as fundamental in non-Western systems of medicine cannot be described or measured by Western science, and thus cannot provide "scientific" evidence. In such cases even though compelling empirical evidence may not be forthcoming observations or subjective accounts may support claims of beneficial outcomes.

Different Understandings of Causality and Evidence in Disparate Systems of Medicine

Practitioners trained in different systems of medicine *learn to see* and interpret illness phenomena in the same way that expert teachers see and interpret phenomena within their respective domains of knowledge. Practitioners in all traditions are instructed how to interpret patients' subjective complaints as clinically pertinent information about the *cause(s) or meanings* of illness. A practitioner's interpretation of the significance of signs and symptoms necessarily takes place within a particular system of medicine which determines which factors may be legitimately regarded as *possible causes or meanings of illness* phenomena. The identification of causes or meanings of illness that are regarded as *possible* (i.e., within a given system of medicine) determines which treatments can *potentially* address identified causes or meanings resulting in symptom amelioration. Different ways of seeing and interpreting objective signs and subjective symptoms are *built into* disparate systems of medicine. A student has progressed to the point of professional competence when he or she reliably sees the same signs, elicits the same symptoms, and proficiently interprets the significance of signs and symptoms using a methodology and clinical methods endorsed by an expert practitioner of the same cloth.

Philosophical problems pertaining to evidence in science and medicine are related to the more general problems of deriving a methodology for determining categories of existence (ontology) and establishing criteria for assigning phenomena to classes (epistemology). On a more practical vein, problems pertaining to evidence in medicine are related to challenges involved in developing a rigorous methodology for classifying and verifying objective *signs* and subjective *symptoms* of illness. As already discussed, disparate systems of medicine posit the existence of illness phenomena on the basis of different kinds of information, ranging from conventional physiological descriptions to theorized "subtle" energies. These important distinctions are implicit in the languages and conventions of disparate systems of medicine, and there is a presumption in both Western biomedicine and non-Western systems of medicine that signs and symptoms denoting illness can be reliably discerned and correctly interpreted by a skilled practitioner. Practitioners trained in different systems of medicine are generally unaware that they are trained to "see" symptoms in ways that a priori exclude certain kinds of information while selectively reifying and giving significance to other kinds of information resulting in unconscious biases about kinds of phenomena associated with illness or treatment response. Findings from medical anthropology research show that practitioners from all traditions "see" symptoms and make inferences about their significance within the constraints of their unique tradition, training, and clinical experience. Different ways of seeing and interpreting phenomena are implicit in disparate philosophical assumptions about phenomena that *exist* and can be observed or measured. In sum, *there is not because there cannot be* an objective "way of seeing" or "knowing" in science and medicine. We are left with different assumptions about the nature of phenomenal reality that translate into different models of evidence in disparate systems of medicine.

Assumptions about causality determine how relationships between illness and health phenomena are interpreted and lead to different definitions of evidence in disparate systems of medicine. The *evidence* that a particular treatment results in a beneficial outcome is related to assumptions of causality embedded in the system of medicine in which the treatment is used. When direct (linear) causal relationships are assumed to take place between changes in illness phenomena and their *causes*, or changes in symptoms and the *effects* of treatment, formal methodologies are used to confirm and characterize those relationships. Assessment uses empirical methods to establish evidence of putative causal relationships between two or more phenomena. Phenomena are systematically "reduced" until primary causes are established. Inferences about causes are used to group symptoms into illness categories that bear phenomenological resemblance to one another. In contrast, in systems of medicine where linear causal relationships are not assumed, there is no (assumed) need to search for causes. The result is that non-Western systems of medicine seldom use formal methodologies to evaluate causality at the level of postulated mechanisms of action or claims of outcomes. Assessment in non-Western systems of medicine uses methods that do not rely on inferences based on empirically obtain information as there is no (assumed) need to demonstrate causal relationships. Symptoms are grouped into categories of illness based on phenomenological similarities. A conceptual model built into the system of medicine is used to *match* information about symptoms obtained through assessment with an *appropriate* treatment. For example, Chinese medical theory assumes that a fundamental energetic principle (i.e., "qi") exists in the universe, and that it is possible to make accurate descriptions of the phenomenology of symptoms associated with different kinds of "qi" and its various states of deficiency or excess. Appropriate energetic treatments that *match* the phenomenology of symptoms being addressed are subsequently identified and recommended to the patient.

Table 2.2 compares Western biomedicine, biomedical psychiatry, and representative non-Western systems of medicine in terms of what constitutes evidence for the causes, meanings, and properties of symptoms.

Philosophical Problems in Psychiatric Classification and Diagnosis

In Western biomedicine the causes of illness must be identified before a formal diagnosis can be established. In contrast, diagnosis in psychiatry emphasizes descriptions of symptom phenomenology over analysis of causes because of inherent difficulties in verifying discrete neurobiological causes of affective, cognitive, and behavioral symptoms. Biomedical psychiatry posits both intrinsic biological processes and extrinsic social or cultural processes as causes of mental illness. Intrinsic factors may include inherited or acquired dysregulation of the brain's neurotransmitters and neural circuitry. Extrinsic factors may include direct or indirect

Table 2.2 How we know about symptoms: evidence for their existence, causes, meanings, and properties

System of medicine	Existence of symptoms	Verification of causes of symptoms	Verification of symptom properties
Western (allopathic) medicine	Symptoms correspond to causes that have material existence	Causes of symptoms can be observed or measured using established empirical methods	Observations by independent researchers provide consistently reliable descriptions of properties of symptoms
Biomedical psychiatry	The causes or meanings of symptoms are established kinds of neurobiological or psychological mechanisms	The causes or meanings of symptoms can be inferred from empirical findings and are consistent with conventional neurobiological or psychological models	Patient interviews, laboratory studies, brain scans, and other biomedical assessment findings adequately characterize the cause(s) or meaning(s) of symptoms Causal chains are inferred between observed or reported symptoms, and presumed neurobiological processes
Non-Western systems of medicine	The existence of symptoms is *implicit* in the "energetic," or spiritual state of the person who experiences them. Empirical verification of existence of a symptom is not relevant	Verification of the causes of symptoms is often impossible using conventional empirical means, but causes can be confirmed by "energetic" or intuitive means regarded as valid within the parent system of medicine. Empirical verification of causes of symptoms is not relevant	Reliable empirical data are seldom available. The non-Western practitioner infers or *intuits* properties of symptoms in the context of the parent system of medicine. Empirical verification of symptom properties is not relevant

effects of a medical illness, medication side effects or substance abuse, and stressful or abusive social or family circumstances. Causal links between affective, cognitive, and behavioral symptoms and extrinsic stressors can often be inferred; however, it is much more difficult to verify causal relationships between postulated intrinsic causes and symptoms. A consequence is reliance of psychiatric diagnosis on self-reported descriptions of highly subjective experiences that are interpreted as syndromes or "disorders" by an expert practitioner. The goal of conventional psychiatric assessment is to correlate subjective patient reports with objective data obtained from recent medical or neurological evaluations, functional brain scans, neuropsychological testing, laboratory studies, and so on. This approach assumes that correct inferences about causality in mental illness can be made on the basis of (apparent) temporal correlations between subjective reports of distress (i.e., "symptoms") and objective medical findings. The prevailing view in biomedical psychiatry is that correct inferences lead to accurate understandings of underlying causes and

subsequently, *appropriate* and *effective* treatment. Biomedical psychiatry assumes that established physiological, social, or psychological processes can adequately explain the causes of symptoms. Not only is there no convincing scientific basis for this view, but there is strong evidence for the contrary view (see Chap. 5 for more discussion on this point).

Diagnosis in contemporary biomedical psychiatry is based on the assumption that self-reported subjective states provide accurate and reliable information about causes of symptoms. In fact, hypothesized causes of self-reported cognitive, affective, or behavioral symptoms are seldom identified because existing technologies are not able to confirm their existence or verify their causal relationships with symptoms. This problem has resulted in the absence of a rigorous empirical methodology for verifying postulated causal relationships between affective, cognitive, and behavioral symptoms and discrete physiological or neuropharmacological processes. By extension, there is no consensus on a methodology for verifying relationships between a postulated mechanism of action (i.e., of a biological treatment) and response to treatment.

The above argument can be put forward with respect to the non-verifiability of psychological models. In other words, there is no methodology capable of testing postulated relationships between the causes of symptoms and psychological models. Well over 100 years after Freud announced his proposal to develop a "scientific psychology," there is still no falsifiable theory about neurobiological substrates of "ego," "id," "superego," and "subconscious." In sum, biomedical psychiatry rests on hypotheses that are not testable using existing research methods and technologies. Consequently, hypothesized biological and psychological *causes* of affective, cognitive, and behavioral symptoms cannot be verified by current Western science. By extension (at least at the present time) it is not possible to verify causal relationships between the effects of treatments and outcomes.

Considerable work has been done on philosophical problems pertaining to the classification, assessment, and diagnosis of mental health problems (Gupta & Kay, 2002a, 2002b; Radden, 1994, 1996; Sadler et al., 1995; Sartorius, Jablensky, Regier, Burke, & Hirschfeld, 1990). The fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-V)* contains the standard methodology for classification of psychiatric disorders and is strongly endorsed by mental health providers in Western countries. The *DSM* represents the efforts of research psychiatrists to derive a theory-neutral way of classifying symptoms into discrete disorders on the basis of expert consensus on descriptions of symptom patterns. Diagnostic criteria are revised when there are changes in expert consensus on evidence for new diagnostic categories or changes in existing ones.

Key Points

- Western medicine and non-Western systems of medicine rest on disparate metaphysical assumptions about the nature of reality, causality, and time.
- Science interprets phenomenal reality as interactions between physical entities in a world that is knowable.

- Asian systems of medicine postulate primary categories of existence in relationship to fundamental energetic principles. "Energy states" are reportable as subjective experiences and are knowable and observable by a skilled practitioner thus establishing that a "disorder" exists in non-Western systems of medicine is regarded by Western medicine as entirely subjective.
- According to non-Western systems of medicine primary material causes are assumed to *not* exist, obviating the need for a methodology that equates phenomena to primary material causes.
- Most studies on non-Western treatments are done by Western-trained scientists using conventional biomedical criteria to identify discrete biological mechanisms of non-Western modalities, while ignoring postulated "energetic" phenomena.
- Science uses an empirical methodology capable of verifying only those phenomena a priori assumed to be real in the first place. This is called scientism.
- Scientism limits science to the investigation of hypotheses that are congruent with *current* science.
- All methodologies employed in science and medicine ultimately rest on prescientific assumptions about phenomena that can exist thus no methodology can be completely objective or value-neutral.
- Most psychological explanations rest on dualist assumptions about a physical "brain" and a non-physical "mind." In contrast biomedical psychiatry avoids philosophical problems inherent in dualism by claiming that all mental functions are reducible to neurobiological processes.
- There is no consensus that any single theory provides more complete explanations of phenomenal reality than any other theory. This has resulted in the absence of a unifying conceptual framework across disparate systems of medicine.
- Disparate meanings assigned to "entity" and "process" in Western medicine and non-Western systems of medicine have led to different understandings of illness and health.
- Different systems of medicine conceptualize evidence in different ways in relationship to their respective assumptions about the nature of phenomenal reality.
- In Asian systems of medicine there is no requirement for an "objective" test verifying a causal relationship between treatment and response. In contrast, Western biomedicine adheres to strict objective standards of measurement and observation.
- Evidence in Western medicine is inherently probabilistic as there can be no absolute confirmation or refutation that any given treatment approach *works* or does *not work*.
- Understandings of evidence in disparate systems of medicine are often noncommensurate because of disparate assumptions about phenomena associated with illness.
- Practitioners trained in different systems of medicine learn to see and interpret illness phenomena in the same way that expert teachers see and interpret phenomena within their respective domains of knowledge.

- Assumptions about causality determine how relationships between illness and health phenomena are interpreted and lead to different definitions of evidence in disparate systems of medicine.
- The evidence that a particular treatment results in a beneficial outcome is related to assumptions of causality embedded in the system of medicine in which the treatment is used.
- Diagnosis in psychiatry emphasizes descriptions of symptom phenomenology over analysis of causes because of difficulties inherent in verifying discrete neurobiological causes.
- Causal links between affective, cognitive, and behavioral symptoms and extrinsic stressors can often be inferred however it is much more difficult to verify causal relationships between postulated intrinsic causes and symptoms.
- Underlying causes of self-reported cognitive, affective, and behavioral symptoms are seldom identified because existing technologies are not able to confirm their existence or verify their causal relationships with symptoms.
- Biomedical psychiatry rests on hypotheses that are not testable using existing research methods and technologies thus hypothesized causes of affective, cognitive, and behavioral symptoms cannot be verified. By extension it is not possible to verify causal relationships between the effects of treatments and outcomes.
- The current version of the Diagnostic and Statistical Manuel (DSM) represents the efforts of research psychiatrists to derive a theory-neutral way of classifying symptoms into discrete disorders on the basis of expert consensus on descriptions of symptom patterns.

References

Boss, M. (1994). *Existential foundations of medicine and psychology*. Northvale, NJ: Jason Aronson.

Browne, L. (2017). *The many faces of coincidence* (pp. 143–145). Exeter: Imprint Academic.

Gupta, M., & Kay, L. (2002a). Phenomenological methods in psychiatry: A necessary first step. *Journal of Philosophy, Psychiatry, and Psychology, 9*(1), 93–96.

Gupta, M., & Kay, R. (2002b). The impact of "phenomenology" on North American psychiatric assessment. *Journal of Philosophy, Psychiatry, and Psychology, 9*(1), 73–85.

Radden, J. (1994). Recent criticism of psychiatric nosology. *Journal of Philosophy, Psychiatry, and Psychology, 1*(3), 193–200.

Radden, J. (1996). Lumps and bumps: Kantian faculty psychology, phrenology, and twentieth-century psychiatric classification. *Philosophy, Psychiatry, & Psychology, 3*(1), 1–14.

Sadler, J., Wiggins, O., & Schwartz, M. (Eds.). (1995). *Philosophical perspectives on psychiatric diagnostic classification*. Baltimore: Johns Hopkins University Press.

Sartorius, N., Jablensky, A., Regier, D., Burke, J., & Hirschfeld, R. (1990). *Sources and traditions of classification in psychiatry*. New York: Hogrefe & Huber.

Chapter 3
Evolving Paradigms and Their Impact on Mental Health Care

"It is not...that some people do not know what to do with truth when it is offered to them, but the tragic fate is to reach, after patient search, a condition of mind-blindness, in which the truth is not recognized though it stares you in the face."
—Sir William Osler, MD

Contents

Paradigms in Science and Medicine

In the broadest sense, a paradigm is a set of beliefs that make up a theoretical framework within which scientific theories can be critically evaluated or revised. Thomas Kuhn put forward the idea of competing paradigms in *The Structure of Scientific Revolutions* (Kuhn, 1962). According to Kuhn a paradigm is a conceptual framework of presuppositions that define how scientists in different traditions approach their theoretical and practical work. Kuhn argued that *ultimate truth* is unattainable and the acceptance or exclusion of theories in science has more to do with consensus and political affiliation than the rational demonstration of claims. Kuhn held that

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paradigms—which reflect shared points of view and not objective reality—evolve and are eventually overthrown as new "maps" of reality are accepted by scientists and achieve political and institutional backing.

In science, a paradigm is a set of theories and methods regarded by a relevant professional group as a valid conceptual framework for making observations and inferences about the nature of phenomena. Metaphysical naturalism, the dominant paradigm of Western science, claims that all phenomena are *knowable* using the methods of current science. Materialism is a somewhat narrower perspective within metaphysical naturalism which posits that only material entities can have existence in the world. Together metaphysical naturalism and materialism define the conceptual framework of Western medicine, although psychiatry as currently configured is based on both materialism and phenomenology.

All paradigms are *dynamic* and *evolving* because new research findings and theories transform ways of knowing over time. Evolving paradigms lead to increased openness to new findings and novel theories such that paradigms evolve in a way that is reciprocal and self-reinforcing. Historically, changes in the paradigm underlying Western medicine have led to new models of illness causation, improvements in reliability and accuracy of assessment, and enhanced treatment outcomes. Because of changes in social and economic factors that shape theories and clinical practices, clinical approaches in all systems of medicine are subject to change on an ongoing basis. The evolution of paradigms that inform disparate systems of medicine will result in novel models and more complete understandings of the causes or meanings of symptoms.

The value of a paradigm is related to its ability to deepen our understanding of illness phenomena resulting in improvements in clinical approaches. A paradigm has practical utility when the application of clinical approaches based on it can resolve ambiguity about causes of symptoms, resulting in more accurate assessment and more effective treatment. The potential clinical benefit of a particular approach reflects the ability of the paradigm on which it is based to adequately explain the causes or meanings of symptoms. Assessment approaches used in Western medicine and other systems of medicine provide valuable clues about the nature of the human body in space-time, and the biological, social, cultural, psychological, and postulated "energetic" factors that cause or contribute to symptoms.

The practitioner's conceptual framework biases his or her inferences about causes or meanings underlying symptoms. Clinical judgments about *valid* assessment and treatment approaches are based on (often implicit) assumptions about the nature of phenomenal reality. This explains the enormous variability in clinical approaches regarded as legitimate from the perspectives of disparate systems of medicine. In other words, the paradigm within which a practitioner *experiences the world* and obtains information about symptoms biases inferences about kinds of phenomena that potentially contribute to illness. This results in a *circularity* in which the practitioner's beliefs bias choices of clinical approaches used to assess or treat symptoms confirming the practitioner's beliefs about the causal nature of illness phenomena. In sum, the paradigm that influences how a practitioner interprets

illness phenomena biases choices of clinical approaches and affects treatment outcomes.

The end point of any investigation is determined by the conceptual framework in which questions are asked. Inferences about the significance of findings are context-dependent in that they can *be made only with respect to* a particular system of medicine in which observation or research takes place. Western medicine (also called allopathic medicine or biomedicine) is the dominant paradigm in developed countries because it is perpetuated by widely shared cultural beliefs and powerful economic factors that ensure its dominant role (Jobst, 1998). Unfortunately, Western medical modalities have failed to adequately address medical and psychiatric illnesses in North America and other developed world regions. In the USA, 15% of the gross national product (approximately $1.6 trillion) is spent on health care, yet drug reactions, infections, surgical errors, or other complications of medical care are among the leading causes of death and morbidity (Pham et al., 2012; Starfield, 2000; Zhan & Miller, 2003). The shortcomings of biomedicine reflect the inability of so-called "normal" science (Kuhn, 1962) to explain illness phenomena and invite consideration of new ways to understand and treat mental illness.

Different Understandings of Energy and Information in Western Medicine and Non-Western Systems of Medicine

Disparate systems of medicine postulate the existence of different forms of energy. Western medicine posits that health and illness can be adequately characterized in terms of classically described forms of energy. For example, in biomedical psychiatry inferences about the causes of both normal conscious functioning and mental illness are based on electrical or metabolic activity of the brain. Brain functioning at the level of large groups of neurons is inferred from measurements of electromagnetic fields, light or changes in sub-atomic particles emitted from the brain following stimulation. Functional brain imaging approaches include functional magnetic resonance imaging (fMRI), positron emission tomography (PET), single photon emission computed tomography (SPECT), magnetoelectroencephalography (mEEG), and quantitative electroencephalography (qEEG). Research findings have demonstrated relationships between energetic patterns of brain function and cognitive, affective, and behavioral symptoms however, existing technologies are not capable of determining whether metabolic or energetic "abnormalities" in brain function are the *causes* or *effects* of pathology. Biomedical psychiatry uses electrical currents and pulsed electromagnetic fields to treat mental illness. Electrical current and focused magnetic fields probably have immediate effects on brain functioning as well as long-term effects on the activity of brain circuits associated with mood, cognition, and behavior.

Like Western medicine, some CAM treatments use classically described forms of energy such as electromagnetic energy and sound. Examples include electroen-

cephalographic (EEG) biofeedback, music and binaural sound beats, full-spectrum bright light exposure, dim light exposure at selected narrow wavelengths, and microcurrent electrical brain stimulation. Treatment approaches based on classically described forms of energy have both direct *energetic* effects and indirect *informational* effects on biological or energetic processes in the body and brain. In contrast, treatments based on nonclassical models, including quantum mechanics and quantum field theory, may have both direct and more subtle, indirect effects on brain functioning and physiology (Curtis & Hurtak, 2004; Hankey, 2004).

The paradigm of "functional" medicine views health and illness in relationship to informational changes in complex intercellular communication processes. Explanations in functional medicine rely on conventional biomedical models of pathophysiology and assumptions of biochemical and genetic individuality (Bland, 1999). In this perspective, health and illness are regarded as dynamic states resulting from interactions between the unique genetic constitution of each individual and a multiplicity of factors, including infection, trauma, lifestyle, diet and, environmental influences, that can modify genetic expression and alter intercellular communication resulting in physical or mental illness. Disparate molecules serve as cellular mediators, including neuropeptides, steroids, inflammatory mediators, and neurotransmitters. Functional assessment approaches identify informational changes in intercellular communication associated with symptoms. Effective treatments are those which modify the informational basis of illness and correct dysregulations at the intercellular level, resulting in improved health.

In contrast to Western medicine, non-Western systems of medicine posit that "normal" and "abnormal" functional states of the body are manifestations of interrelationships between physiological processes and postulated nonclassical or "subtle" forms energy. A subtle domain is a field or background in which processes in the brain or body take place outside of constraints widely held to be boundary conditions in classical Newtonian space-time. Some CAM assessment approaches claim that illness phenomena can be more completely described in terms of postulated nonclassical forms of energy. Examples include analysis of the vascular autonomic signal (VAS), Chinese pulse diagnosis, homeopathic constitutional assessment, and gas discharge visualization (GDV). Examples of CAM treatment approaches based on postulated nonclassical forms of energy include acupuncture, homeopathic remedies, Healing Touch, Qigong, and Reiki. In Chinese medicine, qi is a postulated elemental energetic principle that cannot be adequately described in the language of current science, but which may have properties consistent with quantum field theory (Chen, 2004). Quantum brain dynamics (QBD) is a nonclassical model that invokes quantum field theory to explain subtle characteristics of brain functioning, possibly including influences of nonclassical forms of "subtle" energy on mental health. It has been suggested that healing intention operates through nonlocal "subtle" energetic interactions between the consciousness of the medical practitioner and the physical body or consciousness of the patient (Zahourek, 2004). Practitioners of *energy psychology* claim that energetic techniques, including acupuncture, acupressure, and Healing Touch, achieve beneficial effects by changing the body's overall energetic balance. *Mind energetics* postulates the exchange of

energy through language and intention during therapeutic encounters and claims that "energy" transforms psychological defenses in beneficial ways (Pressman, 2004).

There is no consensus on a sufficient explanatory model of mind–body interactions in Western medicine (Kendler, 2001). Important breakthroughs in understanding of mind–body interactions will probably require a convergence of classical and nonclassical models (Shang, 2001). For example, while light exposure therapy has beneficial effects on melatonin and neurotransmitter activity, bright light may also interact with brain dynamics on subtle levels consistent with quantum mechanics or quantum brain dynamics (Curtis & Hurtak, 2004). The human biofield can be characterized as complex interactions between classical and nonclassical energy and information, including electrical, magnetic, acoustic, and large-scale quantum properties of living systems (Rein, 2004). Many physicians and other Western trained practitioners regard energy treatments as examples of the placebo effect on the assumption that postulated forms of energy on which "subtle" energy treatments rest simply do not exist. Rigorous research designs investigating energy medicine are difficult to achieve, and findings on the effectiveness of directed intention and putative nonclassical energy effects on human health are largely inconclusive (Abbot, 2000; Hammerschlag, Marx, & Aickin, 2014; Radin, Schlitz, & Baur, 2015). Nevertheless, accumulating research findings show that the beneficial effects of some energy therapies can be replicated under controlled conditions, suggesting that nonclassical forms of energy can influence outcomes in beneficial ways.

Disparate Systems of Medicine Rest on Different Assumptions About the Nature of Living Systems and Human Beings

Living systems, including the special case of human beings, can be characterized in terms of physiological, molecular genetic, biomagnetic, informational and energetic processes. Different perspectives reflect established or emerging models supported by greater or lesser degrees of evidence. Some perspectives are consistent with established classical models in physics that describe the properties of light and electromagnetic fields, whereas other perspectives rest on nonclassical models, including quantum mechanics and quantum field theory. Depending on the perspective from which a living system—and by extension, the human body—is conceptualized, different kinds of phenomena may be regarded as relevant to the existence and functioning of the body in space and time. By the same token, different perspectives lead to different assumptions about phenomena that may or may *not* be related to health or illness. The perceived legitimacy of any clinical approach used in medicine or mental health care will ultimately be determined by shared beliefs about the correctness of assumptions contained in the paradigm from which the approach is derived. This is a matter for future science.

Physical, biological, energetic and informational processes that influence living systems probably function in both linear and nonlinear ways at multiple levels in a dynamic hierarchical web. This general description can be applied to the dynamics of the human brain, including both so-called "normal" and "abnormal" states of consciousness. The multitiered complexity of the body–brain in space-time is the central premise on which the conceptual framework of integrative medicine is based.

Certain assessment approaches may more accurately or reliably identify abnormalities or "imbalances" in entities or processes that comprise the body–brain system (see Chap. 2 for a discussion of entities and processes). Accurate characterization of the type and *hierarchic location* of an abnormality or dysregulation in the body–brain is equivalent to a determination of the cause or causes of symptoms. Disparate hierarchic levels at which dysregulation in the body–brain system takes place may be directly, indirectly, or *both* directly and indirectly related to symptoms. The type, severity, duration, and timing of expression of symptoms are determined by a multiplicity of dynamic relationships between hierarchically interrelated processes. Thus, symptom patterns interpreted as *illness* reflect complex dynamic patterns of dysregulation or imbalance at various levels in the body–brain system.

Important work in the life sciences and consciousness research has come from complex systems theory (Jordan, Srinivasan, & Van Leeuwen, 2015) and other recently proposed paradigms, including the work of Edelman (Edelman & Mountcastle, 1978), Pribram, Penrose (Penrose, 1994; Pribram, 1991), and others. Much of this work is highly theoretical, and until now Western medicine has invested few resources into investigating mechanisms of action postulated by novel models of consciousness (see Chap. 4 for a discussion of models of consciousness). In Western medicine, the assumption that only empirically verifiable entities or processes can influence living systems has led to the corollary assumption that legitimate assessment and treatment approaches must also be based on empirically verifiable biological or physical mechanisms.

Western medicine subscribes to the materialist view that symptoms and their causes are reducible to knowable dysregulations of physiological processes that take place within Newtonian space-time. Proponents of Western medicine argue that current models in biology and physics provide complete explanations of both normal and pathological states of the human body, and the same models can be used to explain consciousness. According to Western medicine patterns in nature recur in predictable ways, permitting rational inferences about causes of illness. The conceptual framework of Western medicine is based on the following assumptions:

- Phenomena affecting living systems are observable or measurable and thus empirically verifiable.
- Living systems behave in predictable linear ways as described by the laws of classical physics.
- Living systems exist in four-dimensional space-time described by Newtonian physics.

I am arguing a contrary position, namely that ontological assumptions of linear causality and thus predictability in living systems, including the special case of the human body–brain, fail to take into account important recent findings from physics and consciousness research. The assumption of linear cause-effect relationships between pathological processes and discrete symptoms or symptom patterns does not and *cannot potentially explain* relationships that characterize even the simplest living systems. Living systems behave in complex nonlinear ways that cannot be adequately described by current science and Western medicine which rely on an empirical methodology for making inferences about linear causality based on measurements of presumed discrete processes. The naïve assumption that linear causality operates in living systems is deeply embedded in contemporary science and Western medicine. It is a carryover from pre-twentieth century classical physics and *cannot adequately describe or explain* the nature of complex relationships between disparate "normal" or "abnormal" states of consciousness and hierarchically nested biochemical, energetic, or informational processes that influence cognition, emotions and behavior.

The conceptual and methodological limitations of science invite radical revisioning of the core assumptions of Western medicine in the context of complex systems theory and quantum mechanics. By the same token it is fundamentally important to develop a robust methodology in clinical medicine that will permit the integration of substantiated Western medical treatments and substantiated CAM modalities when postulated mechanisms of action are consistent with the predictions of established mechanisms, complex systems theory or quantum mechanics in cases when combining treatments may have beneficial synergistic effects. Examples of CAM modalities that rely on postulated nonlinear processes include EEG biofeedback, homeopathy, and energy medicine.

Biochemical and Energetic Individuality and Models of Body–Brain

In recent years, the concept of biochemical individuality has become increasingly accepted in Western medicine. The perspective that unique biochemical and corresponding genetic processes constitute every unique organism—including human beings—implies that every patient has a unique biochemical and genetic constitution. All symptoms should be evaluated and treated with this fact in mind. Human beings can be described as having unique biomagnetic, informational, and spiritual "constitutions."

There is growing evidence for homeodynamic rather than homeostatic interrelationships between body, brain and environment at a multiplicity of biological, psychological, energetic, informational, and possibly "subtle" or spiritual levels (Miller, 2003). *Homeodynamic efficiency* is a term used to describe the extent to which complex psychophysiological processes maintain mind–body in the optimal range

of functioning. This paradigm describes continuously changing dynamic processes that influence the causes of both good health *and* illness. The homeodynamic model invites consideration of assessment and treatment approaches based on psychological, biological, energy, and spiritual effects on mind–body environment (Dossey, 1982; Jankovic, 1994; Shealy & Myss, 1993). A recently proposed paradigm called *extended network generalized entanglement theory* expands the homeodynamic mind–body model to include concepts from complex systems theory, quantum mechanics, and genetics. The model suggests that the body is a dynamically self-organizing system in space and time that responds to biological, psychological, physical, and "subtle" information in the context of genetic constraints that define and limit possible patterns of self-organization (Hyland, 2003). This novel paradigm provides an explicit place for the operation of postulated subtle energy therapies.

From the perspective of conventional Western medicine, patients who complain of a symptom or symptom *pattern* presumably share similar biologically mediated causes. Biomedical treatments based on the same or similar mechanisms of action are administered to patients complaining of similar symptoms on the assumption that each patient is an "average case" of an objectively describable *disorder caused by dysregulation of the same underlying biological process*. The impressive outcomes of many conventional allopathic treatments suggest that assumptions of *average causes* and *average cases* are correct for some illnesses, including, for example, infectious diseases, heart disease, and many kinds of cancer. However, sporadic or poor outcomes of Western medical treatments of many illnesses suggest that the "average case" approach to understanding pathology fails to recognize the importance of individual variability in pathogenesis. In some cases, poor outcomes take place when the mechanism of a treatment fails to address primary biological causes of pathology. In other cases of sporadic or poor outcomes, a treatment may be supported by a sound theory of mechanism but fail to take into account individual variability at one or more levels of biological, energetic, or informational organization.

Consistently sporadic or poor outcomes of Western medical treatments of mental illness suggest that cognitive, affective, and behavioral symptoms are significantly influenced by individual biochemical, energetic, informational, and possibly other processes that are highly variable and poorly characterized in current models. This view is consistent with emerging understandings of the body–brain in the context of complex systems theory. Integrative assessment and treatment planning address the inherent complexity of the body in space and time by taking into account individual psychological, biological, energetic-informational, and possibly spiritual differences between individuals complaining of symptoms that are typically classified as discrete or "average" disorders in Western medicine and treated using "average" approaches, frequently yielding disappointing results. Table 3.1 compares concepts of normal and pathological functioning in the context of current Western medical understandings of body–brain and emerging models of body–brain based on complex systems theory.

Table 3.1 Models of body–brain contain disparate concepts of normal and pathological functioning

Definition	Western medicine	Medicine vis complex systems theory
Body–brain	Body–brain comprises molecules, cells, and tissues Body–brain can be completely described in terms of entities (anatomy), processes (physiology), and interactions with the environment All structures and processes that constitute body–brain exist in four-dimensional space-time, are empirically verifiable, and can be described in linear terms	Molecular dynamics are functions of complex subatomic and molecular dynamic patterns of structure, energy, and information Cells and their functions are determined by complex dynamics at the molecular level and other hierarchic levels in living systems Interactions between body–brain and the physical, energetic, or informational environment take place in four-dimensional space-time and at other hierarchic levels in the system (possibly including macroscopic quantum fields) Interactions at some hierarchic levels within body–brain are linear; other interactions are nonlinear
Normal functioning	Static structures and dynamic processes can be described in terms of conventional scientific models of biological structures and processes interrelated in linear ways Normal functioning rests on linear patterns of structure or function describable and verifiable using current empirical methods	There is no real distinction between "structure" and "function," which are really different ways of describing interrelationships at different hierarchic locations in a complex living system Normal functioning can be described using concepts in complex systems theory, but processes or structures cannot be empirically verified because they ultimately rest on chaotic, nonlinear phenomena
Pathological functioning	Causes of pathology in living systems, including the body–brain, are measurable and therefore "knowable," resulting in consistent and reliable assessment findings Reliable and specific treatment strategies can be derived on the basis of empirically defined biological mechanisms underlying pathology	Nonlinear dynamics underlying pathology in complex living systems, including the body–brain, are by definition not completely measurable using empirical methods, and are therefore not "knowable" "Correct" or complete assessment findings are not possible A treatment is "effective" when changes in dynamic patterns underlying pathology result in clinical improvement

Disparate Paradigms Lead to Different Concepts of Assessment and Treatment

Disparate ways of explaining illness imply the legitimacy of different assessment and treatment approaches. Four paradigms containing different assumptions about the nature of health and illness phenomena have been proposed (Tataryn, 2002):

- Body paradigm
- Mind–body paradigm

- Body–energy paradigm
- Body–spirit paradigm

The body paradigm regards health and illness as manifestations of physiological processes only. Higher order paradigms embody the assumptions of lower order paradigms and add new assumptions to them. For example, the mind–body paradigm assumes the existence of a mind apart from the physical body and regards health and illness phenomena from the perspective of mind–body interactions. The body–energy and body–spirit paradigms include assumptions about the existence of primary energetic or spiritual phenomena and their respective roles in health and illness. Western medicine operates within the body paradigm and sometimes the mind–body paradigm. Chinese medicine, Ayurveda and Tibetan medicine operate within all four paradigms. Certain CAM modalities are based on materialist assumptions that are congruent with the body paradigm whereas others assume the existence of primary energetic or spiritual phenomena. Numerous assessment and treatment approaches employed in both Western medicine and non-Western systems of medicine fall under the body or mind–body paradigms. At present only CAM approaches fall under the body–energy and body–spirit paradigms. Following is an overview of modalities that are subsumed within the four paradigms.

1. *Conventional Western medical and CAM biological treatments* (*body paradigm*) are based on biological interventions that may be targeted at a particular organ or the body as a whole, depending on the technique employed. 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 on multiple organs. The body paradigm suggests that a mechanistic overlap exists between conventional Western medical and CAM biological treatments. For example, *S*-adenosylmethionine (SAMe) and prescription antidepressants probably have similar beneficial effects on neurotransmitters that improve depressed mood.
2. *Somatic and mind–body treatments* (*mind–body paradigm*) achieve beneficial effects by acting directly on the body or the *mind–body*. Examples include massage, craniosacral therapy, exercise, meditation, guided imagery and yoga. Treatment approaches in this paradigm also have biological effects like those described in the body paradigm.
3. *Conventional energy treatments* (*body–energy paradigm*) employ scientifically validated forms of energy that act on the body–brain. Beneficial effects result from the action of classically described forms of energy on biological processes. Conventional energy modalities that have been validated by science include electroconvulsive therapy (ECT), transcranial magnetic stimulation (TMS), electroencephalographic (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.
4. *Treatments based on postulated forms of energy* (*body–spirit paradigm*) assume that body–mind–spirit can be described in terms of *subtle* energies that have not

been verified by Western science. Body–spirit treatment approaches based on putative nonclassical "subtle" forms of energy raise important unsolved questions about the nature of phenomenal reality including the nature of the human body and consciousness. Postulated beneficial effects of subtle energies assume that classically described biological processes in the body–brain and postulated subtle energetic attributes of human beings are interrelated. Subtle energy treatments include prayer, Shamanic healing, directed intention, Reiki, Qigong, and possibly also homeopathy. It has been suggested that subtle energetic effects of homeopathic remedies may be consistent with the predictions of quantum field theory. Modalities used in this paradigm also operate at the levels of body–energy, mind–body, and body.

Advances in all four paradigms will lead to progress in treatments of cognitive, affective, and behavioral symptoms resulting in improved outcomes. A principle goal of integrative medicine and mental health care is to build a synthesis of disparate paradigms in order to better characterize the causes of symptoms at multiple hierarchic levels of body–mind–energy–spirit. A more complete understanding of biological, somatic, and energetic processes will result in more accurate assessment and more effective treatment of symptoms. Emerging paradigms in science and medicine will contribute to future models of consciousness, result in novel research methods, and yield better assessment and treatment approaches in mental health care. Table 3.2 summarizes the assumptions of emerging paradigms in science and comments on their relevance to CAM and their implications for Western medicine.

Western Medicine and Psychiatry Are Evolving Paradigms

Western (or allopathic) medicine is the current dominant conceptual framework of the body paradigm in Western culture. This paradigm is founded on assumptions about the nature of existence that date to the philosophical roots of Western civilization. Greek empiricism eventually led to formal methods of observation and measurement, culminating in the establishment of modern scientific method with Descartes in the seventeenth century. Despite confirmation of the role of quantum mechanics in living systems—including the human brain—Western medicine remains entrenched in a dogma of naïve materialism based on classical Newtonian physics. In other words, Western medicine—and by extension biomedical psychiatry—rests on assumptions borrowed from a materialist world-view of the universe—that was replaced well over a century ago by a more inclusive paradigm informed by quantum mechanics and general relativity theory. Biomedical psychiatry claims that "mind" is what the brain *does*. Psychiatry includes a variety of perspectives however there is no consensus on a model that adequately explains both normal conscious functioning and mental illness (Kendler, 2001; Wright & Potter, 2003). In contrast to biomedical psychiatry which is based on the neurotransmitter theory, cognitive psychology and hermeneutics argue that *meaning* is the central determinant of human behavior.

Table 3.2 Emerging paradigms, relevance to CAM, and implications for Western medicine

Paradigm	Relevance to non-Western systems of medicine	Implications for Western medicine	Comments
Functional medicine	Internal and external factors affect biological mediators, including neuropeptides, neurotransmitters, and inflammatory molecules which influence the patient's unique biological constitution at level of intercellular communication	Functional medicine examines relationships between symptoms and dynamic interactions at the molecular and cellular levels. This model broadens and deepens Western medicine	Postulated dynamic relationships between individual genetic factors and biological mediators are consistent with psychoneuroimmunology. Discrete mechanisms are difficult to confirm (using current research methods) for many physical, cognitive, and affective symptom patterns
Mind–body medicine	Chronic stress results in dysregulation of hormones, immunologic functioning, and neurotransmitters that manifest as cognitive, affective, and behavioral symptoms	Integration of mind–body practices with Western medical treatments will probably result in significant improvements in patient autonomy, improved outcomes, and reduced mental health care costs	Extensive research has confirmed medical and mental health benefits of meditation, mindfulness training, yoga, and other mind–body practices
Electromagnetic body	Normal and pathological states of living systems can be described in terms of electromagnetic fields	Interpreting health and illness in relation to interactions between electromagnetic fields (including both endogenous and external fields) and established molecular, genetic, and cellular processes will deepen understanding of the causes of disease	Existing Western medical treatments such as electroconvulsive therapy (ECT) and transcranial magnetic stimulation (TMS) use electromagnetic energy to disrupt brain electromagnetic activity. Emerging CAM therapies, including microcurrent stimulation and EEG biofeedback, operate at more subtle levels
Nonclassical forms of energy such as quantum mechanics (QM) and quantum field theory (QFT)	Therapeutic benefits of acupuncture, homeopathy, and possibly "energy" healing may be mediated through nonclassical forms of energy consistent with QM, QFT, or other models	Acceptance of the role of nonclassical influences in health and illness could transform current theories and methods in contemporary Western medicine	Nonclassical phenomena take place on the scale of subatomic particles Coherent large-scale phenomena may take place in living systems on the scale of molecules or coordinated "groups" of cells, including neurons Current technology and research methods cannot verify claimed effects of nonclassical phenomena

(continued)

Table 3.2 (continued)

Paradigm	Relevance to non-Western systems of medicine	Implications for Western medicine	Comments
Zero-point energy	Useful information is potentially available in space-time regions described as "empty" space in Newtonian mechanics	Zero-point energy may be consistent with the body–spirit paradigm and may provide conceptual validation for energy medicine	The existence of zero-point energy has not been demonstrated and remains purely theoretical. There are no existing means to verify claims made by this model
Models of anomalous consciousness or "psi"	Special states of consciousness permit accessing or transmitting information outside of normal space-time constraints	Validation of "psi" influences on living systems may help explain claims of energy medicine such as the putative role of directed intention or prayer in healing	Poorly understood factors interfere with attempts to replicate "psi" research studies, including outcome studies on energy medicine. Current Western research methods are unable to falsify psi models or validate claims of specific effects on illness
Holographic universe	Bohm's theory of implicate order, later modified in Pribram's holographic brain theory, implies that complex living systems are embedded in *N*-dimensional space-time manifolds, permitting nonlocal influences between two or more brains, possibly manifesting as state changes corresponding to pathogenesis of certain illnesses or improved health	The paradigm has important implications for understanding energetic-informational processes that take place in the universe. Acceptance of this paradigm by Western medicine would lead to novel models of symptom causation and treatment "effects" in the context of theories purporting *N*-dimensional space-time, while avoiding metaphysical arguments of nonlocal influences	Like zero-point energy and psi models, claims of the holographic universe paradigm cannot be verified by current science. It remains an interesting speculative paradigm that may be congruent with models in physics purporting *N*-dimensional space-time permeating complex structures including living systems

In modern times, Western medicine has shifted away from eclectic treatments incorporating plant-derived medications, toward synthetic pharmaceuticals designed to target specific molecular markers of disease. This shift has been a gradual process in which ancient healing traditions have been replaced by treatments based on molecular biology and neuroscience. The paradigm shift from indigenous systems of healing to biomedicine has been paralleled by a gradual transition from the use of herbal formulas, to single herbs, to ingredients purified from plant-derived molecules, and, most recently, to synthetic or semisynthetic analogues of isolated bio-

molecules engineered to achieve a specific biological effect on a target cellular receptor or other discrete molecular-level process. In Western medicine, movement away from reliance on compound herbal preparations or crude extracts to highly purified bioactive molecules, has been accelerated by rapid advances in understanding of biochemical, metabolic and immunologic mechanisms underlying medical disorders (Sharma, 1997). At the same time, pharmaceutical companies continue to invest heavily in new-drug discovery programs dedicated to investigating promising natural products as candidates for future treatments of medical and mental illness.

The belief that particular biomolecules represent optimal treatments of discrete disorders is a carryover from early twentieth-century Western medicine, which held that purified chemical substances have desirable physiological effects on the discrete *causes* of illness. This concept emerged from early work in analytic chemistry aimed at isolating "pure" "active ingredients" from "crude" plant extracts on the assumption that pure isolates would result in highly selective or amplified pharmacologic effects. The active ingredient concept is the result of reductionist thinking embedded in Western science. It has led to the exclusion of numerous traditionally used herbal formulas from scientific inquiry. The result is that many herbal formulas used in Asian healing traditions such as Chinese medicine, Ayurveda, Tibetan medicine, Japanese Kampo medicine, and other world systems of medicine have been overlooked because of the absence of single "active ingredients."

In face of the entrenched conservatism of Western medicine, Western culture has become increasingly open to novel ideas about health and healing. Acupuncture and other CAM treatments are gradually being incorporated into the fabric of Western medicine, and concerted efforts are being made to explain beneficial effects of CAM in the language of current science. In parallel with these efforts acupuncture is being practiced according to concepts borrowed from ancient Chinese medical theory. Homeopathic remedies are being evaluated in Western style research studies in attempts to identify a scientifically plausible mechanism of action. The same kind of *trans-paradigm validation* has historically led to acceptance of concepts that were originally regarded as invalid by science and Western medicine. Examples include the use of denatured virus particles to immunize individuals against live viruses, the use of antisepsis before and after surgery, hypnotic trance induction in the treatment of neurosis, the use of x-rays to diagnose fractures, and the use of weak electrical currents to induce seizures in the treatment of severe depression or psychosis. Each of these now mainstream approaches was at first rejected by Western medicine as spurious, ineffective, or dangerous, but after years or decades of debate was eventually accepted as reasonable, safe and effective. Along the way Western medicine has evolved into an eclectic assemblage of disparate ideas and methods. The growing endorsement of Chinese medicine by Western medical practitioners confirms that Western medicine is integrative at both a conceptual and practical level. Despite these changes a truly unified paradigm that encompasses both Western medicine and CAM may be difficult to achieve because many CAM modalities are not falsifiable using available technologies and Western style research methods (Federspil & Vettor, 2000).

Competing Models in Psychiatry

There is no consensus on a *best* or *most adequate* explanatory model in psychiatry. Psychiatrists and other Western mental health professionals generally endorse one of four perspectives on the causes or meanings of mental illness (McHugh & Slavney, 1998):

- Disease
- Dimensional
- Behavioral
- Life-story

Table 3.3 summarizes core assumptions and clinical implications of the four perspectives.

The existence of multiple perspectives has resulted in debate among mental health care providers about treatment approaches that are most appropriate and most efficacious with respect to different disorders (McHugh & Slavney, 1998). The practitioner's preference for a particular perspective depends on ideological biases and training. Psychiatrists are trained in the biomedical model and interpret psychopathology in relationship to presumed underlying neurobiological abnormalities. In contrast, psychologists and other non-medically trained mental health providers interpret symptoms from a perspective that considers both psychological and biological factors. In fact, the assumptions underlying disparate perspectives are not mutually exclusive. Many practitioners who recommend psychotropic meditations also recommend psychotherapy and regard both approaches as legitimate.

Over 100 years have gone by since Freud promulgated his "project for a scientific psychology" (Woody & Phillips, 1995); however, a robust research methodology for verifying the neurophysiological correlates of cognitive, affective and behavioral symptoms has still not been achieved. Advances in genetics, pharmacology, and brain imaging have yielded largely inconclusive evidence for *apparent* correspondences between particular states of consciousness (including symptoms of mental illness) and discrete neurobiological processes. The research evidence suggests that *indirect* relationships may exist between dysregulation at multiple levels of brain function or structure, and broad symptom categories. To date only basic mechanisms of brain function at the level of single neurons or groups of neurons in nonhuman animal models have been clearly elucidated and it is unclear to what extent these findings may generalize to the human brain. The enormous complexity of the brain and the inherent limitations of existing research tools translate into slow progress in understanding the pathogenesis of cognitive, affective, and behavioral symptoms. We can confidently assert that Freud's "project" has not been achieved. Further, it is uncertain whether science in its *current* form can potentially unravel the complex relationships that exist between neurophysiological substrates and mental illness. The question Freud posed more than 100 years ago, and which continues to guide contemporary research programs in psychiatry, rests on the assumption that strict causal relationships exist between discrete neurophysiological

Table 3.3 The perspectives of psychiatry

Perspective	Core assumptions	Clinical implications
Disease	Defining characteristics of mental illness are discrete abnormalities of brain structure or function Clear correspondences exist between etiology, pathological condition, and clinical entity	Psychiatric disorders can be prevented or cured when underlying brain abnormalities are identified Treatments are pharmacologic agents that target presumed neurobiological substrates (psychopharmacology)
Dimensional	Mental illness occurs in individuals who are susceptible to distress because of their relative intellectual or emotional functioning on a quantitative scale of human psychological variation There are no discrete mental illnesses, and patients experience different degrees or severities of symptoms depending on their relative position on the scale of variation	Causes of mental illness are the same stresses that affect all people, but result in cognitive or affective symptoms in some individuals because of their relatively lower level of intellectual or emotional functioning Distress and resulting symptoms are not "cured" but avoided Treatment involves cognitive skills training to improve future coping strategies (cognitive-behavioral therapy, supportive psychotherapy)
Behavioral	Disordered or abnormal behaviors result from excessive attempts to satisfy biological drives in response to cultural or social conditioning Certain abnormal behaviors result from psychiatric vulnerability in the context of anomalous early learning	Mental or emotional symptoms are caused by inappropriate or excessive responses to universal physiological drives Treatment entails psychological and medical approaches to prevent, improve, or interrupt abnormal behaviors (psychopharmacology and cognitive-behavioral therapy)
Life-story	Disturbing experiences result in distress and associated cognitive or affective symptoms that are subsequently incorporated into self-defeating narratives	Causes of mental illness are expectable responses to distressed states of mind that become fixed as self—defeating narratives Rescripting narratives in the context of supportive therapy permit the patient to avoid disturbing future experiences (narrative therapy)

substrates and particular *normal* mental processes and, by extension, cognitive, affective, and behavioral symptoms. In view of what is known about complex hierarchical relationships between cellular, synaptic, and modular components of the brain, the assumption of correspondences between discrete neurophysiological processes and specific mental states or symptoms is at best naïve and simplistic, and at worst irrelevant and misleading.

Numerous ways of conceptualizing brain function and the nature of consciousness have been proposed since Freud's time. The model most widely embraced by the scientific community is functionalism, one version of which postulates correspondences between every specifiable brain state and every mental state. This model is essentially a restatement of Freud's original idea in the language of contemporary metaphors of brain function. Functionalism argues that the most rational and most

probable description of brain function requires the assumption that correspondences exist between discrete functional brain states and specified mental or emotional processes or experiences. There is no need to verify claims of functional correspondences between brain states and mental states because they are a priori assumed to exist.

Limitations of Biomedical Psychiatry

Biomedical psychiatry is limited in its ability to alleviate mental and emotional suffering because available treatments address only some of the root causes and meanings of mental illness. Incomplete understanding of the complex causes of mental illness has led to a multiplicity of unsubstantiated theories and therapies that fail to correct the root psychological, biological, social or postulated "energetic" causes of symptoms (Wright & Potter, 2003). Current research methods are not capable of elucidating the effects of disparate biological and environmental factors on affective, cognitive, and behavioral functioning.

Starting in the 1960s with the discovery of neurotransmitters biomedical psychiatry rapidly emerged as the dominant perspective of Western mental health care. Biomedical psychiatry claims that dysregulations at the level of specific neurotransmitters (or their receptors) correspond to, cause, and adequately *explain* the constellation of affective, cognitive, and behavioral symptoms. After decades of research the neurotransmitter theory has failed to provide a robust explanatory model of mental illness causation (Lopez-Munoz & Alamo, 2009). In North America and other industrialized world regions the neurotransmitter theory has become a self-perpetuating dogma and has received the full support and funding of academic institutions and the pharmaceutical industry. This dogma based on a model that has not been substantiated by decades of research and billions of dollars of funding has resulted in the majority of studies in psychiatry being conducted on synthetic pharmaceuticals targeting a handful of neurotransmitter receptors. Despite these circumstances, the neurotransmitter theory and its offshoot—the practice of psychopharmacology—are strongly endorsed by psychiatrists and other Western-trained mental health practitioners.

The neurotransmitter theory rests on an implicit physicalist assumption, namely, that cognitive, affective, and behavioral symptoms are *caused by* dysregulations of neurotransmitters or systems of interrelated neurotransmitters in ways that are analogous to causation of medical illness by discrete infectious or physiological processes. Misgivings about the neurotransmitter theory as an adequate explanatory model of mental illness have led to widely shared concerns over the limited efficacy of pharmacological treatments based on this theory.

Studies on the roles of discrete neurotransmitters in the pathogenesis of cognitive, affective, and behavioral symptoms have yielded inconclusive findings including the following:

- Brain levels of neurotransmitters can only be indirectly and imprecisely estimated from laboratory studies of the cerebrospinal fluid (CSF), urine, or from functional brain imaging scans such as positron emission tomography (PET) or functional magnetic resonance imaging (fMRI). Existing functional brain imaging technologies show only *relative* levels of neurotransmitter receptor binding activity and do not indicate absolute levels. Existing functional imaging technologies are not able to quantify relationships between discrete neurotransmitters and discrete symptom patterns or *disorders*.
- Decades of research have failed to demonstrate consistent correspondences between discrete neurotransmitters, neurotransmitter receptors, or their relative or absolute global or regional levels of activity in the brain, and the presence or absence of specific psychiatric symptoms or disorders.
- Research findings have failed to demonstrate consistent correspondences between changes in symptoms during psychopharmacological treatment and changes in brain or CSF neurotransmitter (or neurotransmitter metabolite) activity levels.
- Many psychopharmacological drugs (appear to) have beneficial effects on symptoms in the absence of changes in neurotransmitters that are believed to be mechanisms of action. This finding may be consistent with a placebo effect associated with prescription medications used in mental health care broadly.

Recently characterized neurotransmitters are not stored in synaptic vesicles and do not act on post-synaptic receptor sites, and thus do not fulfill criteria for neurotransmitters as conventionally understood. D-serine is an example of such "atypical" neurotransmitters. D-serine is synthesized and stored in neuroglia and binds to *n*-methyl-D-aspartate (NMDA) receptors that have been implicated in the pathogenesis of schizophrenia and other psychotic disorders. Other "atypical" neurotransmitters that may play important roles in the pathogenesis of psychiatric disorders include nitric oxide, carbon monoxide, and possibly hydrogen sulfide. Nitric oxide (NO) may play an important role in learning and memory.

After decades of research, biomedical psychiatry has failed to verify the existence of postulated relationships between discrete neurobiological processes and symptom formation. It is unlikely that current research methods and technologies *will be able to verify* the existence of putative causal relationships between discrete neurotransmitters or brain circuits, and cognitive, affective and behavioral symptoms or *disorders*. Because explanations of symptom causation have not been established, classification and diagnosis in psychiatry rely on descriptions of symptoms but do not infer their causes. In Chap. 5 I discuss problems in classification and diagnosis in psychiatry which call into question the validity of "disorder" as presently conceptualized.

Biomedical psychiatry is also limited by practical problems. For example, it emphasizes treatment of serious chronic mental illnesses and neglects wellness and prevention. While pharmacological treatments sometimes result in rapid, dramatic stabilization of severe symptoms, the so-called *maintenance* therapies of depressed mood, bipolar disorder, schizophrenia, and other severe psychiatric disorders are

often only marginally more effective than placebos (see Chap. 1). Unresolved safety issues and the high cost of many psychotropic drugs limit the potential reach of biomedical psychiatry globally, rendering many drugs inaccessible in less developed world regions. Mental health care as practiced in North America, and EU countries is often limited to brief impersonal appointments emphasizing "medication management" under cost constraints of "managed care" organizations that fail to take into account complex medical, psychosocial, cultural or spiritual factors that frequently contribute to mental illness or interfere with response to treatment.

In view of the limitations of biomedical psychiatry it is not surprising that it lacks a unifying theoretical framework and has few treatments that are effective and safe (Grof, 1985; Wilber, 2001).

Cognitive Psychology and Hermeneutics Offer Alternative Explanations of Mental Illness

Cognitive psychology and hermeneutics were advanced in the twentieth century (Widdershoven, 1999) as methods for verifying the existence of both normal and pathological mental states on the basis of observable behaviors or subjective reports of distress. Both approaches rely on a systematic logical approach to show relationships between the *meanings* of different phenomena, but neither approach requires the empirical verification of causes underlying changes in brain activity. Both methods are used to make inferences about normal or pathological brain states, and both approaches avoid the constraints imposed by empirical research methods.

Cognitive psychology argues that mental states *cause* actions or behaviors. Irrational or pathological behavior results from conflicting cognitive "strategies" or incompatible behavioral rules resulting from systematic misrepresentations of percepts or situations. Stable cognitive frameworks are acquired through learning in which sensory input shapes neural circuits. Those cognitive frameworks that are reinforced by consistent experiences gradually become resistant to change, even when a framework results in systematic misrepresentations that are maladaptive for the individual. Cognitive therapy has the goal of correcting maladaptive strategies or rules, thus converting maladaptive cognitions or behaviors to more adaptive or useful strategies. Cognitive distortions, anxiety, depression, and other symptoms are manifestations of disruptive functioning due to maladaptive rules that result in systematic misrepresentations. More adaptive rules are acquired through cognitive therapy, resulting in the gradual alleviation of pathological behaviors or cognitions.

Hermeneutics was conceived by Martin Heidegger (1962) and developed by Gadamer (1960) and Merleau-Ponty (1962). Hermeneutics is a discursive process in which interpretation through shared dialog transforms and clarifies meaning. Hermeneutics posits that there are no objective facts but only varying interpretations of subjective meanings. The back-and-forth approach of hermeneutics results in

successive levels of interpretation through the exchange of stories or narratives about different viewpoints or personal histories. The milieu in which a "hermeneutic circle" takes place makes up our collective "preunderstandings." The narrative exchange of interpretations in the background of our preunderstandings leads to useful interpretations. Progress in science takes place when novel shared meanings emerge through dialogue. Pathological mental or emotional states occur when individuals fail to achieve interpretations of novel situations or information from their preunderstandings. When a useful or adaptive interpretation is not successful the individual experiences distress which can be manifested as confusion, anxiety, depression, or other cognitive or affective symptoms. The work of psychotherapy is to help the patient to develop a new shared dialogue (i.e., a more useful hermeneutic circle) that will permit him or her to understand novel situations in his or her existing worldview or to transform his or her worldview to accommodate novel experiences.

Key Points

- A paradigm is a set of beliefs that make up a theoretical framework within which scientific theories can be critically evaluated or revised.
- Materialism is the conceptual framework of Western medicine, although psychiatry is based on both materialism and phenomenology.
- Because of changes in social and economic factors that shape theories and clinical practices, clinical approaches in all systems of medicine are subject to change on an ongoing basis resulting in more complete understandings of the causes and meanings of symptoms.
- The paradigm that influences how a practitioner interprets illness phenomena biases choices of clinical approaches and affects treatment outcomes.
- Inferences about the significance of findings are context-dependent in that they can be made only with respect to a particular system of medicine in which observation or research takes place.
- Western medicine is the dominant paradigm in developed countries because it is perpetuated by widely shared cultural beliefs and powerful economic factors that ensure its dominant role.
- Disparate systems of medicine postulate the existence of different forms of energy and information.
- Western medicine posits that health and illness can be adequately characterized in terms of classically described entities and processes.
- Non-Western systems of medicine posit that "normal" and "abnormal" functional states of the body are manifestations of interrelationships between physiological processes and postulated nonclassical or "subtle" forms energy.
- Some CAM approaches claim that illness phenomena can be more completely described in terms of postulated nonclassical forms of energy.
- The perceived legitimacy of any clinical approach used in medicine or mental health care will ultimately be determined by shared beliefs about the correctness of assumptions contained in the paradigm from which the approach is derived.

- The multitiered complexity of the body–brain in space–time is the central premise on which the conceptual framework of integrative medicine is based.
- Symptom patterns interpreted as illness reflect complex dynamic patterns of dysregulation or imbalance at various levels in the body–brain system.
- According to Western medicine existing models in biology and physics provide complete explanations of both normal and pathological states of the human body, and the same models can be used to explain consciousness.
- Living systems behave in complex nonlinear ways that cannot be adequately described by current science and Western medicine which rely on an empirical methodology for making inferences about linear causality based on measurements of presumed discrete entities and processes.
- Human beings can be described as having unique biomagnetic, informational, and spiritual "constitutions."
- Sporadic or poor outcomes of Western medical treatments of many illnesses suggest that the "average case" approach to understanding pathology fails to recognize the importance of individual variability in pathogenesis.
- Sporadic or poor outcomes of Western medical treatments of mental illness suggest that cognitive, affective, and behavioral symptoms are significantly influenced by individual biochemical, energetic, informational, and possibly other processes that are highly variable and poorly characterized in current models.
- Disparate ways of explaining illness imply the legitimacy of different assessment and treatment approaches. Four paradigms containing different assumptions about the nature of health and illness phenomena have been proposed: body paradigm; mind–body paradigm; body–energy paradigm; body–spirit paradigm.
- A principle goal of integrative medicine and mental health care is to build a synthesis of disparate paradigms in order to better characterize the causes of symptoms at multiple hierarchic levels of body–mind–energy–spirit.
- Emerging paradigms in science have important implications for both Western medicine and CAM.
- Western medicine and biomedical psychiatry continue to rest on assumptions borrowed from a materialist world-view that was replaced well over a century ago by a more inclusive paradigm informed by quantum mechanics and general relativity theory.
- In face of the entrenched conservatism of Western medicine, Western culture has become increasingly open to novel ideas about health and healing. This "shift" has resulted in research directed at investigating putative mechanisms of action previously regarded as invalid by science and Western medicine.
- Psychiatry includes a variety of perspectives however there is no consensus on a model that adequately explains both normal conscious functioning and mental illness.
- After decades of research the neurotransmitter theory has failed to provide a robust explanatory model of mental illness causation. This has led to widely shared concerns over the limited efficacy of pharmacological treatments based on this theory.

- Biomedical psychiatry emphasizes treatment of severe chronic mental illnesses and neglects wellness and prevention. Pharmacological treatments sometimes result in rapid, dramatic stabilization of severe symptoms. Maintenance therapies of depressed mood, bipolar disorder, schizophrenia, and other severe psychiatric disorders are often only marginally more effective than placebos.
- Unresolved safety issues and the high cost of many psychotropic drugs limit the potential reach of biomedical psychiatry, globally rendering many drugs inaccessible in less-developed world regions.
- Cognitive psychology and hermeneutics argue that meaning is the central determinant of human behavior. Both approaches rely on a systematic logical approach to show relationships between the meanings of different phenomena, but neither approach requires the empirical verification of causes underlying changes in brain activity.

References

Abbot, N. C. (2000). Healing as a therapy for human disease: A systematic review. *Journal of Alternative and Complementary Medicine, 6*(2), 159–169.

Bland, J. (1999). New functional medicine paradigm: Dysfunctional intercellular communication. *International Journal of Integrative Medicine, 1*(4), 11–16.

Chen, K. W. (2004). An analytic review of studies on measuring effects of external QI in China: Review article. *Alternative Therapies in Health Medicine, 10*(4), 38–50.

Curtis, B., & Hurtak, J. (2004). Consciousness and quantum information processing: Uncovering the foundation for a medicine of light. *Journal of Alternative and Complementary Medicine, 10*(1), 27–39.

Dossey, L. (1982). *Space, time and medicine*. Boston: Shambala.

Edelman, G., & Mountcastle, V. (1978). *The mindful brain: Cortical organization and the group-selective theory of higher brain function*. Cambridge, MA: MIT Press.

Federspil, G., & Vettor, R. (2000). Can scientific medicine incorporate alternative medicine? *Journal of Alternative and Complementary Medicine, 6*(3), 241–244.

Gadamer, H. G. (1960) Wahrheit und Methode: Grundzuge einer philosophischen Hermeneutik. Tubingen: Mohr.

Grof, S. (1985). *Beyond the brain: Birth, death and transcendence in psychotherapy*. Albany: State University of New York Press.

Hammerschlag, R., Marx, B., & Aickin, M. (2014, December). Nontouch biofield therapy: A systematic review of human randomized controlled trials reporting use of only nonphysical contact treatment. *Journal of Alternative and Complementary Medicine, 20*(12), 881–892.

Hankey, A. (2004). Are we close to a theory of energy medicine? *Journal of Alternative and Complementary Medicine, 10*, 83–86.

Heidegger, M. (1962). *Being and Time*. San Francisco: Harper.

Hyland, M. (2003). Extended network generalized entanglement theory: Therapeutic mechanisms, empirical predictions, and investigations. *Journal of Alternative and Complementary Medicine, 9*(6), 919–936.

Jankovic, B. (1994). *Neuromodulation: The state of the art*. New York: New York Academy of Sciences.

Jobst, K. (1998). Toward integrated healthcare: Practical and philosophical issues at the heart of the integration of biomedical, complementary and alternative medicines [Editorial]. *Journal of Alternative and Complementary Medicine, 4*(2), 123–126.

Jordan, J., Srinivasan, N., & Van Leeuwen, C. (2015). The role of complex systems theory in cognitive science. *Cognitive Processing, 16*, 315–317.

Kendler, K. (2001). A psychiatric dialogue on the mind–body problem. *American Journal of Psychiatry, 158*(7), 989–1000.

Kuhn, T. S. (1962). *The structure of scientific revolutions*. Chicago: University of Chicago Press.

Lopez-Munoz, F., & Alamo, C. (2009). Historical evolution of the neurotransmission concept. *Journal of Neural Transmission (Vienna), 16*(5), 515–33.

McHugh, P. R., & Slavney, P. R. (1998). *The perspectives of psychiatry*. Baltimore: Johns Hopkins University Press.

Merleau-Ponty, M. (1962). *Phenomenology of perception*. London: Routledge & Kegan Paul.

Miller, D. W. (2003). Homeodynamics in consciousness. *Advances in Mind–Body Medicine, 19*(3–4), 35–46.

Penrose, R. (1994). *Shadows of the mind: A search for the missing science of consciousness*. Oxford: Oxford University Press.

Pham, J., Aswani, M., Rosen, M., Lee, H., Huddle, M., Weeks, K., et al. (2012). Reducing medical errors and adverse events. *Annual Review of Medicine, 63*, 447–463.

Pressman, M. (2004). Mind energetics: Evolution and arrival. *Seminars in Integrative Medicine, 2*, 36–47.

Pribram, K. (1991). *Brain and perception: Holonomy and structure in figural processing*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Radin, D., Schlitz, M., & Baur, C. (2015, November). Distant healing intention therapies: An overview of the scientific evidence. *Global Advances in Health and Medicine, 4*(Suppl.), 67–71.

Rein, G. (2004). Bioinformation within the biofield: Beyond bioelectromagnetics. *Journal of Alternative and Complementary Medicine, 10*(1), 59–68.

Shang, C. (2001). Emerging paradigms in mind–body medicine. *Journal of Alternative and Complementary Medicine, 7*(1), 83–91.

Sharma, H. (1997). Phytochemical synergism: Beyond the active ingredient model. *Alt Ther in Clin Practice*, 91–96.

Shealy, C., & Myss, C. (1993). *The creation of health: The emotional, psychological, and spiritual responses that promote health and healing*. Walpole, NH: Stillpoint Publishing.

Starfield, B. (2000). Is U.S. health really the best in the world? *Journal of the American Medical Association, 284*(4), 483–485.

Tataryn, D. (2002). Paradigms of health and disease: a framework for classifying and understanding complementary and alternative medicine. *Journal of Alternative and Complementary Medicine, 8*(6), 877–892.

Widdershoven, G. (1999). Cognitive psychology and hermeneutics: Two approaches to meaning and mental disorder. *Jour Philosophy, Psychiatry & Psychology, 6*(4), 245–253.

Wilber, K. (2001). *Quantum questions: Mystical writings of the world's greatest physicists*. Boston: Shambala.

Woody, J., & Phillips, J. (1995). Freud's "Project for a Scientific Psychology" after 100 years: The unconscious mind in the era of cognitive neuroscience. *Philosophy, Psychiatry, & Psychology, 2*(2), 123–134.

Wright, J., & Potter, P. (2003). *Psyche and soma: Physicians and metaphysicians on the mind–body problem from antiquity to enlightenment*. Oxford: Clarendon Press.

Zahourek, R. P. (2004). Intentionality forms the matrix of healing: A theory. *Alternative Therapies in Health and Medicine, 10*(6), 40–49.

Zhan, C., & Miller, M. (2003). Excess length of stay, charges, and mortality attributable to medical injuries during hospitalization. *Journal of the American Medical Association, 290*, 1868–1874.

Chapter 4
Models of Consciousness: How They Shape Understandings of Normal Mental Functioning and Mental Illness

"Gentlemen, I have a confession to make. Half of what we have taught you is in error, and furthermore we cannot tell you which half it is."

—Sir William Osler, MD

Contents

Approaching Consciousness

Despite millennia of observation, research and debate, there is still no compelling evidence for any single model of consciousness (Dehaene & Changeux, 2011). Nor is there agreement on how to *define* consciousness, what constitutes a rigorous model of consciousness, or research methods that are most appropriate or productive for investigating consciousness. Disparate models start from different assumptions that in turn lead to different inferences about the properties and functions of

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consciousness. For example, the assumption that consciousness is a specialized property of the brain leads to very different kinds of models than the assumption that consciousness exists as a "primary" kind of phenomenon in the universe (i.e., panpsychism). Some models rest on assumptions about mechanisms that are not falsifiable using available empirical means and are essentially *metaphors* as they *describe* consciousness in different ways but do not offer testable hypotheses. Non-Western systems of medicine describe consciousness in terms of postulated "energetic" phenomena and—like scientific models—cannot be confirmed using available empirical means. In view of the above it is unlikely that a strong consensus definition or model of consciousness will be forthcoming in the foreseeable future (Gierer, 2008).

The paradigm within which a particular model is developed places constraints on the methodology used to investigate consciousness, and influences interpretations of findings regarded as *legitimate*. Along these lines, current science accepts as dogma that *legitimate* explanations of disparate properties and functions of consciousness must *follow from* and be *consistent with* core assumptions of a general model of consciousness widely endorsed by a community of "experts." My view is that there are no "experts" on consciousness only writers and researchers with different intellectual or spiritual perspectives and biases. Because agreement on *valid* interpretations of observations and research findings on consciousness varies between disparate paradigms, the paradigm within which a researcher investigates or *thinks about* consciousness influences *what he or she may discover* through observation or research. The methodology selected for making inferences about the significance of findings pertaining to a particular property or function of consciousness *necessarily biases* understandings regarded as *legitimate* which must be consistent with the paradigm in which observation or research take place. A consequence is that the ability of any model to *accurately* and *adequately* characterize consciousness is related to the *explanatory power of* the research methodology that is employed, which in turn (above) reflects core premises of the paradigm in which the model is embedded. In sum, the paradigm that *prefigures* the way researchers *see* and interpret phenomena related to consciousness constrains findings obtained using a particular research methodology and determines shared beliefs about legitimate interpretations of findings.

Is a *Complete* Model of Consciousness Possible?

Efforts to develop a *complete* model of consciousness capable of *accurately* and *adequately* describing and explaining the broad range of characteristics, functions and subjective experiences associated with consciousness should ideally invite rigorous open-minded debate from multiple perspectives including science, religion, spirituality, and other *ways of knowing* (i.e., epistemologies). The problem of reconciling disparate models of consciousness derived in the context of different

epistemologies is related to the more general problem of transparadigm validation. An important future goal of interdisciplinary dialog on consciousness should be derivation of a *general systems model that accommodates multilevel analysis of a broad range of phenomena including biological processes and postulated quantum mechanical (QM) or other nonclassical processes related to both ordinary states and "pathological" states (*i.e.*, mental illness) of consciousness. A complete model of consciousness should be able to rigorously characterize and reconcile postulated QM-level properties with established neurophysiological mechanisms at the levels of single neurons, neural circuits, and networks of circuits.*

The problem of adducing a complete model of consciousness that adequately addresses the above problems entails developing a methodology that is *acceptable to and accessible by current science and alternative epistemologies*. The methodology used to achieve an adequate systems model of consciousness will influence the ability of the model to generate testable hypotheses. A complete model of consciousness should ideally start from assumptions that are congruent with established scientific models of consciousness, as well as assumptions underlying emerging models of space-time, matter, energy, and information. This approach will provide the conceptual foundation for a "meta-theory" in which a complete systems model of consciousness can be achieved.

Scientific Models of Consciousness Are Grounded in Unexamined Materialist Assumptions

Contemporary scientific models of consciousness reflect naïve *reductionist* assumptions about the nature of phenomenal reality. For example, the assumption that established neurobiological processes are *necessary and sufficient for consciousness to take place* is equivalent to the assumption that consciousness is reducible to *classically described* properties of matter and energy in living systems. Numerous alternative models have been proposed but so far have had little influence on scientific inquiry into the nature of consciousness. The result is that many theorists endorse models based on outdated ideas as adequate explanations of consciousness. Despite a growing theoretical literature on QM-models of consciousness, the reductionist framework imposed by mainstream science and Western medicine on methodologies used to investigate consciousness excludes quantum-level processes or other postulated *nonclassical* phenomena because such phenomena are not verifiable in living systems using available technologies. Thus, the current dogma limits contemporary scientific understandings of consciousness to naïve materialist assumptions while delaying progress toward stronger models based on research findings from physics that could potentially lead to novel understandings of mechanisms underlying both "normal" and "pathological" functions and states of consciousness.

Models of Consciousness—An Overview of Categories

Models of consciousness fall into a few categories such as monist, dualist, physicalist, and metaphysical. During the twentieth century, models of consciousness evolved from Cartesian dualism to naïve realism, to type–type and token–token identity theories, and finally to functionalist models, including most recently psycho-functionalism. Popular scientific models of consciousness include identity theories and functionalism. Both models are *monist* and *physicalist* in that they posit the existence of one kind of thing *underlying* consciousness, namely, physical processes. Both models are also reductionist in that they equate mental events to discrete identifiable processes in the brain (e.g., changes in the level or activity of neurotransmitters or neurotransmitter receptors, synapses, or neural circuits). Words describing mental events are merely descriptions of processes that take place *only in relationship* to brain function. Neither model has been strongly substantiated; however, both models are frequently invoked by Western medicine to explain illness phenomena.

The dominant model of consciousness implicit in Western medicine, and by extension, biomedical psychiatry, is a type of psycho-functionalism called *computational functionalism.* Although unsubstantiated by research, this model is frequently advanced as an explanation of the mind–body problem (i.e., how the "non-physical" mind interacts with and influences the physical brain). According to this model, consciousness describes *what the brain does*. The functional attributes of consciousness that correspond to different kinds of subjective experiences (i.e., qualia) are assumed to be equivalent to discrete neurochemical or biomagnetic processes in the brain. Different versions of functionalism are invoked in psychological and biological explanations of symptom formation. In contrast to functionalism, the *dynamic core hypothesis* of consciousness, based on complex systems theory, equates disparate conscious experiences with complex interactions between distributed groups of neurons (Tononi & Edelman, 1998).

Non-Western systems of medicine typically rest on *dualist* models of consciousness that posit the existence of a fundamental energetic principle or two fundamentally irreducible kinds of phenomena—the mental (spiritual or energetic) and the physical—that interact in complex ways. Systems of medicine based on an irreducible energetic principle imply a model of consciousness called metaphysical monism. Dualist models introduce the problem of agency with respect to causality in consciousness. The problem of agency refers to scientific and philosophical dilemmas that dualist models encounter when attempting to explain interactions between physical and nonphysical phenomena that manifest as characteristics or functions of consciousness. Systems of medicine or CAM modalities based on a dualist model of consciousness are often dismissed a priori by science and Western medicine and are rarely subjected to rigorous Western-style research studies. Since monist physicalist models posit that only physical processes exist they avoid the problem of agency.

Table 4.1 summarizes the assumptions, strengths, and limitations of leading contemporary models of consciousness.

Table 4.1 Contemporary models of consciousness

Model	Assumptions	Strengths	Limitations
Type–type identity theory	"Mind" is identical with brain thus mental phenomena are physical phenomena Each "type" of mental state is identical with a specific "type" of brain state	The mind–body problem is eliminated as only physical states are posited to exist This theory is congruent with psychiatric theories of mental illness based on genetics and molecular biology which assume type–type equivalence between discrete brain states and mental phenomena	Requires verifiable correlations between specific mental states and discrete brain states. This level of evidence is not possible using available technologies Some research findings (e.g., neural plasticity in post-stroke patients) show that pathological states are correlated with dysfunction of discrete brain circuits
Token–token identity theory	Every token or particular instance of a given type of mental state is identical with a token or particular instance of a given type of physical brain state	The mind–body problem is eliminated Assumes that mental states are "multiply realized" thus repairs a major weakness of type–type identity theory	Functional brain imaging studies do not demonstrate unvarying systematic equivalence between specific mental states and specific physical–spatial brain locations or processes Thus token–token theories are inherently unverifiable Does not avoid the problem of dualism
Metaphysical functionalism	Mind or consciousness is a function in which specific mental states can be adequately specified in formal terms as inputs, outputs and relations to other mental states	Avoids the problem of agency in dualism Avoids problems inherent in type–type identity theories of verifying correspondences between mental states and brain states	Does not attempt to reconcile posited brain functions with known neurophysiological processes, and is therefore not empirically falsifiable
Psycho-functionalism	Materialist view that mental functions are contained in many kinds of processes in both living systems (including brains) and machines (including computers) Computational functionalism is a specific type of psycho-functionalism Mental states are reduced to complex input-output functions of physical structures or states	Avoids problems of dualism Avoids apparent paradox of behavior causality in that behaviors consist of "being in" a specified mental state (e.g., pain) Similar to token–token identity theory in that mental states may be multiply realized Mental states are not restricted to human consciousness	Does not account for intentionality or subjectivity of many mental states like beliefs, attitudes and desires (this is the problem of "absent qualia")

Current Science Cannot Verify Western or Non-Western Models of Consciousness

Monist physicalist models, dualist models and monist metaphysical models of consciousness are not empirically verifiable in the context of current science. The problem of agency (i.e., how a non-physical "mind" interacts with a physical "brain") is avoided by monist physicalist models but is a central problem for metaphysical monism and dualism. Because of this basic conceptual difference, Western models of consciousness—which are both physicalist and monist—have historically emphasized empirical approaches for determining the *neural correlates* of subjective experiences of consciousness or *qualia*. In contrast, non-Western models have historically relied on metaphysical arguments postulating agency or nonphysical explanations of causation. Neither kind of model is falsifiable because verification of causal relationships between discrete mental events and discrete physical processes—or presumed metaphysical processes in the case of metaphysical monism—cannot be confirmed by (existing) empirical means. In the case of Western models of consciousness attempts to do so have led to paradoxes of infinite regress entailing unprovable causal chains of neurobiological events. Examples include "super" or "sentient" neurons, which amount to neurophysiological metaphors for homunculus theories. Along the same lines, attempts to verify non-Western models of consciousness have led to vague descriptions of postulated "energetic" phenomena that are not susceptible to empirical investigation. Progress in functional brain imaging will lead to improved understandings of temporal and spatial relationships between mental events and brain states however fundamental advances in the paradigm of current science will be needed to verify the core assumptions of any single model of consciousness.

Explanations of Mental Illness Imply a Theory of Consciousness

Every model of mental illness includes or implies a corresponding theory of consciousness that contextualizes understandings of cognitive, affective, and behavioral symptoms. Disparate systems of medicine incorporate disparate models or metaphors of consciousness that reflect their respective assumptions. A model of consciousness may be explicitly stated or remain unstated (i.e., implicit) in a model of mental illness. Claims about the validity of clinical approaches used in all systems of medicine assume that causes and meanings of symptoms are congruent with a particular model of consciousness. In sum:

- Every model of mental illness implies or makes explicit a corresponding theory of consciousness. All models of mental illness contain assumptions that must be

congruent with assumptions in a model of consciousness in which it is contextualized.
- Analysis of causes and meanings of symptoms *can only take place* in the context of a particular model of mental illness, and by extension, a particular model of consciousness.
- Disparate models of consciousness explicitly state or imply disparate explanations of psychopathology and determine clinical approaches regarded as legitimate.

Disparate systems of medicine use different metaphors of consciousness to describe treatment outcomes in terms of state changes in complex biological, informational, or "energetic" phenomena that manifest as amelioration of symptoms. To the extent that states of consciousness *change* when affective, cognitive and behavioral symptoms respond to treatment, influencing the characteristics or functions of consciousness is a central and necessary part of mental health care.

Models of Consciousness in Western Medicine and Non-Western Systems of Medicine Rest on Disparate Metaphysical Assumptions

It is instructive to examine representative non-Western systems of medicine in the context of their respective models of consciousness with the goal of clarifying their underlying assumptions and contrasting these models to Western models. When examining Western medicine and major non-allopathic systems of medicine it is evident that the assumptions on which they are based differ in content but have a similar *logical form*. That is, core assumptions in the principal world systems of medicine have in common the same logical structure of statements describing *states of affairs* or *conditions* of reality, and statements describing (presumed) relationships between states of affairs. Table 4.2 lists core assumptions of three major non-allopathic systems of medicine.

Neither Western allopathic medicine nor non-allopathic systems of medicine contain core assumptions that are empirically derived or, as I have argued above, empirically verifiable. This observation is significant with respect to the goal of determining the degree of *congruence* between disparate systems of medicine at a basic conceptual level, and the related problem of determining degrees of compatibility when concepts or actual treatment modalities from disparate systems of medicine are being explored for possible combined use in a single integrative treatment plan. In Chap. 5 I propose a general methodology for integrative medicine and mental health care taking into account conceptual differences between disparate systems of medicine from which candidate treatment approaches are selected.

Table 4.2 Core assumptions of three non-allopathic systems of medicine

System of medicine	Core assumptions
Ayurveda	• The physical body is a manifestation of mental tendencies carried from previous lives. The body is therefore the gross form of the mind • The body exists and allows the mind to perceive and act • The mind has a material structure—a set of observable energies and conditions • The mind is not physical matter but matter of a subtle nature—it is the most subtle form of matter • The brain is the physical organ through which the mind works • The mind is not limited to the physical apparatus of the brain • There are five levels of mind: higher self, inner consciousness, intelligence, sense mind, and ego • Chitta, the field of thought, is the level of consciousness • The human soul is the "true self," which is "pure awareness" that is linked with but not limited to the mind–body complex • There are three levels, or "primal qualities," of nature that underlie matter, life, and mind. These are Sattva (waking), Rajas (dreaming), and Tamas (deep sleep) • The mind (consciousness) is the domain of Sattva
Chinese medicine	• Qi is a primordial force in the universe that underlies all phenomena and determines all natural laws • Qi pervades all things manifesting as unity, continuity, and centeredness • Qi moves in a predictable patterned way, resulting in balance in nature • Qi is in balance in humans and other living and nonliving entities when it is sufficient in quantity and moves in a patterned rhythm • Many functioning constituents of qi interconnect in each entity as parts of the "cosmic whole" • Body and mind are similar in kind but are different manifestations of qi • Reversible transformations of qi between body and mind manifest as disease or health, depending on the nature and direction of the transformation • Spirit (shen) is a category of qi manifested as energy on the mental plane • Imbalances of qi that affect shen can manifest in mental disturbances
Homeopathy	• An unseen, unified, and intelligent force organizes all natural phenomena • This fundamental force is equivalent to spirit, and is the source of life • Psychological, physiological, and cellular processes are interconnected manifestations of this unifying intelligent force • The same force manifests as health or illness, depending on its magnitude and state of balance between the environment and the body, and different internal organs • Mental and emotional attributes are manifestations of this force • Cognitive, emotional, and behavioral symptoms are manifestations of imbalances in this force • Substances that cause symptoms like those being treated (law of similars) stimulate self-healing through a "rebalancing" of this unifying intelligent force • Dilutions of substances are "succussed" to activate this force and thereby increase the potency and specificity of remedies

Assumptions About Causality in Consciousness Are Paradigm-Dependent

Current science and Western medicine assume that biological processes in general and the special case of consciousness in complex living systems can be adequately described in terms of discrete physical and biological processes linked by linear relationships. According to this perspective, established scientific models in physics, chemistry, and biology, would be expected to eventually explain all causal mechanisms that exist or can potentially exist in nature. If this is the case there is no need to invoke nonclassical models or radically different understandings of causality to explain phenomena. Current scientific models of consciousness rest on assumptions of linear causality; however, recently proposed models of consciousness invoke nonlinear causality or *acausality*.

Models of consciousness based on quantum mechanics or other nonclassical paradigms are premised on non-local or acausal relationships between phenomena (Vannini, 2008). For example, quantum mechanics posits that photons and other subatomic particles can exist as entangled states related in exact and predictable ways, but that characteristics of entangled subatomic particles—and phenomena related to them—*cannot be formally described* using simple deterministic models of causality. Although entanglement between photons has been experimentally verified, classical Newtonian concepts of space, time, and causality cannot adequately explain or predict properties of subatomic particles. Considerable debate is taking place over the relevance of quantum mechanics to models of consciousness (Baars & Edelman, 2012). Research in quantum mechanics has so far demonstrated that simple two-particle systems of photons sometimes remain probabilistically correlated or "entangled" over vast distances however entanglement has so far not been demonstrated to take place in more complex physical systems or in living systems.

The same dilemma that limits the explanatory power of current science with respect to the postulated role of quantum-level events in consciousness may hinder ongoing research efforts to elucidate mechanisms associated with claims of "energy" healing, telepathy, clairvoyance, psychokinesis, and other so-called "non-ordinary" or "anomalous" phenomena associated with human consciousness. For example, above-chance correspondences have been reported between certain states of consciousness including sustained intention or attention, prayer, or meditation, and "intended" physical effects in living systems—however, to date, scientific investigations have failed to elucidate a mechanism for apparent *non-local* effects. It is not clear whether energetic changes at the level of subatomic particles or energy fields in cases where entanglement is confirmed are related to biological processes associated with the effects of human intention on living systems. Despite the absence of a testable model of quantum level *events* or *effects* in consciousness, reports of beneficial outcomes following "healing intention" and above-chance changes in both nonliving and living systems following "directed intention" may provide useful concepts for investigating phenomena associated with human consciousness (Jonas & Crawford, 2003).

Current science subscribes to materialism, the philosophical perspective that so-called "ordinary" states of consciousness including perception, cognition and emotions are reducible to knowable and verifiable physiological processes at the level of neurotransmitters and brain circuits. As discussed above, functionalist models of consciousness claim that normal, healthy brain function as well as pathological states including neurological or psychiatric disorders corresponds to discrete neurophysiological processes. From a functionalist point of view, so-called "non-ordinary" or "anomalous" states such as transpersonal experiences and verified claims of psychic functioning would also be expected to correspond to discrete physiological processes in the brain. In fact, there is emerging research evidence that this is indeed the case (Williams, 2015).

Proponents of orthodox models of consciousness argue that an adequate explanatory model of ordinary, pathological, and the so-called "non-ordinary" functions and experiences associated with consciousness will emerge from ongoing advances in the current dominant paradigm, namely, functionalism, and there is no need to introduce new ways of thinking about the world in general or consciousness in particular. Biological, energetic, and informational processes that shape living systems function in both discrete linear ways and complex nonlinear ways. As discussed in Chap. 3 the body–brain can be conceptualized as an extremely complex, dynamic system that exists as hierarchically interrelated biological, informational, and energetic processes.

All models of consciousness must start with a rigorous examination of body–brain in humans and other living systems, and in the future, advanced artificially intelligent (AI) systems, in which consciousness *may potentially* take place (Tegmark, 2017; Tononi & Edelman, 1998). From a systems perspective, disparate hierarchic levels of structure–function in body–brain may be directly or indirectly causally related to disparate kinds of ordinary, pathological, or so-called "non-ordinary" or anomalous conscious experiences. Experiences interpreted as pathological or "non-ordinary" states might reflect particular transitional states in a dynamic web of interrelated biological, energetic, and informational processes that comprise body–brain. In this model particular properties and functions of the brain and the biological, energetic, or informational processes that comprise them may reflect the category, relative severity, or "intensity" of subjective experiences of ordinary, pathological, and "non-ordinary" conscious experiences.

Models that do not assume or argue that consciousness can be *accurately* or *completely* characterized in terms of direct causal relationships between discrete neurophysiological processes and specific "states" or experiences, invoke nondeterministic ideas about the nature of causality, including Jungian synchronicity, quantum field theory, morphogenetic field theory, and other models, to explain objective characteristics or subjective states of consciousness. The debate over determinism (i.e., the role of causality versus acausality) in nature in general, and consciousness in particular, is at the heart of discussions on methodological problems pertaining to consciousness research and psychiatry, because disparate perspectives on causality translate into divergent methodologies for investigating postulated causes of particular normal or "abnormal" functions or subjective experiences. The debate over

causality is reflected in the debate over research designs used to investigate the claims of disparate models of consciousness. The reader is referred to the section on causality in Chap. 2.

The Nature of the Body–Brain System and Its Relationship to Consciousness

If the body–brain is regarded as a highly complex dynamic system that exists in space-time, consciousness can be understood in terms of relationships between *embodied* structures and processes and phenomena that exist "outside of" body–brain (i.e., in the "world"). Understanding the phenomenological nature of "body–brain" and relationships between "body–brain" and "world" entails analysis of how phenomena are situated in space-time. Disparate models of consciousness start from different assumptions about the phenomenological nature of "body–brain," "world," and space-time which, in turn, influence understandings of consciousness construed as legitimate within any given model. Conceptual problems related to "body–brain" and "embodiment" are closely related to practical problems involved in designing research methodologies for investigating consciousness. This is true because the core premises underlying any given model of consciousness lead to and *pre-figure* a methodology regarded as valid for designing research studies aimed at characterizing the features and functions of consciousness with respect to *that particular* model. Chapter 5 develops a general methodology for designing research studies and planning clinical approaches in integrative mental health care.

Models of life—including the special case of living systems capable of exhibiting consciousness—take into account research findings from complex systems theory, quantum mechanics, and other perspectives that are not part of current science. Recent advances in quantum biology are yielding important insights into the role of quantum-level processes in the animal and plant kingdoms (Bunting, 2013). However, most of this work remains highly theoretical and most *scientific* studies on consciousness focus on mechanisms of action that are strictly biological in nature. The assumption in current science that only those phenomena which are empirically verifiable using available technologies can influence living systems is based on a *prescientific* (metaphysical) assumption about the *kind of thing* consciousness is. This assumption has led to a dogma that *legitimate* models of body–brain must be grounded in already established biological mechanisms. Further, this assumption has *not* been verified by decades of research and *may not be verifiable* in the context of current scientific thinking. In contrast to the orthodox view, some recently proposed models posit that ordinary, pathological (i.e., as in mental illness), and "non-ordinary" (i.e., anomalous) experiences or states of consciousness are manifestations of complex structure–function relationships between the body–brain–environment system and incompletely characterized forms of energy or information. Emerging research findings suggest that a *subtle* domain or "field" may comprise the *ground* in which the body–brain

exists and functions outside of constraints widely held to be fundamental boundary conditions as described in classical Newtonian space-time.

Models that purport to explain how body–brain is situated in space-time are based on prescientific (i.e., metaphysical) assumptions about the nature of phenomenal reality and *ways of knowing* (i.e., epistemologies) that are *implicit* or *explicit* in disparate models of consciousness. Disparate assumptions about the nature of reality and disparate perspectives on valid *ways of knowing about* reality translate into different schemata for identifying and characterizing attributes of body–brain that exist or *can potentially* exist. Important questions when approaching the problem of how body–brain is situated in space-time include the following:

- What *primary* entities or processes (if any) constitute body–brain? (i.e., what primary phenomena constitute necessary and sufficient conditions for the existence of body–brain?)
- What primary *external* phenomena interact or interface with body–brain comprising the *body–brain–environment system* (i.e., the system in which body–brain is situated in space-time)? Stated differently, what constitutes the *ground* in which body–brain is situated? Further, what research methods and technologies can most accurately and completely characterize the nature of the brain–body–environment system?
- Can strong inferences be made (i.e., within current science) about specific properties of the body–brain–environment system that may help clarify necessary or sufficient conditions for consciousness, or necessary and sufficient boundary conditions in which consciousness *can potentially* take place in relationship to systems situated in space-time? Stated differently, *in view of what is known about the nature of the physical universe and how body–brain is situated in space-time, is it possible to accurately describe properties of the body–brain–environment system using current science?* Further, can this general approach be expected to lead to a more *complete* model of consciousness?
- *Can current scientific models of consciousness yield falsifiable hypotheses about the nature of the body–brain–environment system in which consciousness exists or can potentially exist?* If so, what *testable* hypotheses (if any) can be generated? If not, what changes in current models would be expected to yield falsifiable hypotheses about the nature of consciousness?
- Can claims of correspondences between particular characteristics of body–brain–environment and particular observable characteristics or subjective states of consciousness be *empirically verified* using available research methodologies and technologies?
- In view of what is known or *knowable* (i.e., within current science) about relationships between body–brain–environment and consciousness, are certain research methodologies more likely to yield more accurate or more complete descriptions of particular objective characteristics or functions, or subjective *states* (i.e., qualia) of consciousness? Along these lines, can current research methodologies be optimized to more adequately address problems related to consciousness?

Table 4.3 summarizes how current science approaches different problems of consciousness and compares these to the author's proposed systems model of consciousness.

A Complete Model of Consciousness Must Take into Account "Non-ordinary" Experiences

Current scientific models rely on established theories in psychology and neuroscience to explain the range of perceptual experiences and states of consciousness and do not invoke *subtle* energy, poorly described neural mechanisms or quantum mechanics to explain claims of so-called "non-ordinary" experiences. Cognitive psychology models hold that normal sensory functioning encompasses nonconscious "sub-liminal" or "sub-threshold" perception in addition to *ordinary* perception. The concept of nonconscious perception is conventionally understood as a process by which an organism is *aware* of environmental stimuli that are *below* the *normal* sensory threshold. The organism can *perceive* in the absence of "awareness," that is, a percept is formed in response to a stimulus however the organism is *not conscious* of the percept. Other conventional models posit that humans and other species have a capacity for awareness of *subtle* stimuli that are *not* perceived. In such cases there is *awareness in the absence of perception*. In contrast to mainstream models of perception Psi models postulate the existence of novel *kinds of energy or information* and neural functions that permit perception of subtle environmental signals.

Evidence supporting claims of the so-called "anomalous" experiences or "extrasensory perception" has been steadily accumulating over many decades. Well-designed sham-controlled studies show that prayer and other forms of *directed intention* influence living systems on the scale of cellular activity and physiology (Astin, Harkness, & Ernst, 2000; Jonas & Crawford, 2003; Radin, Taft, & Yount, 2004). It has been suggested that verified claims of *non-local* perception may reflect a special kind of macroscopic quantum entanglement consistent with predictions of how quantum mechanical phenomena operate in living systems (Tressoldi, 2011). Pizzi has reported an apparent case of macroscopic quantum entanglement between cultured nerve cells that are electromagnetically isolated (Pizzi, Fantasia, Gelain, Rossetti, & Vescovi, 2004).

Healing intention may be an essential factor involved in *healing* in both Western medicine and non-Western systems of medicine (Zahourek, 2004). Both current science and emerging nonclassical paradigms may eventually help elucidate postulated relationships between prayer and other forms of *distant healing intention* and changes in brain function measured using electroencephalography (EEG) or functional magnetic resonance imaging (fMRI). Extremely low-frequency electromagnetic waves may explain some observed cases of apparent information transfer between two or more isolated individuals even when electromagnetic field

Table 4.3 Current scientific models of consciousness and proposed systems model

Problems in consciousness research	Current science	Author's proposed model
Understanding the nature of body–brain	Body–brain comprises molecules, cells, and tissues Body–brain can be *accurately* and *completely* described in terms of anatomy, physiology, and interactions with the environment Structures and processes that characterize complex living systems including brain–body exist in four-dimensional space-time, are observable and empirically verifiable, and can be accurately and completely described using available technologies and research methods	Body–brain comprises quantum-level processes and physiological processes at the level of molecules, cells, tissues, energy, and information interacting with "world" and situated in space-time Both linear and nonlinear interactions take place within body–brain and between body–brain and "world" Interactions between body–brain and world take place in four-dimensional space-time, and in some cases possibly also in higher order n-dimensional space-times
Ordinary functions and states of consciousness	Structures and processes in living systems can be adequately described in linear terms using conventional scientific models Ordinary functions and states of consciousness including memory, cognition, and emotions, can be accurately and completely described in terms of established scientific models and investigated using current research methods and technologies	There is no real distinction between "structure" and "process" in living systems. These terms reflect different semantic frames for describing complex interrelationships at different hierarchical locations in body–brain Ordinary functions and states of consciousness *cannot* be accurately or completely described using established scientific models and methods because they ultimately rest on poorly understood nonlinear or quantum-level phenomena that are not susceptible to investigation using current research methods and technologies
Pathological functions or states of consciousness	Pathological states of consciousness (i.e., mental illness) can be accurately and completely described using established scientific models describing brain function	Some aspects of pathological states can be described using established scientific models. More accurate and more complete understandings of pathological states of consciousness will be achieved using nonlinear dynamics (i.e., complex systems theory) than current models that use linear dynamics to describe or explain discrete functions or states of consciousness
"Non-ordinary" or "anomalous" experiences	"Non-ordinary" or "anomalous" experiences including transpersonal experiences and verified claims of psychic functioning can be explained (away) using established models in neuroscience, psychology and anthropology	Some "non-ordinary" or "anomalous" experiences can be explained using current psychological or neuroscientific models. Some "non-ordinary" states of consciousness including (some) near-death experiences and verified claims of extrasensory perception *cannot* be adequately explained by current science and may be consistent with the predictions of quantum mechanics or other nonclassical models in physics

(EMF) shielding is used (Miller, 2013; Sidorov, 2012). Reports of apparent correlations between changes in brain activity and prayer or other forms of directed intention may be consistent with macroscopic quantum entanglement effects postulated by Thaheld (2000, 2005).

Final Reflections

Despite rapid advances in neuroscience basic questions about the nature of consciousness remain unanswered. There is still no consensus on *how to define* consciousness, what a model of consciousness should *look like*, or optimal research strategies for investigating different aspects of consciousness (Boly et al., 2013). Inquiry into the nature of consciousness is more than a rarefied academic pursuit, as future research findings will have enormous implications for science and medicine. Advances in consciousness research will emerge from the collective imaginations of scientists, philosophers, and contemplatives. Future more complete models of consciousness will go beyond strictly biological explanations taking into account findings from physics including the postulated role of macroscopic coherent quantum fields and quantum non-locality (Vannini, 2008). A more complete model of consciousness will come from better understanding of dynamic interrelationships between biological, informational, and energetic processes associated with normal, pathological, and so-called "anomalous" experiences. This will lead, in turn, to more effective treatment approaches addressing causes of symptoms at multiple hierarchical levels of body–brain.

Key Points

- Despite millennia of observation, research, and debate, there is still no compelling evidence for any single model of consciousness nor is there agreement on how to define consciousness, what constitutes a rigorous model of consciousness, or research methods that are most appropriate or productive for investigating consciousness.
- Many models of consciousness rest on assumptions about mechanisms that are not falsifiable using available empirical means and do not offer testable hypotheses.
- The paradigm that prefigures the way researchers see and interpret phenomena related to consciousness constrains findings obtained using a particular research methodology and determines shared beliefs about legitimate interpretations of findings.
- An important future goal of interdisciplinary dialog on consciousness should be derivation of a general systems model that accommodates multilevel analysis of a broad range of phenomena including biological processes and postulated quantum mechanical (QM) or other nonclassical processes related to both ordinary states and "pathological" states (i.e., mental illness) of consciousness.
- A complete model of consciousness should ideally start from assumptions that are congruent with established scientific models of consciousness, as well as

assumptions underlying emerging models of space-time, matter, energy, and information.

- Contemporary scientific models of consciousness reflect naïve reductionist assumptions about the nature of phenomenal reality.
- The reductionist framework imposed by mainstream science and Western medicine on methodologies used to investigate consciousness excludes quantum-level processes or other postulated nonclassical phenomena because such phenomena are not verifiable in living systems using available technologies.
- The dominant model of consciousness implicit in Western medicine including biomedical psychiatry is computational functionalism which claims that functional attributes of consciousness are equivalent to discrete neurochemical or biomagnetic processes in the brain.
- Non-Western systems of medicine typically rest on dualist models of consciousness that posit the existence of a fundamental energetic principle or two fundamentally irreducible kinds of phenomena—the mental (spiritual or energetic) and the physical—that interact in complex ways.
- Neither Western physicalist models nor non-Western metaphysical models of consciousness are falsifiable because verification of causal relationships between discrete mental events and discrete physical processes (Western models) or presumed metaphysical processes (non-Western models) cannot be confirmed by (existing) empirical means.
- Fundamental advances in the paradigm of current science will be needed to verify the core assumptions of any single model of consciousness.
- Every model of mental illness includes or implies a corresponding theory of consciousness that contextualizes understandings of cognitive, affective, and behavioral symptoms.
- Disparate systems of medicine incorporate different models or metaphors of consciousness that reflect their respective assumptions.
- Western medicine and major non-allopathic systems of medicine are based on implicit or explicit models of consciousness that differ in content but have a similar logical form.
- Current science and Western medicine assume that biological processes and the special case of consciousness in complex living systems can be adequately described in terms of discrete physical and biological processes linked by linear relationships.
- Considerable debate is taking place over the relevance of quantum mechanics to models of consciousness.
- Orthodox models of consciousness argue that an adequate explanatory model of ordinary, pathological, and the so-called "non-ordinary" states will emerge from advances in functionalism, and there is no need to introduce new ways of thinking about consciousness.
- Some models invoke non-deterministic ideas about the nature of causality to explain objective characteristics or subjective states of consciousness.
- Disparate models of consciousness start from different assumptions about the phenomenological nature of body–brain, "world" and space-time which, in turn,

influence understandings of consciousness construed as legitimate within any given model.
- The assumption that only those phenomena which are empirically verifiable using available technologies can influence living systems has led to a dogma that legitimate models of body–brain must be grounded in already established biological mechanisms.
- Emerging research findings suggest that a subtle domain or "field" may comprise the ground in which the body–brain exists and functions outside of constraints widely held to be fundamental boundary conditions as described in classical Newtonian space-time.
- Disparate assumptions about the nature of reality and disparate perspectives on valid ways of knowing about reality translate into different schemata for identifying and characterizing attributes of body–brain that exist or can potentially exist.
- Verified claims of non-local perception may reflect a special kind of macroscopic quantum entanglement consistent with predictions of how quantum mechanical phenomena operate in living systems.
- Healing intention may be an essential factor involved in healing in both Western medicine and non-Western systems of medicine.
- A more complete model of consciousness will come from better understanding of biological, informational, and energetic processes associated with normal, pathological, and so-called "non-ordinary" or "anomalous" experiences, and lead to more effective treatment approaches addressing causes of symptoms at multiple hierarchical levels of body–brain.

References

Baars, B., & Edelman, D. (2012). Consciousness, biology and quantum hypotheses. *Physics of Life Reviews, 9*, 285–294.

Boly, M., Seth, A., Wilke, M., Ingmundson, P., Baars, B., Laureys, S., et al. (2013). Consciousness in humans and non-human animals: Recent advances and future directions. *Frontiers in Psychology, 4*, 1–20.

Bunting, M. (2013). From photosynthesis and magnetoception to psychopathology, free will and consciousness: Advances in quantum biology and questions for the future (Guest editorial). *NeuroQuantology, 4*, 509–510.

Dehaene, S., & Changeux, J. (2011). Experimental and theoretical approaches to conscious processing. *Neuron, 70*, 200–227.

Gierer, A. (2008). Brain, mind and limitations of a scientific theory of human consciousness. *BioEssays, 30*, 499–505. Wiley.

Miller, I. (2013). Schuman resonance, psychophysical regulation and Psi (Part I). *Journal of Consciousness Exploration and Research, 4*(6), 599–612.

Sidorov, L. (2012). On the possible mechanism of intent in paranormal phenomena. *Journal of Nonlocality and Remote Mental Interactions, 1*(1).

Tegmark, M. (2017). *Life 3.0: Being human in the age of artificial intelligence*. New York, NY: Penguin Random House.

Thaheld, F. (2000, July–October). Proposed experiment to determine if there are EPR nonlocal correlations between two neuron transistors *APEIRON, 7*(3–4), 202–205.

Thaheld, F. (2005, August). Does consciousness really collapse the wave function? A possible objective biophysical resolution of the measurement problem. *Biosystems, 81*(2), 113–124.
Tononi, G., & Edelman, G. (1998). Consciousness and complexity. *Science, 282*, 1846–1851.
Tressoldi, P. (2011). Extraordinary claims require extraordinary evidence: The case of non-local perception, a classical and Bayesian review of evidences. *Frontiers in Psychology, 2*, 117, 1–5.
Vannini, A. (2008). Quantum models of consciousness. *Quantum Biosystems, 2*, 165–184.
Williams, B. (2015). *Psychic phenomena and the brain: Exploring the neuropsychology of Psi, Monograph No 3*. Australian Institute of Parapsychological Research.
Zahourek, R. (2004). Intentionality forms the matrix of healing: A theory. *Alternative Therapies in Health and Medicine, 10*(6), 40–49.

Part II
Methodology and Clinical Applications

Chapter 5
Foundations of Methodology in Integrative Mental Health Care

"Acquire the art of detachment, the virtue of method, and the quality of thoroughness, but above all the grace of humility."
—Sir William Osler, MD

Contents

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First Principles

Important conceptual and practical problems must be addressed when developing a methodology for integrating Western medical and CAM modalities into an coherent integrative care plan. Achieving safe and effective integrative mental health care involves making clinical decisions based on the highest level of evidence, keeping in mind patient preferences, available medical resources, and financial constraints. This chapter comments on how CAM research findings are used to develop individualized integrative care plans but does not contain detailed evidence reviews. The reader is referred to the Appendix A for resources on the range of CAM modalities used to evaluate and treat mental health problems.

A Conceptual Framework for Methodology in Integrative Mental Health Care

In its broadest sense, methodology refers to a general kind of analytical approach to solving problems based on the application of rules. The parameters and goals of analytical tests reflect assumptions in disparate systems of medicine about the nature of phenomenal reality. As discussed in Chap. 3, the Western physician claims to identify phenomena in and of themselves. In contrast, the Chinese medical practitioner claims to characterize phenomena with respect to his or her unique subjective energetic state. The assumptions underlying any methodology are often implicit in the philosophical framework of the system of medicine from which the methodology originates. There is no perceived need to demonstrate the validity of a methodology because the assumptions underlying the methodology will be regarded as true a priori, and the methodology will be accepted as valid. Methodologies for deriving legitimate treatment and assessment approaches in all systems of medicine are inherently limited and biased to the extent that all systems of medicine rest on metaphysical assumptions about the nature of illness phenomena. For more on philosophical issues see Chap. 2.

Methodologies used in disparate systems of medicine reflect different *ways of seeing* in disparate cultures and intellectual traditions. Beliefs about the efficacy of a given treatment approach are based on assumptions in the system of medicine in which the treatment is used. A consequence is the absence of universally shared standards for evaluating evidence. A practitioner can develop a treatment strategy only from the perspective of the system of medicine in which he or she is trained. In other words, because there is no theory-neutral system of medicine there can be no theory-neutral methodology in medicine.

Research methodologies employed in Western medicine are *not appropriate or adequate* for investigating postulated mechanisms of action underlying many CAM modalities. This is because the truth claims of many CAM modalities *cannot potentially be falsified* by current science (Dossey, 1995). The same limitation holds for

widely used approaches in Western medicine. For example, mechanisms of action underlying many Western medical treatments have not been verified by robust research evidence, yet these approaches remain in use because of professional consensus or market interests.

The Absence of a Methodology in Integrative Medicine: Causes and Consequences

The term *integrative medicine* has been in widespread use for years however, until now, no coherent theory of integration has been adduced, nor has a practical clinical methodology for combining disparate approaches been advanced. A consequence is the absence of a systematic research program to examine CAM modalities in contexts where investigators are not inherently biased against non-Western systems of medicine. Research studies sponsored by the National Center for Complementary and Integrative Medicine (NCIM) of the National Institutes of Health (NIH) have been conducted on many CAM modalities. However, most NIH-sponsored studies are conducted in academic medical centers, use "Western style" biomedical research methodologies to examine non-Western approaches, and have the goal of abstracting a presumed *active ingredient* or identifying a presumed discrete *mechanism of action*. This approach would be equivalent to examining Western medical modalities from the viewpoint of Chinese medicine, Ayurveda, or another established World system of medicine, and making inferences about mechanisms of action or efficacy solely on the basis of the evaluative methods and core assumptions of those respective systems of medicine.

Establishing a Typology of Modalities

Making informed judgments about effectiveness when considering which Western medical or CAM modality to recommend requires a methodology for *comparing* disparate modalities. Making comparisons of two or more modalities requires a classification system, or typology (Defining and Describing Complementary and Alternative Medicine, 1997; Turner, 1998). Classification must take into account different *ways of seeing* used in disparate systems of medicine (Cassidy, 2002). For purposes of this discussion, a typology is used to categorize modalities according to an established or postulated mechanism of action and the level of evidence supporting claims of outcomes.

Treatment modalities used in mental health care fall into five general categories:

- Psychological—insights and changes in symptoms or behaviors are achieved in psychotherapy.

- Biological—a biologically active substance affects the brain or body in a beneficial way.
- Somatic and mind–body—manipulation of the physical body or mind–body in a prescribed manner yields generally beneficial effects.
- Established forms of energy or information—light, sound or electromagnetic energy—have beneficial effects on the body or brain.
- Postulated forms of energy or information—so-called "subtle" energy—have beneficial effects on the body or brain.

With the exception of the last category, all categories apply to both Western medicine and non-Western systems of medicine. A given modality may be regarded as legitimate by Western medicine only, by Western medicine and the parent non-Western system of medicine from which it originates, by the parent system of medicine only, or from neither perspective. The latter case applies to Western medical and CAM approaches that are in current use but for which there is not substantial evidence supporting claims of a mechanism of action or beneficial outcomes. Some approaches for which there is no or weak evidence remain in use because (usually limited) research findings or case reports suggest that beneficial outcomes *sometimes* take place.

Getting to the Right Balance of Rigor and Relevance When Planning Integrative Mental Health Care

Both Western medical and CAM treatments are intrinsically limited because of the highly subjective nature of symptoms being treated. Outcomes measures that reflect *subjective reports of distress* are often difficult to confirm using psychometric instruments and formal assessment approaches, and may not correspond to observable changes in brain function or physiology. Because of the intrinsically subjective nature of symptoms, the limitations of study designs, and the central role of the patient–psychiatrist relationship in shaping expectations in mental health care, placebo response rates of most psychiatric disorders to Western medical treatments are consistently high (Gray, 2004; Jakovljevic, 2014). By the same token, placebo response rates to CAM are also high (Kaptchuk, 2002). The prevalence of placebo effects in response to disparate modalities may contribute to outcomes and patient satisfaction in important if poorly understood ways. A consistently large placebo effect is complicated by the fact that many CAM modalities are not amenable to quantitative analysis using available empirical means. Examples include mind–body practices, healing practices described as "energy medicine," the majority of compound herbal formulas used in non-Western systems of medicine, and homeopathy. Practitioners of both Western medicine and CAM often rely on placebo effects to encourage positive expectations among patients (Colloca, Jonas, Killen, Miller, & Shurtleff, 2014).

The inherent unreliability of quantitative methods for comparing outcomes of approaches used to obtain subjective patient reports calls for reliable measures of rigor and relevance (Richardson, 2002). *Rigor* refers to the strength of evidence used to establish that a specified modality *works*. *Relevance* refers to the appropriateness of a specified modality with respect to the needs and preferences of a unique patient.

Empirically Based, Consensus-Based, Intuitive, and Mixed Approaches

Empirically based approaches are those which are supported by research evidence. Relatively few CAM or integrative regimens are based on large well-designed randomized placebo-controlled studies (Bloom, Retbi, Dahan, & Jonsson, 2000; Oh, Kim, Park, & Kang, 2007). Most integrative regimens incorporate treatments that are *presumed* to be effective based on professional consensus. This limitation also holds for many Western medical interventions that combine two or more modalities in that relatively few studies examine the effectiveness of combined treatment protocols (Smith, 1991; Williams et al., 2016).

Assessment and treatment approaches that are *not verifiable by current science* remain in use based on beliefs or *intuitions* shared by practitioners and patients. Qigong is an example of an intuitive approach. In this ancient energetic healing practice, a Qigong master "projects" qi into the patient with the intention of "rebalancing" postulated energetic principles to achieve improved health and well-being. A discrete mechanism of action underlying qigong has not been empirically verified however numerous studies have demonstrated that the regular practice of qigong is associated with psychological, physiological and possibly also "energetic" effects including increased overall quality of life, beneficial changes in immune function and markers of inflammation as well as measurable changes in heat, low-frequency sound, or electromagnetic energy at the practitioner's fingertips (Abbott & Lavretsky, 2013; Lake, 2001). Some systems of medicine incorporate both empirically based and intuitive modalities. Examples include Chinese medicine, Ayurveda, and Tibetan medicine.

Evidence-Based Medicine Places Arbitrary Limits on Western Medicine and Excludes Many CAM Modalities

In recent years Western medicine has strongly endorsed *evidence-based medicine* (EMB), a methodology that uses a hierarchy of evidence approach to assess the significance of findings with respect to the parameters of a unique study design, together with pertinent findings of systematic reviews and meta-analyses. EBM relies heavily

on systematic reviews of the Western medical research literature to "guide the judicious use of current best evidence in making decisions about the care of individual patients" (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996; Tilburt, 2008).

Clinical treatment recommendations are made on a case-by-case basis following a review of "best evidence" in the context of the physician's expertise and the patient's preferences. According to EBM the highest and most reliable level of evidence of efficacy for any treatment modality is obtained through a systematic review of rigorously designed and conducted randomized placebo-controlled trials. Progressively lower levels of evidence include individual trials with narrow confidence intervals, all-or-none case series, systematic reviews of cohort studies, individual cohort studies, and trials with less than 80% follow-up. EBM places evidence obtained from cohort studies, case series, and expert opinion at the low end of the evidence hierarchy. Although psychiatrists and family physicians are increasingly aware of EBM a minority of Western trained practitioners who treat patients for mental health problems base their clinical recommendations exclusively on its principles. Reasons for this discrepancy include time constraints in fast-paced clinic settings, provider attitudes toward EBM, and concerns that EBM does not take into account many widely used treatments including off-label pharmacological treatments and innovative psychotherapy approaches (Smolders et al., 2010).

The assumptions of EBM do not adequately reflect the complex causes and meanings of mental illness. EBM assumes that the causes of change in symptoms can be empirically measured however the absence of discrete biological markers for the majority of psychiatric disorders makes this assumption invalid in contemporary psychiatry. In contrast Merleau-Ponty's ontology "views *truth* as the expression of our deepest embodied feeling and perception of the world, which establishes all our thinking, and on which all our thinking relies, including *scientific* thinking (Morstyn, 2013)." Morstyn argues that this perspective allows "psychiatrists to consider the truth of clinically important, but non-measurable, aspects…while not excluding scientific thinking but recognizing its limitations and potential for misuse."

Evidence-Based Medicine and CAM

Studies show that EBM can be validly applied to both CAM and biomedical modalities (Wilson, Mills, Ross, & Guyatt, 2002), and suggest that the same standards of evidence used in Western medicine should be applied to CAM (Fontanarosa & Lundberg, 1998; Haynes, 1999). However, efforts to adapt CAM research methodologies to Western medical research standards may be inherently self-limiting. This is because EBM methodology assigns certain kinds of research designs and clinical findings to a lower level of significance with the result that a hierarchy of evidence is biased in favor of study designs traditionally used in Western medical research. EBM assumes that clinically pertinent information can be obtained only from study designs that employ certain statistical measures of significance that describe correlations of causes and outcomes that can be directly observed and isolated (i.e., controlled for)

from all possible interfering or confounding variables. EBM assumes that averaged results of systematic reviews or meta-analyses of several studies can be validly applied to all individuals who have the same diagnosis, providing clinically pertinent guidance in treatment planning (Churchill, 1999). EBM requirements for obtaining medical information contain implicit biases against many non-Western systems of medicine as well as many CAM modalities (Vickers, 1999). A consequence has been the relegation of many CAM modalities to the lowest levels of the EBM evidence hierarchy despite robust findings of beneficial outcomes consistent with the worldview of the parent system of medicine in which a specific modality is used.

Practice-based evidence is an important concept in personalized medicine that is emerging in response to the limitations of EBM in the context of widespread use of electronic health records (Pincus & Sokka, 2006; Shah, 2013). In contrast to EBM in which treatment protocols addressing a particular disorder are based on the published medical literature, practice-based evidence derived from electronic health records is used to determine treatment approaches more likely to be effective in patients with similar demographic profiles, shared disease comorbidities and treatment histories (Jensen, Jensen, & Brunak, 2012).

Table 5.1 summarizes unresolved research issues and how they influence perceptions of Western medical and CAM modalities used in mental health care.

Research Methodologies in Integrative Mental Health

Different Research Methodologies Are Used in Disparate Systems of Medicine

There is controversy over the most appropriate research methodologies to use when investigating CAM modalities (Bengston, 2004; Zhang, 2004). Proponents of Western medicine argue that legitimate medical practices must rest on compelling evidence for a discrete mechanism of action. In the Western (medical) context *compelling* evidence means an empirically verifiable mechanistic description of processes known to current science. The assumptions underlying a particular modality are regarded as nonvalid when claims of outcomes cannot be causally linked to a putative mechanism of action using available empirical means (Murphy, 1997). In this view, many CAM modalities rest on inherently nonvalid assumptions because available empirical means cannot demonstrate correspondences between a putative mechanism of action and a claimed outcome. CAM practitioners nevertheless argue that the approaches they use are both valid and effective based on principles foreign to current science and Western medicine. For example, practitioners of Chinese medicine claim that inserting and rotating fine needles in certain points on the skin causes changes in the distribution and balance of qi in a complex network of "meridians," manifesting as consistent and expected improvements in discrete kinds of "energetic imbalances." At present, no technology is capable of verifying the existence of qi or characterizing putative relationships between the skillful insertion of acupuncture

Table 5.1 Research issues influencing perceptions of Western medical and CAM treatments used in mental health care

Treatment category	Unresolved research issues
Biological treatments	Inconsistent results of well-designed studies due to absence of standardized preparations (e.g., St. John's wort (*Hypericum perforatum*)) Unclear role of placebo effect on outcomes Difficult to assess general versus specific effects Problems measuring or correlating specific treatments (including antidepressants, antipsychotics, and many natural products) with targeted biological change or functional brain states believed to be "therapeutic"
Body therapies	*Very* difficult to design controlled, blinded studies Difficult to recruit unbiased subjects Difficult to assess general versus specific effects Debate among CAM practitioners over best treatment protocols (e.g., craniosacral therapy)
Mind–body therapies	Difficult to design controlled, blinded studies Difficult to assess general versus specific effects Constraints on outcomes measurements using existing technologies probably bias results
Treatments based on forms of energy verified by current science	Debate among CAM practitioners over best treatment protocols (e.g., microcurrent electrical stimulation, EEG biofeedback, electroconvulsive therapy (ECT), transcranial magnetic stimulation (TMS)) Problems measuring or correlating specific protocols with targeted changes in brain and desired outcomes Difficult to assess general versus specific effects
Treatments based on postulated forms of energy not verified by current science	Very difficult to design controlled, blinded studies (variables affecting outcomes unknown) Postulated mechanism of action outside of Western scientific paradigm constrains study design and outcomes measurement (Qigong, Reiki, Healing Touch, etc.) Difficult to recruit unbiased researchers or subjects

needles and consistent beneficial changes in target symptoms. Even in cases where there is quality research evidence supporting CAM use there is a gap between research findings and the clinical practice of CAM (Leach & Tucker, 2017).

Disparate Systems of Medicine Use Different Criteria to Evaluate Outcomes

Debate is ongoing over the meaning of treatment effects or *outcomes* in CAM research. Outcomes in response to some CAM modalities are observable using established Western medical tests. For example, reduction in levels of hepatic enzymes is an expected effect of milk thistle (*Silybum* spp.) extract in patients

diagnosed with hepatitis. Outcomes in response to other CAM treatments are difficult or impossible to objectively assess based on quantitative Western medical tests. In such cases, demonstrating effects of treatment must rely on patient reports of changes in subjective symptoms. For example, anxious patients who self-treat their symptoms using regular Qigong exercises frequently report significant and sustained reductions in state anxiety levels that cannot be objectively verified to take place or to be *causally related* to Qigong. As is true of Western medicine, three kinds of outcomes can take place in the context of CAM treatment (Long, 2002):

- Effects related to the general philosophy or principles of a non-allopathic system of medicine
- Effects arising from the relationship between a patient and a practitioner
- Effects resulting from the application of a particular technique in a unique patient

Because all three kinds of outcomes or effects occur in both Western medicine and non-Western systems of medicine, both quantitative and qualitative methods are used to evaluate outcomes. Table 5.2 lists measures used to determine whether a desired outcome has been achieved following treatment (Coates & Jobst, 1998).

Desirable outcomes of Western medical care and CAM treatments of mental health problems are often reportable as subjective changes, are sometimes observable by skilled medical practitioners, but are rarely *quantifiable*. Assessment approaches used in Western medicine and non-Western systems of medicine can demonstrate only *apparent correlations* between postulated causes and reportable symptoms but can seldom confirm the existence of a discrete cause or causes. In biomedical psychiatry, functional brain-imaging scans point to *possible* correlations between "dysfunction" in brain activity and depressed mood, anxiety, schizophrenia, or other disorders. However, the enormous complexity of the brain and limitations of technology preclude definitive conclusions about causal relationships between discrete neurobiological factors and specific cognitive, affective, or behavioral symptoms.

Table 5.2 Measures of outcomes following treatment

• Observable response to a clinical problem that had not improved with previous treatments
• Alleviation or reduction of chronic physical or psychological effects of ill health
• Improved overall feelings of health and well-being following treatment
• Reduction in the frequency or intensity in relapsing ill health or return of a specified symptom or symptom pattern that is the focus of treatment
• Improved general level of comfort, including the reduction or alleviation of distress or symptoms causing distress
• Enhanced social, psychological, relationship, or employment functioning
• Reduction or alleviation of the patient's sense of suffering
• Enhanced capacity for insight or ability to manage one's own medical or psychological health
• Enhanced capacity to influence external factors that directly or indirectly undermine a patient's state of medical or psychological health
• Improved patient satisfaction with the kind or quality of care

The Limitations of Randomized Controlled Trials

The current gold standard in Western medical research is the randomized controlled trial (RCT) in which all variables that potentially affect outcomes are presumed to be both known and accurately characterized. The validity of the RCT design is based on the assumption that all variables *potentially* affecting outcomes are subject to known constraints (i.e., controls) imposed by the researcher on the experimental design. The RCT design reinforces the closed, self-referential nature of Western medical research because of the assumption that all variables potentially affecting outcomes are identifiable and subject to control. In this context, *control* implies that the experimenter can identify and modify the relative strengths (dosing) or timings of phenomena that directly or indirectly affect outcomes. The same constraints apply to determinations of the validity of assessment approaches on the assumption that phenomena affecting the accuracy or reliability of assessment findings are able to be verified and, in some way "controlled."

An important consideration in RCT designs is the choice of randomization method. Numerous randomization methods are used in RCT designs including block randomization, stratified randomization, covariate-adaptive techniques and others however there is no consensus on criteria for selecting a randomization protocol. A consequence is that researchers often use disparate methods in RCTs on the same intervention with the result that differences in outcomes may reflect biases of the randomization method more than actual differences in effectiveness (Lin, Zhu, & Su, 2015).

RCT research designs are based on the assumption that effectiveness rests on the demonstration of efficacy against a suitable placebo. Although this goal can sometimes be achieved in studies on single pharmacological agents, tests of discrete biological molecules used in RCT designs are not able to characterize complex cause–effect relationships that may take place when two or more treatment modalities have effects at multiple locations in the body or brain. The situation is further complicated by the fact that RCT research designs frequently employ measures of "effect size" that are statistically underpowered with respect to the intervention being studied, fail to take into account possible *nonspecific* beneficial effects, or ascribe such effects to placebo when they occur. The result is that Western-style RCT studies of CAM modalities, such as acupuncture, homeopathy, and Healing Touch, often conclude that these modalities are *ineffective* (Walach, 2001). Poor outcomes are often reported when CAM researchers adhere to strict RCT criteria. For example, in a review of 26 CAM efficacy trials meeting criteria for placebo control, moderate attrition rates and size, only two studies reported outcomes significantly superior to placebo (Barker Bausell, 2009). The authors concluded that CAM therapies are no more effective than placebos when adequate controls and rigorous experimental methods are adhered to.

Critics of conventional research methods argue that RCT studies are often poorly designed, do not use the most appropriate randomization method, and because of their short duration or limited numbers of enrolled subjects, their findings often lack the requisite statistical power to establish significant correspondences between

treatments and outcomes. This is especially problematic for Western medical research on mental illness where brief premarketing trials sometimes fail to adequately characterize effect sizes or side effect risks of new drugs. In an effort to address the limitations of RCT designs in psychotropic drug research a group of 45 experts from academia, the US Food and Drug Administration (FDA) and the National Institutes of Mental Health, convened in 2007 to critically review the literature on clinical trials methodology for research on antidepressants and make recommendations aimed at improving study design and data analysis (Gelenberg et al., 2008). The expert panel recommended that academic centers and the pharmaceutical industry should collaborate on small proof-of-concept studies, identify potential biomarkers of treatment response, and develop new instruments capable of differentiating subtypes and "symptom clusters" that might respond differently to pharmacologic treatment.

Because of their inherent constraints, RCTs and other quantitative research designs are more suited to investigations of single discrete molecules such as synthetic drugs or "active" ingredients contained in natural products but do not adequately address complex synergistic mechanisms involved in many Western medical and CAM interventions. Continued reliance on RCT study designs to validate CAM modalities will not only fail to confirm a putative mechanism of action in many cases but will also result in continued rejection of potentially legitimate assessment and treatment approaches that are not susceptible to verification by Western-style research studies (Richardson, 2002). On a practical level, even in cases where it is reasonable to use a RCT protocol to investigate a particular CAM approach, it is seldom practical to implement RCT studies outside of Western medical institutions because of the high cost of most RCT studies, as well as the frequent absence of private or public funding (Linde, 2000).

Other factors that may interfere with or limit quantitative research studies of CAM modalities include (Verhoef, Casebeer, & Hilsdew, 2002; Walach, 2001):

- CAM interventions are often complex, incorporating multiple modalities and making quantitative analysis of underlying mechanisms or cause–effect relationships between treatments and outcomes very difficult.
- Many CAM modalities are *not standardized*, but individualized and flexible to adapt to the history, needs, and circumstances of each unique patient.
- Many CAM modalities are used to assess or treat nonspecific or multifactorial conditions, not single symptoms or "disorders."
- CAM modalities are typically used to restore balance rather than remove a putative cause of a specified symptom or disorder.
- Because the mechanisms of action of many CAM modalities are difficult or impossible to quantify, it is often impossible to identify an appropriate placebo response in CAM research, making outcomes studies very difficult or impossible.
- RCT study designs have the express goal of minimizing the impact of the patient–provider relationship, which is a desirable or even necessary aspect of many CAM modalities.

The RCT has become the dominant research design in Western medicine because it is a reliable way to differentiate a discrete mechanism of action associated with "active" treatment from a presumably inert placebo. In contrast, in studies on many CAM modalities multiple mechanisms may be involved and patient beliefs and attitudes toward treatment may be difficult or impossible to isolate and control for (Barry, 2006). In such cases outcomes studies investigating both quantitative and qualitative measures may yield more useful insights than conventional RCT designs. On this basis Hoenders recommends first investigating a CAM modality using outcomes studies and later, in cases where beneficial outcomes have been established, using RCT designs to identify underlying mechanisms (Hoenders, Appelo, & de Jong, 2012; Hoenders, Bos, de Jong, & de Jonge, 2012).

Different research questions pertaining to Western medicine, CAM or integrative medicine call for a variety of research methodologies (Walach, Falkenberg, Fonnebo, Lewith, & Jonas, 2006). Considerations of the limitations and benefits of different research design choices should always guide the choice of study design especially when complex, multilevel interventions are being investigated (Mercer, De Vinney, Fine, Green, & Dougherty, 2007). The following section summarizes recent innovations in research methodology and implications for clinical integrative medicine.

Novel Research Methodologies in CAM and Integrative Medicine

In studies on both Western medical and CAM treatments it is often difficult or impossible to "blind" both patient and researcher to the intervention. For example, a surgeon is necessarily aware of the surgical procedure being used, and a Chinese medical practitioner is aware that he or she is administering an acupuncture protocol that is *believed to be* beneficial or one that is *believed to be* ineffective. The absence of double-blinding can potentially bias analysis of research findings. A proposed solution is the use of a *"dual-blind" research design*, in which the patient is blinded, the researcher administering the treatment is not blinded, but a second investigator who evaluates outcomes is blinded. It has been suggested that this approach can improve the integrity of research in both Western medicine and non-Western systems of medicine by bypassing problems related to nonblinded experimenters (Caspi, Millen, & Sechrest, 2000).

In response to the limitations of RCT study designs Williams et al. (2016) have proposed a research methodology designed to compare two active treatments or "usual care" with another active treatment modality plus usual care. This approach, called *comparative effectiveness research*, may provide a conceptual framework for conducting comparative effectiveness studies on integrative regimens used in real-world clinical settings. Comparative effectiveness studies may be especially useful for conducting investigations of promising integrative interventions that are not tightly controlled by a regulatory environment.

When a treatment approach is potentially beneficial but little evidence supports it, a *single-case (N = 1) study* may provide a valid way to determine whether the approach is actually beneficial and safe (Johnston & Mills, 2004). A single-case study is a prospective trial on one individual in which the treatment being investigated is administered and withheld in alternating fashion while an agreed-on outcome is measured. Depending on the research question that is being asked, a single-case study can be performed in a single- or double-blind fashion, can be randomized or nonrandomized, and may or may not include a placebo–control arm. Single-case studies can follow a crossover design or a continuous treatment protocol. In contrast to research designs that define treatment outcomes in terms of probabilities, single-case studies result in *definitive, individualized outcomes* for each patient. This approach also has drawbacks and limitations, including the impossibility of generalizing findings to other patients, and the fact that findings may not be applicable to illnesses that are "unstable" over time (Ernst, 1998a, 1998b).

Case series are accumulated reports of uncontrolled findings from one or more individuals. Although case series sometimes point in useful directions, they are limited because they cannot account for placebo effects or other the so-called *nonspecific* treatment effects. *Participant-centered analysis* is a variant of case series in which multiple measures of a single variable are taken for each individual in a sample. This methodology permits statistical analysis of complex relationships between treatments and outcomes at the individual level and makes up for some of the disadvantages of typical case series (Aickin, 2003). In integrative mental health care, single-case studies and case series analysis are methodologies that can help clarify the potential benefits of treatments that are ranked in a low position on the evidence hierarchy, but for which more substantiated research findings are currently lacking.

Aptitude × treatment interaction (ATI) has been suggested as a useful conceptual framework for analysis of outcomes in integrative medicine research. This methodology assumes that outcomes depend on the match or mismatch between patient characteristics, or aptitudes, including biological, psychological, and cultural factors that affect treatment response, and the specific treatment received. The model regards outcomes as manifestations of dynamic interactions in a complex system and argues that effective treatment planning must take these factors into account (Caspi & Bell, 2004). ATI study designs may be especially germane to investigations of meditation and other mind–body approaches that incorporate therapeutic elements that are difficult to quantify and standardize (Caspi & Burleson, 2007).

A methodology called *design-adaptive allocations* has been suggested as an alternative to conventional randomization used in RCT studies (Aickin, 2002). This approach addresses concerns over randomization methods used in RCT designs (Lin et al., 2015) and may permit a better balance between treatment groups and more accurate measurement of factors affecting outcomes. It may be especially useful for analyzing findings in small studies that would generally be viewed as statistically "underpowered" in Western medicine.

Because of the limitations of RCT designs the likelihood is increased that studies on CAM modalities will yield clinically useful information when RCT research

designs are complemented by other research methods, including observational studies, case series analysis, double-blinding, design-adaptive allocations, participant-centered research, and "*N* of 1" trials (Linde, 2000).

Qualitative Research Methodologies

The limitations of quantitative methods in CAM research have led to the widespread use of observational studies and other kinds of qualitative methods in investigations of non-allopathic modalities. In contrast to quantitative research designs aimed at verifying causal correlations between discrete mechanisms and specific outcomes, qualitative research methods are more suitable for the investigation of CAM interventions that invoke complex psychological, psychosomatic and physiological responses such as mind–body, energy, or spiritual approaches. Qualitative methodologies are useful for gathering data relevant to the experiences and clinical outcomes of unique patients in response to a range of medical, social and psychological interventions. Qualitative criteria include ratings of consistency of training, duration of training, the historical duration of use of a particular CAM modality, how well established the use of a particular modality is for cognitive, affective or behavioral symptoms, the level of concern (if any) over potential safety issues when a CAM modality is administered by a professional practitioner, and the existence of a coherent body of theory supporting specific uses of a particular approach.

Mixed Methods: Combining Quantitative and Qualitative Methodologies

Continued reliance on standardized quantitative research designs may delay efforts to elucidate putative mechanisms of action and verify highly subjective outcomes associated with many CAM modalities (Long, 2002). By the same token, although qualitative research methods provide useful information on subjective responses to treatment they cannot elucidate mechanisms of action. The tension between quantitative and qualitative research methodologies mirrors the ideological conflict between EBM and patient-centered care. Combining quantitative and qualitative methodologies permits researchers to more adequately address the complex factors that contribute to health and illness (Vuckovic, 2002). Researchers of non-Western systems of medicine are developing novel methodologies that take account of the comparative strengths and weaknesses of quantitative and qualitative research methodologies (Richardson, 2002). Mixed methods approaches are being applied to "whole systems" of CAM in an effort to elucidate complex dynamic interactions between synergistic factors that influence outcomes in non-Western systems of medicine (Verhoef, Koithan, Bell, Ives, & Jonas, 2012).

Most studies on interventions used in Western medicine and CAM employ randomized controlled trial designs that examine single interventions in artificial populations that are not representative of the diversity and complex medical and mental health problems of real-world populations. This point relates to the conceptual and methodological gap between studies on efficacy and studies on effectiveness (see below). A practical consequence is that few studies are capable of comparing a Western medical modality with a CAM therapy. Study designs that employ mixed methods and statistical measures provide a robust conceptual framework for comparing disparate modalities across systems of medicine and establishing whether certain modalities have superior effectiveness. Mixed methods research designs also have important practical implications for day to day clinical decisions on which modality to recommend at the time of the intake and throughout the course of treatment.

Although research designs that combine quantitative and qualitative methods may yield more complete understandings of complex phenomena underlying illness, until now relatively few studies have used mixed methods designs. In a systematic review of mixed methods studies on CAM published in 2012 the top ten journals on integrative and complementary medicine found that only 4% of papers used mixed methods study designs (Bishop & Holmes, 2013). Overall, quantitative methods were rated as having higher quality than qualitative methods. The authors recommended that future mixed methods studies on CAM should improve on analytic methods used in qualitative research components and employ more rigorous sampling and recruitment procedures.

Increasing interest in non-Western systems of medicine at the World Health Organization (WHO) has led to the establishment of the universal valuation system, a program aimed at developing universal tools to assess quality of life changes in response to medical interventions from the perspective of any particular system of medicine (Liverani, 2000). The goal of the WHO universal valuation system is to develop qualitative and quantitative methodologies for assessing treatment effectiveness at biological, individual, and social levels of functioning. This program will help to determine the cost-effectiveness of disparate CAM modalities compared with more expensive Western medical treatments for both medical and mental health problems.

Mixed Methods Studies Address the Issue of Precedence in Treatment Planning

Some writers argue that widely used Western medical modalities (sometimes referred to as "treatment as usual" or TAU) should always take precedence over considerations of CAM or integrative regimens which should be recommended only after viable Western medical options have been exhausted (Hoenders, Appelo, et al., 2012; Hoenders, Bos, et al., 2012). This perspective assumes that the evidence base

for CAM or integrative treatment regimens is by definition weaker than the evidence base supporting existing Western medical modalities. As mixed methods study designs are increasingly used, it will become possible to make direct comparisons between discrete Western medical, CAM and integrative regimens on the basis of both quantitative and qualitative outcomes measures. In some cases, findings will favor usual care over CAM, and in some cases, findings will favor a particular CAM or an integrative regimen over usual care. In cases where effect sizes or other measures used in mixed methods studies are roughly equivalent, patient preferences and cost constraints become relatively more important for selecting viable treatment options.

Optimizing Research Designs for Investigating Integrative Interventions

In order to more accurately reflect the way many people approach their mental health care, future clinical trials should ideally examine individually tailored, multiple-component interventions that combine widely used psychotropic medications and popular CAM modalities. Outcomes would be assessed using mixed methods approaches including quantitative outcomes measures such as laboratory tests and validated psychometric scales, together with qualitative measures such as patients' ratings of improved functioning and researchers' observations on the role of placebo and nocebo effects. For example, a controlled trial on patients diagnosed with major depressive disorder could compare *treatment as usual* (i.e., antidepressant medications) with a multimodal treatment protocol using a decision-tree algorithm employing specific combinations of validated Western medical and CAM modalities. Along these lines, a single-subject time series analysis was done to examine dynamic relationships between factors affecting symptoms and interactions between treatment modalities in a patient receiving integrative care for anxiety (Hoenders, Appelo, et al., 2012; Hoenders, Bos, et al., 2012). Findings of this "*N* of 1" study revealed complex interrelationships between the patient's symptoms and responses to treatment, positive feedback loops between lifestyle behaviors and outcomes, and differential effects of disparate treatment variables that would potentially have gone unnoticed in more conventional group study designs. Along similar lines Hamilton (Hamilton personal communication) compared treatment as usual (TAU) (defined as antidepressants or cognitive-behavioral therapy) with select integrative interventions for depressed mood using effect size as a common metric. She found that effect sizes for integrative treatments that have been meta-analyzed compare favorably to those of TAU alone. In particular, meta-analytic findings for select integrative psychological therapies, Omega-3 fatty acids, exercise, yoga, and bright light exposure had moderately higher effect sizes than TAU. The same approach could easily be adapted to statistical comparisons of TAU and integrative regimens for other psychiatric disorders.

A research agenda that encompasses promising CAM and integrative interventions will help clarify the roles of genetic and biochemical individuality, ethnicity, family history, and culture in the pathogenesis of mental illness. Future studies will ideally use mixed methods research designs to investigate integrative regimens that more accurately reflect how people perceive symptoms and seek mental health care. Examples include combinations of psychotropic medications, high-quality natural product supplements, technology-based modalities that use light, sound, magnetic fields, or weak electrical current, mindfulness and mind–body practices, as well as nutritional advice and exercise.

Optimizing mixed methods research designs for evaluating outcomes in complex patients afflicted with two or more psychiatric, substance abuse or medical problems is especially important (see Chap. 9 on integrative management of complex cases with high comorbidity). Future research findings may favor Western medical, CAM or integrative modalities depending on the complex factors influencing treatment response in such complex cases. As the evidence base for disparate biomedical, CAM and integrative interventions shifts over time, the "optimal" treatment strategy for a unique patient may change reflecting genetic and biochemical individuality, personal preferences, and constraints on availability and cost.

Priorities in integrative mental health research should include studies on:

- mechanisms of action of single CAM treatments or complex integrative protocols using advanced pharmacogenomic, epigenetic, and neuroimaging approaches
- the impact of lifestyle modification (e.g., diet, exercise, and stress management) on mental health aimed both at prevention and treatment
- interactions between specific pharmaceuticals and CAM modalities aimed at elucidating potentially beneficial synergistic effects and potentially dangerous adverse effects as well as potentially unsafe interactions

Evaluating Outcomes

Patient Satisfaction; Effectiveness; Cost Versus Cost-Effectiveness; Cost–Utility Analysis; and Cost–Benefit Analysis

Quantitative and qualitative, objective and subjective approaches are used to evaluate outcomes including indices of patient satisfaction, measures of effectiveness, and measures of direct and indirect costs associated with treatment.

Patient satisfaction is regarded as an important metric for evaluating the quality of health care and thus plays a role in insurance reimbursement policies; however, factors that determine patient satisfaction are complex and poorly understood (Berkowitz, 2016). Individuals who receive care in outpatient settings tend to be more satisfied with care than hospitalized patients. Men and the elderly are more likely to be satisfied with mental health care compared to women and younger indi-

viduals. Being diagnosed with a severe psychiatric disorder such as schizophrenia is associated with decreased overall patient satisfaction (Fortin, Bamvita, & Fleury, 2018). Good communication between providers and patients, and the perception of positive attitudes and professional competence of providers predict higher patient satisfaction. Higher quality of life in terms of financial security, relationships, and family and social networks is also predictive of increased overall patient satisfaction with mental health care services. Many instruments are used to rate patient satisfaction based on quantitative, qualitative, or mixed methods approaches depending on study goals. The Client Satisfaction Questionnaire is used to estimate overall satisfaction with mental health services, whereas the Barker instrument assesses patient satisfaction in response to care received from psychiatrists.

Treatment efficacy refers to measured results of a treatment administered in a RCT under ideal controlled conditions, including a homogeneous patient population, specially trained therapists, and monitored outcomes. *Treatment effectiveness* deals with outcomes measures in real-world clinical settings. Treatments that are *efficacious* under ideal conditions may not be *effective* in the real world because of differences between patients, the absence of ideal conditions, and the unmonitored application of the treatment. Many physicians believe that an "efficacy gap" exists with respect to the treatment of depressed mood because many currently available treatments are not regarded as *fully effective*, while efficacious and more cost-effective alternatives are frequently not available through conventional health care delivery systems (Fisher, van Haselen, Hardy, Berkovitz, & McCarney, 2004).

Treatment costs can be measured in direct and indirect terms. *Direct costs* include the cost (if any) of the intervention itself, practitioner fees, the cost of medicines (natural or synthetic), and administrative costs. *Indirect costs* include the cost of time off work necessary to obtain treatment, as well as the intangible costs of distress when treatment is not successful. *Cost-effectiveness* refers to the cost of achieving a given outcome. Some treatments have good efficacy and effectiveness but are very expensive to implement. The result is that *less effective* but inexpensive treatments are sometimes *more cost-effective* compared with more effective, expensive treatments. Because of the highly individualized nature of integrative mental health care, generic indices of cost-effectiveness for different integrative strategies are seldom possible. A specified treatment (or treatment combination) may be more effective, whereas a very different Western medical or CAM treatment (or combination of modalities) may be significantly more cost-effective. For example, in some cases moderately effective interventions that cost little to implement, including life style changes such as regular exercise, healthy changes in diet and stress reduction provide cost-effective solutions when used alone or in conjunction with Western medical treatments.

Cost-effectiveness analyses of both Western medical and CAM modalities are difficult to perform and rely on accurate measurements of both effectiveness and cost. Increased cost-effectiveness can be achieved by improving outcomes at the same cost or obtaining similar outcomes at reduced cost. Obviously, cost-effectiveness is not improved in cases where a CAM or integrative regimen has comparable efficacy but is more expensive or more difficult to obtain compared

with a Western medical treatment. In cases where an integrative regimen is arguably equivalent to or more effective than available and affordable medications (i.e., "usual treatment"), eliminating or lowering the dose of a prescription medication may result in fewer safety issues, improved treatment adherence, generally improved outcomes, and reduced risk of relapse, all of which translate into reduced long-term costs to the patient in terms of both direct treatment costs and losses in productivity.

In industrialized countries mental health services are seldom delivered in ways that are cost-effective. Health Maintenance Organizations (HMO) attempt to cut costs on a continuous basis by restricting access to select (more expensive) drugs while reducing the frequency of clinic visits allowed under individual insurance plans. Restricting access to prescription medications results in higher costs related to increased patient acuity associated with increased visits to doctors' offices and emergency rooms, as well as increased hospitalizations. Clinical decisions to recommend effective versus cost-effective treatments depend on a complex analysis of local resources and symptom severity in the context of each unique patient's preferences and financial resources. Cost offsets alone should never be the sole basis for treatment decisions, though in real-world clinical decision making, they almost always play a significant role. Analysis of the economics of complementary, alternative and integrative medical services is important for containing costs in a competitive health care marketplace in which patients may choose from a variety of conventional and CAM treatment choices (Coulter, Herman, & Nataraj, 2013).

Cost–utility analysis is a form of cost-effectiveness analysis that is based on measures of distress and life quality. Cost–utility analysis measures the desirability of outcomes to the patient. This approach is highly subjective and relative to the cultural context in which treatment takes place. In contrast to cost–utility analysis, *cost–benefit analysis* compares the financial cost of treatment to the financial benefits of treatment, and subjective factors are not considered. Some approaches that have high cost–benefit ratios may have low or unacceptable cost utility, depending on the preferences and perspectives of the individual patient (Coulter et al., 2013; White, Resch, & Ernst, 1996). It follows that a CAM or integrative intervention perceived by a patient as enhancing the quality of his or her life *will probably be more sought after* than a Western medical treatment that results in equivalent or better objective outcomes that *may have superior cost–benefit ratios but is not perceived as enhancing quality of life*.

The Role of Expert Panels

Expert consensus is widely used to develop clinical practice guidelines. Two kinds of expert panels widely used in medicine are consensus panels and appropriateness panels. Both types of panels are utilized by the National Institutes of Health (NIH) and the Institute of Medicine (IOM) to guide clinical decision making. Expert consensus guidelines are generally defended as "authoritative" based on interpretations

of outcomes that show consistent beneficial effects. Unfortunately, recommendations of expert panels are often limited by the paucity of studies available on a particular biomedical or CAM modality, poor quality of studies, or ethical or methodological issues that preclude research on a specific modality. However, many consensus-based practices in both Western medicine and non-Western systems of medicine reflect biases of a small body of academics and selectively exclude evidence or modes of investigation that are not congruent with the parent system of medicine from which they originate. For these reasons the opinions of experts are assigned to the lowest level of the evidence hierarchy in systematic reviews. These circumstances have led to both Western medicine and non-Western systems of medicine disregarding pertinent evidence for a range of Western medical and CAM modalities. A consequence is that treatment planning in Western medicine generally overlooks evidence for CAM modalities, and by the same token treatment planning in non-Western systems of medicine generally excludes evidence for Western medical approaches.

Recent innovations in expert panels have been proposed that may overcome the above limitations through a combination of rigorous literature review, making expert opinions transparent, and inviting critical review. RAND Corporation together with the Samueli Institute have developed more efficient and more cost-effective approaches for conducting expert panels based on work done at the National Institutes of Health Consensus Development Conference and the Institute of Medicine (Coulter, Elfenbaum, Jain, & Jonas, 2016). Collectively, three types of expert panels comprise the Scientific Evaluation and Review of Claims in Health Care (SEaRCH™) process: a clinical expert panel, a research expert panel, and a patient expert panel (Jonas, Crawford, Hilton, & Elfenbaum, 2017). In the SEaRCH™ process expert panels are highly structured and streamlined so that they can be conducted rapidly in a cost-effective manner and can be adapted to the unique needs and preferences of each patient. Each expert panel comprises five academics and four clinicians reflecting equal emphasis on clinical and research expertise. With the goal of reducing time spent reviewing the literature, expert panels use a streamlining approach called Rapid Evidence Assessment of Literature (REAL™). The RAND methodology holds promise for reducing costs, improving cost-effectiveness and reducing time needed to develop a comprehensive care plan. As this methodology can be equally applied to considerations of biomedical and CAM modalities, it may be a valuable contribution to clinical methods in integrative mental health care. However, the RAND methodology has only recently been introduced and has not yet been compared to conventional expert panels in real-world clinical situations in terms of speed, cost, or cost-effectiveness.

Key Points

- Planning safe and effective integrative mental health care involves making clinical decisions based on the highest level of evidence, keeping in mind patient preferences, available medical resources, and financial constraints.
- Methodologies for deriving legitimate treatment and assessment approaches in all systems of medicine are inherently limited and biased to the extent that all

systems of medicine rest on metaphysical assumptions about the nature of illness phenomena.
- Beliefs about the efficacy of a given treatment approach are based on assumptions in the system of medicine in which the treatment is used. A consequence is the absence of universally shared standards for evaluating evidence.
- Research methodologies employed in Western biomedicine are not appropriate or adequate for investigating postulated mechanisms of action underlying many CAM modalities because the truth claims of many CAM modalities cannot potentially be falsified by current science.
- Treatment modalities used in mental health care fall into five general categories: psychological; biological; mind–body; established forms of energy or information; postulated forms of energy or information.
- Both Western medical and CAM treatments are intrinsically limited because of the highly subjective nature of symptoms being treated.
- Placebo response rates of most psychiatric disorders to Western medical treatments or CAM modalities are consistently high.
- Practitioners of both Western medicine and CAM often rely on placebo effects to encourage positive expectations among patients.
- Consensus-based practices in both Western medicine and non-Western systems of medicine often amount to self-reinforcing beliefs that selectively exclude evidence or modes of investigation that are not congruent with the parent system of medicine from which they originate.
- Treatment planning in Western medicine generally overlooks evidence for CAM modalities, and treatment planning in non-Western systems of medicine generally excludes evidence for Western medical approaches.
- Assessment and treatment approaches that are not verifiable by current science remain in use based on shared beliefs or intuitions among practitioners and patients.
- Western medicine strongly endorses evidence-based medicine (EMB), a methodology that uses a hierarchy of evidence approach to assess the significance of findings with respect to the parameters of a unique study design, together with pertinent findings of systematic reviews and meta-analyses.
- A minority of Western trained practitioners who treat patients for mental health problems base clinical recommendations exclusively on EBM because of time constraints in fast-paced clinic settings, provider attitudes toward EBM, and concerns that EBM does not take into account many widely used treatments.
- EBM assumes that the causes of change in symptoms can be empirically measured; however, the absence of discrete biological markers for the majority of psychiatric disorders makes this assumption invalid in contemporary psychiatry.
- Efforts to adapt CAM research methodologies to Western medical research standards may be inherently self-limiting because EBM methodology assigns certain kinds of research designs and clinical findings to a lower level of significance with the result that a hierarchy of evidence is biased in favor of study designs traditionally used in Western medical research.

- EBM requirements for obtaining medical information contain implicit biases against many non-Western systems of medicine as well as many CAM modalities with the result that many CAM modalities are relegated to the lowest levels of the EBM evidence hierarchy despite robust findings of beneficial outcomes consistent with the worldview of the parent system of medicine in which a specific CAM modality is used.
- In contrast to EBM, *practiced based evidence* is an approach used to develop protocols addressing a particular disorder based on the published medical literature and evidence derived from electronic health records of patients with similar demographic profiles, shared disease comorbidities and treatment histories.
- In Western medicine evidence is based on an empirically verifiable mechanistic description of processes known to current science.
- From a Western medical perspective many CAM modalities rest on inherently nonvalid assumptions because available empirical means cannot demonstrate correspondences between a putative mechanism of action and a claimed outcome.
- CAM practitioners argue that the approaches they use are both valid and effective based on principles foreign to current science and Western medicine.
- The outcomes in response to some CAM modalities are observable using established Western medical tests while outcomes in response to other CAM modalities are difficult or impossible to objectively assess based on quantitative Western medical tests.
- Three kinds of outcomes can take place in the context of Western medical or CAM treatment: effects related to the general philosophy or principles of a system of medicine; effects arising from the relationship between a patient and a healer; effects resulting from the application of a particular technique in a unique patient.
- Assessment approaches used in Western medicine and non-Western systems of medicine can demonstrate only apparent correlations between postulated causes and reportable symptoms but can seldom confirm the existence of a discrete cause or causes.
- The current gold standard in Western medical research is the randomized controlled trial (RCT) in which all variables that potentially affect outcomes are presumed to be both known and accurately characterized.
- The validity of the RCT design is based on the assumption that all variables potentially affecting outcomes are subject to known constraints (i.e., controls) imposed by the researcher on the experimental design.
- RCTs and other quantitative research designs are more suited to investigations of single discrete molecules such as synthetic drugs or “active” ingredients contained in natural products but do not adequately address complex synergistic mechanisms involved in many Western medical and CAM interventions.
- RCT studies are often poorly designed, do not use the most appropriate randomization method, and because of their short duration or limited numbers of enrolled subjects, their findings often lack the requisite statistical power to establish significant correspondences between treatments and outcomes.

- Different research questions pertaining to Western medicine, CAM or integrative medicine call for a variety of research methodologies.
- Considerations of the limitations and benefits of different research design choices should always guide the choice of study design especially when complex, multilevel interventions are being investigated.
- Novel research methodologies are being used to investigate CAM and integrative treatment approaches.
- In contrast to quantitative research designs aimed at verifying causal correlations between discrete mechanisms and specific outcomes, qualitative research methods are more suitable for the investigation of CAM interventions that invoke complex psychological, psychosomatic and physiological responses such as mind–body, energy, or spiritual approaches.
- Mixed methods research designs that combine quantitative and qualitative research methods may help elucidate complex dynamic interactions between synergistic factors that influence outcomes in response to integrative treatment regimens.
- Mixed methods study designs permit direct comparisons between discrete Western medical, CAM and integrative regimens on the basis of both quantitative and qualitative outcomes measures.
- In order to more accurately reflect the way many people approach their mental health care, future clinical trials should ideally examine individually tailored, multiple-component interventions that combine widely used psychotropic medications and popular CAM modalities.
- Useful methods for evaluating outcomes include measures of patient satisfaction, effectiveness, cost versus cost-effectiveness, cost–utility analysis, and cost–benefit analysis.
- Recommendations of expert panels are often limited by the paucity of studies available on a particular biomedical or CAM modality, poor quality of studies, or ethical or methodological issues that preclude research on a specific modality.
- Recent innovations in expert panels use a methodology for streamlining literature review, making expert opinions transparent, and inviting critical review that may result in more effective, more cost-effective, and more individualized clinical guidelines.

References

Abbott, R., & Lavretsky, H., (2013, March). Tai Chi and Qigong for the treatment and prevention of mental disorders. *Psychiatric Clinics of North America, 36*(1), 109–119.

Aickin, M. (2002). Beyond randomization. *Journal of Alternative and Complementary Medicine, 8*(6), 765–772.

Aickin, M. (2003). Participant-centered analysis in complementary and alternative medicine comparative trials. *Journal of Alternative and Complementary Medicine, 9*(6), 949–957.

Barker Bausell, R. (2009, December). Are positive alternative medical therapy trials credible?: Evidence from four high-impact medical journals. *Evaluation & the Health Professions, 32*(4), 349–369.

Barry, C. A. (2006). The role of evidence in alternative medicine: Contrasting biomedical and anthropological approaches. *Social Science & Medicine, 62*(11), 2646–2657.

Bengston, W. (2004). Methodological difficulties involving control groups in healing research: Parallels between laying on of hands for the treatment of induced mammary cancers in mice to research in homeopathy. *Journal of Alternative and Complementary Medicine, 10*(2), 227–228.

Berkowitz, B. (2016). The patient experience and patient satisfaction: Measurement of a complex dynamic online. *Journal of Issues in Nursing, 21*(1), 1.

Bishop, F., & Holmes, M. (2013). Mixed methods in CAM research: A systematic review of studies published in 2012. *Evidence-Based Complementary and Alternative Medicine, 2013*, 187365.

Bloom, B. S., Retbi, A., Dahan, S., & Jonsson, E. (2000). Evaluation of randomized controlled trials on complementary and alternative medicine. *International Journal of Technology Assessment in Health Care, 16*(1), 13–21.

Caspi, O., & Bell, I. (2004). One size does not fit all: Aptitude x treatment interaction (ATI) as a conceptual framework for complementary and alternative medicine outcome research. Part II: Research designs and their applications. *Journal of Alternative and Complementary Medicine, 10*(4), 698–705. Mary Ann Liebert Publications.

Caspi, O., & Burleson, K. O. (2007, Winter). Methodological challenges in meditation research. *Advances in Mind-Body Medicine, 22*(3–4), 36–43.

Caspi, O., Millen, C., & Sechrest, L. (2000). Integrity and research: Introducing the concept of dual blindness. How blind are double-blind clinical trials in alternative medicine? *Journal of Alternative and Complementary Medicine, 6*(6), 493–498.

Cassidy, C. M. (2002). Commentary on terminology and therapeutic principles: Challenges in classifying complementary and alternative medicine practices. *Journal of Alternative and Complementary Medicine, 8*(6), 893–895.

Churchill, W. (1999). Implications of evidence based medicine for complementary and alternative medicine. *Journal of Chinese Medicine, 59*, 32–35.

Coates, J. R., & Jobst, K. A. (1998). Integrated healthcare: A way forward for the next five years? A discussion document from the Prince of Wales's Initiative on Integrated Medicine. *Journal of Alternative and Complementary Medicine, 4*(2), 209–247.

Colloca, L., Jonas, W. B., Killen, J., Miller, F. G., & Shurtleff, D. (2014). Reevaluating the placebo effect in medical practice. *Zeitschrift für Psychologie, 222*(3), 124–127.

Coulter, I., Elfenbaum, P., Jain, S., & Jonas, W. (2016). SEaRCH™ expert panel process: Streamlining the link between evidence and practice. *BMC Research Notes, 9*, 16.

Coulter, I. D., Herman, P. M., & Nataraj, S. (2013). Economic analysis of complementary, alternative, and integrative medicine: Considerations raised by an expert panel. *BMC Complementary and Alternative Medicine, 25*(13), 191.

Defining and describing complementary and alternative medicine. Panel on Definition and Description, CAM Research Methodology Conference, April 1995. (1997). *Alternative Therapies in Health and Medicine, 3*(2), 49–57.

Dossey, L. (1995). How should alternative therapies be evaluated? *Alternative Therapies, 1*(2), 76–85.

Ernst, E. (1998a). Establishing efficacy in chronic stable conditions: Are "*N* = 1 study" designs or case series useful? *Forschende Komplementarmedizin, 5*(1), 128–130.

Ernst, E. (1998b). Single-case studies in complementary/alternative medicine research. *Complementary Therapies in Medicine, 6*, 75–78.

Fisher, P., van Haselen, R., Hardy, K., Berkovitz, S., & McCarney, R. (2004). Effectiveness gaps: A new concept for evaluating health service and research needs applied to complementary and alternative medicine. *Journal of Alternative and Complementary Medicine, 10*(4), 627–632.

Fontanarosa, P., & Lundberg, G. (1998). Alternative medicine meets science. *Journal of the American Medical Association, 280*, 1618–1619.

Fortin, M., Bamvita, J. M., & Fleury, M. J. (2018). Patient satisfaction with mental health services based on Andersen's Behavioral Model. *Canadian Journal of Psychiatry, 63*(2), 103–114.

Gelenberg, A., Thase, M., Meyer, R., Goodwin, F., Katz, M., Kraemer, H. C., et al. (2008). The history and current state of antidepressant clinical trial design: A call to action for proof-of-concept studies. *The Journal of Clinical Psychiatry, 69*(10), 1513–1528.

Gray, G. (2004). *Concise guide to evidence-based psychiatry*. Washington, DC: American Psychiatric Publishing.

Haynes, B. (1999). A warning to complementary medicine practitioners: Get empirical or else. *British Medical Journal, 319*, 1629–1632.

Hoenders, R., Appelo, M., & de Jong, J. (2012). Integrative medicine: A bridge between biomedicine and alternative medicine fitting the spirit of the age. *Sociology Mind, 2*, 441–446.

Hoenders, H. J., Bos, E. H., de Jong, J. T., & de Jonge, P. (2012). Temporal dynamics of symptom and treatment variables in a lifestyle-oriented approach to anxiety disorder: a single-subject time-series analysis. *Psychother Psychosom. 81*(4):253–5.

Jakovljevic, M. (2014, March). The placebo-nocebo response: Controversies and challenges from clinical and research perspective. *European Neuropsychopharmacology, 24*(3), 333–341.

Jensen, P. B., Jensen, L. J., & Brunak, S. (2012). Mining electronic health records: Towards better research applications and clinical care. *Nature Reviews Genetics, 13*(6), 395–405.

Johnston, B. C., & Mills, E. (2004). N-of-1 randomized controlled trials: An opportunity for complementary and alternative medicine evaluation. *Journal of Alternative and Complementary Medicine, 10*(6), 979–984.

Jonas, W., Crawford, C., Hilton, L., & Elfenbaum, P. (2017). Scientific evaluation and review of claims in health care (SEaRCH): A streamlined, systematic, phased approach for determining "what works" in healthcare. *Journal of Alternative and Complementary Medicine, 23*(1), 18–25.

Kaptchuk, T. J. (2002). The placebo effect in alternative medicine: Can the performance of a healing ritual have clinical significance? *Annals of Internal Medicine, 136*(11), 817–825.

Lake, J. (2001). Qigong. In S. Shannon (Ed.), *Complementary and alternative medicine in psychiatry*. New York: Academic.

Leach, M. J., & Tucker, B. (2017, January–February). Current understandings of the research-practice gap from the viewpoint of complementary medicine academics: A mixed-method investigation. *Explore (NY), 13*(1), 53–61.

Lin, Y., Zhu, M., & Su, Z. (2015, November). The pursuit of balance: An overview of covariate-adaptive randomization techniques in clinical trials. *Contemporary Clinical Trials, 45*(Pt A), 21–25.

Linde, K. (2000). How to evaluate the effectiveness of complementary therapies. *Journal of Alternative and Complementary Medicine, 6*(3), 253–256.

Liverani, A. (2000). Subjective scales for the evaluation of therapeutic effects and their use in complementary medicine. *Journal of Alternative and Complementary Medicine, 6*(3), 257–264.

Long, A. (2002). Outcome measurement in CAM: Unpicking the effects. *Journal of Alternative and Complementary Medicine, 8*(6), 777–786.

Mercer, S. L., De Vinney, B. J., Fine, L. J., Green, L. W., & Dougherty, D. (2007, August). Study designs for effectiveness and translation research identifying trade-offs. *American Journal of Preventive Medicine, 33*(2), 139–154.

Morstyn, R. (2013). Escaping the behavioural 'spin' of evidence-based psychiatry: Merleau-Ponty's ontology of truth. *Australasian Psychiatry, 21*(4), 311–314.

Murphy, E. (1997). *The logic of medicine*. Baltimore, MD: Johns Hopkins University Press.

Oh, K., Kim, K. S., Park, J. W., & Kang, J. (2007). Quality evaluation of randomized controlled trials on complementary and alternative medicine. *Asian Nursing Research (Korean Society of Nursing Science), 1*(3), 153–164.

Pincus, T., & Sokka, T. (2006). Evidence-based practice and practice-based evidence. *Nature Clinical Practice Rheumatology, 2*(3), 114–115.

Richardson, J. (2002). Evidence-based complementary medicine: Rigor, relevance and the swampy lowlands. *Journal of Alternative and Complementary Medicine, 8*(3), 221–223.

Sackett, D. L., Rosenberg, W. M., Gray, J. A., Haynes, R. B., & Richardson, W. S. (1996). Evidence-based medicine: What it is and what it isn't. *British Medical Journal, 312*, 71–72.

Shah, N. H. (2013). Mining the ultimate phenome repository. *Nature Biotechnology, 31*(12), 1095–1097.

Smith, R. (1991). Where is the wisdom? *British Medical Journal, 303*(6806), 798–799.

Smolders, M., Laurant, M., Verhaak, P., Prins, M., van Marwijk, H., Penninx, B., et al. (2010, March). Which physician and practice characteristics are associated with adherence to evidence-based guidelines for depressive and anxiety disorders? *Medical Care, 48*(3), 240–248.

Tilburt, J. C. (2008, October). Evidence-based medicine beyond the bedside: Keeping an eye on context. *Journal of Evaluation in Clinical Practice, 14*(5), 721–725.

Turner, R. N. (1998). A proposal for classifying complementary therapies. *Complementary Therapies in Medicine, 6*, 141–143.

Verhoef, M., Casebeer, A., & Hilsdew, R. (2002). Assessing efficacy of complementary medicine: Adding qualitative research methods to the "gold standard". *Journal of Alternative and Complementary Medicine, 8*(3), 275–281.

Verhoef, M., Koithan, M., Bell, I. R., Ives, J., & Jonas, W. (2012). Whole complementary and alternative medical systems and complexity: Creating collaborative relationships. *Forschende Komplementärmedizin, 19*(Suppl. 1), 3–6.

Vickers, A. (1999). Evidence-based medicine and complementary medicine. *ACP Journal Club, 130*, A13–A14.

Vuckovic, N. (2002). Integrating qualitative methods in RCTs: The experience of the Oregon Center for CAM. *Journal of Alternative and Complementary Medicine, 8*(3), 225–227.

Walach, H. (2001). The efficacy paradox in randomized controlled trials of CAM and elsewhere: Beware of the placebo trap. *Journal of Alternative and Complementary Medicine, 7*(3), 213–218.

Walach, H., Falkenberg, T., Fonnebo, V., Lewith, G., & Jonas, W. B. (2006). Circular instead of hierarchical: Methodological principles for the evaluation of complex interventions. *BMC Medical Research Methodology, 6*, 29–29.

White, A., Resch, K., & Ernst, E. (1996). Methods of economic evaluation in complementary medicine. *Forschende Komplementarmedizin, 3*, 196–203.

Williams, C. M., Skinner, E. H., James, A. M., Cook, J. L., McPhail, S. M., & Haines, T. P. (2016, August 17). Comparative effectiveness research for the clinician researcher: A framework for making a methodological design choice. *Trials, 17* (1), 406.

Wilson, K., Mills, E. J., Ross, C., & Guyatt, G. (2002). Teaching evidence-based complementary and alternative medicine: 4. Appraising the evidence for papers on therapy. *Journal of Alternative and Complementary Medicine, 8*(5), 673–679.

Zhang, H. L. (2004). Qigong commentary. *Journal of Alternative and Complementary Medicine, 10*(2), 228–230.

Chapter 6
Evaluating and Using Medical Evidence in Integrative Mental Health Care: Literature Review, Evidence Tables, Algorithms, and the Promise of Artificial Intelligence

"Three things cannot be long hidden: the sun, the moon, and the truth."

—The Buddha

Contents

Links to all websites mentioned in this chapter are included in the book's companion website http://integrativementalhealthplan.com

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Evaluating Medical Evidence

Framing the Problem

In Western medicine findings from laboratory studies comprise the highest level of evidence used to demonstrate relationships between a putative mechanism of action and desirable changes in target symptoms. In contrast, non-Western systems of medicine conceptualize "evidence" in a variety of ways congruent with the values and beliefs of the parent culture (Barry, 2006). A modality may be *efficacious*, *effective*, or both efficacious and effective with respect to a specified symptom pattern (or "disorder"). *Efficacy* has to do with how well a treatment works under ideal circumstances in a controlled research setting. In contrast, *effectiveness* refers to how well a treatment works in real world populations. Establishing an underlying mechanism of action is unnecessary for a treatment to be regarded as *effective* as effectiveness is determined on the basis of outcomes alone. In other words, *effective* treatments are those for which a *putative mechanism of action might or might not be established*, and for which substantial evidence supports claims of consistent beneficial outcomes in non-laboratory conditions. Efficacious treatments are not always effective, and effective treatments are not always efficacious. Kinds of evidence used to substantiate efficacy or effectiveness include reliable clinical observations, replicated findings from randomized controlled trials, and, to a lesser extent, consistent anecdotal reports or expert opinion. There may be considerable variation in the strength of available evidence for a putative mechanism of action or the effectiveness of a specified Western medical or CAM modality. A consequence is that a general hierarchy of evidence can provide only a crude conceptual model, and separate tables need to be constructed showing the levels and kinds of evidence for a specific modality with respect to a given symptom pattern (i.e., "disorder").

Constructing a Hierarchy of Quantitative Medical Evidence

Table 6.1 lists criteria for constructing an evidence hierarchy for evaluating quantitative information with respect to a putative mechanism of action or a claimed outcome for modalities that are empirically verifiable. The schema includes seven general kinds and five general levels of evidence. All kinds and levels of evidence are applicable to both Western medicine and CAM.

With respect to the first four kinds of evidence, empirical information is often available and permits inferences about both a putative mechanism of action (i.e., within the context of current science) and the efficacy of a specified modality. In contrast, for the last three kinds of evidence, efficacy claims are verified or *verifiable* however inferences cannot be made about a putative mechanism of action. The last three kinds of quantitative evidence are relevant when evaluating intuitive modalities for which there may be outcomes data but for which, by definition, a

Table 6.1 Kinds and levels of quantitative evidence

Kinds of evidence	• Efficacy and mechanism verified • Efficacy verified, mechanism not verified • Efficacy verified, mechanism refuted • Efficacy and mechanism refuted • Efficacy verified, mechanism unverifiable • Efficacy unverified, mechanism unverifiable • Efficacy refuted, mechanism unverifiable
Levels of evidence	• "*N* of 1" trials or systematic reviews of RCTs • RCTs where follow-up is greater than 80% • Cohort studies • Case control studies or observational studies • Expert opinion

putative mechanism of action cannot be verified by current science. Evidence-based medicine assigns "*N* of 1 trials" and systematic reviews of randomized controlled trials to the highest level of evidence, and "expert opinion" to the lowest level of quantitative evidence because there are seldom strong correspondences between expert opinions and research evidence (Gray, 2004).

The overall strength of evidence for the use of a particular modality can be expressed as a factor of the level and kind of available evidence supporting it. The optimal treatment regimen addressing a specified symptom pattern will ideally include the modality for which the *strongest kind* and *highest level* of evidence are present. However, in some instances the patient may have already tried what is arguably the optimal treatment (i.e., based on a review of the available evidence) but responded only partially or failed to respond. This may be due to many factors including, for example, unavailability of a qualified practitioner, the patient's refusal of the recommended approach because of cultural preferences or financial constraints. In some cases, disparities between the strength of quantitative evidence and outcomes may reflect failure to take into account qualitative indices of patient satisfaction, insight or wellness that may interfere with positive outcomes. Ideally, the practitioner and patient will work together to identify candidate treatments supported by quantitative and qualitative evidence that reflect the patient's personal preferences and are available where the patient resides and are affordable.

Criteria for Assigning Levels of Evidence

There are four general levels of evidence based on combinations of quantitative and qualitative information when evaluating a given modality with respect to a specified symptom pattern (or "disorder"). In some cases, high-quality studies will have been conducted but not yet analyzed in a systematic review. In other cases, studies may be ongoing, recently concluded but not yet published or published in specialty journals but not subjected to a critical peer-review process. Below are criteria for

different levels of evidence that can be used to evaluate Western medical, CAM or integrative assessment or treatment approaches:

- *Substantiated* approaches are supported by compelling qualitative and quantitative evidence, widely practiced and strongly endorsed by a relevant community of professional practitioners.
- *Provisional* approaches are supported by consistent but *not* compelling findings, may be in widespread use and are sometimes endorsed by a relevant professional association.
- *Possibly effective* approaches are supported by limited or inconsistent findings, are not widely used or strongly endorsed by a relevant professional association and their use may be controversial.
- *Refuted* approaches have been found to be ineffective due to consistent negative findings of well-designed studies, are seldom used, and a relevant professional association may recommend against using them.

In some cases the strength of evidence for a given modality will change as significant new *confirming or disconfirming* evidence emerges with respect to a specified symptom pattern (i.e., "disorder"). The *relative strength* of evidence supporting the use of a particular modality may also vary over time in relationship to changes in the level and kind of evidence supporting all modalities used to treat a particular symptom pattern. In other words, the strength of evidence for a given modality relative to the strength of evidence for other modalities used to treat the same condition may increase or decrease over time. The comparative "weights" of evidence for disparate modalities being considered when addressing a specified symptom pattern should be reevaluated on an ongoing basis and—if needed—revised based on emerging research findings. Some empirically based modalities that are not strongly substantiated may be confirmed or refuted by future research findings. In other cases, the strength of evidence supporting a modality may remain relatively unchanged following additional studies. By the same token, a consensus-based or intuitive modality may become substantiated or refuted by future research studies and subsequently fulfill criteria for (a confirmed or refuted) empirically based modality, respectively.

Performing Literature Review and Constructing Evidence Tables

Searching the medical literature entails formulating a question, selecting databases to search, choosing appropriate keywords or phrases, doing the search, retrieving articles and, if needed, modifying the search strategy to gather more or better information pertaining to the question (Moore & McQuay, 2006, p. 9). http://integrativementalhealthplan.com.

Formulating the Question and Defining Keyword Search Parameters

A clearly phrased question is the essential first step for any literature search. If the question is ambiguous, the literature search will be unfocused, important resources will be overlooked, and relevant information will be missed. The authors of "Bandolier's Little Book of Making Sense of the Medical Evidence" suggest thinking about four components (Moore & McQuay, 2006, p. 9):

- Population or patient
- Intervention (therapy, diagnostic test, exposure, risk factor)
- Comparison to the intervention
- Outcome(s) of interest

Table 6.2 lists terms and phrases often used to describe mental health problems that may be useful when searching databases.

Searches using only nomenclature for psychiatric disorders as defined, for example, in the DSM-V and the ICD-11 may bias results in favor of citations on Western medical modalities, and there may be few relevant "hits" pertaining to uses of CAM modalities in mental health care. To capture the greatest number of relevant citations from the medical and anthropological literature, descriptors of major categories of cognitive, affective, and behavioral symptoms and culture-specific descriptors of emotional distress should be used as keyword search terms. For example, sadness and depressed mood should be used instead of major depressive disorder. Anxiety and fear should be used instead of generalized anxiety disorder or panic disorder. Specialized lexicons should subsequently be developed using modality-specific keywords to improve yields of searches for citations on clinically pertinent CAM modalities.

Literature Review: Obtaining Pertinent Information

After a question is clearly formulated and search terms have been identified, a computerized literature search is done to identify current reliable information about pertinent Western medical and CAM modalities. Relevant sources include randomized controlled studies, systematic reviews, meta-analyses, and case reports pertaining to modalities used to assess or treat cognitive, affective, and behavioral symptoms. In addition to completed studies, preliminary findings pertaining to ongoing research can be obtained from several sources, including the Cochrane Controlled Register of Trials https://www.cochranelibrary.com/central/about-central and the National Institutes of Health National Center for Complimentary and Integrative Medicine database of clinical trials https://clinicaltrials.gov/search/term=(NCCIH)++(completed)++OR+(NCCIH)++(suspended)++OR+(NCCIH)++(terminated)+. Using several literature search strategies in parallel often yields more complete information than

Table 6.2 Representative search terms and strings for symptoms and disorders pertaining to mental health

Symptom pattern (disorder)	Representative search terms and strings
Anxiety (anxiety disorders)	Generalized anxiety, generalized anxiety disorder, panic attacks, panic disorder, post-traumatic stress disorder (PTSD), agoraphobia, social phobia, Obsessive-compulsive disorder (OCD)
Mood swings (bipolar disorder)	Bipolar Disorder, labile mood, mood swings, mania/hypomania, bipolar affective disorder, cyclothymic disorder, manic-depressive disorder
Disorders of childhood	Childhood psychiatric disorders, developmental delay, mental retardation, learning disorders, dyslexia, autism-spectrum disorders, autism, Asperger's syndrome, attention-deficit hyperactivity disorder, ADHD, oppositional-defiant disorder, pervasive developmental disorder
Cognitive impairment (dementia)	Dementia, mild cognitive impairment (MCI); Alzheimer's disease, vascular dementia, "benign senescent forgetfulness," amnestic disorder, memory loss, age-related memory loss
Depressed mood	Depression; major depressive disorder, depressed mood, dysthymia, dysthymic disorder, mood disorders
Psychosis	Psychotic disorders, schizophrenia, schizoaffective disorder, schizophreniform disorder, brief psychotic disorder, paranoia, hallucinations, delusions, delusional disorder
Insomnia (sleep disorders)	Sleep disorders, insomnia, primary sleep disorders, sleep disturbances, parasomnias, dyssomnias, narcolepsy
Substance abuse	Substance abuse, substance dependence, alcohol, cannabis, marijuana, hallucinogens, psychedelics, nicotine, inhalant, opioid, polysubstance, cocaine, methamphetamine, heroin, dependence, intoxication, addiction, withdrawal
Other symptoms (disorders)	Somatoform disorder, conversion disorder, hypochondriasis, body dysmorphic disorder, adjustment disorders, symptoms or disorders caused or exacerbated by an underlying medical or neurologic disorder; personality disorder, sexual disorders, dissociative disorder, eating disorders, etc.

any single strategy because every search strategy is inherently self-limiting or biased against certain kinds of medical information. A meta-analysis increases the statistical power of a study, or the capacity of the study design to detect significant differences between two or more treatments that are being compared. Different sources of bias affect meta-analysis findings, including biases in publication, reference selection, methods of data extraction, and outcomes caused by improper blinding, incomplete randomization, and the use of certain kinds of inclusion or exclusion criteria (Mancano & Bullano, 1998).

The National Guideline Clearinghouse (www.guideline.gov) is a service of the US Department of Health and Human Services, Agency for Healthcare Research and Quality. The site indexes most established guidelines for Western medical treatments and some CAM modalities. Recall that not all clinical practice guidelines are based on comprehensive reviews of *best evidence*, according to the standards of evidence-based medicine (Browman, 2001).

I am not assuming that all pharmaceutical or other Western medical modalities used in existing practice guidelines endorsed by the American Psychiatric Association (APA) or academic medical institutions always reflect reliable or current information based on the latest research findings. In fact, many studies on the effectiveness of psychotropic medications published in the peer-reviewed medical journal literature reflect ideological biases and economic interests of the pharmaceutical industry, academic psychiatry, and the APA. The literature review process on which APA-endorsed guidelines or other mainstream practice guidelines are based largely ignores citations of studies on CAM modalities (Beckner & Berman, 2003). Whitaker and Cosgrove (2015) make a compelling case for incomplete and inaccurate reporting of research findings on a range of psychotropic medications resulting from the financial or "guild" interests of academic psychiatry, the pharmaceutical industry and the APA. Selective reporting of positive findings and misrepresentation of research findings in the academic psychiatry journal literature has resulted in an enormous "gap" between what the research evidence supports and media-fueled beliefs about the benefits and risks of psychotropic medications among the general public. Nevertheless, numerous meta-analyses have been published by the FDA or psychiatrists outside of the APA-academic "guild" which provide accurate information on effectiveness and safety of widely used psychotropic medications. A valuable resource for obtaining publications of research studies and meta-analyses pertaining to psychotropic medications is a comprehensive database on FDA approved drugs https://www.fda.gov/Drugs/InformationOnDrugs/ucm135821.htm. Although official FDA publications are probably less biased than publications of industry-sponsored studies, many FDA advisory committee members have undisclosed conflicts of interest or close financial relationships with a sponsoring pharmaceutical company that influence their voting behavior (Hayes & Prasad, 2018; Lurie, 2018; Pham-Kanter, 2014). In response to widespread concerns about bias, in 2013 the US Cochrane Center together with the Johns Hopkins Bloomberg School of Public Health established an initiative aimed at restoring invisible and abandoned trials to the published medical journal literature to provide clinicians and patients more reliable information about the true value of a treatment (Doshi, Kickersin, Healy, Vedula, & Jefferson, 2013). These efforts have led to the establishment of an organization called "Restoring Invisible and Abandoned Trials" (RIAT) (https://restoringtrials.org/) that offers free support to researchers in all world regions who are seeking to publish an unpublished trial or correct or republish a misreported trial (Doshi, Shamseer, Jones, & Jefferson, 2018).

Publication bias resulting in distorted or absent trials data also impacts the knowledge base on CAM. Negative peer review bias against publications on CAM is a significant problem interfering with accurate and objective reporting of research findings. Negative reviews of CAM research studies sometimes rely on misrepresentations of findings, misleading statements, failure to refer to the relevant research literature, selective use of certain published papers reporting negative findings, and inaccurate reporting of contents of published papers (Manchikanti, Kaye, Boswell, & Hirsch, 2015; Morley, Rosner, & Redwood, 2001; Rankin-Box, 2006; Resch, Ernst, & Garrow, 2000).

Selecting Quality Resources to Search for Information on CAM

Questions about treatment efficacy are best answered by randomized controlled trials, while questions about the reliability or specificity of an assessment approach are best determined by cross-sectional studies (Guyatt & Rennie, 2002). As noted in Chap. 5, evidence-based medicine (EBM) follows a rigorous methodology, but this approach is inherently limited by assumptions that result in the a priori exclusion of many CAM modalities as either spurious or irrelevant. It is important to keep in mind that the *kind* of evidence sought, that is, whether it is evidence of safety, treatment efficacy or effectiveness, or assessment specificity will determine the resources most likely to yield pertinent information (Jadad & Gagliardi, 1998).

Disparate criteria for peer review in Western medicine and non-Western systems of medicine, combined with the selective exclusion of citations on topics outside of a defined area of interest, and different approaches to indexing, reflect the shared biases and beliefs of medical practitioners and administrators who design medical databases. This fact has resulted in the limited usefulness of any single medical database for the purposes of performing a comprehensive review of the literature pertaining to both Western medical and CAM approaches. Because many mainstream medical databases do not index publications on CAM modalities, and many research studies on CAM modalities are unpublished or published in journals that are not peer-reviewed, a comprehensive search strategy must cover nonindexed publications, including conference proceedings and newsletters. Non-English-language articles must also be obtained and reviewed because of the likelihood that published English-language studies are biased in favor of Western medical modalities. Some databases include only citations of studies that meet strict research biomedical criteria, including RCT designs, established tests for statistical significance, and peer review.

Knowing where to look is complicated by the fact that many mainstream medical databases as well as resources on CAM modalities use different approaches and terminology to describe or index studies on CAM treatments. PubMed is a public domain medical database run by the US National Library of Medicine of the National Institutes of Health. It includes millions of citations mainly from US medical journals dating to the mid-1960s. In 2001, PubMed created a subset of its data base dedicated to CAM that includes millions of citations and abstracts from thousands of journals published in the USA and more than 70 other countries (https://www.ncbi.nlm.nih.gov/pubmed?cmd_current=Limits&pmfilter_Subsets=Complementary+Medicine). PubMed also includes a dietary supplement subset developed jointly by the National Library of Medicine (NLM) and the Office of Dietary Supplements (ODS). The data set includes citations related to vitamins, minerals, phytochemicals, botanical, and herbal supplements in human nutrition and animal models. https://www.ncbi.nlm.nih.gov/pubmed?cmd_current=Limits&pmfilter_Subsets=Dietary+Supplements.

Although PubMed and other public domain databases are valuable resources and include an enormous number of citations of studies pertaining to CAM, citations

from many journals are not completely indexed, making it difficult to locate all pertinent citations (Beckner & Berman, 2003). Thus, exclusive reliance on PubMed may result in serious omissions of relevant findings pertaining to CAM modalities.

In addition to public domain databases numerous proprietary databases provide comprehensive data sets on CAM. EMBASE is maintained by Elsevier and indexes hundreds of thousands of citations from thousands of medical journals starting in 1947 representing more non-English language journals than PubMed, as well as conference abstracts. Appendix A contains a list of the above websites and other well vetted websites on CAM.

Optimizing and Streamlining Literature Search: The Cochrane Databases and Evidence Mapping

Evidence-based medicine experts recommend the use of prefiltered resources to streamline searches of what they describe as "foreground questions" pertaining to a specific patient and browsing in authoritative textbooks on specialty areas of medicine to obtain relevant information on "background questions" pertaining to general issues about the efficacy or effectiveness of a particular treatment (Guyatt & Rennie, 2002). Reliable prefiltered sources include the Cochrane databases, the TRIP database (www.tripdatabase.com), the Allied and Complementary Medicine Database (AMED) (https://www.ebsco.com/products/research-databases/amed-the-allied-and-complementary-medicine-database), and Bandolier (http://www.bandolier.org.uk/index.html) among others.

The Cochrane databases provide valuable prefiltered resources including the complementary medicine field in the Cochrane registry of systematic reviews (http://cam.cochrane.org/). Because of the stringent criteria used to select studies for review and rigorous standards applied to the analysis of research designs and outcomes, the findings of Cochrane reviews are frequently negative or inconclusive. In addition to the Cochrane database of systematic reviews, the Cochrane Collaboration puts out the Database of Abstracts of Reviews of Effectiveness (DARE), which provides citations of both Cochrane and non-Cochrane reviews for comparison (http://community.cochrane.org/editorial-and-publishing-policy-resource/overview-cochrane-library-and-related-content/databases-included-cochrane-library/database-abstracts-reviews-effects-dare). The Cochrane Collaborative Review Groups (CRGs) are another valuable resource for researchers (http://www.cochrane.org/contact/review-groups). CRGs are formed around professional reviewers who systematically examine published and unpublished studies pertaining to specific medical or psychiatric illnesses. Cochrane CRGs collect information on emerging evidence for treatments of depression, anxiety, dementia, cognitive impairment, and schizophrenia. The Cochrane resources also include a database containing economic evaluations and health technology assessments from which it is possible to estimate cost-effectiveness of specific CAM modalities with

respect to a specified psychiatric disorder. In addition to prefiltered databases clinically pertinent information can be obtained from institutions that maintain online database directories on CAM including the Rosenthal Center for Complementary and Alternative Medicine http://beta.global.columbia.edu/institutes-programs-initiatives/richard-and-hinda-rosenthal-center-complementary-alternative, and McMaster University Alternative Medicine Resources http://library.mcmaster.ca/category/nerdsubjects/alternative/complementary/integrative-medicine.

In contrast to the Cochrane methodology, which relies exclusively on RCT research designs, evidence mapping examines the quality and relevance of a variety of research methodologies (Katz et al., 2003). Evidence mapping also differs from the Cochrane methodology by not excluding studies that are regarded as methodologically flawed. This approach begins with identification of individuals who have expertise in a specific area of medicine. A "region of medical evidence" is subsequently mapped, and a search for the relevant evidence "terrain" is conducted. An evidence map is constructed from the terrain, and the process concludes with an overview of the "lay of the land." Evidence mapping differs in significant ways from other methodologies used to synthesize evidence in medicine. For example, unlike the Cochrane field approach, evidence mapping does not a priori exclude studies considered to be methodologically "weak" for various reasons. In contrast to the Cochrane databases and other resources of prefiltered medical information, studies other than randomized controlled trials (RCT) are included in the terrain of evidence mapping. Evidence mapping ensures that CAM modalities that have not been examined in RCTs are included in the evidence base that is considered in medical decision making. CAM and integrative approaches are more amenable to evidence mapping compared with the Cochrane field approach and other, more established methodologies.

For readers of the printed textbook links to the above resources are included in the companion website developed for this book which can be found at www.IntegrativeMentalHealthPlan.com.

Populating the Evidence Tables

Results of the literature search should yield four sets of citations corresponding to Western medical and CAM assessment and treatment modalities, respectively. Key findings including links to online sources are sorted into predefined cells of evidence tables by major symptom pattern (or disorder) and ranked as "substantiated," "provisional," or "possibly effective" based on the criteria discussed above. Blank evidence tables for documenting assessment approaches and treatment approaches, respectively, can be downloaded from the companion website www.IntegrativeMentalHealthPlan.com, populated with pertinent clinical information, labeled with the patient's name and date, and saved as a proprietary computer file.

"Refuted" modalities are not regarded as legitimate choices and are not included in the evidence tables. In cases where the evidence for a specific Western medical or CAM modality is ambiguous and does not clearly meet criteria for one of the above

three levels, the modality is assigned to the lower of two levels pending additional literature review or publication of additional studies or systematic reviews. Citations supporting use of a specific assessment or treatment modality for more than one symptom pattern (or disorder), or the use of more than one Western medical or CAM modality for a specified symptom pattern (or disorder), qualify for two or more cells in the appropriate evidence tables and are not viewed as redundant citations. In such cases the same citation is included in more than one evidence table.

It is important to periodically repeat a literature search to update the evidence tables with pertinent new research findings. Changes in keyword search parameters or search strategy may be needed to better answer the original question or to answer new questions that emerge during the course of treatment. Figure 6.1 summarizes steps involved in literature research and populating evidence tables.

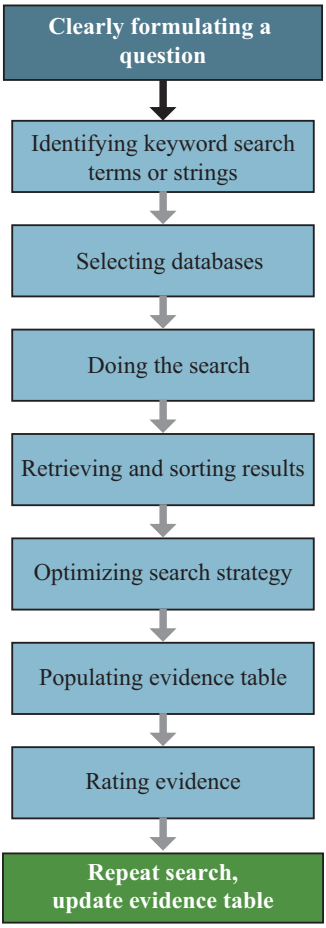

Fig. 6.1 Steps in literature search and populating evidence tables (one principal condition). ***Comment***: during the course of treatment new questions or new search parameters may be needed to optimize search strategy

Algorithms

Algorithms in Western Medicine and Mental Health Care: Overview and Limitations

An algorithm is a problem-solving method that takes into account how internal and external factors influence outcomes in a complex system. Algorithms describe how information flows from initial conditions to a series of possible outcomes through progressively branching steps in treatment planning guided by empirical information, analytical judgments, and subjective considerations. As such algorithms comprise the "built-in" logic contained in treatment planning guidelines. Rigorously designed algorithms decrease the risk of inappropriate, unnecessary or harmful treatment, and guide practitioners toward those treatments more likely to be effective, safe and cost-effective.

Clinical practice guidelines used in all systems of medicine and the algorithms on which they are based are inherently limited by sociocultural and institutional biases of the parent system of medicine from which they originate, and also of course by biases of their authors. The majority of treatment-planning algorithms used in Western medicine exclude CAM and lifestyle interventions without comparing findings of effectiveness to "standard" Western medical modalities. Algorithms used in Western medicine are limited in that they identify standardized health care approaches addressing a generic "disorder" in a group of individuals who share the same diagnosis. Treatment-planning algorithms used in Western medicine are seldom closely coupled with assessment findings and are frequently based on consensus opinions that reflect biases about particular treatment approaches rather than objective medical evidence. Although many guidelines are based on expert consensus, the value of such guidelines is limited by wide—sometimes arbitrary—differences of opinion among experts. Guidelines based on literature review only may be limited by the finite amount of searchable research literature or the questionable clinical relevance of findings.

Treatment planning algorithms used in conventional mental health care emphasize psychotropic medications and a few psychotherapeutic modalities and may include (for severe symptoms) electroconvulsive therapy and transcranial magnetic stimulation therapy (TMS). Historically, clinical practice guidelines in psychiatry have not been based on the latest evidence and have not included processes for ongoing review and revision. However important recent advances have taken place in the development of algorithms for guiding diagnosis and treatment planning in mental health care (Jašović-Gašić et al., 2013). For example, widely used guidelines emphasize use of mood stabilizers such as lamotrigine and lithium for maintenance therapy of bipolar disorder, atypical antipsychotics (which have fewer adverse effects than first-generation antipsychotics) in schizophrenia, and newer, safer antidepressants including serotonin-selective reuptake inhibitors (SSRI) and serotonin norepinephrine reuptake inhibitors (SNRI) in the treatment of severe depressed mood. Algorithm-based approaches are associated with earlier response and more sustained

improvement of severe symptoms compared to the non-algorithm-based approaches (Miller et al., 2004). In order to more adequately identify interventions that match individualized needs future clinical guidelines should take into account the role of cultural diversity and biological subtypes of disparate psychiatric disorders.

Algorithms in Integrative Mental Health Care

I have argued that *there is no standard or best integrative strategy* for all patients who report similar affective, cognitive, or behavioral symptoms. Integrative mental health care rests on the assumption that every individual has a unique psychological, biological, and energetic constitution, and the corollary assumption that unique causes or meanings of symptoms may be present in patients who report similar symptoms. These assumptions naturally lead to highly individualized approaches to assessment and treatment planning. The optimal integrative strategy for a given patient depends on his or her history, symptoms, circumstances, preferences, and financial constraints in the context of locally available health care resources, and the professional judgment and clinical experience of the practitioner.

Unlike generic algorithms used in Western medicine and biomedical psychiatry, algorithms used in CAM and integrative medicine are designed to identify health care options that *optimally address* the unique history, symptoms, circumstances, needs, and preferences of an individual patient. Algorithms for planning integrative mental health care incorporate three general categories of information:

- Biomedical and CAM assessment or treatment modalities supported by the best available evidence contained in relevant up-to-date evidence tables.
- Opinions reflecting the professional judgment and experience of the practitioner or an expert consultant.
- Patient preferences and other pertinent practical financial or other constraints.

As described above, the detailed contents of the evidence tables are based on literature research supplemented by secondary sources such as expert opinions and conference proceedings. The evidence tables help the practitioner identify appropriate Western medical or CAM modalities or services to recommend when evaluating or treating one or more symptom patterns or "disorders." The determination of modalities that are appropriate to enter into an algorithm for use in treatment planning is based on the comparative evidence of effectiveness and safety for disparate modalities in the context of each patient's unique history of response to previous treatment (if any).

Information in the appropriate evidence tables, the patient's prior treatment history, current symptoms and symptom severity, and, in complex cases, comments on comorbid substance abuse or medical disorders are entered into the algorithm (see Chap. 9). This information is used to generate reasonable choices to consider when selecting assessment and treatment approaches. The accuracy and quality of information entered into the algorithm will determine the appropriateness of clinical

approaches generated by the algorithm for a unique patient. Inaccurate or incomplete patient information will result in a suboptimal care plan that does not adequately address that patient's unique symptoms, preferences, and constraints.

Algorithms used in integrative medicine and mental health care do not have a fixed starting point and—unlike algorithms used in Western medicine—the contents are not static and the logical flow of steps does not follow a fixed or predetermined path. In any given instance the most appropriate "starting point" is determined by where the patient is "located" in a multitiered process of receiving care including, for example, the initial appointment (i.e., the intake), assessment, and ongoing care. During the course of treatment changes in the algorithm are made on an ongoing basis to reflect:

- incomplete response to current treatment
- new symptoms calling for different assessment or treatment
- changes in evidence ratings assigned to modalities included in evidence tables based on new research findings

In some cases, treatment planning takes place in parallel with formal assessment or referral to a Western medical or CAM practitioner. In other cases, the work of integrative mental health care may focus exclusively on optimizing the dosages of natural supplements or psychotropic medications, improving nutrition, establishing a regular exercise program, or getting to greater clarity about the optimal type, duration and frequency of acupuncture treatments, psychotherapy, Healing Touch or another energy therapy. These considerations together with salient clinical information are different for each patient and provide the basis for developing an individualized care plan that is optimized to the patient's unique symptoms, preferences, and constraints.

With respect to a particular symptom pattern (i.e., "disorder") the most appropriate starting point and the most *appropriate* and *productive* pathway to follow within the algorithm depend on the following:

1. Symptom severity which will influence the choice of precedence of formal assessment (if any) techniques and treatments.
2. History of response *or non-response* to previous Western medical or CAM modalities.
3. The existence of comorbid substance abuse, mental health problems, or medical problems.

Broadly speaking, the algorithm is structured to direct the integrative practitioner to three kinds of goals which are not mutually exclusive:

- Maintaining optimal wellness or "well-being."
- Achieving a safe and effective treatment plan that adequately addresses symptoms.
- Preventing relapse when symptoms are well controlled.

Maintaining optimal wellness should be regarded as an important and appropriate goal for any patient no matter what their mental health issues may be. Relapse prevention should take place in parallel with "active" treatment using Western medical or CAM modalities and continue after "active" treatment has ended.

When, during the course of treatment, a new "ideal" care plan is determined (i.e., treatments that more effectively address symptoms based on new research evidence) patient preferences and constraints on cost and availability are used to identify a care plan that is "realistic" for a particular patient. It is likely that both the "ideal" and "realistic" care plan will vary over time with respect to any set of mental health (or other problems) for any given patient because information about disparate modalities, their relative evidence ratings, and patient preferences and constraints will probably change over time. In the future artificial intelligence (AI) software such as "Deep Learning" or "Deep Mind" will use algorithms to optimize treatment planning taking account of dynamic changes in a multiplicity of factors (see below).

Integrative Treatment Planning Is Iterative, Flexible, and Open

Several appointments may be required to gather all pertinent information about causes and meanings of symptoms, incorporate emerging assessment findings (if any) into the algorithm, and evaluate the safety and effectiveness of treatment. Treatment planning is iterative in that it may involve multiple "cycles" during which the formulation is modified based on changes in symptoms or new assessment findings, which may lead to changes in optimal treatment choices. The failure of a particular treatment plan to ameliorate symptoms will lead to new inputs in the algorithm that will generate new treatment options. New inputs may result in changes in the optimal treatment plan addressing a particular symptom pattern in the same patient at different times. In this way the algorithms invite a flexible, open approach to treatment planning.

The evidence base used in a treatment-planning algorithm is subject to modification when pertinent new research findings come to light. It is important for the integrative practitioner to keep in mind that the detailed contents of the evidence tables are subject to change as new research findings emerge for Western medical and CAM modalities. As noted above, in some cases, new findings will strengthen the evidence for a particular Western medical or CAM assessment or treatment approach, whereas in other cases new findings will weaken the evidence for a particular modality. Novel integrative strategies are generated and implemented until symptoms resolve, or remain unchanged after all reasonable, realistic (i.e., affordable and locally available) treatment choices are exhausted. During the course of treatment, integrative strategies regarded as optimal with respect to a specified symptom pattern (i.e., "disorder") will emerge in response to advances in both Western medicine and CAM.

It is important to update the evidence tables on a routine basis to ensure that significant new research findings are included and information found to be erroneous or obsolete is removed. This is an important consideration because content changes in the evidence tables may result in changes in integrative strategies generated by the algorithms.

Figure 6.2 illustrates the essential logic built into the algorithm to help practitioners plan integrative mental health care.

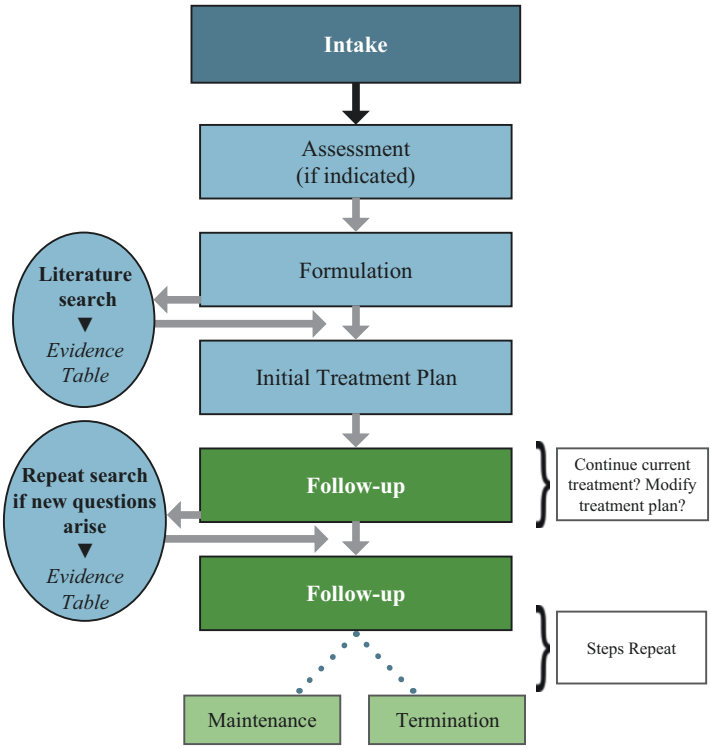

Fig. 6.2 Logic of algorithm for planning integrative mental health care (one principal condition). ***Comments***: (1) Poor or partial response, new assessment findings, adverse effects or treatment non-adherence may require modification of the treatment plan. (2) New symptoms lead to new questions calling for further literature search. Findings of literature search may suggest new assessment or treatment options and commensurate changes in the algorithm. (3) Changes in research evidence for existing assessment and treatment modalities, or emerging evidence for other modalities, may lead to changes in evidence ratings for existing modalities or adding new modalities to evidence table, and commensurate changes in the algorithm

The general algorithm and relevant evidence table(s) are modified during the course of treatment planning to reflect emerging new evidence, changes in treatment response, new symptoms, and changing preferences or constraints of each unique patient. A template for the general algorithm is available for downloading from the companion website. The algorithm is subsequently modified reflecting changes in symptoms, new assessment findings (if any), and outcomes that may point to the need for further assessment or new treatment approaches.

Chapters 7 and 8 describe how evidence tables and algorithms are used to help plan assessment and treatment, respectively, from an integrative perspective. Chapter 9 develops a methodology for the integrative management of severe mental health problems with high comorbidity including cases where a mental health problem co-occurs with substance abuse, a medical disorder or both.

Artificial Intelligence (AI) Is Transforming Medicine and Mental Health Care

Implications of AI for the Future of Mental Health Care

Artificial intelligence (AI) holds enormous promise for medicine and mental health care because it will permit practitioners to (Dilsizian & Siegel, 2014; Neill, 2013; Patel et al., 2009; Pearson, 2011):

- Rapidly extract useful information from very large data sets on patient medical information that were previously difficult and time consuming to access
- Rapidly access reliable resources containing up to date information on a broad range of Western medical and CAM modalities
- Use advanced AI tools for guidance in identifying optimal treatment protocols addressing complex cases and predicting treatment outcomes.

Most AI applications in health care utilize "supervised learning" an algorithm-based method that involves training software to determine optimal outcomes associated with particular symptoms and treatment choices. Software programs incorporating neural network algorithms are now being used to characterize complex nonlinear relationships between symptoms being treated, disparate treatment modalities (inputs), and clinical outcome measures that are difficult to ascertain using more traditional software tools. *Deep learning* is a recent off-shoot of neural network-based algorithms capable of investigating complex nonlinear relationships in data that are difficult or impossible to characterize using less advanced software. Deep learning algorithms widely used in medicine include convolution neural networks, recurrent neural networks and deep neural networks. In recent years, deep learning algorithms have been used to identify complex nonlinear relationships in data from functional brain imaging research that were previously impossible to analyze (Vieiraa, Pinayab, & Mechellia, 2017).

"Big Data" Makes Possible Analysis of Very Large Volumes of Complex Medical Data

Big data refers to very large, complex data sets for which existing data processing methods cannot provide useful analysis (Gantz & Reinsel, 2011; Laney, 2012). Data is categorized as "structured" or "unstructured." Structured data refers to information that adheres to a defined template or schema such as textbooks and articles published in medical journals. Advances in big data analysis methods will soon permit the automation of literature research yielding high quality information on a wide range of CAM modalities. In contrast to "structured" data, "unstructured" data contains information in a form that is difficult to analyze using traditional statistical methods. Examples of unstructured medical data include text in electronic health

records, images from diagnostic studies, and audio recordings. It is estimated that over 80% of "big data" consists of the so-called "unstructured" biomedical and health-related data. Obtaining big data that is useful for medical decision making is a nontrivial problem because payors and providers have different kinds of confidential data on the same patient often coded in different ways. The inability of traditional data analysis methods to make use of the majority of unstructured data, much less keep up with the sheer volume, complexity and variety of data has led to new processes for enhancing medical decision making and discovery.

Linking fragments of related data to data sets that are suitable for research purposes and modeling is a complex and time-consuming task. In big data there is often a trade-off between accuracy at the micro level and insights about treatment benefits at the macro level (Mayer-Schönberger & Cukier, 2013). This problem is being addressed by combining big data sets on multiple domains such as clinical research data, quality improvement data, electronic health records, and administrative claims data and using multivariate analysis to identify patient subgroups that may more likely respond to different treatments in different settings (Matthews, Edison, Geraghty, & Johnson, 2014). Valuable sources of big data in health care include the Centers for Medicare and Medicaid and a recently created directory of international databases on health care research (International Society for Pharmacoeconomics and Outcomes Research (ISPOR), 2012).

Applications of "Big Data" in Mental Health Care

A landmark research project used big data analysis methods to better understand the etiology of psychiatric disorders (Mewes, 2013). Super learning is a program being developed to predict outcomes to treatment of substance use disorders (Acion et al., 2017). The program compares data generated from a variety of prediction algorithms such as deep learning neural networks and logistic regression. A database consisting of 100,000 patients being treated for a substance use disorder analyzed using Super learning yielded outcomes predictions superior to all but one of the individual algorithms being compared. The same software could be applied to predict treatment outcomes of psychiatric disorders treated using different biomedical and CAM modalities. The results could then be used to modify treatment protocols to optimize outcomes.

In addition to "big data" "small data" (i.e., data generated by self-monitoring technologies and Apps) is being investigated as a source of clinically pertinent information in personalized medicine. In the future as health care relies more heavily on computerized data, both perspectives will probably be used to inform models and statistical methods. Social networking sites, blogs, and online discussion forums are also valuable sources of information on health, wellness, and adverse effects of medications or supplements (Bernardo et al., 2013; White, Tatonetti, Shah, Altman, & Horvitz, 2013).

AI Systems in Health Care Encompass Machine Learning and Natural Language Processing

In order to have practical clinical utility an AI system must encompass machine learning software capable of processing very large volumes of structured data, and natural language processing (NLP) software capable of mining unstructured data such as narrative text in electronic health records and medical imaging data. To assist health care providers with clinical decision making the AI system must be "trained" to a requisite level of expertise within a particular domain of medical knowledge. Following completion of training, it is vital to keep the supply of pertinent accurate medical data current. Widespread data sharing between payors and providers is critical in order for this to succeed (Kayyali, Knott, & Kuiken, 2013). IBM's Watson AI system includes both machine language and NLP capabilities and is being widely used in the field of cancer research (Lohr, 2016). Progress in implementing Watson and other sophisticated software in health care is being slowed by the absence of FDA standards on safety and efficacy applicable to AI systems. At present, the FDA classifies all AI systems as "general wellness products" (Graham, 2016) intended to promote wellness while presenting low safety risks to users.

Natural Language Processing for Extracting Unstructured Medical Information

Accessing important clinical data in physicians' notes calls for natural language processing software and requires overcoming hurdles of confidentiality. Natural language processing software is being used to extract key concepts and relationships in very large textual data sets contained in published biomedical literature; electronic health records and web-based medical resources (Doan, Conway, Phuong, & Ohno-Machado, 2014). Using automated natural language processing software text mining and analysis of the enormous volume of unstructured data contained in PubMed, other medical databases and electronic health records is a necessary response to the rapid rate of growth in medical data (Baumgartner, Cohen, Fox, Acquaah-Mensah, & Hunter, 2007; Lu, 2011).

Studies using natural language processing have analyzed unstructured data from millions of patients, converting key information into structured content leading to improved surveillance of treatment response as well as potentially harmful medication side effects (Leeper et al., 2013; LePendu et al., 2013). Advances in natural language processing are making it possible to directly use unstructured data in electronic health records (EHR) for research purposes (Pathak, Bailey, et al., 2013; Pathak, Kho, & Denny, 2013).

Dynamic Simulation Modeling

Dynamic simulation modeling (DSM) is an approach used to design and develop mathematical representations that simulate interventions and predict responses to them over time based on patient preferences and outcomes when limited or no data are available (Banks, 1998; Harrison, Lin, Carroll, & Carley, 2007; Marshall, Burgos-Liz, IJzerman, Crown, et al., 2015; Marshall, Burgos-Liz, IJzerman, Osgood, et al., 2015; Sokolowski & Banks, 2009).

DSM is being used in engineering to model problems that are too complex to solve using traditional analytic methods (Appelboom, LoPresti, Reginster, Sander Connolly, & Dumont, 2014). Big data and DSM are being applied to medicine to improve health care delivery and facilitate treatment planning that is faster and more consistent with research evidence (Marshall, 2012). DSM is being successfully used to estimate differences in effectiveness between health care interventions before they are implemented (Brailsford, Harper, Patel, & Pitt, 2009; Marshall, Burgos-Liz, IJzerman, Crown, et al., 2015; Marshall, Burgos-Liz, IJzerman, Osgood, et al., 2015). Big data and DSM have reciprocal synergistic relationships. DSM will allow widespread applications of big data to decision making in large health care systems. On the other hand, big data can provide updated research findings to ensure that the model is simulating outcomes based on the most current findings (Ong et al., 2010; Osgood & Liu, 2014).

Apps and Machine Learning Software Will Improve Integrative Mental Health Care

While computer programs cannot replace the experience, skill, expert judgment, and intuition of mental health professionals, the judicious use of software can improve mental health care by automating literature research and performing other tasks that take a great deal of time, effort and expense. As this book is going to press efforts are ongoing to develop a series of Apps for planning integrative mental health care. The Apps will help practitioners and patients develop individualized care plans addressing common mental health problems such as depressed mood, anxiety, and many others.

A long-term project aimed at developing sophisticated software using advanced machine learning algorithms and natural language processing is still in the early stages. When finished that software will automate the literature research process, generate individualized evidence tables and algorithms for integrative treatment planning on a case by case basis, and guide the integrative practitioner through all steps involved in planning and refining integrative care addressing the needs, preferences, and constraints of each unique patient. Incorporating the methods discussed in this book, the software will provide practitioners with a set of AI tools for developing individualized care plans addressing the complex needs, preferences, and constraints of unique patients. The software will permit integrative practitioners to evaluate the benefits and limitations of disparate treatment choices with respect to

the needs and preferences of a unique patient, determine the most effective and cost-effective treatment strategy, and identify treatment combinations most likely to have beneficial synergistic effects on target symptoms. As envisioned the software will:

- Identify high quality online resources and optimize literature research strategies.
- Automate literature research and seamlessly update the relevant evidence tables on an ongoing basis.
- Customize the content of evidence tables with respect to the unique history and symptoms of each patient.
- Populate the evidence tables with the most relevant and high-value findings from the medical literature, and modify content on an ongoing basis in light of significant new research findings.
- Rate the quality of evidence for different modalities and adjust comparative ratings on an ongoing basis in light of emerging research findings.
- Guide the practitioner in assigning relative priorities to disparate problems being addressed when managing complex patients with high comorbidity.
- Automatically incorporate content from the relevant evidence tables into appropriate steps in the algorithm and make changes in content in the algorithm in light of emerging research findings.
- Identify the most parsimonious care plan that adequately and cost-effectively addresses the symptoms of each unique patient.
- Generate a *realistic* individualized integrative care plan taking into account each patient's unique history, preferences, and constraints on cost and availability of medical resources.

Updates on the Apps and the machine learning software project are available on the companion website www.IntegrativeMentalHealthPlan.com.

Key Points

- In Western medicine findings from laboratory studies comprise the highest level of evidence used to demonstrate relationships between a putative mechanism of action and desirable changes in target symptoms.
- Non-Western systems of medicine conceptualize "evidence" in a variety of ways congruent with the values and beliefs of the parent culture.
- Efficacy has to do with how well a treatment works under ideal circumstances as in a controlled research setting.
- Effective treatments are those for which substantial evidence supports claims of consistent beneficial outcomes in non-laboratory conditions.
- Efficacious treatments are not always effective, and effective treatments are not always efficacious.
- The overall strength of evidence for the use of a particular modality can be expressed as a factor of the level and kind of available evidence supporting it.
- The optimal treatment regimen addressing a specified symptom pattern will ideally include the modality for which the strongest kind and highest level of evidence are present.

- Disparities between the strength of quantitative evidence and outcomes may reflect failure to take into account qualitative indices of patient satisfaction, insight or wellness that may interfere with positive outcomes.
- The strength of evidence for a given modality relative to other modalities used to treat a particular symptom pattern may increase or decrease over time.
- The first step in populating evidence tables is a computerized literature search to identify current reliable information about Western medical and CAM modalities.
- Using several literature search strategies in parallel often yields more complete information than any single strategy because every search strategy is inherently self-limiting or biased against certain kinds of medical information.
- Many studies on the effectiveness of psychotropic medications published in the peer-reviewed medical journal literature reflect ideological biases and economic interests of the pharmaceutical industry, academic psychiatry, and the American Psychiatric Association.
- Findings of meta-analyses authored by psychiatrists outside of the APA-academic "guild" should be used when searching for unbiased information about psychotropic medications for use in the evidence tables.
- Negative peer review bias against publications on CAM is a significant problem interfering with accurate and objective reporting of research findings.
- A clearly phrased question is the basis for any literature search. If the question is ambiguous, the literature search will be unfocused, important resources will be overlooked, and relevant information will be missed.
- The *kind* of evidence sought, that is, whether it is evidence of safety, treatment efficacy or effectiveness, or assessment specificity will determine the resources most likely to yield pertinent information.
- Disparate criteria for peer review in Western medicine and non-Western systems of medicine, combined with the selective exclusion of citations on topics outside of a defined area of interest, and different approaches to indexing, reflect the shared biases and beliefs of medical practitioners and administrators who design medical databases. This fact has resulted in the limited usefulness of any single medical database for the purposes of performing a comprehensive review of the literature pertaining to both Western medical and CAM approaches.
- To capture the greatest number of relevant citations from the medical and anthropological literature, descriptors of major categories of cognitive, affective, and behavioral symptoms used in both Western medicine and non-Western systems of medicine should be used as keyword search terms.
- The most robust search strategy should include both conventional biomedical psychiatric nomenclature and generic descriptors of common mood symptoms (e.g., "anxiety," "sadness," "agitation," as well as relevant culture-specific descriptions of emotional distress).
- Reliable prefiltered sources include the Cochrane databases, the TRIP database, the Allied and Complementary Medicine Database (AMED), and Bandolier.
- In contrast to resources on prefiltered medical information "evidence mapping" includes studies other than randomized controlled trials (RCT) when evaluating medical evidence.

- Key findings of the literature search including links to online sources are sorted into predefined cells of evidence tables by major symptom pattern (or disorder) and ranked as "substantiated," "provisional" or "possibly effective."
- Algorithms describe how information flows from initial conditions to a series of possible outcomes through progressively branching steps in treatment planning guided by empirical information, analytical judgments, and subjective considerations.
- Clinical practice guidelines used in all systems of medicine and the algorithms on which they are based are inherently limited by sociocultural and institutional biases of the parent system of medicine from which they originate, and also by biases of their authors.
- The majority of treatment-planning algorithms used in Western medicine exclude CAM and lifestyle interventions without comparing findings of effectiveness to "standard" Western medical modalities.
- Algorithms used in Western medicine are limited in that they identify standardized health care approaches addressing a generic "disorder" in a group of individuals who share the same diagnosis.
- There is no standard or best integrative strategy for all patients who report similar affective, cognitive, or behavioral symptoms because every individual has a unique psychological, biological, and energetic constitution thus unique causes or meanings of symptoms are present in patients who report similar symptoms.
- The optimal integrative strategy for a given patient depends on his or her history, symptoms, circumstances, preferences, and financial constraints in the context of locally available health care resources, and the professional judgment and clinical experience of the practitioner.
- Information in the appropriate evidence tables, the patient's prior treatment history, current symptoms and symptom severity, the presence of comorbid substance abuse, or medical disorders are entered into the algorithm and used to generate outputs that guide the integrative practitioner in selecting appropriate *individualized* assessment and treatment approaches.
- The accuracy and quality of information put into an algorithm will determine the effectiveness and relevance of clinical solutions generated by it for each unique patient.
- The algorithms direct the integrative practitioner to three kinds of goals which are not mutually exclusive: maintaining optimal wellness or "well-being"; achieving a safe and effective treatment plan that adequately addresses symptoms; preventing relapse when symptoms are well controlled.
- The failure of a particular treatment plan to ameliorate symptoms will lead to new inputs in the algorithm that will generate new treatment options.
- The detailed contents of the evidence tables are subject to change as new research findings emerge for conventional biomedical and CAM modalities.
- In some cases, new findings will strengthen the evidence for a particular Western medical or CAM assessment or treatment approach, whereas in other cases new findings will weaken the evidence for a particular modality.
- Artificial intelligence (AI) holds enormous promise for medicine and mental health care because it will permit practitioners to rapidly extract useful informa-

tion from very large data sets on patient medical information that were previously difficult and time consuming to access; to rapidly access reliable resources containing up-to-date information on a broad range of Western medical and CAM modalities; and to use advanced AI tools for guidance in identifying optimal treatment protocols addressing complex cases and predicting treatment outcomes.

- Software programs incorporating neural network algorithms are now being used to characterize complex nonlinear relationships between symptoms being treated, disparate treatment modalities (inputs) and clinical outcomes measures that are difficult to ascertain using more traditional software tools.
- Advances in big data analysis methods will soon permit the automation of literature research yielding high quality information on a wide range of CAM modalities.
- In order to have practical clinical utility an AI system must encompass machine learning software capable of processing very large volumes of structured data, and natural language processing (NLP) software capable of mining unstructured data.
- Dynamic simulation modeling (DSM) is an approach used to design and develop mathematical representations that simulate interventions and predict responses to them over time based on patient preferences and outcomes when limited or no data are available.
- DSM is being successfully used to estimate differences in effectiveness between health care interventions before they are implemented.

References

ISPOR Connections. (2012). International Society for Pharmacoeconomics and Outcomes Research (ISPOR) (pp. 3–4). Retrieved from http://www.ispor.org

Acion, L., Kelmansky, D., van der Laan, M., Sahker, E., Jones, D., & Arndt, S. (2017). Use of a machine learning framework to predict substance use disorder treatment success. *PLoS One, 12*(4), e0175383.

Appelboom, G., LoPresti, M., Reginster, J. Y., Sander Connolly, E., & Dumont, E. P. (2014). The quantified patient: A patient participatory culture. *Current Medical Research and Opinion, 30*(12), 2585–2587.

Banks, J. (1998). *Handbook of simulation*. New York: Wiley.

Barry, C. A. (2006). The role of evidence in alternative medicine: Contrasting biomedical and anthropological approaches. *Social Science & Medicine, 62*(11), 2646–2657.

Baumgartner Jr., W. A., Cohen, K. B., Fox, L., Acquaah-Mensah, G. K., & Hunter, L. (2007). Manual curation is not sufficient for annotation of genomic databases. *Bioinformatics, 23*, i41–i48.

Beckner, W., & Berman, B. (2003). *Complementary therapies on the Internet*. St. Louis, MO: Churchill Livingstone.

Bernardo, T. M., Rajic, A., Young, I., Robiadek, K., Pham, M. T., & Funk, J. A. (2013). Scoping review on search queries and social media for disease surveillance: A chronology of innovation. *Journal of Medical Internet Research, 15*(7), e147.

Brailsford, S. C., Harper, P. R., Patel, B., & Pitt, M. (2009). An analysis of the academic literature on simulation and modelling in health care. *Journal of Simulation, 3*(3), 130–140.

Browman, G. (2001). Development and aftercare of clinical guidelines: The balance between rigor and pragmatism. *Journal of the American Medical Association, 286*, 1509–1511.

Dilsizian, S. E., & Siegel, E. L. (2014). Artificial intelligence in medicine and cardiac imaging: Harnessing big data and advanced computing to provide personalized medical diagnosis and treatment. *Current Cardiology Reports, 16*, 441.

Doan, S., Conway, M., Phuong, T. M., & Ohno-Machado, L. (2014). Natural language processing in biomedicine: A unified system architecture overview. In R. J. A. Trent (Ed.), *Clinical bioinformatics*. New York: Springer.

Doshi, P., Kickersin, K., Healy, D., Vedula, S., & Jefferson, T. (2013, June). Restoring invisible and abandoned trials: A call for people to publish the findings, *BMJ, 13*, 346.

Doshi, P., Shamseer, L., Jones, M., & Jefferson, T. (2018, April 26). Restoring biomedical literature with RIAT. *BMJ, 361*, k1742.

Gantz, J., & Reinsel, D. (2011). Extracting value from chaos. *IDC Iview, 1142*, 9–10. Good Practices Task Force. Value Health. 2015b;18(1):5–16.

Graham, J. (2016). *Artificial intelligence, machine learning, and the FDA*. Retrieved from https://www.forbes.com/sites/theapothecary/2016/08/19/artificial-intelligence-machine-learning-and-the-fda/#4aca26121aa1

Gray, G. (2004). *Concise guide to evidence-based psychiatry*. Washington, DC: American Psychiatric Publishing.

Guyatt, G., & Rennie, D. (Eds.). (2002). *Users' guide to the medical literature: Essentials of evidence-based clinical practice*. Chicago: AMA Press.

Harrison, J. R., Lin, Z., Carroll, G. R., & Carley, K. M. (2007). Simulation modeling in organizational and management research. *The Academy of Management Review, 32*(4), 1229–1245.

Hayes, M. J., & Prasad, V. (2018). Financial Conflicts of Interest at FDA Drug Advisory Committee Meetings. *Cent Rep.* 48(2):10–13.

Jadad, A., & Gagliardi, A. (1998). Rating health information on the Internet: Navigating to knowledge or to Babel? *Journal of the American Medical Association, 279*, 611–614.

Jašović-Gašić, M., Dunjic-Kostić, B., Pantović, M., Cvetić, T., Marić, N. P., & Jovanović, A. A. (2013). Algorithms in psychiatry: State of the art. *Psychiatria Danubina, 25*(3), 280–283.

Katz, D. L., Williams, A. L., Girard, C., Goodman, J., Comerford, B., Behrman, A., et al. (2003). The evidence base for complementary and alternative medicine: Methods of evidence mapping with applications to CAM. *Alternative Therapies in Health and Medicine, 9*(4), 22–30.

Kayyali, B., Knott, D., & Kuiken, S. V. (2013). *The big-data revolution in US health care: Accelerating value and innovation*. Retrieved from http://www.mckinsey.com/industries/healthcare-systems-and-services/ourinsights/the-big-data-revolution-in-us-health-care

Laney, D. (2012). *The importance of 'big data': A definition*. Gartner. Retrieved from https://www.scirp.org/(S(oyulxb452alnt1aej1nfow45))/reference/ReferencesPapers.aspx?ReferenceID=1287330

Leeper, N. J., Bauer-Mehren, A., Iyer, S. V., LePendu, P., Olson, C., & Shah, N. H. (2013). Practice-based evidence: Profiling the safety of cilostazol by text-mining of clinical notes. *PLoS One, 8*(5), e63499.

LePendu, P., Iyer, S. V., Bauer-Mehren, A., Harpaz, R., Mortensen, J. M., Podchiyska, T., et al. (2013). Pharmacovigilance using clinical notes. *Clinical Pharmacology & Therapeutics, 93*(6), 547–555.

Lohr, S. (2016). *IBM is counting on its bet on Watson, and paying big money for it*. Retrieved from https://www.nytimes.com/2016/10/17/technology/ibm-is-counting-on-its-bet-on-watson-and-paying-big-money-for-it.html

Lu, Z. (2011). PubMed and beyond: A survey of web tools for searching biomedical literature. *Database, 2011*, baq036.

Lurie, P. (2018). Suggestions for improving conflict of interest processes in the US Food and Drug Administration Advisory Committees-Past Imperfect. *JAMA Internal Medicine, 178*(7), 997–998. https://doi.org/10.1001/jamainternmed.2018.1324

Mancano, M., & Bullano, M. (1998). Meta-analysis: Methodology, utility, and limitations. *Journal of Pharmacy Practice, 11*(4), 239–250.

Manchikanti, L., Kaye, A. D., Boswell, M. V., & Hirsch, J. A. (2015, January–February). Medical journal peer review: Process and bias. *Pain Physician, 18*(1), E1–E14.

Marshall, D. A. (2012). Getting connected: Systems solutions for generating maximal value from health care resources. In International Society for Pharmacoeconomics and Outcomes Research (ISPOR) Connections. 2012, International Society for Pharmacoeconomics and Outcomes Research (ISPOR) (pp. 3–4).

Marshall, D. A., Burgos-Liz, L., IJzerman, M. J., Crown, W., Padula, W. V., Wong, P. K., et al. (2015). Selecting a dynamic simulation modeling method for health care delivery research—part 2: Report of the ISPOR Dynamic Simulation Modeling Emerging Good Practices Task Force. *Value in Health, 18*(2), 147–160.

Marshall, D. A., Burgos-Liz, L., IJzerman, M. J., Osgood, N. D., Padula, W. V., Higashi, M. K., et al. (2015). Applying dynamic simulation modeling methods in health care delivery research—The SIMULATE checklist: Report of the ISPOR Simulation Modeling Emerging Good Practices Task Force. *Value in Health, 18*(1), 5–16.

Matthews, P. M., Edison, P., Geraghty, O. C., & Johnson, M. R. (2014). The emerging agenda of stratified medicine in neurology. *Nature Reviews Neurology, 10*(1), 15–26.

Mayer-Schönberger, V., & Cukier, K. (2013). *Big data: A revolution that will transform how we live, work, and think*. New York: Houghton Mifflin Harcourt.

Mewes, H. W. (2013). Perspectives of a systems biology of the brain: The big data conundrum understanding psychiatric diseases. *Pharmacopsychiatry, 46*(Suppl 1), S2–S9.

Miller, A. L., Crismon, M. L., Rush, A. J., Chiles, J., Kashner, M., Toprac, M., et al. (2004). The Texas medication algorithm project: Clinical results for schizophrenia. *Schizophrenia Bulletin, 30*, 627–647.

Moore, M., & McQuay, H. (2006). *Bandolier's little book of making sense of the medical evidence*. New York, NY: Oxford University Press.

Morley, J., Rosner, A. L., & Redwood, D. (2001). A case study of misrepresentation of the scientific literature: Recent reviews of chiropractic. *Journal of Alternative and Complementary Medicine, 7*(1), 65–78.

Neill, D. B. (2013). Using artificial intelligence to improve hospital inpatient care. *IEEE Intelligent Systems, 28*, 92–95.

Ong, J. B. S., Chen, M. I., Cook, A. R., Lee, H. C., Lee, V. J., Lin, R. T., et al. (2010). Real-time epidemic monitoring and forecasting of H1N1-2009 using influenza-like illness from general practice and family doctor clinics in Singapore. *PLoS One, 5*(4), e10036.

Osgood, N., & Liu, J. (2014). Towards closed loop modeling: Evaluating the prospects for creating recurrently regrounded aggregate simulation models using particle filtering. In *Proceedings of the 2014 Winter Simulation Conference*. IEEE Press.

Patel, V. L., Shortliffe, E. H., Stefanelli, M., Szolovits, P., Berthold, M. R., Bellazzi, R., et al. (2009). The coming of age of artificial intelligence in medicine. *Artificial Intelligence in Medicine, 46*, 5–17.

Pathak, J., Bailey, K. R., Beebe, C. E., Bethard, S., Carrell, D. S., Chen, P. J., et al. (2013). Normalization and standardization of electronic health records for high-throughput phenotyping: The SHARPn consortium. *Journal of the American Medical Informatics Association, 20*(e2), e341–e348.

Pathak, J., Kho, A. N., & Denny, J. C. (2013). Electronic health records-driven phenotyping: Challenges, recent advances, and perspectives. *Journal of the American Medical Informatics Association, 20*(e2), e206–e211.

Pearson, T. (2011). *How to replicate Watson hardware and systems design for your own use in your basement*. https://www.ibm.com/developerworks/community/blogs/insideSystemStorage/entry/ibm_watson_how_to_build_your_own_watson_jr_in_your_basement7?lang=en

Pham-Kanter, G. (2014, September). Revisiting financial conflicts of interest in FDA advisory committees. *The Milbank Quarterly, 92*(3), 446–470.

Rankin-Box, D. (2006, May). Shaping medical knowledge II: Bias and balance. *Complementary Therapies in Clinical Practice, 12*(2), 77–79.

Resch, K., Ernst, E., & Garrow, J. (2000). A randomized controlled study of reviewer bias against an unconventional therapy. *Journal of the Royal Society of Medicine, 93*(4), 164–167.

Sokolowski, J. A., & Banks, C. M. (2009). *Principles of modeling and simulation: A multidisciplinary approach*. Hoboken: Wiley.

Vieiraa, S., Pinayab, W. H. L., & Mechellia, A. (2017). Using deep learning to investigate the neuroimaging correlates of psychiatric and neurological disorders: Methods and applications. *Neuroscience and Biobehavioral Reviews, 74*, 58–75.

Whitaker, R., & Cosgrove, L. (2015). *Psychiatry Under the Influence: Institutional corruption, social injury and prescriptions for reform*. New York, NY: Palgrave Macmillan.

White, R. W., Tatonetti, N. P., Shah, N. H., Altman, R. B., & Horvitz, E. (2013). Web-scale pharmacovigilance: Listening to signals from the crowd. *Journal of the American Medical Informatics Association, 20*(3), 404–408.

Chapter 7
History-Taking, Assessment, Diagnosis, and Formulation

"The value of experience is not in seeing much, but in seeing wisely."

—Sir William Osler MD

Contents

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Foundations of Diagnosis and Assessment in Western Medicine and CAM

Incomplete Understandings of the Causes of Mental Illness

The hypothesis that internal and external factors "cause" mental illness and that there are genetic predispositions to *maladies mentales* dates to Freud (Freud, 1909/1955); however, research findings are inconsistent. Advances in understanding of the biological basis of mental illness using gene mapping and other molecular genetics techniques are limited by poorly defined, complex interactions between multiple genes and gene–environment interactions (Owen, Cardno, & O'Donovan, 2000; Owen, Holmans, & McGuffin, 1997). In molecular genetics research, gene mapping (genomics) is combined with proteomics, which has the goal of creating a database of correspondences between complex polygenic interactions and effects on protein synthesis that may manifest as medical or psychiatric illness (Anthony, 2001). Molecular genetics research uses gene mapping of polygenic markers associated with increased susceptibility to a particular mental illness. A related step is gene cloning to determine whether an identified gene is associated with changes in protein synthesis that affect neurotransmitter or receptor structure or function in ways that can be expected to produce psychiatric symptoms. There is evidence that genetic factors are involved in at least some cases of bipolar disorder, depressive or anxiety symptoms, schizophrenia, and alcoholism (Cutrona et al., 1994; Kendler, 1995; Kendler, Heath, Martin, & Eaves, 1987; Reiss et al., 1995; Wahlberg et al., 1997). However, except for the finding of an association between the APO E-4 allele and a subset of individuals with early-onset Alzheimer's disease, discrete relationships between specific genetic problems and the phenotypes of specific psychiatric disorders have not been identified. The dominant status of molecular genetics as the "holy grail" of psychiatric research has diminished the relative importance of studies on social and cultural factors, including poverty, unemployment, and ethnic conflicts, as well as nongenetic concomitants of mental illness (Thomas, Romme, & Hamelijnck, 1996).

Symptom Patterns or Disorders?

Making inferences about the causes and meanings of symptoms is a prerequisite to developing an accurate formulation and deriving an adequate and effective treatment plan. Affective, cognitive, and behavioral symptoms may correspond to psychopathological processes at one or more levels of psychological, neurobiological, or possibly energetic functioning (Krueger, 1999; Krueger, Caspi, Moffitt, & Silva, 1998). Because of the multiplicity of factors that potentially influence symptom formation there are seldom simple or discrete causes of mental illness. By the same token few cognitive, affective, or behavioral symptoms recur in a coherent and predictable manner (Shanfield, 2004). In contrast to causes, the *meanings* assigned to

symptoms are subjective interpretations of distress or impaired functioning that reflect an individual's beliefs, values, and culture.

The system of medicine in which symptoms are investigated biases interpretations of subjective experiences regarded as *pertinent*, that is, those which reflect *pathology*. For example, in contemporary psychiatry certain kinds of subjective experiences are regarded as *disorders*, whereas other kinds of subjective experiences are regarded as *normal variants* of affect, cognition, or behavior. The definition of "disorder" in psychiatry is based on expert consensus on thresholds of symptom severity or functional impairment below which there is *no* disorder, and above which a disorder is said to be present (Zimmerman, Chelminski, & Young, 2004). According to the current dogma symptom patterns comprising "disorders" are stable over time, occur in the same way in different populations, and are verifiable by qualified, independent observers (i.e., they have interrater reliability). Using these criteria, a psychiatric "disorder" can be understood as a pattern of a pattern, or a "meta-pattern" of affective, cognitive, or behavioral symptoms. However, there is ongoing debate among academic psychiatrists and the community of non-medically trained mental health providers over appropriate threshold values of criteria that permit diagnosis of a legitimate "disorder" (Regier 2004). Furthermore, non-Western systems of medicine are based on disparate assumptions about the causes (if any), meanings and significance of symptoms. Thus, mental and emotional "disorders" described in Western medicine and non-Western systems of medicine seldom overlap.

In real world populations mental illness is characterized by complex symptom patterns that change over time, *not* unchanging aggregates of symptoms. Changes in symptoms occur in relationship to dynamic internal (biological and psychological) and external (social, cultural, and family) influences that are difficult to quantify. Epidemiologic studies show considerable variation in core symptoms over time among individuals diagnosed with a particular psychiatric disorder, and significant interindividual variation in symptom type and severity for individuals diagnosed with the same disorder. Findings of prospective longitudinal studies show that symptom patterns reported by individuals diagnosed with major depressive disorder, panic disorder, social anxiety disorder, and other anxiety disorders lack stability over time (Angst, 1996; Wittchen & Von Zerssen, 1987). In sum, there are few core psychopathological processes (Wittchen, Hofler, & Merikangas, 1999).

Factor analysis of psychiatric comorbidity based on epidemiologic data suggests that certain core symptoms (and presumably underlying psychopathological processes) are associated with complex presentations of cognitive, affective, behavioral, and somatic symptoms (Kessler, Chiu, & Demler, 2005). The above findings imply that diagnostic criteria in current use do not accurately reflect the phenomenology and comorbidity of mental illness. A more adequate model needs to be developed that includes a developmental perspective and takes into account dynamic processes that influence the formation and persistence of discrete symptoms or complex *symptom patterns* during development in the context of genetic and epigenetic factors that are highly variable among individuals who report similar symptoms (Carragher, Krueger, Eaton, & Slade, 2015).

Diagnosis in Conventional Mental Health Care—Progress and Pitfalls

There is ongoing controversy over how to define and categorize mental health problems. There is no consensus definition of what constitutes a "mental disorder." Criteria used to classify affective, cognitive, or behavioral states as "disorders" vary widely over time and across cultures (Giosan, Glovsky, & Haslam, 2001; World Health Organization, 2005). While some argue that classifying symptoms into "disorders" reflects value judgments of practitioners, others argue that the process reflects rigorous scientific understandings of the nature and causes of symptoms. Classification schemes used in industrialized countries such as the Diagnostic and Statistical Manual of Mental Disorders (DSM) and the International Classification of Diseases (ICD) Classification of Mental and Behavioral Disorders strive to be a-theoretical in that they describe the phenomenology of symptoms but do not impute their causes. The validity and clinical utility of different classification schemes across disparate cultures have been widely criticized (Baca-Garcia et al., 2007; Beutler & Malik, 2002; Cosgrove, Krimsky, Vijayaraghavan, & Schneider, 2006; Hudziak & Helzer, 2002; Munro & Bhugra, 1997).

Through progressive revisions of a formal classification scheme of psychiatric disorders, biomedical psychiatry tacitly admits to incomplete understandings of the causes of mental illness. Early versions of the DSM put forward psychodynamic explanations of mental and emotional disorders. Later versions attempted to divide symptoms along the so-called functional and organic lines on the presumption that some disorders are manifestations of intrinsic biological processes while others are a consequence of extrinsic social or cultural factors. That approach resulted in a debate over the boundaries between functional and organic causes of mental illness that led to the elimination of the organic-functional dichotomy starting with the DSM-IV in 1994. Since that time, classification in psychiatry has taken a neutral or "a-theoretical" stance, with the goal of avoiding making unprovable inferences about mechanisms of action based on ambiguous findings. Causes of symptoms are no longer discussed in the DSM with the result that diagnostic classification of "mental disorders" relies almost exclusively on self-reported history or semiquantitative inventories of self-reported symptoms.

The most recent edition of the DSM—the DSM5—has stimulated contentious debate within academic psychiatry, among mental health professionals and in public discourse broadly (Frances, 2013). Critics of the DSM5 argue that new diagnostic criteria are often too vague to be useful and that many new disorders are not adequately supported by research findings and have low interrater reliability. Changes in diagnostic thresholds introduced for many disorders in the DSM5 have resulted in *apparent* increases in numbers of children and adults being diagnosed with specific disorders such as attention deficit hyperactivity disorder (ADHD), autism spectrum disorders, bipolar disorder, and others (Nemeroff et al., 2013). This situation has resulted in overdiagnosis of several "disorders" when pathology is not present and increased rates of psychotropic medication prescribing in all age groups when treatment is unnecessary or may have harmful consequences.

The practice of creating labels for diagnostic categories that may not exist in real-world populations has led to a muddle in contemporary psychiatric thinking. According to some critics the above issues have led to a crisis in confidence in psychiatric diagnosis among both psychiatrists and the general public (Frances, 2013). An alternative methodology to the DSM categorizes symptoms along a continuum from normal to disturbed, avoiding the need for classification of symptoms into discrete disorders that may lack construct validity (Shanfield, 2004).

The construct validity of the concept "psychiatric disorder" rests on the assumption that symptom patterns occur in highly organized ways and that self-reported subjective states provide accurate and reliable information about the quality and severity of symptoms. I have argued that this is clearly not the case. Psychiatry has adopted a strictly descriptive methodology for classifying symptoms into disorders that circumvents questions about causes of symptoms because such questions *cannot be answered* by current science. The result is that while some DSM diagnostic categories may reliably correspond to symptom patterns that occur in real-world populations, other categories of "disorders" are labels of symptom patterns that may not exist outside of the academic literature. The presumption of clear understanding in the face of unresolved problems in theory and method has resulted in slow research progress, the absence of consensus on research priorities, and the widespread use of clinical practices that are frequently ineffective or unsafe. This issue is more than a curious footnote about a misguided dogma embedded in psychiatry as it has practical consequences that impact how millions of individuals are evaluated and treated for mental health problems.

Assessment in Conventional Mental Health Care—What It Can and Cannot Do

Assessment in biomedical psychiatry entails a review of medical and psychiatric records, a structured diagnostic interview eliciting pertinent history and current symptoms, a brief mental state examination, and in some cases, the use of standardized symptom rating scales (e.g., Beck Depression Inventory, the Hamilton Anxiety Scale, and others). The biopsychosocial model stipulates the use of a tiered approach for obtaining information about relationships between the patient's biological, psychological, and social history and reported symptoms. Assessment approaches used in psychiatry have changed little since the late nineteenth century, have not been strongly validated by rigorous empirical testing, and rely on statistical or narrative interpretations of patient reports of highly subjective phenomenological experiences (Berrios & Markova, 2002).

Psychiatry relies on inferences about the nature and causes of pathology based on self-reported subjective states that are seldom empirically verifiable. The essential logic of this method involves identifying symptom patterns that cause distress or impair functioning, and subsequently determining treatment choices that address imputed causes of symptoms. Biomedical psychiatry assumes that symptoms are

caused by discrete biological processes manifesting as distressing emotions, impaired cognitive functioning, maladaptive behavioral changes and so on. Indirect causes of symptoms including acute or chronic stresses lead to biological (including neurobiological and endocrinological) changes manifesting as symptoms. Making inferences about underlying neurobiological causes of symptoms is seldom straight forward. Genetic and laboratory studies often result in ambiguous findings that do not correspond to discrete "disorders." Genetics studies show that specific genes regulate activity in brain circuits associated with symptoms and that the neurobiological or genetic basis of discrete cognitive or affective symptoms does not vary across different DSM disorders in which the same symptom is present (Stahl, 2003a, 2003b). This finding is consistent with findings that the same psychotropic drug is often an effective treatment of similar symptoms that occur in different "disorders."

There is a schism between the proposed "a-theoretical" empirically based descriptive nosology implicit in the DSM and the highly subjective information obtained from structured clinical interviews that frequently constitute the sole basis for diagnosing an individual with a psychiatric disorder. Although structured interviews have improved over time they are seldom used in clinical settings and their validity in terms of interrater reliability is questionable (Regier et al., 1998). Laboratory studies are sometimes ordered when a psychiatrist or other health care provider suspects an underlying medical cause of symptoms. Frequently ordered tests include thyroid studies, complete blood count (CBC), urinalysis, serum iron levels, and assays of liver enzymes and kidney function. Psychiatrists may refer patients who complain of apparent neurological symptoms to a neurologist for a formal evaluation, including electroencephalography (EEG) and brain scans, to obtain detailed structural or functional information about the brain to rule out primary diseases of the central nervous system. Functional neuroimaging, including functional magnetic resonance imaging (fMRI), quantitative electroencephalography (qEEG), single photon emission computed tomography (SPECT) and positron emission tomography (PET), will play an increasingly important role in psychiatric assessment. Information obtained from structured interviews and laboratory and neuroimaging studies provides the practitioner with a broad diagnostic picture of possible social, psychological, or biological causes of symptoms, and points to social, psychological and biological treatments that can reasonably be expected to address identified causes and meanings of symptoms. Evidence-based medicine (EBM) claims to base diagnostic conclusions and treatment choices on rigorous evaluation of pertinent empirical information accepted as valid indices of illness or health. However, history taking in EBM relies on narrowly formulated questions that often overlook symptomatic complaints that do not fit into preconceived understandings of illness. In cases where there is limited empirical evidence of a cause (i.e., based on biomedical assessment), symptoms may be branded as "psychosomatic" and are often presumed to be psychological in origin.

In cases where empirical findings suggest a likely cause or causes of a particular symptom pattern, direct causal relationships between biological processes and subjective experiences are seldom confirmed. Assessment approaches used in psychiatry, including urine assays of neurotransmitter metabolites, serum endocrinological

assays, and structural and functional brain-imaging (e.g., computed tomography, functional magnetic resonance imaging (fMRI), and quantitative electroencephalography (qEEG), single photon emission computed tomography, and positron emission tomography (PET)) frequently yield nonspecific information about the patient's general state of health, or general brain structure and function. Thus, with few exceptions, the information available from psychiatric assessment generally does not support inferences about discrete causal relationships between symptom patterns and their postulated causes at the level of neurotransmitters, neurons, or brain circuits. Ambiguous findings obtained from psychiatric assessment have resulted in numerous models and few falsifiable hypotheses linking affective, cognitive, or behavioral symptoms to discrete underlying causes of brain dysfunction. After more than a century of intensive research efforts the majority of psychiatric "disorders" are supported by inconclusive and limited findings pertaining to discrete neurobiological or other kinds of causes (Beutler & Malik, 2002).

With few exceptions, the occurrence of psychiatric "disorders" in populations cannot be verified because available assessment approaches are not able to demonstrate causal relationships between discrete symptom patterns and discrete neurobiological or other biological processes. In other words, there are few reliable markers for most psychiatric "disorders." Exceptions include the severe form of bipolar disorder (bipolar I), severe psychotic syndromes, and some dementias. In these cases, discrete genetic or neurobiological factors probably play important roles in the progression of illness, and there is considerable overlap in the phenomenology of symptom patterns between individuals diagnosed with the same "disorder." In view of the absence of a strong empirical methodology for verifying putative biological causes of cognitive, affective, and behavioral symptoms, most so-called psychiatric "disorders" should be regarded as arbitrary constructs.

CAM Assessment Approaches in Mental Health Care—Overview

Many conventionally trained physicians recommend CAM approaches only after mainstream Western medical approaches have failed. This is regarded as a "conservative" approach because it gives precedence to conventional biomedical approaches over CAM modalities (Eisenberg, 1997). In fact, no dichotomy exists between biomedicine and CAM on the basis of strength of evidence alone. Some CAM approaches are substantiated by strong research evidence while some biomedical approaches in current use are supported by weak or inconsistent findings.

Recent advances in neuroscience suggest that the causes of mental illness may be *subtler* and more *complex* than the prevailing biopsychosocial model is capable of elucidating. Novel practitioner-centered assessment approaches (e.g., kinesiology and Healing Touch) and emerging technologies will permit future integrative practitioners to capture information that is unattainable using contemporary biomedical assessment approaches. The result will be a more complete understanding of neuro-

biological, somatic, and postulated "energetic" processes associated with cognitive, affective, and behavioral symptoms. Assessment approaches based on emerging paradigms in science or non-Western systems of medicine are frequently rejected by Western medicine because they have not been validated by Western style research studies (Ernst & Hentschel, 1995).

Important advances in the biological assessment of cognitive, affective, and behavioral symptoms are taking place in functional medicine. Technology-based assessment approaches including quantitative electroencephalography (qEEG) and heart rate variability (HRV) monitoring, provide useful clinical information about functional dysregulations of the brain and heart related to mental illness. Assessment approaches that purport to detect postulated forms of "energy" not validated by current science are being used to assess mental health problems. These include applied kinesiology, pulse diagnosis in Chinese, Ayurvedic, and Tibetan medicine, analysis of the vascular autonomic signal (VAS), and gas discharge visualization (GDV).

CAM assessment approaches can be divided into four general categories:

- Assays of biological structure or function.
- Measures of bodily structure or function on a gross (i.e., whole body) level.
- Measures of kinds of energy or information that have been validated by current science.
- Measures of postulated "subtle" energetic or informational processes that have *not* been validated by current science.

Functional medicine is an emerging interdisciplinary field that uses established quantitative analysis methods to investigate relationships between nutritional status, neurotransmitters, endocrine and immune function, and psychological symptoms. Functional tests used to evaluate psychiatric disorders include urinary assays of neurotransmitters and their metabolites and serum assays of cholesterol, triglycerides, vitamins, minerals, amino acids and their metabolites, hormones, fatty acids, proinflammatory cytokines (e.g., interleukin-6 [IL-6], IL-8, and IL-1b), and immunologic factors. At present there are no specific or sensitive immunologic markers of specific cognitive, affective, or behavioral symptoms. Although chronic depressed mood is associated with suppression of certain immunologic factors (e.g., lower natural killer cell activity and decreased lymphocytes) and excess activity of others (e.g., increased neutrophils and increased haptoglobin levels), these relationships are inconsistent. Highly specific biological markers of specific psychiatric disorders have not been identified, and functional assessment findings generally do not translate into treatment strategies that yield improved outcomes.

Central nervous system (CNS) levels of certain neurotransmitters including norepinephrine, epinephrine, and phenylethylamine (PEA), and serum or urine levels of neurotransmitter metabolites follow a diurnal pattern of variation. A possible CNS deficiency state of a specific neurotransmitter that follows a circadian pattern can best be determined by performing an assay when levels are expected to be high. In contrast, a possible CNS excess of a specific neurotransmitter can best be determined by taking measurements when levels are expected to be low according to the normal diurnal variation of the neurotransmitter. The use and timing of psychotropic medications or

CAM treatments, diet, stress, and activity level can influence neurotransmitter levels. Urine specimens collected in the early morning are less likely to be affected by these factors, and therefore will more likely show a baseline deficiency or excess of a specific neurotransmitter. Calculating ratios of neurotransmitters to creatinine in the urine compensates for urinary dilution and may provide more accurate indicators of CNS levels of specific neurotransmitters compared with measurements of neurotransmitters alone.

In his membrane phospholipid model Horrobin (Horrobin, 1996, 1998) proposed that abnormal metabolism of phospholipids resulting from genetic and environmental factors manifests as a chronic severe symptom pattern classified as schizophrenia or other severe psychiatric disorders. The hypothesis suggests that a spectrum of psychiatric disorders is associated with abnormalities at the level of the neuronal membranes, and that the type and severity of symptoms reflect the magnitude and type of metabolic errors leading to abnormal phospholipid metabolism. Severe psychiatric syndromes like schizophrenia develop when genetic errors of metabolism resulting in chronic brain deficiencies of dietary fatty acids are combined with other metabolic abnormalities resulting in errors of fatty acid incorporation in phospholipid membranes or abnormally high rates of removal of fatty acids from nerve cell membranes by phospholipases. The membrane phospholipid hypothesis may provide a unifying conceptual framework for understanding schizophrenia, other psychotic disorders, bipolar disorder, dyslexia and schizotypal personality disorder. Evidence in support of the membrane phospholipid model in the pathogenesis of psychotic syndromes includes the following (Horrobin, 1998):

- Magnetic resonance imaging (MRI) studies show relatively increased rates of phospholipid breakdown in the brains of never-medicated schizophrenics.
- Reduced electroretinogram (ERG) response is found in individuals diagnosed with schizophrenia, an indicator of reduced retinal levels of the fatty acid docosahexaenoic acid (DHA).
- The antipsychotic clozapine has been shown to increase red blood cell phosopholipid and DHA levels, suggesting that this may be a mechanism of action for clozapine, or other atypical antipsychotic drugs, in addition to its dopamine-blocking effects.
- Clozapine is known to act like a prostaglandin E analogue, which may relate to its antipsychotic mechanism of action in regulating neuron membrane lipid metabolism.

There is emerging evidence for the clinical utility of heart rate variability (HRV) monitoring and quantitative electroencephalography (QEEG) in psychiatric assessment (Chabot, di Michele, & Prichep, 2005; Hammond, 2010). Abnormal electroencephalography (EEG) findings occur in up to 40% of depressed patients, and "small sharp spikes" are often present in severely depressed suicidal patients (Small, 1993). However, there are no correlations between discrete QEEG findings and specific mood disorders. EEG changes frequently associated with anxiety include decreased alpha activity in generalized anxiety, increased theta activity in OCD, and paroxysmal activity in patients who experience panic attacks (Hughes & John, 1999). Neurometric brain mapping is a specialized QEEG approach that compares

EEG characteristics of the individual being evaluated with normative databases for the same age. Neurometric mapping helps to clarify functional brain correlates of cognitive impairment and yields information that is useful for planning EEG biofeedback protocols addressing specific kinds of dysfunction. Neurometric brain mapping is being used increasingly to differentiate cognitive impairments due to head injuries, medical disorders, progressive dementia, alcohol or substance abuse, depressed mood, and learning disorders.

Assessment approaches used by "energy" healers are based on beliefs about correspondences between postulated subtle "energies" and psychological symptoms. In Chinese medicine, Ayurveda, and Tibetan medicine analysis of the pulse is used to assess energetic "dysregulations" associated with both physical and mental symptoms. In all three healing traditions the patient's unique energetic constitution is determined from history and energetic assessment. A treatment plan consisting of psychological, physical, and energy "balancing" therapies is directed at normalizing energetic imbalances and improving the patient's general health. Anecdotal reports suggest that subtle characteristics of the pulse described in Chinese, Ayurvedic, or Tibetan medical theory correspond to specific energetic *imbalances* that manifest as symptoms of medical or mental illness. For example, mild or moderate anxiety and depressed mood are frequently associated with a "tight" or rapid rate when the pulse is palpated at the pericardium position or as a subtle sensation of "smooth vibration" over the entire pulse at all depths. The most severe symptoms, including psychosis and acute mania, are reportedly associated with the most abnormal energetic pattern of the pulse. Measuring changes in skin electrical resistance has been used to assess qi energy and the effects of acupuncture treatment (Zhang, 2002). Brain-imaging research using fMRI has validated claims of predicted therapeutic effects when specific acupuncture points are stimulated (Zhang et al., 2004). Machines have been developed that purport to measure indicators of qi in meridians (Borg, 2003). Measuring electrodermal potentials at acupoints following Qigong treatment may provide information about changes in electrical activity associated with beneficial effects of qi that can be used to monitor treatment response to acupuncture or other energetic modalities (Colbert, Spaulding, Ahn, & Cutro, 2011; Syldona & Rein, 1999). However, research findings on electrodermal activity are limited by the small size or poor methodological quality of many studies including flawed technical procedures and poorly controlled laboratory conditions (Colbert, Spaulding, Larsen, Ahn, & Cutro, 2011).

Research findings suggest that Chinese medical practitioners can be trained to quantify measures of yin and yang in a reliable manner, permitting standardized assessments of postulated energetic changes before or after treatment (Langevin et al., 2004). Subjective responses to Chinese medical treatments are also useful indicators of outcomes. Beneficial changes following acupuncture frequently include improved attitude toward health and positive lifestyle changes (Gould & MacPherson, 2001).

A technology-based approach that is adding to assessment methods used in Chinese medicine and energy medicine is analysis of the vascular autonomic signal (VAS) (Agnes, 2002). The VAS is a postulated reflex that is triggered by different biophysical or energetic stimuli inside or outside the human body. Proponents of this model argue that the VAS reflex maintains the body's principal systems, including the endocrine, immune, and central nervous system, in homeodynamic balance,

and that optimum energetic balance is disrupted by both external and internal stresses. For several decades acupuncturists have used the VAS reflex to assess the energetic conditions underlying both medical and psychiatric symptom patterns. Studies suggest that the VAS reflex can be reliably captured using Doppler monitoring of arterial wall movement (Ackerman, 2001). Subtle changes in arterial wall tone occur almost instantaneously in response to energetic stimuli that affect the physical and psychological state of the body but do not enter into conscious awareness. Changes in VAS tone are believed to take place when postulated "neurohormones" resonate in response to subtle electromagnetic fields emitted by substances held in proximity to various parts of the human body. Particular substances induce specific resonance patterns and commensurate changes in the dynamic biophysical environment of the body. The brain responds to these changes at the level of the autonomic nervous system. Physical or psychological symptoms may result depending on the nature of resonant changes induced by different substances. Changes in arterial wall tone can be interpreted as VAS energetic signatures corresponding to the energetic patterns of different substances and their effects on the dynamic energy balance of the human body. Analysis of the VAS reflex is also used to assess potential adverse effects of treatments that are being considered. Analysis of the VAS is often performed to evaluate the nutritional status of a patient before acupuncture is administered to facilitate detoxification from alcohol or drugs. With continued research the VAS reflex may provide information about putative energetic imbalances associated with affective, cognitive, and behavioral symptom patterns, suggesting treatments that address such imbalances.

Muscle testing using an approach called applied kinesiology has been in widespread use in energy psychology and chiropractic since its invention in the USA several decades ago. Practitioners argue that subtle differences in muscle strength provide a precise indication of energetic imbalances in specific meridians corresponding to particular physical or emotional symptoms, including anxiety and depressed mood (Shafer & Garten, 2013). Muscle testing is believed to provide useful information about energetic treatments that will most likely yield beneficial changes. Pending further evidence from future observations and research, the skillful use of applied kinesiology may prove a useful adjunct to the assessment of certain mental or emotional symptoms.

In 2002, the National Institutes of Health (NIH) and the National Institute on Aging jointly sponsored a 2-day meeting dedicated to the scientific discussion of gas discharge visualization (GDV), a technology developed by Russian scientists that claims to measure human energy fields and to make medical diagnoses on the basis of those measurements (Francomano & Jonas, 2002). GDV—recently renamed electrophoton capture—uses a high-intensity electric field applied to the fingertips to stimulate emission of photons and electrons from living tissue. The emitted energy, in turn, results in a gaseous discharge that is photographed and analyzed with respect to an energetic model based on Chinese meridian theory. The postulated biophysical processes that GDV claims to detect have been described using quantum mechanics (Korotkov, Williams, & Wisneski, 2004). The GDV bioelectrography machine includes software that makes inferences about postulated energetic factors associated with medical or psychiatric symptoms based on the identified

energetic pattern (Korotkov, 2002). A systematic review identified 19 randomized controlled trials and 26 systematic research reports on GDV used to evaluate the human energy field in response to treatment of a variety of medical and mental health problems (Korotkov, Matravers, Orlov, & Williams, 2010). A study on 23 healthy adults receiving massage therapy found significant differences in GDV parameters before and after massage therapy that correlated with measures of well-being, pain, stress, and muscle tension (Haun, Patel, Schwartz, & Ritenbaugh, 2015). A study published in the Proceedings of the Eighth International Scientific Congress on Bioelectrography, St. Petersburg, Russia, reported that changes in GDV parameters in over 600 patients undergoing short-term rehabilitation were correlated with "general improvement of an emotional condition, and removal of emotional and nervous excitation and tension" (Sergeev & Pisareva, 2004).

Limitations of CAM Assessment Approaches

Before recommending any CAM assessment approach the practitioner should first review the available research evidence. Compared with the robust findings supporting the use of select CAM treatment approaches, there is limited evidence for most CAM assessment approaches. Furthermore, most CAM assessment approaches that have been carefully evaluated in Western-style research studies have resulted in findings that are not reproducible, sensitive, or specific (Ernst & Hentschel, 1995). Examples include iridology, hair analysis, kinesiology, radionics, clairsentient diagnosis, and electroacupuncture. The use of consensus-based or intuitive CAM assessment approaches based on limited evidence may lead the patient away from biomedical or CAM approaches that can more reliably identify the causes of symptoms. This is an important issue because *misdiagnoses or missed diagnoses* may potentially harm the patient by delaying appropriate care.

Research evidence for select CAM assessment approaches is accumulating at a rapid rate. The recommendation of any assessment approach should depend foremost on the strength of evidence, taking account of cost, availability, and the patient's preferences.

The Intake Interview, Assessment, and Formulation in Integrative Mental Health Care

Integrative Assessment Broadens Western Medical Understandings of Mental Illness

The integrative perspective regards Western medical theory as providing legitimate but incomplete explanations of *all possible* causes and meanings of affective, cognitive, and behavioral symptoms. In addition to discrete biological and psychological causes, integrative mental health care takes into account complex relationships

between biological, informational, or postulated energetic processes that affect the body–brain system at a multiplicity of hierarchically interrelated levels. These include neuroimmunological functioning, biomagnetic fields associated with the brain, heart, and other organs, and possibly also nonclassical processes such as large-scale coherent quantum fields or other postulated "subtle" energetic phenomena associated with human consciousness. Disparate ways of "seeing" and interpreting causes and meanings of symptoms have profound implications for the practice of medicine and mental health care. The increased use of CAM assessment approaches will deepen current Western medical understandings of mental illness while expanding treatment choices to more effectively address the complex causes and meanings of symptoms.

The Intake Interview in Integrative Mental Health Care

Goals of the initial interview—or intake—include obtaining a complete history, identifying symptoms associated with distress or impaired functioning, making a provisional assessment of causes and meanings of symptoms (i.e., a "formulation"), determining the need for specialized assessment tests (if any), and defining initial treatment goals. In the interest of economy of time, many practitioners ask new patients to bring medical or psychiatric records and to complete a self-assessment questionnaire before the first appointment. Asking new patients to bring prescription medications and supplements to the interview helps ensure that doses and brands are accurately documented. During the initial interview, the practitioner gathers pertinent information about the patient's medical, psychiatric, social, cultural, family, and religious or spiritual history. Obtaining a complete and reliable history is challenging because practitioners trained in disparate systems of medicine frequently assign different degrees of importance to different kinds of historical information which influences how the intake interview is conducted.

The absence of a standardized methodology in history-taking interferes with cross-disciplinary communication between Western medical practitioners and CAM practitioners. The judicious integrative practitioner uses "open-ended" questions that invite the patient to describe their symptoms and pertinent history. This approach to history taking naturally leads to a more open and flexible approach to assessment and formulation, resulting in an integrative treatment plan that addresses different causes and meanings of symptoms. Below are examples of open ended questions asked to elicit clinically pertinent information:

- Please tell me about the problems that brought you to see me.
- It is important for me to know about any treatment you received in the past for the same problem.
- If (specify treatment) worked for the same problem before why did you decide to stop the treatment?
- What is your nutrition like?

- What about sleep?
- What do you do for exercise (or "physical activity").
- Is drinking or using drugs a problem?
- What do you do for stress?
- Is your mental health problem related to problems at work or in a relationship?
- Do you have any medical problems? If so, are they currently being treated?
- Please tell me about any medical or mental health problems among your relatives.
- Are you currently being treated by a CAM practitioner for a medical or mental health problem?
- Are there religious or spiritual problems that are important for me to know about?

A core group of questions may become the basis for future standardized interview tools in integrative medicine (Lindahl, Barrett, Peterson, Zheng, & Nedrow, 2005). After taking the patient's history, the Mini-Mental State Exam (MMSE) is often used as a preliminary screening tool when there are concerns over possibly severe impairment or patient safety. Findings of the MMSE may suggest the need for more extensive neuropsychological testing or a formal consultation with a neurologist.

At the end of the initial appointment, the practitioner may have enough information to make a provisional formulation of causes and meanings associated with cognitive, affective, or behavioral symptoms. The practitioner should inform the patient of pertinent observations and clinical impressions within his or her Western medical or CAM specialty area only, recommend formal assessment approaches or make referrals if indicated, and comment on reasonable treatment choices. A return appointment should be scheduled at an appropriate interval, depending on the severity of symptoms.

The chief responsibility of a Western medical practitioner is to rule out medical illness based on the patient's self-reported history, collateral information, and findings from previous assessment. Treatment goals should be clarified and the evidence supporting conventional and CAM treatment recommendations should be carefully reviewed before treatment is initiated or referrals are made. If a patient complains of symptoms that may reflect a serious or potentially life-threatening medical problem, such as severe headaches, an untreated head injury, recent changes in the level of consciousness or other severe or recent-onset changes in mental functioning, or other serious or rapidly worsening symptoms, the patient should be immediately referred to the nearest urgent care facility or emergency room.

When symptoms do not point to a serious or rapidly worsening medical problem, or in cases where a medical problem has already been ruled out by a Western-trained physician, it is reasonable for the patient to work primarily with a qualified CAM practitioner and to focus on one or more appropriate CAM treatments. In cases where a patient becomes medically ill while under the care of a CAM practitioner, it is always prudent to refer the patient to a Western-trained physician to avoid delays in the assessment and treatment of a possibly serious medical illness.

Combining Western Medical and CAM Approaches Enhances Conventional Psychiatric Assessment

In some cases, a specific Western medical or CAM approach substantiated by research may not be an appropriate or realistic option because of expense, limited availability, or patient preferences. The use of CAM assessment approaches substantiated by research findings along with established Western medical assessment approaches will help future practitioners obtain more complete information about the multiplicity of possible causes of cognitive, affective, and behavioral symptoms than can be achieved using conventional assessment only. A more complete *picture* of the causes and meanings of symptoms will translate into treatment choices that are more effective and cost-effective. The integration of biomedical and CAM assessment approaches will be useful in cases where conventional psychiatric assessment approaches, such as brain scans, serologic studies, and neuropsychological inventories, result in ambiguous findings. The benefits of integrative approaches in psychiatric assessment include:

- Integrative assessment will help clarify the medical and psychiatric differential diagnosis in cases where biomedical or CAM assessment alone fails to identify the causes of symptoms, or the patient's medical or psychiatric history is vague or complex.
- Combining biomedical and CAM biological assessment approaches based on current medical theory, such as quantitative electroencephalography (qEEG) and urinary or serologic studies of neurotransmitter metabolites, and immunologic or endocrinological factors, will result in increased specificity and accuracy when ruling out possible biological causes or markers of affective, cognitive, or behavioral symptoms.
- Combining biomedical assessment approaches with approaches that are currently excluded from Western medicine will clarify the role of postulated "energetic" causes of symptoms.
- Incorporating integrative assessment approaches in treatment planning algorithms will more adequately address the range of neurobiological, psychological, psychosomatic, or postulated "energetic" causes of symptoms.

The Logic of Assessment in Integrative Mental Health Care

The goals of assessment are often clear when a discrete symptom pattern (or disorder) has been identified as the underlying cause of distress or functional impairment. In over two decades as a clinical psychiatrist my experience has been that most patients see me for a particular symptom pattern (or "disorder") that is causing distress or impaired functioning in a relationship, at work or in school. In cases where a primary symptom pattern is evident, the initial priorities of assessment and treatment

planning are relatively clear. However, many patients complain of two or more disparate symptom patterns (or disorders) (e.g., generalized anxiety, depressed mood, and insomnia). In such cases, the practitioner must decide whether to focus on one or more than one symptom pattern at the same time, and whether to evaluate the patient using one or more than one Western medical or CAM assessment approach.

Determining the most appropriate assessment strategy when evaluating a patient is based on core symptoms, the strength of evidence for different assessment techniques, findings that helped clarify the causes of similar symptoms in the past, the availability of qualified practitioners to perform specialized kinds of assessment, the cost (and insurance coverage, if any) of various assessment approaches, and the patient's preferences. In many cases there will be no apparent need for formal assessment beyond the initial diagnostic interview and a brief mental state exam. Because assessment typically involves passive monitoring of biological, biomagnetic, somatic, or "energetic" functioning, toxicities and adverse effects seldom occur. Thus, there are no compelling safety reasons to avoid the use of any assessment approach alone or in combination with other assessment approaches.

Identifying the Optimal Assessment Strategy for Your Patient

Certain assessment approaches provide more useful information than others for clarifying the causes of a specified symptom pattern. Determination of the Western medical or CAM assessment approach that will most likely yield clinically pertinent information starts with a review of the evidence for disparate assessment approaches with respect to a specified symptom pattern (i.e., disorder). In this process the practitioner tries to get to a clear understanding of the causes, course, and meanings of symptoms. There is a multiplicity of possible biological, social, cultural, psychological or postulated energetic causes or meanings of symptoms. Pertinent assessment findings *point to treatments that modify underlying causes* resulting in the alleviation of symptoms. For example, a quantitative electroencephalography (qEEG) finding of abnormal left frontotemporal lobe activity in the mid-alpha frequency range (10–12 Hz) in a patient who complains of new-onset impairment in attention following a closed head injury suggests that treatments directed at "renormalizing" frontotemporal brain electrical activity in the mid-alpha range will probably result in improved capacity for sustained attention. Reasonable treatment choices would include certain EEG-biofeedback protocols, binaural sound, mind–body practices, certain natural products or prescription medications, and virtual reality exposure therapy. In all cases the practitioner must decide whether to recommend a specific Western medical or CAM assessment approach and whether it is appropriate to refer a patient for specialized testing.

When evaluating the response to any treatment it is helpful to use a quality of life index that takes account of subjective personal factors that influence outcomes including, for example, attitude, self-esteem, level of autonomy, quality of social relationships, sexual activity, considerations of financial security and home environment, and

spiritual values and activities (Liverani, Minelli, & Ricciuti, 2000). Personal information adds an important qualitative dimension to the objective findings of standardized symptom rating inventories and Western medical or CAM assessment approaches.

A multimodal formulation, based on history, the practitioner's clinical observations, and assessment findings, is a hypothesis about the causes and meanings of symptoms. Treatment response is assessed on successive return appointments using appropriate standardized symptom rating inventories or other Western medical or CAM approaches. Changes in the principal symptom pattern, including worsening or newly emerging symptoms, may indicate a need for further specialized assessment to better characterize the causes of changes in the patient's baseline. Previously untried assessment approaches may yield significant new findings pointing to changes in treatment that more effectively or cost-effectively address the patient's symptoms.

The optimal assessment strategy incorporates approaches that will most reliably yield accurate and complete information about the causes and meanings of symptoms. In many cases practical constraints on cost and availability, as well as patient preferences may require modification of the optimal strategy into one that is more realistic. In some cases, assessment may include two or more approaches at the same time. In other cases, it is more practical and cost-effective to recommend two or more assessment approaches sequentially depending on the nature or severity of symptoms, response to ongoing treatment (or lack thereof), and findings of the initial assessment. Criteria for determining whether to recommend two or more assessment methods at the same time (parallel assessment) or one after another (sequential assessment) are reviewed below.

The process of defining and refining the assessment and treatment plan is iterative and continues until the causes and meanings of the principal symptom pattern are accurately characterized and an effective and realistic treatment plan is successfully implemented. When the initial assessment is completed, the practitioner prepares a formulation illustrating both quantitative and qualitative evidence of social, cultural, psychological, biological, or energetic causes and meanings of the patient's complaint. Chapter 8 discusses the steps involved in translating a multimodal formulation into an appropriate individualized integrative treatment plan.

Deciding on the Type, Order and Number of Assessment Approaches to Use

Depending on the type and severity of a patient's symptoms, the formulation and treatment plan may be achieved based on information obtained from the history and the intake interview alone, a symptom-rating inventory, or multiple assessment approaches undertaken at the same time or in sequence. It is prudent to begin with an approach that has a high probability of yielding pertinent information about the causes and meanings of symptoms. In identifying the assessment strategy there are two basic choices: the use of one approach only or two or more approaches in parallel. These choices are discussed in the following sections.

Using One Assessment Approach or a Series of Approaches

Most practitioners recommend one assessment approach at a time because of practical constraints on cost and availability. The practitioner should start with the approach that will most likely yield reliable clinical information about causes or meanings of the principal symptom pattern(s). In cases where reliable information is obtained from history and a multidimensional formulation has led to an effective treatment strategy, there is no need for formal assessment. In cases where accurate or reliable information is not obtained from the intake interview, the practitioner should carefully review the patient's symptoms and history to obtain salient information that may have been overlooked. Evidence tables can be constructed to rank disparate assessment approaches with respect to common symptom patterns (see Chap. 6 on constructing evidence tables). The practitioner and patient then discuss assessment options in the context of practical constraints on cost, availability and patient preferences and select an appropriate and realistic approach. This process continues during the course of treatment until assessment findings clarify the causes or meanings of the patient's complaints, and an effective treatment plan is implemented.

The advantages of recommending the use of single assessment approaches one after another include reduced costs and greater simplicity. Using only one assessment approach at a time also avoids the risk of confounding the diagnostic picture with conflicting explanations of symptoms in cases where disparate assessment approaches yield contradictory or inconsistent findings. Delay in the implementation of effective treatment is a potential disadvantage of using single assessment approaches one after another.

Using Two or More Assessment Approaches at the Same Time

Recommending two or more assessment approaches at the same time is prudent when a principal symptom pattern has not improved or has worsened during the course of treatment or the clinical picture is complicated by newly emerging symptoms. These circumstances suggest that pertinent clinical information was overlooked in the intake interview, the initial treatment plan was not adequate, or both. In such cases there is some urgency in accurately identifying the causes or meanings of the patient's complaint. The practitioner should review the patient's history in detail to ensure that pertinent medical, psychological or other problems have not been overlooked. In complicated cases, the use of two or more assessment approaches at the same time may yield significant new findings that will clarify the nature of persisting symptoms, permit a more complete formulation, and lead to a more effective treatment plan.

Key Points

- Advances in understanding of the biological basis of mental illness are limited by poorly defined, complex interactions between multiple genes and gene–environment interactions.
- Genetic factors are probably associated with some psychiatric disorders; however, with the exception of a subset of individuals with early-onset Alzheimer's disease, discrete relationships between specific genetic problems and specific psychiatric disorders have not been established.
- Affective, cognitive, and behavioral symptoms may correspond to psychopathological processes at one or more levels of psychological, neurobiological, or possibly energetic functioning.
- The system of medicine in which symptoms are investigated biases interpretations of subjective experiences regarded as *pertinent*, that is, those which reflect *pathology*.
- Non-Western systems of medicine are based on disparate assumptions about the causes, meanings and significance of symptoms thus mental and emotional "disorders" described in Western medicine and non-Western systems of medicine seldom overlap.
- Changes in symptoms occur in relationship to dynamic internal (biological and psychological) and external (social, cultural, and family) influences that are difficult to quantify.
- There is no consensus definition of what constitutes a "mental disorder." Criteria used to classify affective, cognitive, or behavioral states as "disorders" vary widely over time and across cultures.
- Through progressive revisions of a formal classification scheme of psychiatric disorders, biomedical psychiatry tacitly admits to incomplete understandings of the causes of mental illness.
- Psychiatry has adopted a strictly descriptive methodology for classifying symptoms into disorders because questions about causes of symptoms cannot be answered by current science.
- Assessment approaches used in conventional psychiatry have changed little since the late nineteenth century, have not been strongly validated by rigorous empirical testing, and rely on statistical or narrative interpretations of patient reports of highly subjective experiences.
- Conventional mental health care involves identifying symptom patterns that cause distress or impair functioning, and subsequently determining treatment choices that address imputed causes of symptoms.
- There is a schism between the "a-theoretical" empirically based descriptive nosology implicit in the DSM and the highly subjective information obtained from structured clinical interviews that frequently constitute the sole basis for diagnosing an individual with a psychiatric disorder.
- Novel practitioner-centered assessment approaches and emerging technologies will permit future integrative practitioners to capture information that is unattainable using contemporary biomedical assessment approaches. This will result in

more complete understandings of processes associated with cognitive, affective, and behavioral symptoms.

- CAM assessment approaches can be divided into four general categories: (1) Assays of biological structure or function; (2) Measures of bodily structure or function on a gross (i.e., whole body) level; (3) Measures of kinds of energy or information that have been validated by current science; (4) Measures of postulated "subtle" energetic or informational processes that have *not* been validated by current science.
- There is limited evidence for most CAM assessment approaches. Most CAM assessment approaches that have been carefully evaluated in Western-style research studies have resulted in findings that are not reproducible, sensitive, or specific.
- In addition to discrete biological and psychological causes, integrative mental health care takes into account complex relationships between biological, informational or postulated energetic processes that affect the body–brain system at a multiplicity of hierarchically interrelated levels.
- Goals of the intake interview include obtaining a complete history, identifying symptoms associated with distress or impaired functioning, making a provisional assessment of causes and meanings of symptoms (i.e., a "formulation"), determining the need for specialized assessment tests (if any), and defining initial treatment goals.
- The use of "open-ended" questions naturally leads to a more open and flexible approach to assessment and formulation, resulting in an integrative treatment plan that addresses different causes or meanings of symptoms.
- The chief initial responsibility of a Western medical practitioner is to rule out medical illness.
- If a patient has symptoms that may reflect a serious or potentially life-threatening medical problem he or she should be immediately referred to the nearest urgent care facility or emergency room.
- The integration of biomedical and CAM assessment approaches will be useful in cases where conventional psychiatric assessment approaches result in ambiguous findings.
- Determining the most appropriate assessment strategy when evaluating a patient is based on core symptoms, the strength of evidence for different assessment techniques, findings that helped clarify the causes of similar symptoms in the past, the availability of qualified practitioners to perform specialized kinds of assessment, the cost (and insurance coverage, if any) of various assessment approaches, and the patient's preferences.
- Determination of the Western medical or CAM assessment approach that will most likely yield clinically pertinent information starts with a review of the evidence for disparate assessment approaches with respect to a specified symptom pattern (i.e., disorder).
- A multimodal formulation, based on history, the practitioner's clinical observations, and assessment findings, is a hypothesis about the causes and meanings of symptoms.

- The optimal assessment strategy incorporates approaches that will most reliably yield accurate and complete information about the causes and meanings of a symptom pattern.
- The process of defining and refining the assessment and treatment plan is iterative and continues until the causes or meanings of the principal symptom pattern are accurately characterized and an effective and realistic treatment plan is successfully implemented.
- Using only one assessment approach at a time avoids the risk of confounding the diagnostic picture with conflicting explanations of symptoms in cases where disparate assessment approaches yield contradictory or inconsistent findings.
- Recommending two or more assessment approaches at the same time is prudent when a principal symptom pattern has not improved or has worsened during the course of treatment or the clinical picture is complicated by newly emerging symptoms.

References

Ackerman, J. (2001). The biophysics of the vascular autonomic signal and healing. *Frontier Perspectives, 10*(2), 9–15.

Agnes, M. (2002). *Toward an integral energy medicine model for understanding the vascular autonomic signal*. PhD dissertation, Holos University Graduate Seminary.

Angst, J. (1996). Comorbidity of mood disorders: A longitudinal prospective study. *The British Journal of Psychiatry. Supplement, 30*, 31–37.

Anthony, J. C. (2001). The promise of psychiatric enviromics. *British Journal of Psychiatry, 178*(Suppl. 40), 8–11.

Baca-Garcia, E., Perez-Rodriguez, M. M., Basurte-Villamor, I., Fernandez del Moral, A. L., Jimenez-Arriero, M. A., Gonzalez de Rivera, J. L., et al. (2007, March). Diagnostic stability of psychiatric disorders in clinical practice. *The British Journal of Psychiatry, 190*(3), 210–216. https://doi.org/10.1192/bjp.bp.106.024026. PMID 17329740.

Berrios, G., & Markova, I. (2002). Assessment and measurement in neuropsychiatry: A conceptual history. *Seminars in Clinical Neuropsychiatry, 7*(1), 3–10.

Beutler, L., & Malik, M. (Eds.). (2002). *Rethinking the DSM: A psychological perspective*. Washington, DC: American Psychological Association.

Borg, H. (2003, December). Alternative method of gifted identification using the AMI: An apparatus for measuring internal meridians and their corresponding organs. *Journal of Alternative and Complementary Medicine, 9*(6), 861–867.

Carragher, N., Krueger, R., Eaton, N., & Slade, T. (2015). Disorders without borders: Current and future directions. *Social Psychiatry and Psychiatric Epidemiology, 50*, 339–350.

Chabot, R. J., di Michele, F., & Prichep, L. (2005, January). The role of quantitative electroencephalography in child and adolescent psychiatric disorders. *Child and Adolescent Psychiatric Clinics of North America, 14*(1), 21–53, v–vi.

Colbert, A. P., Spaulding, K. P., Ahn, A. C., & Cutro, J. A. (2011). Clinical utility of electrodermal activity at acupuncture points: A narrative review. *Acupuncture in Medicine, 29*(4), 270–275.

Colbert, A. P., Spaulding, K., Larsen, A., Ahn, A. C., & Cutro, J. A. (2011). Electrodermal activity at acupoints: Literature review and recommendations for reporting clinical trials. *Journal of Acupuncture and Meridian Studies, 4*(1), 5–13.

Cosgrove, L., Krimsky, S., Vijayaraghavan, M., & Schneider, L. (2006). Financial ties between DSM-IV panel members and the pharmaceutical industry. *Psychotherapy and Psychosomatics, 75*(3), 154–160.

Cutrona, C. E., Cadoret, R. E., Suhr, J. A., Richards, C. C., Troughton, E., Schutte, K., et al. (1994). Interpersonal variables in the prediction of alcoholism among adoptees: Evidence for gene–environment interaction. *Comprehensive Psychiatry, 35*, 171–179.

Eisenberg, D. (1997). Advising patients who seek alternative medical therapies. *Annals of Internal Medicine, 127*, 61–69.

Ernst, E., & Hentschel, C. (1995). Diagnostic methods in complementary medicine: Which craft is witchcraft? *International Journal of Risk and Safety in Medicine, 7*, 55–63.

Frances, A. (2013). The new crisis in confidence in psychiatric diagnosis. *Annals of Internal Medicine, 159*, 221–222.

Francomano, C., & Jonas, W. (2002, April 17–18). *Measuring the human energy field: State of the science.* Paper presented at The Gerontology Research Center, National Institute on Aging, and National Institute of Health, Baltimore, MD.

Freud, S. (1955). Analysis of a phobia in a five-year-old boy. In J. Strachey (Ed. and Trans.), *Standard edition of the complete psychological works of Sigmund Freud* (Vol. 10, pp. 5–147). London: Hogarth Press. (Original work published 1909)

Giosan, C., Glovsky, V., & Haslam, N. (2001). The lay concept of 'mental disorder': A cross-cultural study. *Transcultural Psychiatry, 38*(3), 317–332.

Gould, A., & MacPherson, H. (2001). Patient perspectives on outcomes after treatment with acupuncture. *Journal of Alternative and Complementary Medicine, 7*(3), 261–268.

Hammond, D. (2010). The need for individualization in neurofeedback: Heterogeneity in QEEG patterns associated with diagnoses and symptoms. *Applied Psychophysiology and Biofeedback, 35*(1), 31–36.

Haun, J., Patel, N., Schwartz, G., & Ritenbaugh, C. (2015, September). Evaluating the use of gas discharge visualization to measure massage therapy outcomes. *Journal of Complementary and Integrative Medicine, 12*(3), 231–239.

Horrobin, D. (1996). Schizophrenia as a membrane lipid disorder which is expressed throughout the body. *Prostaglandins, Leukotrienes and Essential Fatty Acids, 55*(2), 3–7.

Horrobin, D. (1998). The membrane phospholipid hypothesis as a biochemical basis for the neurodevelopmental concept of schizophrenia. *Schizophrenia Research, 30*, 193–208.

Hudziak, J., & Helzer, J. E. (2002). *Defining psychopathology in the 21st century: Dsm-V and beyond. American Psychopathological Association Series* (1st ed.). Washington, DC: American Psychiatric Association. ISBN 1-58562-063-7.

Hughes, J. R., & John, E. R. (1999). Conventional and quantitative electroencephalography in psychiatry. *The Journal of Neuropsychiatry and Clinical Neurosciences, 11*, 190–208.

Kendler, K. S. (1995). Genetic epidemiology in psychiatry: Taking both genes and environment seriously. *Archives of General Psychiatry, 52*, 895–899.

Kendler, K. S., Heath, A. C., Martin, N. G., & Eaves, L. J. (1987). Symptoms of anxiety and depression: Same genes, different environments? *Archives of General Psychiatry, 44*, 451–457.

Kessler, R., Chiu, W., & Demler, M. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry, 62*(6), 617–627.

Korotkov, K. (2002). *Human energy field: Study with GDV bioelectrography*. Fairlawn, NJ: Backbone Publishing Co..

Korotkov, K. G., Matravers, P., Orlov, D. V., & Williams, B. O. (2010). Application of electrophoton capture (EPC) analysis based on gas discharge visualization (GDV) technique in medicine: A systematic review. *Journal of Alternative and Complementary Medicine, 16*, 13–25.

Korotkov, K., Williams, B., & Wisneski, L. (2004). Assessing biophysical energy transfer mechanisms in living systems: The basis of life processes. *Journal of Alternative and Complementary Medicine, 10*(1), 49–57.

Krueger, R. (1999). The structure of common mental disorders. *Archives of General Psychiatry, 56*, 921–926.

Krueger, R., Caspi, A., Moffitt, T., & Silva, P. (1998). The structure and stability of common mental disorders (DSM-III-R): A longitudinal-epidemiological study. *Journal of Abnormal Psychology, 107*, 216–227.

Langevin, H., Badger, G., Povolny, B., Davis, R. T., Johnston, A. C., Sherman, K. J., et al. (2004). Yin and yang scores: A new method for quantitative diagnostic evaluation in traditional Chinese medicine research. *Journal of Alternative and Complementary Medicine, 10*(2), 389–395.

Lindahl, M., Barrett, R., Peterson, D., Zheng, L., & Nedrow, A. (2005). Development of an integrative patient history intake tool: A Delphi study. *Alternative Therapies in Health and Medicine, 11*(1), 52–56.

Liverani, A., Minelli, E., & Ricciuti, A. (2000). Subjective scales for the evaluation of therapeutic effects and their use in complementary medicine. *Journal of Alternative and Complementary Medicine, 6*(3), 257–264.

Munro, A., & Bhugra, D. (1997). *Troublesome disguises: Underdiagnosed psychiatric syndromes*. Oxford: Blackwell Science. ISBN 0-86542-674-0.

Nemeroff, C., Weinberger, D., Rutter, M., MacMillan, H., Bryant, R. A., Wessely, S., et al. (2013). DSM-5: A collection of psychiatrist views on the changes, controversies, and future directions. *BMC Medicine, 11*, 202.

Owen, M., Cardno, A., & O'Donovan, M. (2000). Psychiatric genetics: Back to the future. *Molecular Psychiatry, 5*, 22–31.

Owen, M., Holmans, P., & McGuffin, P. (1997). Guest editorial: Association studies in psychiatric genetics. *Molecular Psychiatry, 2*, 270–273.

Regier, D. (2004). For DSM-V, it's the "disorder threshold," stupid [letter to the editor]. *Archives of General Psychiatry, 61*, 1051.

Regier, D., Kaelber, C., Rae, D., Farmer, M. E., Knauper, B., Kessler, R. C., et al. (1998). Limitations of diagnostic criteria and assessment instruments for mental disorders: Implications for research and policy. *Archives of General Psychiatry, 55*, 109–115.

Reiss, D., Hetherington, M., Plomin, R., Howe, G. W., Simmens, S. J., Henderson, S. H., et al. (1995). Genetic questions for environmental studies: Differential parenting and psychopathology in adolescence. *Archives of General Psychiatry, 52*, 925–936.

Sergeev, S. S., & Pisareva, S. A. (2004). The use of gas-discharging visualization method (GDV) for monitoring a condition of the personnel at short-term rehabilitation. In *Proceedings of VIII International Scientific Congress on Bioelectrography, St. Petersburg, Russia* (pp. 128–129).

Shafer, J., & Garten, H. (Eds.). (2013). *The muscle test handbook (1st ed.): Functional assessment, myofascial trigger points and meridian relationships*. Imprint: Churchill Livingstone.

Shanfield, S. (2004). *The dimensional construct in psychiatric disorders [abstract 12d], Symposium 12: Behavioral dimensions of psychiatric disorders*. APA Annual Meeting, New York City, NY.

Small, J. (1993). Psychiatric disorders and EEG. In E. Niedermeyer & F. Lopes da Silva (Eds.), *Electroencephalography: Basic principles, clinical applications, and related fields* (3rd ed., pp. 581–596). Baltimore: Williams & Wilkins.

Stahl, S. (2003a). Deconstructing psychiatric disorders, Part I: Genotypes, symptom phenotypes, and endophenotypes. *The Journal of Clinical Psychiatry, 64*(9), 982–983.

Stahl, S. (2003b). Deconstructing psychiatric disorders, Part 2: An emerging neurobiologically based therapeutic strategy for the modern psychopharmacologist. *The Journal of Clinical Psychiatry, 64*(10), 1145–1146.

Syldona, M., & Rein, G. (1999). The use of DC electrodermal potential measurements and healer's felt sense to assess the energetic nature of Qi. *Journal of Alternative and Complementary Medicine, 5*(4), 329–347.

Thomas, P., Romme, M., & Hamelijnck, J. (1996). Psychiatry and the politics of the underclass. *British Journal of Psychiatry, 169*, 401–404.

Wahlberg, K. E., Wynne, L. C., Oja, H., Keskitalo, P., Pykäläinen, L., Lahti, I., et al. (1997). Gene–environment interaction in vulnerability to schizophrenia: Findings from the Finnish Adoptive Family Study of Schizophrenia. *American Journal of Psychiatry, 154*, 355–362.

Wittchen, H., Hofler, M., & Merikangas, K. (1999). Toward the identification of core psychopathological processes: Commentary. *Archives of General Psychiatry, 5*, 929–931.

Wittchen, H., & Von Zerssen, D. (1987). *Verlaufe behandelter und unbehandelter Depressionen und Angst-storungen: eine klinisch-psychiatrische und epidemiologische verlaufsuntersuchung*

[Course of treated and untreated depression and anxiety disorders: a clinical psychiatric and epidemiological follow-up]. Berlin: Springer.

World Health Organization. (2005). WHO Resource Book on Mental Health: Human rights and legislation (PDF). ISBN 92-4-156282-X.

Zhang, C.-L. (2002). Skin resistance vs body conductivity: On the background of electronic measurement on skin. *Frontier Perspectives, 11*(2), 15–25.

Zhang, W., Jin, Z., Luo, F., Zhang, L., Zeng, Y. W., & Han, J. S. (2004). Evidence from brain imaging with fMRI supporting functional specificity of acupoints in humans. *Neuroscience Letters, 354*(1), 50–53.

Zimmerman, M., Chelminski, I., & Young, D. (2004). On the threshold of disorder: A study of the impact of the DSM-IV clinical significance criterion on diagnosing depressive and anxiety disorders in clinical practice. *The Journal of Clinical Psychiatry, 65*, 1400–1405.

Chapter 8
Treatment Planning in Integrative Mental Health Care

"The good physician treats the disease; the great physician treats the patient who has the disease."

—Sir William Osler MD

Contents

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Unresolved Issues Call for Change in Mental Health Care

Limitations of Conventional Mental Health Care

Despite progress in neuroscience and pharmacology research, there is a widening gap between advances in the basic sciences and the rate of introduction of promising new psychotropic medications (Rotman, 2004). The widespread use of psychotropic medications is associated with serious safety concerns such as sudden cardiac death, neurologic adverse effects, and overweight and diabetes caused by metabolic syndrome. As many as one half of individuals being treated for a psychiatric "disorder" fail to respond or respond only partially to psychotropic medications and other conventional Western medical treatments (Bhui, 2017; Dubin, 2004; Fournier et al., 2010) and are labeled "treatment-resistant" or "non-responders." As many as one half of all patients diagnosed with major depressive disorder do not achieve remission in response to available treatments, meaning that they do not fully respond after trials on two or more antidepressants following accepted protocols for dosing and duration of treatment (Müller et al., 2018). Treatment algorithms and consensus guidelines have been developed to address the problem of "treatment resistance," but so far this problem remains unsolved.

Conventional treatment-planning algorithms exclude CAM modalities and do not significantly improve outcomes in "non-responders" for the following reasons:

- Brief 15-min medication visits do not give psychiatrists enough time to develop adequate treatment plans.
- Single-drug prescription medications are frequently changed to multiple-drug regimens without waiting for the patient to respond (and before trying a CAM or integrative treatment regimen).
- Polypharmacy addressing treatment resistance frequently leads to medication nonadherence and treatment failure.
- Co-occurring psychiatric symptoms are often missed during brief medication-management sessions and are thus not adequately addressed.
- The role of psychotherapy is often devalued, especially in the management of severe symptoms such as mania, severe depressed mood, and psychosis.
- Inpatient treatment generally emphasizes crisis intervention rather than treatment of core symptoms.

The 2013 Medical Expenditure Panel Survey (MEPS) estimated that roughly one in six Americans take at least one psychotropic medication (Moore & Mattison, 2017). Antidepressants are most commonly prescribed followed by antianxiety drugs and antipsychotics. Women are almost twice as likely to use a psychotropic medication compared to men (21% vs. 12%). 21% of white adults use one or more psychotropic medications compared to 9% of adult Hispanics. In terms of age, roughly 10% of younger adults aged 18–39 years take at least one psychotropic medication compared to 25% of older adults aged 60–85 years.

Inappropriate prescribing of medications resulting in polypharmacy in the elderly is a major public health concern in North America and other industrialized world regions. Twelve percent of elderly US and European adults residing in the commu-

nity are prescribed inappropriate medications resulting in potential safety risks (Gallagher, Barry, Ryan, Hartigan, & O'Mahony, 2008). Roughly one half of all elderly US adults in skilled nursing homes or admitted to a hospital take seven or more prescribed drugs—including psychotropics—significantly increasing the risk of drug–drug interactions and potentially resulting in serious morbidity or death (Flaherty, Perry, Lynchard, & Morley, 2000; Gallagher et al., 2008). Individuals who take sedative-hypnotics or antidepressants with sedating side effect profiles are at increased risk of being in a motor vehicle accident, especially when treatment is starting or dosages are being adjusted (Orriols et al., 2012; Ramaekers, 2003). Elderly patients who take any psychotropic medication are 5 times more likely to have a motor vehicle accident compared with the general population, and this risk increases as doses go up (Orriols et al., 2012; Ray, Fought, & Decker, 1992). Safety concerns, poor treatment response, and high cost of conventional mental health care define an agenda for developing innovative strategies that offer safer, more effective, and more affordable treatments compared with psychotropic medications.

Placebo and Nocebo Effects Play an Important Role in Treatment Response

Placebos and nocebos are substances that have no known "active" effects but result in positive or negative effects, respectively, depending on the beliefs or expectations of the provider who recommends them and the patient who takes them. Although physicians have been aware of the placebo phenomena since the eighteenth century, attitudes about appropriate, morally defensible uses of placebos in Western medicine have changed over the centuries (Gensini, Conti, & Conti, 2005). How placebos and nocebos work to alleviate symptoms or cause physical symptoms or psychological distress, is the subject of ongoing research and debate. There is no consensus on a theory that adequately explains these effects and the validity of the concept has been questioned. A reanalysis of findings from hundreds of placebo-controlled studies concluded that there is no compelling evidence for a placebo effect (with the possible exception of certain treatments of asthma) because of the absence of untreated control groups in the majority of studies reviewed (Kienle & Kiene, 1996, 1997).

It is estimated that as many as 40% of individuals who take treatments believed to be inactive experience nocebo effects (Tangrea, Adrianza, & Helsel, 1994). Meta-analyses have found correlations between high nocebo response rates and neuroticism, pessimism and type A personalities (Data-Franco & Berk, 2012). High prevalence rates of placebo and nocebo response to "inactive" treatments suggest that many Western medical and CAM treatments probably have nonspecific effects that may be beneficial or detrimental to health, including general effects on the body's immune, endocrinologic, and central nervous system but for which mechanisms of action are not susceptible to contemporary research methods. Along these lines, it is plausible that intangible personal and interpersonal factors facilitate or interfere with self-healing when patients undergo treatment of any type depending on patient and

provider expectations and beliefs and the context in which treatment takes place. When investigating placebo and nocebo effects it is important to consider the intriguing possibility that the effectiveness of some Western medical and CAM treatments (i.e., for which there is no established mechanism of action) may be at least partly attributable to poorly characterized mechanisms that cannot be adequately described or investigated using existing Western medical research methods and technologies.

Conventionally trained Western physicians often assume that the beneficial effects of CAM can be *explained away* by the placebo effect when improvements in health are not attributable to effects of treatment. While some CAM therapies are probably no more effective than placebos, the same applies to treatments used in Western medicine. In fact, Western medicine openly acknowledges that the placebo effect plays an important role in the treatment of medical and mental health problems (Dixon & Sweeney, 2000). Both placebo and nocebo effects are commonly reported in response to psychotropic medications and other conventional treatments of mental health problems (Požgain, Požgain, & Degmečić, 2014). Meta-analyses of placebo-controlled trials suggest that many prescription medications used to treat depressed mood and other serious mental health problems are no more effective than placebos (Denys, & de Haan, 2008; Fournier et al., 2010; Hartling et al., 2012; Herrmann, Chau, Kircanski, & Lanctôt, 2011; Kelley, 2010; Kirsch, Moore, Scoboria, & Nicholls, 2002; Kirsch et al., 2008; Stafford et al., 2015; Sussman, 2004; Thase, 2002, 2007; Velligan et al., 2009). These findings are consistent with findings from brain imaging studies showing similar beneficial changes in regional brain activation after taking an antidepressant, a placebo or no treatment (Mayberg et al., 2002; Vallance, 2007).

The problem of placebo response rates in psychotropic medication trials has been carefully examined. A review of early and recent meta-analyses reported a trend toward decreasing effect sizes of many psychotropic medications over time (Leucht, Hierl, Kissling, & Dold, 2012). It is not clear whether this trend reflects actual or apparent declines in drug effectiveness. Early meta-analyses were based on small or single-center trials that used less well-developed methodologies. Published findings of early studies may have been more subject to positive publication bias compared to more recent publications which are subject to greater scrutiny. By the same token, more recent meta-analyses of psychotropic medication trials often include large multicenter studies that have difficulty recruiting medication naïve or severely symptomatic individuals, resulting in lower overall response rates compared to earlier studies on the same psychotropic medication.

CAM Treatments of Affective, Cognitive, and Behavioral Symptoms

Categories of CAM Treatment Modalities

Important advances are taking place in CAM approaches used to treat cognitive, affective, and behavioral symptoms. This section briefly reviews representative CAM treatments in current use and is not a detailed review of research findings. A recently

published comprehensive review is available in Lake (2017). The appendix lists valuable resources on CAM treatments where the reader can find publications on a range of CAM modalities. In addition to natural supplements, mind-body practices and other specific CAM therapies, lifestyle changes such as regular exercise, healthy diet and sufficient sleep have general beneficial effects on mental health while reducing the relapse risk for many psychiatric disorders. As discussed in Chap. 3, therapeutic modalities used in all systems of medicine belong to one of five categories with respect to a known or postulated mechanism of action:

- *Biological treatments* include synthetic medications and natural product supplements and have effects at the level of a discrete biological mechanism of action
- *Somatic therapies* affect the whole body, not a discrete molecular or cellular biological mechanism of action.
- *Mind–body practices* combine a mental technique with physical training to optimize mind–body functioning.
- *Scientifically validated forms of energy or information* include electromagnetic fields, bright light, dim light, microcurrent electrical stimulation, high-density negative ions, music, binaural beats, and biofeedback.
- *Postulated forms of energy or information* have not been validated by current science and are theorized to be the basis of energetic healing approaches such as Reiki, Qigong, and Healing Touch.

CAM Biological Modalities Used to Treat Mental Health Problems

Biological treatments of mental health problems affect the body and brain at the level of cells or biomolecules resulting in the amelioration of symptoms. Examples include psychotropic medications and natural products derived from plants or animals. Natural products used to maintain optimal wellness or treat cognitive, affective, and behavioral symptoms include herbals, essential fatty acids, vitamins, minerals, essential oils, amino acids, and hormones. Although homeopathic preparations are taken in tablet form they are regarded as "energetic" treatments because their purported beneficial effects do not involve a known biological mechanism of action. Steadily accumulating research findings are providing evidence for both safety and efficacy of select CAM treatments of depressed mood, anxiety, and other mental health problems, including pharmaceutical-grade natural products, lifestyle modifications (Lifestyle Medicine), mind–body approaches, and whole-system approaches such as traditional Chinese medicine and Ayurveda (Lake, 2017). Examples of natural supplements being used to treat mental health problems include *S*-adenosyl methionine (SAM-e) for depressed mood; combining psychotropic medications with natural products such as omega-3 fatty acids, folic acid (especially its active form L-methyl-folinic acid), or the amino acids 5-hydroxytryptophan (5-HTP), and *n*-acetyl cysteine (NAC) for the treatment of mood disorders, and the amino acid L-theanine for treatment of generalized anxiety. Western herbalists generally recommend single herbals taken as teas, tinctures or in dry forms. In contrast, practitioners of Asian systems of medicine more often recommend compound

herbal formulas consisting of several herbals. Many Chinese and Ayurvedic compound herbal medicines have been extensively studied and include remedies for a range of mental and emotional symptom patterns. The compound herbal treatments used in Tibetan medicine hold promise as future treatments of mental health problems and are only beginning to be examined by Western-style research studies.

Somatic, Mind–Body, and Mindfulness Approaches

Exercise, massage, dance, and other expressive movement therapies are beneficial for anxiety, depressed mood, and other mental health problems. Yoga is a mind–body approach that has been extensively researched for the treatment of obsessive-compulsive disorder (OCD), depressed mood, grief, phobias, dyslexia, insomnia, and substance abuse and other problems (Shannahoff-Khalsa, 2003). Research findings from open trials and case reports suggest that specific protocols combining different yogic postures, breathing practices, and meditation are beneficial for different symptom patterns. Different forms of meditation have been investigated as treatments of anxiety, depressed mood, PTSD, and other mental health problems. General beneficial physiological effects of meditation include decreased oxygen consumption, respiratory rate, and blood pressure, as well as EEG changes associated with decreased autonomic arousal. Mindfulness-based stress reduction (MBSR) is an eclectic approach that incorporates elements of different Eastern meditation practices and Western psychology.

CAM Therapies Based on Forms of Energy or Information Validated by Current Science

Therapies based on forms of energy or information validated by current science are used in both contemporary psychiatry and CAM. Treatments that use electricity to treat mental health problems include electroconvulsive therapy (ECT), vagal nerve stimulation and trans-cranial direct current stimulation. Transcranial magnetic stimulation (TMS) uses highly focused magnetic fields to treat individuals diagnosed with severe depressed mood and other problems that do not respond to prescription medications. There is evidence that early morning exposure to bright full-spectrum light or dim blue light is an effective treatment of depressed mood. Listening to binaural beats has beneficial effects on generalized anxiety, depressed mood, memory, and attention. Daily exposure to high-density negative ions may be as effective as bright light exposure in individuals diagnosed with seasonal depressed mood.

Biofeedback is widely used to treat attention-deficit hyperactivity disorder (ADHD) and anxiety disorders. Electroencephalography (EEG) biofeedback (also called “neurofeedback”) is a specialized form of biofeedback in which the individual learns how to modulate brain activity to reduce symptom severity. Virtual reality graded exposure therapy (VRGET) is a technology-enhanced exposure therapy that combines advanced computer graphics, three-dimensional visual displays, and body-tracking technologies to create realistic virtual environments that simulate

feared situations or objects. Virtual environments have been designed to provide visual, auditory, tactile, vibratory, vestibular, and olfactory stimuli to patients in highly controlled settings. VRGET is an effective treatment of post-traumatic stress disorder (PTSD), agoraphobia, fear of flying, fear of heights, and other specific phobias. The approach has also been successful in helping addicts to extinguish craving for narcotics. Individuals who undergo VRGET consistently report achieving "presence," a feeling of actual immersion in the reality being simulated. During a virtual reality exposure session, the therapist monitors physiological indicators of stress, including heart rate and respirations, to closely track the patient's state of arousal. Widespread availability of broadband internet services will result in rapid growth in use of VRGET at home allowing severely symptomatic individuals to self-treat PTSD, agoraphobia and specific phobias. An important advantage of VRGET over conventional in vivo exposure therapy is that virtual environments can be designed to provide graded levels of exposure to situations that are impractical, expensive, or unsafe to use in real life, such as airplanes or combat. EEG biofeedback and VRGET are sometimes combined with cognitive therapy in which a therapist guides the patient through relaxing imagery, deep breathing or other stress-reducing behaviors.

Cranioelectrotherapy stimulation (CES) and transcranial direct current stimulation (tDCS) are widely used to treat depressed mood and other mental health problems. CES uses weak alternating current, and tDCS uses weak direct current. Both approaches are based on the external application of microcurrent electricity to the brain or spinal cord. The mechanism of action probably involves induction of changes in electroencephalographic (EEG) frequencies that result in reduction in anxiety or improved mood. Frequencies between 0.5 and 100 Hz are typically used. Research findings suggest that higher frequencies are associated with relatively greater EEG changes and more noticeable clinical improvements (Schroeder & Barr, 2001). In contrast to electroconvulsive therapy (ECT), the use of microcurrents takes place on an outpatient basis, avoids the requirement of general anesthesia, is not associated with significant adverse medical or psychiatric effects, and can be self-administered following brief training. Changes in cortical excitability caused by microcurrent electrical stimulation may last longer than changes induced by transcranial magnetic stimulation, while offering the advantages of portability and fewer adverse effects.

Microcurrent electrical stimulation is being investigated as a treatment of depressed mood based on the theory that the application of very weak electrical currents to certain brain regions may have beneficial effects on brain circuits involved in attention, perception, learning, and memory that affect mood. Early findings suggest that microcurrent electrical stimulation of the brain may have beneficial synergistic effects when combined with antidepressants. Research findings on CES and tDCS are limited by a paucity of large well-designed studies (Palm, Hasan, Strube, & Padberg, 2016). An attempt to conduct a systematic review of studies on CES in depressed mood failed because no studies met rigorous inclusion criteria (Kavirajan, Lueck, & Chuang, 2014). Pending confirmation of preliminary findings by large well-designed sham-controlled studies CES and tDCS should be regarded as promising, but provisional treatments of depressed mood.

CAM Approaches Based on Postulated Forms of Energy or Information Not Validated by Current Science

Prayer and Energy Medicine: Overview

In recent decades, energy medicine techniques have come into increasing use for the treatment of medical and mental illness. These include acupuncture, Qigong, homeopathy, Therapeutic Touch, Healing Touch, Reiki, prayer, and distant healing intention. Case reports, open trials, and accumulating data from controlled studies support that acupuncture, Qigong, and Therapeutic Touch are probably beneficial for anxiety and general emotional well-being. There is evidence that Reiki is an effective treatment of depressed mood.

Studies on the role of intention or postulated subtle energies in health and illness are difficult to design because of problems inherent in clearly defining study variables and control conditions and measuring outcomes. Studies on the efficacy of "distant healing intention" (DHI) or directed intention on depressed mood or other mental health problems are still at an early stage, and there is ongoing debate over how best to design studies or measure outcomes. Findings from pilot studies, case reports, and controlled, double-blind trials suggest that positive outcomes take place when healing intention (including prayer) is directed at healthy adults or individuals who complain of physical or emotional symptoms. Research findings have so far failed to substantiate a putative mechanism of action or specific effect of intention or *subtle* energies in health and illness. Nor do research findings support the use of specific energetic healing approaches for alleviation of specific mental health problems. Controlled studies on energetic therapies as treatments of affective, cognitive and behavioral symptoms are only beginning to be done and will eventually help clarify the putative role of intention in physical and mental health.

Beneficial Effects of Prayer on Health and Mental Health

Approximately one in three US adults prays to improve health, and more than two thirds of those who pray believe that prayer is beneficial to their health (McCaffrey, Eisenberg, Legedza, Davis, & Phillips, 2004). Significantly, only 10% of those who pray for improved health mention this fact to their physicians. It is estimated that almost 80% of patients believe that their religious or spiritual beliefs influence their physical or mental health. A US survey of 2000 practicing physicians across all medical subspecialities found that 91% believe it is appropriate to discuss religious and spiritual issues if the patient brings them up, and three fourths actively encourage the patient's religious or spiritual beliefs and practices when these issues come up during an appointment (Curlin, Chin, Sellergren, Roach, & Lantos, 2006). In contrast, only 45% of physicians believe it is appropriate to ask patients about their religious or spiritual beliefs. Over half of physicians pray with patients when asked

to do so and many believe that praying has beneficial effects on common medical problems (Anderson, Anderson, & Felsenthal, 1993; Curlin et al., 2006).

The biological effects of intercessory prayer at a distance have been studied extensively in cell cultures, animals, and humans (Dossey, 1997). Healing intention may have beneficial psychological effects and subtle influences on single-celled organisms and nonhuman animals at the levels of physiology, energetics, or information (Zahourek, 2004). Findings of two meta-analyses of sham-controlled studies on distant healing in animals or human subjects showed significant but heterogeneous effect sizes that correlated with blind ratings of study quality (Roe, Sonnex, & Roxburgh, 2015). Positive findings in nonhuman studies were not explainable by placebo and expectancy effects. Sixty percent of studies included in a systematic review of controlled trials on prayer and other forms of distant healing intention used to treat a medical or psychiatric disorder reported positive findings (Astin, Harkness, & Ernst, 2000). Studies on the effects of prayer on medical illnesses often include measures of depressed mood before and after the period of active intercessory prayer. For example, a landmark study on prayer in healing showed that patients with advanced AIDS exhibited improved immunologic status as well as improved mood following several weeks of intercessory prayer (Sicher, Targ, Moore, & Smith, 1998). Interpersonal belief in the efficacy of intercessory prayer probably plays a role when positive outcomes take place (Palmer, Katerndahl, & Morgan-Kidd, 2004).

Evidence from case reports and small controlled studies suggests that above-chance correlations exist between EEG activity and brain metabolic activity based on functional magnetic resonance imaging (fMRI) findings in sensory-isolated human beings (Radin, Taft, & Yount, 2004; Standish, Johnson, Kozak, & Richards, 2003; Achterberg et al., 2005; Giroldini et al., 2016). The magnitude of this effect may be stronger when there is empathic union between two or more subjects (Grinberg-Zylberbaum, Delaflor, & Goswami, 1994). Continued research in this area will help clarify a putative mechanism of action for claims of nonlocal healing associated with directed intention, including Reiki, Healing Touch, and prayer.

The scientific evaluation of postulated beneficial effects of distant healing intention presents complex methodological challenges because of subjective differences between patients' and healers' beliefs and inherent problems identifying and controlling for variables that potentially interfere with study designs or influence outcomes (Radin, Schlitz, & Bauer, 2015). Systematic reviews of randomized controlled trials on prayer and other forms of distant healing intention that purport to ameliorate symptoms by directing subtle energy into patients report largely inconclusive findings because of research design problems, small study sizes, and poor reporting of studies in the medical literature (Abbot, 2000; Radin et al., 2015; Roberts, Ahmed, & Hall, 2000). Despite the absence of compelling findings of RCTs, numerous case reports, findings from open studies and controlled trials provide evidence for consistent beneficial effects of intention, prayer, and other spiritual healing techniques that cannot be adequately explained by current science (Benor, 2002).

Chinese Medicine, Ayurveda, and Tibetan Medicine

Chinese medicine, Ayurveda, and Tibetan medicine posit the existence of a subtle energy body and a manifest physical body. All Asian systems of medicine strive to restore balance in both the energetic and physical body, thus enhancing the body's capacity for self-healing (Clifford, 1990). Afflictive emotions, including anxiety, anger, depressed mood, and psychosis, arise out of unskillful spiritual practice or humoral imbalances, and can be influenced by many internal and external factors (Bodeker, 2001). Acupuncture is used in both Chinese medicine and Tibetan medicine, but not in Ayurveda. Acupuncture has been investigated extensively; however, findings of sham-controlled studies on acupuncture for specific mental health problems are largely inconsistent. Findings of sham-controlled studies show the benefits of acupuncture for depressed mood, anxiety, psychosis, and other mental and emotional symptom patterns. Self-healing through visualization, meditation, listening to music, yoga, and spiritual practices, including the exercise of compassion for oneself and others, are fundamental approaches in Ayurveda and Tibetan medicine (Goleman, 2004; Lhundup & Lake, 2018).

Reiki, Healing Touch, and Therapeutic Touch

Reiki is an energy healing practice introduced to the West from Japan in the nineteenth century; however, its ancient origins may have been in Tibet. Practitioners of Reiki assert that a fundamental energetic principle—*ki*—promotes physical or psychological healing when guided by a skilled practitioner. Like many forms of energy healing, physical contact between practitioner and patient is not believed to be necessary for beneficial effects to take place. In contrast to Healing Touch or Therapeutic Touch, the Reiki practitioner does not consciously direct healing intention to specific regions of the body but serves as a "conduit" for *ki* to "flow into" the patient to restore healthy energetic functioning. Reiki treatments can be *directly* administered to the patient or across considerable distances. Conventionally understood mechanisms involved in hands-on Reiki include beneficial changes in autonomic regulation and EEG activity associated with sustained deep relaxation, reduced heart rate, and blood pressure (Mackay, Hansen, & McFarlane, 2004; Wirth & Cram, 1994). Claims of a distant healing effect rest on a postulated nonlocal role of consciousness that cannot be explained by contemporary scientific models. Findings of a small sham-controlled study reported that regular Reiki treatments may reduce symptoms of depressed mood and stress (Shore, 2004). Recent reviews of clinical trials on Reiki focused on different health problems, used different methodologies and reported disparate findings. A systematic review of studies on Reiki for depressed mood or anxiety identified only three small studies and found insufficient evidence for beneficial effects (Joyce & Herbison, 2015). A narrative review identified seven studies on Reiki for pain or anxiety in cancer patients or post-surgical patients and found effect sizes consistent with beneficial effects of Reiki in these populations (Thrane & Cohen, 2014).

Healing Touch (HT) is a form of energy healing administered by trained practitioners in North America and Europe to treat a range of physical and emotional symptoms. HT techniques include "charka spreading," "magnetic unruffling," "mind clearing," and "stopping." The mechanism of action is not yet clearly established, but HT practitioners and patients who seek this treatment believe that direct spiritual or energetic contact between the practitioner and patient results in relief from physical and emotional symptoms. The HT practitioner positions the hands over certain parts of the body but does not actually touch the patient's body. In contrast to HT, in Therapeutic Touch, there is gentle physical contact. Healing Touch is available on request to pain or cancer patients in many hospitals and increasing numbers of nurses are becoming certified as Healing Touch or Therapeutic Touch practitioners. Systematic reviews of studies on HT and TT do not support claims of effectiveness; however, the authors point out that such energy healing techniques may be efficacious, arguing that inappropriate methodologies and research designs are used to investigate energy healing (Anderson & Taylor, 2011; Cheraghi, Hosseini, Gholami, & Bagheri, 2017). A critical review of research on Healing Touch and Therapeutic Touch can be found in Benor (2002).

Homeopathic Remedies

Homeopathic preparations are widely used to self-treat mental health problems but there is little information about outcomes from case reports or controlled studies. Homeopathic remedies reflect the unique constitutional type of each patient and should be administered by a trained homeopathic physician. Like Chinese medicine, Ayurveda, and other non-allopathic systems of medicine, homeopathy assumes the existence of a vital force or energy. Energetic imbalances are believed to manifest as disparate symptom patterns. Western medicine has been unable to explain a mechanism of action or measure claimed outcomes associated with homeopathic remedies, which are typically diluted beyond the point of possible biological action according to classical models of cause and effect. This problem has been addressed by novel assessment approaches that take into account perceived changes in cognitive and spiritual functioning following treatment (Bell, Lewis, Lewis, Brooks, Schwartz, & Baldwin, 2004). Controlled studies of standardized homeopathic preparations do not reflect complex variables that influence the clinical practice of homeopathy because of individual constitutional differences that translate into unique remedies for each patient. This observation has led to debate over the possible role of placebo effects in homeopathy. Some writers interpret findings of Western style research studies as confirmation that homeopathy is based entirely on the placebo effect (Ernst & Resch, 1996) while others contend that there is evidence for beneficial treatment effects (Kleijnen, Knipschild, & Riet, 1991; Linde et al., 1997).

Similarities exist between homeopathy and conventional psychiatry, including the role of self-healing and postulated "micro-dose effects" of treatments that elicit therapeutic responses at extremely low doses (Davidson, 1994). This conceptual

overlap has recently led to increased use of homeopathic remedies in mental health care. Emerging understandings of complex systems, nonlinear dynamics, and quantum information may help to elucidate the mechanism(s) of action associated with observed beneficial effects of homeopathic treatment (Bell, Baldwin, Schwartz, & Russek, 1998; Schwartz & Russek, 1998; Smith, 2004). Homeopathy may eventually be shown to rest on the induction of subtle changes in poorly characterized kinds of energy or information that influence the bioenergetic systems of the body and brain.

Energy Psychology: Thought Field Therapy and Emotional Freedom Techniques

Other spiritual or energy healing methods used to treat cognitive, affective, and behavioral symptoms include energy psychology, shamanic healing rituals, spiritual methods in Ayurvedic and Tibetan medicine, and the use of crystals to amplify or focus healing energy. Chronically ill individuals who wish to be treated by a spiritual or distant healing technique and *believe they are being treated* report improvements in the quality of life (Wiesendanger, Werthmuller, Reuter, & Walach, 2001). There is ongoing debate on whether quantum mechanics and quantum field theory may help explain postulated subtle effects of human intention on health and illness (Feinstein, 2003; Hankey, 2004). It is likely that expectation plays a role in disparate forms of energy medicine.

Energy psychology draws from Western psychological theory and Chinese meridian theory and posits that energetic imbalances in the meridians are associated with different emotional or mental symptom patterns (Gallo, 1999). Thought field therapy (TFT) and Emotional Freedom Technique (EFT) are energy psychology approaches used to treat mental and emotional symptoms including anxiety and depressed mood. In TFT the patient is first assessed using applied kinesiology or another form of muscle testing. The patient is asked to invoke a "thought field" associated with depressed mood, a traumatic memory, or other principal symptom pattern. The TFT practitioner then reattunes energetic imbalances associated with target symptoms by tapping on specific acupuncture points in a specified manner, resulting in symptomatic relief. TFT is based on shared beliefs among its practitioners and numerous case reports. Controlled studies done to date have resulted in largely negative or inconsistent findings. EFT is a simplified version of TFT that involves only one routine for stimulating acupuncture points without first assessing the patient through muscle testing. There is even less evidence for EFT from case reports or controlled studies. A systematic review of sham-controlled studies on EFT for anxiety reported large effect sizes but too few data to compare EFT to mainstream treatments such as cognitive behavioral therapy (Clond, 2016).

Treatment Planning in Integrative Mental Health Care

Integrative Mental Health Care Is Individualized

Integrative mental health care considers evidence of effectiveness from the dual perspectives of Western medicine and CAM. *The principal goal of integrative mental health care is to identify a treatment or treatments supported by solid research findings that adequately address the patient's symptoms, are acceptable, affordable, and locally available.* Integrative management of mental health problems begins with a complete history with the goal of documenting the type, severity and course of symptoms, and identifying other medical or mental health problems that may be related to the patient's primary complaint (see Chap. 7). Depending on each patient's unique symptoms formal assessment is sometimes undertaken to identify plausible psychological, biological, or postulated "energetic" factors that may be causing or exacerbating symptoms. Assessment findings are used to construct a multilevel formulation about *causes and meanings* of symptoms which point to the *optimal* integrative treatment plan based on an appraisal of the best evidence for Western medical and CAM modalities. Finally, a *realistic* integrative treatment plan is developed taking into account the patient's preferences, financial or insurance constraints (if any), and factors that limit access to qualified providers of a recommended treatment modality.

Follow-up appointments are used to obtain additional pertinent information and establish a relationship of trust and cooperation between practitioner and patient. Different strategies are used to manage moderate versus severe symptoms. For example, when a severely symptomatic patient is seen by a conventionally trained Western physician it is prudent to refer him or her to a CAM practitioner *only after* it has been established that the patient is not actively suicidal, homicidal, or grossly psychotic, and *only after* informed consent for referral to a specific CAM practitioner has been obtained and documented in the patient's chart. As discussed in Chap. 1, the eclectic perspective and personalized attention of the integrative practitioner may result in treatment recommendations that are more effective and more cost-effective compared to conventional mental health care.

Ethical and Liability Issues in Integrative Mental Health Care

Integrative mental health care is associated with ethical and liability issues and may require more time and effort than is customary for more conventional models of mental health care. The ethical and legal relationship between any health care provider and any patient depends on the kinds of services provided and the implied or explicit purpose of the contract between them. The purpose of a relationship between a patient and a health care provider is contained in a contract or agreement to treat and to accept treatment. The relationship between a patient and a health care

provider may consist of a limited one-time consultation, ongoing treatment employing biomedical or CAM modalities, or an agreement to focus on spiritual issues, lifestyle changes, a medical disorder, or a specific affective, cognitive, or behavioral problem. In all cases the choice of treatment modalities defines the purpose of a contract between a patient and a health care provider. The health care provider is obligated to offer competent professional care, and the patient assumes responsibility for complying with the recommended treatment plan or notifying the provider of adverse effects or other concerns that emerge during treatment. The patient is also responsible for informing his or her health care provider in a timely manner of a decision to discontinue a recommended treatment.

Western trained medical practitioners and CAM practitioners assume different risks and liabilities in working with patients or referring them to other providers (Cohen, 1998; Cohen & Eisenberg, 2002; Kerridge & McPhee, 2004; Sanderson, Koczwara, & Currow, 2006; Studdert et al., 1998). It is important for all health care providers to be familiar with legal and ethical requirements and norms within their professional group when treating patients or making referrals. There is no clear ethical or legal framework that defines the scope of practice for physicians or CAM practitioners who treat patients using CAM or integrative approaches. In this ambiguous context clinical practitioners can make recommendations that are ethically and legally sound by taking into account symptom severity, the comparative strength of evidence for Western medical and CAM interventions for the condition being treated, the risk of toxicities or adverse effects of Western medical and CAM treatment choices, the patient's knowledge of risks and consent to receive treatment, and the patient's preference for conventional Western treatment or CAM (Adams, Cohen, Eisenberg, & Jonsen, 2002).

All health care providers have a legal and ethical duty to their patients. This duty includes the demonstration of professional competence when treating patients and the exercise of sound judgment when referring a patient for consultation with another health care provider. Medical practitioners who use interventions that are not recognized as falling within the scope of their professional competence may invite disciplinary action by the state medical board or other regulatory agencies if patients or professional peers make formal complaints to those bodies (Adams et al., 2002; Green, 1996). Disciplinary action may result in probation, suspension, or revocation of a professional license to practice. Western physicians who use CAM or integrative treatments should learn of any applicable restrictions imposed by the state medical board on the scope of medical practices within their medical subspecialty. The determination of acceptable scope of practice standards for a medical subspecialty requires a consideration of many complex ethical and legal issues. Medical practices regarded as legitimate in one state jurisdiction may be cause for probation or other disciplinary action in other states. Changes in the health care legal and regulatory environment will be needed as increasing numbers of Western trained medical practitioners incorporate CAM modalities in their clinical practices (Oguamanam, 2006; Ruggio & DeSantis, 2009).

Making referrals poses important ethical and legal issues (Thorne, Best, Balon, Kelner, & Rickhi, 2002). When a patient's medical or mental health problem is

outside the scope of a practitioner's expertise, the practitioner is ethically obligated to refer the patient to an appropriate and competent provider. When a CAM practitioner is the primary health care provider, it is prudent to refer a patient to his or her primary care physician when there is a concern about a medical problem that cannot be adequately addressed by the CAM practitioner. It is my strong view as a Western trained physician that *giving medical advice to patients is always outside the reasonable scope of practice of CAM practitioners who are not trained in Western medicine*. This can result in inappropriate treatment, delay the start of appropriate treatment, and harmful consequences to the patient. Any patient who may have a serious or undiagnosed medical problem should be referred immediately to the closest urgent care facility. When a Western-trained physician is already caring for the patient, there is no evidence of a serious or undiagnosed medical problem, and there is evidence that a CAM approach is both safe and beneficial, the Western physician is ethically obligated to refer the patient to a qualified CAM practitioner, documenting the patient's informed consent. Physicians should understand that when referring patients to CAM practitioners they assume liability for any negative outcomes resulting from the referral, including harmful effects of treatment. For this reason, physicians should refer patients to CAM practitioners only after confirming that the practitioner is reputable and qualified to practice in his or her specialty.

Safety Issues in Integrative Mental Health Care

This section is offered as a concise overview of important concepts pertaining to safety when CAM or integrative treatment regimens are used in mental health care. Resources on safety are included in the appendix and on the companion website www.IntegrativeMentalHealthPlan.com. Evaluating the safety of a CAM modality or a combination of Western medical and CAM modalities poses complex challenges. Many herbal treatments are widely regarded as safe because of their long-standing historical use in traditional healing practices. Patient surveys show that most Americans believe that all supplements are safe despite limited reliable safety data on the majority of herbals and other natural products. In fact, herbals, vitamins, minerals, and other natural supplements may cause adverse effects when used alone and may interact with other natural products or pharmaceuticals with potentially harmful consequences. In contrast to herbals and non-herbal natural supplements, few safety risks are associated with whole body therapies, mind–body practices, established energy therapies that use light, sound and electricity, and healing techniques based on postulated forms of "subtle" energy.

For decades, public and private organizations, academic institutions, and regulatory bodies have been working with the pharmaceutical industry to develop guidelines for best practices pertaining to the manufacture of natural product supplements for medicinal use. These guidelines—designated "Good Manufacturing Practice (GMP)"—are widely implemented globally with the goal of improving safe practices in all stages of natural product manufacture (Gouveia, Rijo, Goncalo, & Reis,

2015; Whitsitt, Beehner, & Welch, 2013). In 2007 the US Food and Drug Administration (FDA) finalized GMP guidelines pertaining to the safety, quality, consistency, and purity of natural products, including vitamins, herbals, and all non-herbal natural product supplements. Unfortunately, in the USA and other industrialized countries GMP guidelines are vaguely worded and include legal loopholes that interfere with efforts to enforce compliance. The safety and efficacy of imported herbal medicines and other natural products used for medicinal purposes from Asia are even more difficult to assess than botanicals manufactured in Western countries because of the absence of uniform quality control and weak import controls. Herbals imported from China and India are frequently adulterated with steroids, barbiturates, acetaminophen, and other drugs that may result in serious adverse effects and toxic interactions when combined with certain herbs or prescription drugs including psychotropics.

Most safety information on natural supplements comes from case reports of limited reliability, and published reviews of adverse effects sometimes cite conflicting findings. St. John's wort (*Hypericum perforatum*) has the greatest number of reported cases of adverse effects because it is one of the most widely used CAM treatments of depression. However, relatively little is known about specific adverse effects or potential interactions associated with the majority of herbals and other natural supplements. Safety information on medicinal herbs is particularly lacking with regard to young children, pregnant and nursing women, the elderly, and patients with significant liver or kidney disease. The paucity of reliable safety data is complicated by the absence of established standards of professional training or credentialing for CAM practitioners. This is further complicated by the fact that many individuals who take prescription medications self-treat using herbs or other natural products without disclosing CAM use to their psychiatrist or family physician. The result is unknown risks of toxic interactions and underreporting of serious adverse effects and interactions between psychotropic medications and natural products.

Certain herbal products widely used to treat mental health problems are known to have potentially serious adverse effects. For example, St. John's wort (*Hypericum perforatum*) can induce mania in bipolar patients. The uterine stimulating effects of St. John's wort may result in spontaneous abortion in pregnant women. Patients who use St. John's wort should avoid prolonged exposure to sunlight to reduce the risk of a photosensitive rash. Ephedra-containing compounds (Ma Huang) can cause psychosis. There are case reports of neurological adverse effects with kava (*Piper methysticum*). Case reports of reduced uterine tone caused by kava have led physicians to recommend against kava use in pregnant women. Nursing women are also advised to avoid kava use because the active constituents (kava pyrones) pass into breast milk and may have sedating effects on a nursing infant. Kava should be avoided in severely depressed patients, who may experience excessive sedation and worsening of vegetative symptoms. Kava can potentiate benzodiazepines, and all patients who take benzodiazepines should be warned against concurrent kava use because of the risk of excessive sedation. Cases of mild serotonin syndrome have been reported with the methyl donor *S*-adenosyl methionine (SAM-e) and the amino acid L-tryptophan, but not with 5-hydroxytryptophan (HTP). Patients who use

SAM-e or 5-HTP to augment prescription antidepressants—especially selective serotonin reuptake inhibitors (SSRI)—should be closely monitored for signs of serotonin syndrome, a potentially life-threatening condition that manifests as agitation, anxiety, perspiration, confusion, and autonomic arousal. Rare case reports have been published describing hypomania in bipolar patients taking L-tryptophan. Essential oils applied topically or used as aromatherapy to self-treat anxiety disorders can potentially exacerbate asthma and hypertension. The essential oils of parsley and nutmeg are known to have monoamine oxidase–inhibiting (MAOI) activity and should not be used concurrently with MAOI antidepressants.

It is prudent to advise patients about possible toxicities or interactions when considering recommending a vitamin, mineral, herbal, or other natural product concurrently with any prescription medication. All patients should be warned against using particular combinations of pharmaceuticals and natural products for which serious interactions have been documented. Examples of potentially dangerous combinations include the concurrent use of St. John's wort and an immunosuppressive agent; and *Ginkgo biloba* in combination with warfarin, heparin, or other anticoagulants. St. John's wort induces cytochrome P450 liver enzymes, resulting in decreased serum levels of anti-HIV drugs (protease inhibitors), warfarin, digoxin, oral contraceptives, and immunosuppressive drugs. Although there are no confirmed cases of hypertensive crises resulting from interactions with MAOIs, all patients taking MAOIs should be advised against concurrent use of St. John's wort. Patients who elect to take prescription medications concurrently with herbals or other natural products should be provided with a handout listing common adverse effects and—when known—potentially unsafe interactions of the particular combination being used. In such cases informed consent should be carefully documented in the patient's chart.

Selecting Appropriate Treatments in Integrative Mental Health Care

Integrative medicine strives to find a balance between the *rigor* of empirical research and the *relevance* of personal information throughout all phases of assessment, formulation, treatment planning and follow-up. Treatment recommendations are based on evidence of comparative effectiveness and cost-effectiveness (where data are available) of natural product supplements, prescription medications, mind–body approaches, and other modalities identified as reasonable candidate treatments addressing target symptoms. Chapter 9 discusses integrative management of severe and complex cases including patients who have comorbid substance abuse or medical problems (e.g., chronic pain, cancer, heart disease) that may be causing or worsening a mental health problem. Treatment recommendations should always take account of the patient's history of response to previously tried Western medical and CAM modalities including adverse effects or toxic interactions between

prescription medications and natural products. Some patients experience gastrointestinal distress or reduced libido when taking antidepressants and soon discontinue these medications despite beneficial effects on mood. Others may report a history of "nervousness" or insomnia when taking *S*-adenosyl methionine (SAM-e), or daytime sedation when taking the amino acid 5-hydroxytryptophan (5-HTP) for anxiety or depressed mood.

It is prudent to encourage a patient to first try specific modalities and simple lifestyle changes for which there is relatively strong evidence of efficacy for the principal symptom pattern(s) being addressed. In some cases, substantiated Western medical or CAM approaches may have been tried previously and found to be ineffective or discontinued because of adverse effects. In other cases, a patient may refuse to try a recommended treatment because of concerns over adverse effects, high cost, or unavailability of a conventionally trained CAM practitioner where the patient lives. Recommending a Western medical or CAM modality when a qualified practitioner is not available locally, or the treatment is unaffordable or unacceptable for cultural or personal reasons, may delay or compromise patient care.

The *optimal treatment plan* consists of the modality or combination of modalities that will most likely alleviate the causes and meanings of symptoms reported by a patient. As each patient is unique in terms of cultural, psychological, and biological causes of symptoms, a treatment plan that is optimal for one patient may not adequately address similar symptoms in another patient. In some cases, there may be a discrepancy between the *optimal* treatment plan and a *realistic* treatment plan when patient preferences, financial constraints, and availability of mental health care resources are considered. In other cases, combining a treatment approach that is supported by limited evidence with a more substantiated treatment may be more effective than using a single more substantiated Western medical or CAM modality alone while permitting the patient to reduce the dose of a medication or natural supplement and making overall treatment *more affordable and more cost-effective*. It is prudent to recommend treatments supported by limited evidence only in cases where more substantiated treatments have been exhausted or excluded for reasons discussed above.

In some cases, the strength of evidence supporting the use of a specific Western medical or CAM treatment modality increases or decreases over time (i.e., based on new research findings). It is the practitioner's responsibility to the patient to review the research evidence to ensure that treatment recommendations are based on the most current information available (see Chap. 6 for a discussion of literature research methods). Treatment combinations known to be unsafe or *potentially unsafe* should be avoided and discouraged, whereas safe combinations that produce synergistic benefits should be actively encouraged.

In cases where a patient is being seen concurrently by two or more practitioners there is a risk of confusion or miscommunication about treatment recommendations. This risk can be minimized when one practitioner takes responsibility for coordinating patient care, and the patient provides his or her written permission for different practitioners to exchange information. The managing health care practitioner should carefully document all Western medical and CAM modalities being

used. Patients benefit from communication between their health care providers, and well-coordinated care reduces the risk of inappropriate or delayed treatment.

At the outset it is important for the practitioner and patient to agree on a time frame in which improvement is reasonably expected to take place based on the treatments being used. Changes in symptoms and pertinent assessment findings (if any) are reviewed during follow-up appointments. *Assessment and treatment continue until an individualized integrative strategy that is acceptable to the patient, realistic and affordable, results in sustained improvement in target symptoms.*

As in conventional mental health care, patients who receive CAM or integrative therapies may not improve after trying numerous single or combined modalities. In some cases, a patient may complain of two or more severe symptom patterns (or "disorders") that do not respond to Western medical or CAM treatments. In such challenging cases it is helpful to work collaboratively with other practitioners to ensure that the patient's symptoms are thoroughly evaluated, and to develop successful strategies for assessment and treatment. Chapter 9 describes a methodology for working with patients who complain of complex symptom patterns that entail two or more mental health, substance use or medical problems.

Western medical or CAM treatments should not be viewed as substitutes for psychotherapy. Even in cases where prescription psychotropic medications or CAM therapies are effective and well tolerated, important psychological issues are frequently present. Patients who have the capacity for insight and are motivated to do psychological work should be encouraged to enter ongoing individual or group psychotherapy. Journal writing is often helpful for tracking progress, safety problems, and other issues.

Considerations of Treatment Precedence in Integrative Mental Health Care

Many factors need to be considered when determining whether to first recommend a Western medical treatment or a CAM modality. On the assumption that established Western medical treatments are more substantiated than the majority of CAM modalities Hoenders et al. have argued that CAM modalities should be recommended only when conventional Western medical treatments have previously been tried "or at least advised as suggested by guidelines and protocols (Hoenders, Appelo, van den Brink, Hartogs, & de Jong, 2011)." In other words, Western medical treatments should always have precedence over CAM approaches. The authors add that "CAM (should be) considered only in cases when there is no danger when a patient refuses conventional Western medical treatment" and give the example of a patient with severe symptoms of mania or psychosis who is "strongly advised to first accept conventional medication even when asking for CAM." This conservative methodology ensures that urgent psychiatric or medical problems will be aggressively addressed using Western medical diagnostic and treatment modalities.

Although research findings support that many severe mental health problems respond better and more rapidly to psychotropic medications, this is not always the case. For example, head to head comparisons of SAM-e and antidepressants suggest equivalent efficacy and improved response in cases of treatment-refractory depression when SAM-e is used adjunctively with antidepressants (De Berardis et al., 2016). By the same token, the B vitamin L-methyl-folinic acid, certain essential fatty acids, and other natural product supplements may be safely used in combination with antidepressants or antianxiety medications resulting in better outcomes, fewer adverse effects and (in some cases) lower effective medication doses with improved adherence to treatment. The conservative "medication-centric" approach fails to acknowledge each patient's right to autonomy as it does not take into account patients' preferences and financial or other constraints. Further, nutraceuticals and other CAM approaches are often as effective as psychotropic medications for mild or moderate symptoms while avoiding any risk of adverse effects.

As a Western trained physician, I agree in principle with the conservative practice of medicine which comes from the ancient dictum "first do not harm" (*primum non nocere*). However, this perspective reflects entrenched ideological biases in Western medicine that unnecessarily limit treatment choices regarded as viable or "legitimate." Considerations of treatment precedence should weigh both costs and benefits of all reasonable treatment choices including the risk of adverse effects when taking psychotropic medications, nutraceuticals, or other modalities that may lead to early discontinuation and poor response. As discussed in Chap. 5, integrative mental health care uses a flexible open approach to treatment planning—not static algorithms that view all patients as equivalent. This more flexible approach invites the integrative practitioner to be open-minded to a broad range of Western medical treatments and CAM modalities.

In sum, determinations of treatment precedence take into account the unique history, symptoms, preferences, and circumstances of each client. In most cases severe cognitive, affective, and behavioral symptoms generally respond more rapidly to potent psychotropic medications than CAM modalities. However adjunctive nutraceuticals, lifestyle changes, mind–body practices, and other non-pharmacologic modalities may significantly reduce symptom severity, improve functioning and speed the rate of response even when severe symptoms are being treated. Chapter 9 develops a methodology for the integrative management of severe and complex cases involving comorbid substance abuse or medical illness.

Managing Mild and Moderate Symptoms

As previously discussed, research findings support that non-severe symptoms respond as well or better to select CAM modalities or lifestyle changes compared to psychotropic medications or psychotherapy, while avoiding the risk of medication adverse effects. Proponents of the conservative "medication first" approach might argue that improvement in mild or moderate symptoms in response to CAM

therapies is due to the placebo effect, however this argument applies equally to outcomes following treatment of non-severe symptoms with psychotropic medications or psychotherapy. The reflexive prescribing of psychotropic medications to individuals complaining of mild or moderate generalized anxiety or depressed mood ignores the evidence for a variety of CAM modalities and self-directed lifestyle changes known to be effective for these symptom patterns.

Patients who complain of mild or moderate affective, cognitive, or behavioral symptoms should first be evaluated by a conventionally trained Western medical practitioner to rule out possible underlying medical causes. Appropriate Western medical and CAM approaches can then be discussed with the patient during the initial consultation.

Patients interested in trying a prescription medication or a natural supplement for mild or moderate symptoms should be encouraged to first try self-directed approaches aimed at optimal wellness that are supported by research findings. Self-directed approaches often improve mild to moderate symptoms as effectively as prescription medications while avoiding the risk of adverse effects. Beneficial self-directed approaches include dietary changes, regular exercise and mind–body practices. These approaches promote optimal wellness. If a patient who reports mild or moderate symptoms wishes to try a prescription medication or natural supplement he or she should be referred to a qualified Western medical practitioner or CAM practitioner to discuss the risks and benefits of appropriate treatment choices.

Some individuals may benefit from supportive psychotherapy or cognitive-behavioral therapy (CBT) aimed at reducing the severity of their symptoms. CBT alone often ameliorates mild to moderate symptoms of anxiety and depressed mood. Supportive psychotherapy is especially helpful for patients who are motivated to explore interpersonal issues that may be contributing to their symptoms. The practitioner and patient should review progress and problems at regular follow-up appointments and modify the treatment plan if symptoms do not diminish. The practitioner and patient should agree on benchmarks for monitoring changes in symptom severity and a time frame in which improvement in target symptoms should be expected. Specific Western medical and CAM therapies can be tried later if mild or moderate symptoms do not respond to life style changes.

Some patients may not be motivated to try a Western medical or CAM modality because of concerns about adverse effects. Others may not be motivated to try approaches that involve a great deal of effort or time such as regular exercise or dietary changes. In cases where mild or moderate symptoms do not improve *or worsen* after 1 month of consistent effort the patient should be encouraged to consider a prescription medication or natural supplement known to be effective for the target symptom(s). Conversations about prescription medications should always take place with a conventionally trained physician or registered nurse (RN) specializing in psychiatry. Discussions of herbals, other natural supplements, or homeopathic preparations should take place with qualified naturopathic physicians, herbalists, or homeopathic physicians as appropriate.

When considering recommending a prescription medication or natural product supplement, the practitioner should take account of the patient's history of response

to previous trials on medications or supplements, including adverse effects. This information will help the practitioner develop a strategy that will most likely be effective and well tolerated. For example, one patient may experience nausea or reflux when taking a prescription medication and soon stop taking it. Another patient may experience anxiety or irritability after taking even small doses of a natural supplement or feel sedated soon after starting a psychotropic medication. After making treatment recommendations based on the above considerations, the practitioner and patient should agree on a treatment plan that does not pose potential risks in the context of other Western medical or CAM treatments currently being used. Select natural supplements including the B vitamins folate, thiamine, vitamin B_{12}, the amino acids 5-HTP and l-theanine, and omega-3 essential fatty acids are effective against mild to moderate symptoms of anxiety, depressed mood and other mental health problems and can be safely combined with prescription medications to enhance their effectiveness. In some cases, this integrative strategy permits a patient to reduce the dose of a prescription medication with the result that side effects decrease without a loss in effectiveness.

Managing Severe Symptoms

In contrast to mild or moderate symptoms, the most judicious approach to treating severe affective, cognitive, or behavioral symptoms should start with a potent biological agent—including psychotropic medications and select natural products—known to be effective for a target symptom pattern or "disorder." Depending on the patient's unique circumstances, motivation, and preferences, it may be prudent to recommend lifestyle changes such as changes in diet or increased physical activity. Many patients who have severe symptoms of depressed mood, anxiety, bipolar disorder, post-traumatic stress disorder (PTSD), psychosis, or another mental health problem are so impaired that they are unable to make proactive lifestyle changes such as regular exercise or healthy dietary choices. Other beneficial approaches may include select natural supplements, a mind–body practice such as yoga, or individual or group psychotherapy.

During the intake interview the practitioner should try to determine whether there is an undiagnosed medical problem that may be causing or exacerbating the patient's symptoms and refer the patient appropriately. A thorough history will determine whether the patient abuses alcohol or other substances, has previously experienced mania or severe depressed mood, severe anxiety or panic attacks, psychosis or problems with memory. Finding out whether a patient is suicidal, potentially dangerous, or unable to care for his or her basic needs is the single most important task when evaluating any new patient. A patient who is homicidal, psychotic, or contemplating suicide should be referred to the nearest emergency room or urgent care center for evaluation and possible hospitalization. Patients who complain of psychotic symptoms, severe anxiety, depressed mood, cognitive impairment, chronic fatigue or disturbed sleep, but are not impaired by their symptoms,

should be referred to a conventionally trained physician or naturopathic physician for evaluation and treatment with prescription medications or select natural supplements, as appropriate.

Patients who report severe affective, cognitive, or behavioral symptoms should undergo appropriate laboratory tests (e.g., thyroid studies, electrolytes, and complete blood count (CBC)) to rule out possible underlying medical problems. When laboratory studies are abnormal the physician or CAM practitioner should refer the patient to appropriate Western medical or CAM specialists. Common medical causes of depressed mood include hypothyroidism, diabetes, and heart disease. Anemias and other disorders of the blood, electrolyte or metabolic derangements, and other markers of medical illness are often associated with depressed mood. Correcting an underlying medical problem frequently results in symptomatic improvement. The presence of neurological symptoms (e.g., abnormal movements, weakness, changes in vision) or a history of cancer or heart disease warrants referrals to conventionally trained physicians who specialize in these disorders prior to consideration of CAM therapies. Patients who abuse alcohol or other substances should be referred to a Western medical or CAM practitioner who specializes in substance abuse or an appropriate rehabilitation program.

In cases where medical problems and substance abuse have been ruled out, follow-up appointments should be scheduled at regular intervals and the patient should be provided with a phone number or e-mail address so that he or she can contact the practitioner about questions or problems between scheduled appointments. Ideally the patient should be given written instructions to go to the nearest emergency room or call 911 in the event of homicidal or suicidal thoughts. In cases where a patient has two or more principal symptom patterns—for example, depressed mood together with anxiety; or psychosis and insomnia—the practitioner needs to decide whether to treat symptoms at the same time or one after another. In some cases, a specific symptom pattern (e.g., depressed mood, anxiety, bipolar mania) that is causing distress or impairing functioning is the focus of clinical attention, and the treatment plan should be directed at that principal symptom pattern. The practitioner's role is to identify a *realistic* treatment plan that addresses the patient's principal symptom pattern(s) taking account of each patient's preferences and financial constraints. In cases where two or more symptom patterns are being addressed at the same time, it may be both prudent and necessary to use two or more disparate treatment approaches in parallel, especially when no single approach is effective against all symptoms being treated (see below sections on sequential and parallel treatments). The patient should be encouraged to initially try only those Western medical, CAM or integrative approaches supported by strong evidence for the symptom pattern being treated. The practitioner who is managing the patient's care should obtain the patient's formal written consent to exchange information with other practitioners who are seeing the patient. The treatment plan should be reviewed and modified at regular follow-up appointments until the most effective combination of Western medical and CAM treatments has been identified and successfully implemented.

In cases where strongly substantiated treatment approaches have already been tried without benefit, combinations of two or more less substantiated approaches should be considered but *only when they may be combined safely*. This approach is analogous to the practice of "augmentation therapy" in biomedical psychiatry. Taking account of (any) new findings or changes in symptoms, the integrative practitioner continues to refine the treatment plan until the patient reports consistent improvement in the absence of serious adverse effects, or all appropriate, available and affordable treatments or treatment combinations have been tried and the patient has not improved. Chapter 9 discusses strategies to use when addressing complex cases involving severe symptom patterns that have not responded to trials on two or more Western medical or CAM treatments, or when treatment failure may be related to non-adherence due to adverse effects, a medical problem or substance abuse.

When Severe Symptoms Do Not Improve

In cases where severe symptoms do not respond to two or more appropriate treatment regimens following a period in which it is reasonable to expect improvement, or the patient discontinues treatment because of adverse effects, high cost, or the absence of insurance coverage, the practitioner should carefully review the patient's history and assessment findings (if any). In such challenging cases it may be helpful to refer the patient to another medical practitioner to rule out the possibility of undiagnosed psychological, medical, or postulated *energetic* causes of symptoms that have not yet been identified or are not being adequately treated. Self-defeating "primitive" psychological defense mechanisms in individuals diagnosed with certain personality disorders or psychotic disorders have the potential to derail even the most astute treatment plan. Medical problems such as chronic pain, hypothyroidism, other endocrinological disorders, degenerative neurological disorders, cancer, or heart disease may worsen a primary mental health problem, complicate the diagnostic picture, make it harder for a patient to adhere to treatment, or delay response to treatment. Prescription medications sometimes cause adverse effects that worsen mental health or interfere with the beneficial effects of Western medical or CAM therapies. It is prudent to ask a patient who remains a diagnostic dilemma or does not respond to appropriate treatment about substance use. Abuse of alcohol, Cannabis, narcotics and other substances can interfere with emotional and cognitive functioning, confound the diagnostic picture, cause safety problems when pharmacologic or natural supplements are being used, and interfere with response to treatment. Finally, energetic imbalances described in Chinese medicine, Tibetan medicine and Ayurveda, may confound efforts to understand the causes of symptoms and lead to treatment recommendations that do not address postulated energetic causes of symptoms.

Refining the Treatment Plan

Determining the Most Appropriate Realistic *Treatment Plan for Your Patient*

In some cases there may be comparable evidence for disparate treatment choices addressing the same symptom pattern. The integrative practitioner's task is to identify those treatments that take account of each patient's unique history, preferences, financial constraints, and the availability of qualified practitioners. Some substantiated treatment approaches (or Western medical or CAM practitioners qualified to administer them) may be unaffordable or unacceptable because of personal preferences. Even in cases where history or assessment findings suggest that a patient would benefit from a specific Western medical or CAM modality, if a qualified practitioner of the recommended treatment is not available or charges too high a fee, it does not make sense to suggest that treatment. In other cases, a patient may be reluctant to try a recommended Western medical or CAM treatment because of fears or misconceptions about what is involved in the treatment process. For example, some patients hesitate to try acupuncture out of fear over "being stuck with needles." By the same token, it is inappropriate to recommend a prescription antidepressant as a first-line treatment for a moderately depressed patient who has a history of nonadherence to antidepressants because of adverse effects, or who is opposed to taking antidepressants based on strong negative views about pharmaceuticals. A patient who is opposed to taking psychotropic medications or other established Western medical treatments will probably refuse treatment or stop treatment early.

Poor adherence to a treatment that is both appropriate and effective is often the cause of treatment failure. Many patients *forget* to follow professional advice when taking a prescription medication or natural supplement resulting in poor response. For example, a patient taking a serotonin-selective reuptake inhibitor (SSRI) for depressed mood may experience greater improvement when taking the vitamin L-methylfolate at the same time but may often *forget* to take folate. When a patient consistently *forgets* to take a medication or a natural supplement it may be helpful to interpret psychodynamic meanings of *forgetting* assuming the patient is cognitively intact (i.e., is not grossly psychotic or demented). For example, a patient may be conflicted about *feeling better*, and *forgetting* may reflect unconscious resistance. Of course, *forgetting* can also result from a problem with memory or cognition, suggesting the need for formal assessment to rule out memory loss or another primary neurologic disorder. Clarifying the patient's experience of *forgetting* to take a treatment will often improve adherence and provide useful clues about other viable treatment choices. It is important to encourage all patients to take an active role in treatment decisions to improve the practitioner–patient alliance, enhance patient autonomy and motivation, and increase treatment adherence.

Considerations When Recommending One or More than One Treatment

Mild or moderate cognitive, affective, and behavioral symptoms often respond to single treatments. Taking one treatment at a time or trying different treatments sequentially minimizes potential safety concerns because treatments do not overlap in time. An important advantage of this approach is that patients have a straightforward plan that is usually less expensive and more cost-effective than more complicated treatment plans involving two or more modalities. Few potential interactions take place when there is a gap in between the use of disparate modalities; thus, fewer safety problems emerge when treatments are used sequentially. An exception to this general principle includes the possibility of a hypertensive crisis when certain antidepressants (e.g., monoamine oxidase inhibitors (MAOI)) are started within 2 weeks following discontinuation of other antidepressants (e.g., fluoxetine, tricyclic antidepressants, or other long half-life conventional drugs).

Assessment findings that emerge after treatment has started may point to treatment modalities that more adequately address the underlying causes of symptoms. Formal assessment studies, such as thyroid tests, other Western medical diagnostic tests, or CAM assessment approaches may help identify factors that are causing or exacerbating symptoms that were overlooked during the initial workup.

Psychiatrists must often weigh the potential benefits of combining specific medications against the risk of adverse effects. In clinical practice—especially when treating severe symptoms—psychiatrists often choose to accept risks associated with combining two or more medications. In my experience, the use of single psychopharmacologic medications is generally as effective as combinations of two or more medications while avoiding additional risk of adverse effects or potential toxicities. Further, few placebo-controlled studies have demonstrated superior efficacy when two or more prescription medications are taken concurrently for the treatment of many common mental health problems.

In biomedical psychiatry the standard of practice is to start a second medication at a low dose and gradually increase the dose until a consistent positive response is achieved while monitoring for signs of toxicity. This conventional strategy assumes that psychiatrists can recommend combinations of two or more medications based on reliable information about safety and effectiveness pertaining to possible drug combinations. When done carefully the same strategy can guide treatment planning incorporating specific combinations of CAM and pharmaceutical modalities.

Only practitioners trained in a specific Western medical or CAM approach are equipped to advise patients on the use of combinations of treatment modalities employed in their respective systems of medicine. This is especially true when specific combinations of prescription medications or natural supplements are being considered because of the inherently greater risk of toxicity when biologically active agents are combined, compared to combinations of medications or supplements and mind–body or energy approaches. Questions about the safety or effectiveness of specific medicinal agents—whether synthetic pharmaceuticals or natural

supplements—should be addressed only by a practitioner trained in the system of medicine in which those medicinal agents are used. Most Western medical and CAM practitioners are not qualified to give competent clinical advice about treatments used in systems of medicine outside of their formal training. For example, conventionally trained physicians who are not dually trained in Chinese medicine are not qualified to comment on or give advice on uses of Chinese herbs, acupuncture, or moxibustion to their patients. By the same token, licensed Chinese medical practitioners are not qualified to comment on or give advice about uses of psychotropic medications to their patients. Special issues when considering recommending specific combinations of Chinese herbals and Western pharmaceuticals in the management of affective, cognitive, or behavioral symptoms are especially relevant in Western countries, where Chinese medicine is now the dominant non-allopathic system of medicine and Chinese herbals are frequently used together with prescription medications (Lake, 2004; Lhundup & Lake, 2018).

In my experience, combining two or more compatible treatments is often beneficial in cases where the principal symptom pattern has failed to respond to two or more treatments tried one after another. Some patients respond better to combinations of treatments from two or more different categories, including, for example, a prescription medication or natural supplement combined with physical exercise, a mind–body practice or an "energy" treatment. Coordinating patient care that involves several treatment modalities used in parallel is more complicated than monitoring a patient's response to a series of single treatments administered sequentially. In my clinical practice I have found that combining two (sometimes more) disparate treatments at one time, results in more rapid improvement especially when symptoms are severe; and may thus be more cost-effective than single treatments taken one after another. The practitioner should consider recommending using two or more modalities at the same time to patients who have severe symptoms and who are functioning well enough to be able to adhere to a multicomponent treatment plan. However, many severely symptomatic patients are so impaired that they are unable to follow a complicated treatment plan. Of course, recommending taking two or more treatments in parallel can also be helpful for mild or moderate symptoms when there is a history of nonresponse to multiple trials of single medications, natural supplements or other Western medical or CAM approaches.

Recommending Only One Biological Treatment Modality Reduces Risk

To minimize risk and increase the probability of a beneficial response, it is prudent to recommend the use of only one biologically active agent (i.e., a pharmaceutical or natural supplement) when treating any mental health problem. For our purposes, a *biologically active modality* is any substance that affects the body or brain in ways that result in beneficial changes in target symptoms. Many widely used natural

supplements can be safely combined with other natural supplements or prescription medications. For example, accumulating evidence supports that combining folate in the form of L-methyl-folate with an antidepressant has synergistic antidepressant benefits. Natural supplements that ameliorate affective, cognitive, or behavioral symptoms include select vitamins and minerals, amino acids, essential fatty acids, and some hormones or prohormones (e.g., vitamin D3). Select natural products such as L-methylfolate, D-3 (25-hydroxy-cholecalciferol), *S*-adenosyl methionine (SAM-e), and the omega-3 essential fatty acids are known to have general beneficial effects on physical and mental health. Biologically active substances used medicinally such as pharmaceuticals or natural products often make up a central part of integrative treatment strategies addressing severe symptoms. As previously mentioned pharmaceuticals and natural products may be unnecessary when treating mild or moderate symptoms, or in cases when there is a significant risk of toxicity when combining two or more biologically active treatment modalities. In contrast, when approaching severe symptoms, it is judicious to recommend a prescription medication or natural supplement from the outset. The most appropriate pharmaceutical or natural product is determined by reviewing the research evidence in the context of each patient's unique history, preferences, and constraints on treatment cost or availability.

In cases where combinations of three or more biologically active modalities may yield better outcomes compared to one or two treatments, practical considerations may argue against this strategy. For example, patients who have severe symptoms of depressed mood, anxiety, or psychosis are often too impaired to take more than a single treatment. In such cases it may be prudent to recommend combinations of specific pharmaceuticals or supplements depending on the strength of evidence with respect to the principal symptom pattern(s) being addressed. In contrast, recommending a mind–body practice or cognitive-behavioral therapy—at least in the initial phase of treatment—would probably be of limited benefit to patients with severe symptoms.

Evaluating Compatibility When Recommending More than One Treatment

Three basic *levels* of compatibility need to be considered when recommending specific combinations of modalities:

1. Two or more treatment modalities are known to be incompatible and their combined use is therefore contraindicated.
2. Two or more treatment modalities are known to be compatible and can be safely combined but do not yield beneficial synergistic effects.
3. Two or more treatment modalities are known to be compatible and have beneficial synergistic effects when used in combination.

Recommendations about specific combinations of Western medical or CAM modalities are based on a review of the pertinent medical literature on efficacy, effectiveness and safety, and—in cases where there is limited information—on inferences about *possible* risk. Western medical or CAM modalities that belong to the same general category (e.g., SSRI antidepressants or herbals that affect CNS serotonin levels) are based on similar, sometimes identical mechanisms of action. In contrast, treatment modalities that belong to disparate categories are usually based on different underlying mechanisms of action. In cases where the respective mechanisms of action for two or more treatment modalities are clearly established, reasonable inferences can often be made about compatibility even in the absence of empirical evidence from research findings demonstrating compatibility. In contrast, in cases where the respective mechanisms of action of two or more treatment modalities are not well understood, or when only one modality has a clearly established mechanism of action, inferences about compatibility are more difficult to reach. In such cases the practitioner must make clinical decisions based on available outcomes data from human studies, case reports, or preclinical animal trials.

In cases where a putative mechanism of action has not been established, or a specific Western medical or CAM modality is currently in widespread use, and there are *no known physiological effects* of the treatment at the level of a specific target organ, neurotransmitter receptor or other physiological mechanism, it is probably safe to use the modality in combination with another treatment that has an established biological mechanism of action. This generalization also applies to modalities that employ empirically verified forms of energy such as bright light exposure, binaural sound, and biofeedback as well as modalities that purport to use *subtle energy*. In such cases, the *amplification* of effects related to the mechanism of action underlying one modality by the mechanism of action underlying another modality would not be expected because the respective mechanisms of action are unrelated and cannot potentially amplify or interfere with one another resulting in toxicity. Thus, there is little or no real risk that potentially unsafe interactions will take place when the modalities are used at the same time. In contrast, in cases where discrete biological mechanisms of action have been established for two or more disparate treatment modalities being evaluated for concurrent use, there may be a risk of unpleasant or unsafe interactions. In such cases, the type of interaction and its potential seriousness will depend on the likelihood that incompatibilities between respective mechanisms of action may *amplify* unpleasant or harmful side effects when the treatments are taken at the same time or one after another. The situation becomes even more complex when considering recommending two or more treatments that have different effects on different organs or on different neurotransmitter receptors in the brain. There are no potential contraindications to combining self-directed lifestyle changes with biomedical or CAM modalities. When considering combinations of two or more modalities it is always better to err on the side of safety. In other words, *when a specific combination of treatment modalities predictably risks causing safety problems, it is always prudent to not recommend that combination.*

Western physicians make judgments about compatibility after reviewing the relevant medical literature or obtaining expert consultation and only then make specific recommendations to patients about combining two or more treatment modalities. The same conservative approach is useful when evaluating the compatibility of empirically based CAM modalities. For example, if literature review of studies on a specific herbal or other natural supplement for treating depressed mood reveals that the supplement contains bioactive constituents that function as weak serotonin reuptake inhibitors, and the supplement has an established safety record over decades of clinical use alone or in combination with serotonin selective reuptake inhibitors (SSRI), it is reasonable to infer a high degree of compatibility between that supplement and SSRI antidepressants.

In contrast to CAM modalities based on empirically verifiable mechanisms of action, determinations of the safety or effectiveness of combinations of two or more *intuitive* treatment approaches (see discussion in Chap. 5) cannot be made using existing analytical methods because, by definition, the principles on which intuitive modalities are based cannot be reduced to empirically verifiable mechanisms of action. Thus, there are no existing (empirical) means for determining when it may be safe or beneficial—or conversely, unsafe or against therapeutic goals—to combine one (or more) *intuitive* modality with treatments from other categories.

Enhancing Outcomes Through Synergistic Effects

Combinations of two or more treatments that are compatible may result in neutral or synergistic effects. Compatible treatments that are neutral with respect to potential interactions between their respective mechanisms of action are always safe when combined but *would not necessarily* result in improved outcomes. On the other hand, combining two or more treatments based on synergistic mechanisms of action *would be expected* to consistently improve outcomes. Synergistic effects result from amplification of two or more mechanisms of action at one or more functional levels, including at a gross physiological level in the body, at the level of specific neurotransmitter receptors in the brain, at the level of discrete neuronal circuits or networks of circuits, or at the level of postulated "subtle energy" effects. In sum, disparate treatment modalities can be synergistic with respect to each other to varying degrees in relationship to the "levels" at which interactions between their respective mechanisms of action take place.

Synergistic treatment strategies are used in both Western medicine and CAM. When approaching depressed mood, for example, conventionally trained psychiatrists often prescribe more than one medication that affects brain serotonin levels. By the same token, CAM practitioners often recommend combining *S*-adenosyl methionine (SAM-e) and the B vitamin folic acid (especially in the form of L-methylfolate). In both examples, the biological agents are safe when combined and yield synergistic beneficial effects because their respective mechanisms of action work together to enhance a beneficial outcome. Along similar lines, EEG-

biofeedback and prescription antidepressants are compatible and synergistic when used in combination because their respective mechanisms of action reciprocally reinforce beneficial neurobiological and electromagnetic effects in certain brain regions.

Making Inferences About Compatibility When Mechanisms of Action Are Unknown

In cases where a putative mechanism of action has not been established for one or more treatment modalities being considered for combined use, a review of research findings or case reports of adverse effects can help determine the potential risk of incompatibility. Case reports of similar kinds of adverse effects associated with disparate treatment modalities imply similar mechanisms of action. Combinations of disparate modalities that have similar adverse effects should not be recommended in the absence of evidence from placebo-controlled trials or case reports confirming safety.

Recently the "*N* of 1" randomized trial design has gained attention as a research methodology for determining effectiveness and safety of a specific treatment modality in a single patient when placebo-controlled studies have not been conducted (see Chap. 5). In this research design the patient does not know when he or she is taking the "active" treatment or placebo and thus serves as his or her own control. This approach can provide valuable insights and save time in implementing treatment when formal research studies are impractical or unaffordable. Uncertainty about *potential* incompatibility can generally be resolved in a straightforward way in cases where combinations of Western medical or CAM treatments are being considered. In such cases the practitioner can use an "*N* of 1" controlled trial on a patient to estimate the potential benefits and risks of a particular combined treatment regimen.

Considerations When Combining Intuitive and Empirically Based Treatment Modalities

As previously discussed, some CAM treatments are categorized as intuitive modalities because contemporary scientific method can neither verify nor refute a postulated mechanism of action (see Chap. 5 for a discussion of categories of CAM modalities). Some intuitive CAM treatments may have generally beneficial effects on the organism but a discrete mechanism of action at the level of brain function has not been verified. Music therapy is an example of an intuitive treatment approach that is beneficial for moderately anxious or depressed patients. Other intuitive treatments probably lack a biological mechanism of action and can thus be safely combined with other intuitive

or empirically derived modalities. Examples include the concurrent use of Qigong and massage, or concurrent light exposure and mindfulness meditation in a moderately depressed patient. Both kinds of intuitive treatment modalities can be safely combined with Western medical or CAM modalities.

The integrative practitioner should make recommendations on combining an intuitive treatment modality with an empirically derived treatment or combining two or more intuitive modalities based on evidence of safety and effectiveness. Because mechanisms of action underlying intuitive treatments are, by definition, unknown it is not possible to make inferences about possible synergistic effects when intuitive modalities are combined with empirically based treatments.

Ongoing Care and Termination

The practitioner and patient should meet, communicate by telephone, e-mail, or secure video conference, on a regular basis to review progress and modify the treatment plan if target symptoms have not improved within a mutually agreed-upon time frame, or in cases when a patient has decided to *not* use a recommended treatment because of adverse effects, cost or other reasons. When a patient is adherent to the recommended treatment but symptoms have worsened, changed, or have not responded to treatment following a period in which it is *reasonable to expect* improvement, the practitioner should carefully review and clarify possible underlying medical and psychiatric causes of symptoms (i.e., the medical and psychiatric "differential diagnosis"). In such cases it is prudent to refer to an appropriate Western medical or CAM practitioner to perform specialized tests aimed at ruling out undiagnosed medical or psychiatric problems that may be interfering with treatment response. Examples include substance abuse, chronic pain, hypothyroidism, diabetes or other endocrinological disorders, neurologic disorders such as multiple sclerosis and dementia, heart disease, or previously undiagnosed and untreated affective, cognitive, or behavioral symptoms. When suspected underlying medical problems (e.g., thyroid disease or neurologic disorders) or previously undiagnosed mental health problems have been ruled out, the treatment plan should be reviewed and modified on an on-going basis until an effective and realistic treatment plan is achieved.

When a patient has severe symptoms follow-up appointments should be scheduled frequently *and the patient should be instructed to contact the nearest emergency room or urgent care center in the event of suicidal thoughts or symptoms of psychosis.* Patients who have severe symptoms should be encouraged to actively participate in all treatment decisions, closely adhere to treatment recommendations, and promptly disclose concerns about adverse effects.

As treatment progresses the practitioner and patient decide whether to continue working together or to discontinue treatment. It is reasonable to discontinue treatment when symptoms have diminished in severity for a sustained period and psychological, social, or occupational functioning has markedly improved. The time when it is appropriate to discontinue treatment may vary significantly with respect to the treatment modality, the type and severity of symptoms being treated, and the preferences

and resilience of each unique patient. Many patients with a history of uncomplicated mild or moderate symptoms that have responded to treatment and lifestyle changes can safely terminate treatment with little risk of getting worse. In contrast, it is prudent to recommend that all patients with a history of severe or complex symptoms remain on a maintenance therapy that has proven consistently effective.

Table 8.1 illustrates important goals to address at different stages of integrative mental health care starting with the intake interview and assessment, moving on to the initial follow-up appointment, subsequent follow-up appointments, and finally, considerations when deciding whether to continue or terminate care.

Table 8.1 Stages in integrative mental health care

Stage of care	Goals
Intake and assessment	• Comprehensive social, family, medical, psychiatric, cultural, and religious or spiritual history; review of pertinent medical and psychiatric symptoms • Always assess for suicide risk, homicidal ideation and psychosis and urgently refer high risk patients to the nearest emergency room • Order laboratory studies or refer to appropriate CAM practitioner for specialized assessment if indicated • Refer patient to Western physician if symptoms and history suggest underlying undiagnosed or rapidly progressing medical illness • Identify the most substantiated treatments that have not been tried for the principal symptom pattern being addressed. In cases where most or all substantiated treatments have already been tried without benefit, confirm that treatment was done correctly, for an adequate amount of time, and administered by qualified practitioner (where applicable) • In cases where all strongly substantiated treatments that are available to the patient and affordable have already been tried for the principal symptom pattern, consider recommending use of less substantiated treatments in combination with more substantiated treatments (i.e., assuming compatibility) • Identify the most substantiated treatment strategy that has not yet been tried or was previously effective. This is the *optimal integrative treatment plan* • Review medical literature on assessment and treatment approaches for current information on safety and effectiveness. Discuss findings with patient • Work with patient to develop a *realistic treatment* plan that reflects the patient's preferences, financial constraints, and local availability of qualified Western medical or CAM practitioners • For mild or *moderate symptoms*, the treatment plan should emphasize lifestyle changes such as improved nutrition and exercise, together with advice on mindfulness or mind–body practices and select supplements • For *severe symptoms*, the treatment plan should emphasize biological agents, including prescription medications and select supplements • Encourage psychotherapy if appropriate and the patient has insight and is motivated • Review potential safety issues and document informed consent to start treatment or to accept referral to Western medical or CAM practitioner if indicated. Schedule follow-up at an appropriate interval • Summarize the treatment plan for the patient verbally and in writing • Clarify expectations of the time course needed for improvement

(continued)

Table 8.1 (continued)

Stage of care	Goals
Initial follow-up appointment	• Review changes in symptoms and address any problems with adherence • Assess response and recommend treatment addressing new symptoms • Recommend formal assessment if indicated • Review positive or negative findings (if any) from Western medical or CAM assessment • Review any changes in treatment plan with patient. IMPORTANT: Be sure the patient clearly understands the treatment plan and is motivated to adhere to plan • Encourage positive lifestyle changes including nutrition, exercise, sleep hygiene, and stress management • Establish contact with other health care providers involved in patient care. Schedule next two follow-up appointments at appropriate intervals
Subsequent follow-up appointments	• Review changes in symptoms and assess treatment adherence • Modify current treatment plan if the patient complains of adverse effects, treatment is ineffective, patient is not motivated to adhere to treatment, or financial problems or other factors interfere with treatment • If prescription medications are indicated consult psychopharmacology treatment algorithms. IMPORTANT: Only physicians or other Western trained medical practitioners should give advice about medications • Collaborate with the patient to develop the optimal treatment plan including synergistic combinations, taking account of research evidence, known safety risks, financial constraints (if any), and patient preferences • Review treatment plan in detail, answer any questions about treatment goals, side effects, etc. • Obtain signed release if indicated to exchange information with other practitioners to coordinate the treatment plan and reduce risk of inappropriate or unsafe treatment combinations • If symptoms remain unchanged or worsen refer the patient to appropriate Western or CAM practitioner for formal consultation including assessment and treatment recommendations
Ongoing care vs. termination	Treatment and assessment continue until symptoms resolve completely and treatment is no longer needed, symptoms improve and the patient stays on a maintenance regimen, or symptoms do not improve and the patient wishes to terminate treatment

Key Points

- As many as one half of individuals being treated for a psychiatric "disorder" fail to respond or respond only partially to psychotropic medications and other conventional Western medical treatments and are labeled "treatment-resistant" or "non-responders."
- Safety concerns, poor treatment response, and high costs of conventional mental health care define an agenda for developing innovative strategies that offer safer, more effective, and more affordable treatments compared with psychotropic medications.
- High prevalence rates of placebo and nocebo response to "inactive" treatments suggest that many Western medical and CAM treatments probably have nonspecific effects that may be beneficial or detrimental to health.
- Meta-analyses of placebo-controlled trials suggest that many prescription medications used to treat depressed mood and other serious mental health problems are no more effective than placebos.
- Therapeutic modalities used in all systems of medicine belong to one of five categories: biological treatments; somatic therapies; mind–body practices; scientifically validated forms of energy or information; postulated forms of energy or information.
- Research findings are providing evidence for safety and efficacy of select CAM treatments of depressed mood, anxiety, and other mental health problems, including pharmaceutical-grade natural products, lifestyle modifications, mind–body practices, and some "subtle" energy therapies.
- The principal goal of integrative mental health care is to identify treatments supported by solid research findings that adequately address the patient's symptoms and are acceptable, affordable, and locally available.
- Integrative mental health care is associated with ethical and liability issues and may require more time and effort than is customary for more conventional models of mental health care.
- Herbals, vitamins, minerals, and other natural supplements may cause adverse effects when used alone and interact with other natural products or pharmaceuticals with potentially harmful consequences.
- Certain herbal products widely used to treat mental health problems are known to have potentially serious adverse effects.
- All patients should be warned against using particular combinations of pharmaceuticals and natural products for which serious interactions have been documented.
- Integrative medicine strives to find a balance between the rigor of empirical research and the relevance of personal information throughout all phases of assessment, formulation, treatment planning, and follow-up.
- A treatment plan that is optimal for one patient may not adequately address similar symptoms in another patient.
- Treatment combinations known to be unsafe or potentially unsafe should be avoided and discouraged, whereas safe combinations that produce synergistic benefits should be actively encouraged.

- Western medical or CAM treatments should not be viewed as substitutes for psychotherapy.
- Considerations of treatment precedence should weigh both costs and benefits of all reasonable treatment choices including the risk of adverse effects when taking psychotropic medications, nutraceuticals, or other modalities that may lead to early discontinuation and poor response.
- Patients who complain of mild or moderate affective, cognitive, or behavioral symptoms should first be evaluated by a conventionally trained Western medical practitioner to rule out possible underlying medical causes.
- Self-directed approaches such as dietary changes, regular exercise, and mind–body practices often improve mild to moderate symptoms as effectively as prescription medications while avoiding the risk of adverse effects.
- The most judicious approach to treating severe affective, cognitive, or behavioral symptoms should start with a potent biological agent—including psychotropic medications and select natural products—known to be effective for target symptoms.
- Finding out whether a patient is suicidal, potentially dangerous, or unable to care for his or her basic needs is the single most important task when evaluating any new patient.
- A patient who is homicidal, psychotic, or contemplating suicide should be referred to the nearest emergency room or urgent care center for evaluation and possible hospitalization.
- All patients should be encouraged to initially try only those Western medical, CAM, or integrative approaches supported by strong evidence for symptoms being treated.
- The treatment plan should be reviewed and modified at regular follow-up appointments until the most effective *realistic* combination of Western medical and CAM treatments has been identified and successfully implemented.
- In cases where strongly substantiated treatment approaches have been tried without benefit, *combinations of two or more less substantiated approaches should be considered but only when they may be safely combined*.
- In cases where severe symptoms do not respond to two or more appropriate treatment regimens or the patient discontinues treatment because of adverse effects, high cost, or the absence of insurance coverage, the practitioner should carefully review the patient's history and assessment findings (if any) and refer the patient to another medical practitioner to rule out the possibility of undiagnosed psychological, medical, or postulated energetic causes of symptoms that have not yet been identified or are not being adequately treated.
- The integrative practitioner's task is to identify appropriate treatments taking account of each patient's unique history, preferences, financial constraints, and the availability of qualified practitioners.
- When a patient consistently *forgets* to take a medication or supplement it may be helpful to interpret psychodynamic meanings of forgetting assuming the patient is cognitively intact.

- Only practitioners trained in a specific Western medical or CAM approach are equipped to advise patients on the use of specific combinations of treatment modalities used in their respective systems of medicine.
- Combining two (sometimes more) disparate treatments at one time may result in more rapid improvement especially when symptoms are severe and may thus be more cost-effective than single treatments taken one after another.
- The integrative practitioner should consider recommending using two or more modalities at the same time to patients who have severe symptoms and who are functioning well enough to be able to adhere to a multi-component treatment plan.
- To minimize risk and increase the probability of a beneficial response, it is prudent to recommend the use of only one biologically active agent (i.e., a pharmaceutical agent or natural supplement) when treating any mental health problem.
- Three basic levels of compatibility need to be considered when recommending specific combinations of modalities:
  - Two or more treatment modalities are known to be incompatible and their combined use is therefore contraindicated.
  - Two or more treatment modalities are known to be compatible and can be safely combined but do not yield beneficial synergistic effects.
  - Two or more treatment modalities are known to be compatible and have beneficial synergistic effects when used in combination.
- In cases where the respective mechanisms of action for two or more treatment modalities are clearly established, reasonable inferences can be made about compatibility even in the absence of empirical evidence from research findings showing compatibility.
- In cases where a putative mechanism of action has not been established, or a specific Western medical or CAM modality is in widespread use, and there are no known physiological effects of the treatment, it is probably safe to use the modality in combination with another treatment that has an established biological mechanism of action.
- When a specific combination of treatment modalities predictably risks causing safety problems, it is always prudent to not recommend that combination.
- Synergistic effects result from amplification of two or more mechanisms of action at one or more functional levels, including at a gross physiological level in the body, at the level of specific neurotransmitter receptors in the brain, at the level of discrete neuronal circuits or networks of circuits, or at the level of postulated “subtle energy” effects.
- Disparate treatment modalities can be synergistic with respect to each other to varying degrees in relationship to the “levels” at which interactions between their respective mechanisms of action take place.
- Combinations of disparate modalities that have similar adverse effects should not be recommended in the absence of evidence from placebo-controlled trials or case reports confirming safety.

- Uncertainty about potential incompatibility can generally be resolved in a straightforward way in cases where combinations of Western medical or CAM treatments are being considered by conducting a "*N* of 1" controlled trial on a patient to estimate the potential benefits and risks of a particular combined treatment regimen.
- Because mechanisms of action underlying intuitive modalities are by definition unknown it is not possible to make inferences about possible synergistic effects when intuitive modalities are combined with empirically based treatments.
- When a patient is adherent to recommended treatment but symptoms have worsened, changed, or have not responded to treatment following a period in which it is reasonable to expect improvement, the practitioner should refer the patient to an appropriate Western medical or CAM practitioner to perform specialized tests aimed at ruling out undiagnosed medical, psychological, or other problems that may be interfering with treatment response.
- As treatment progresses the practitioner and patient decide whether to continue working together or to discontinue treatment.
- It is reasonable to discontinue treatment when symptoms have diminished in severity for a sustained period and psychological, social, or occupational functioning has markedly improved.
- Many patients with a history of uncomplicated mild or moderate symptoms that have responded to treatment and lifestyle changes can safely terminate treatment with little risk of getting worse.
- It is prudent to recommend that all patients with a history of severe or complex symptoms remain on maintenance therapy that has proven to be consistently effective.

References

Abbot, N. (2000). Healing as a therapy for human disease: A systematic review. *Journal of Alternative and Complementary Medicine, 6*(2), 159–169.

Achterberg, J., Cooke, K., Richards, T., Standish, L. J., Kozak, L., & Lake, J. (2005, December). Evidence for correlations between distant intentionality and brain function in recipients: A functional magnetic resonance imaging analysis. *Journal of Alternative and Complementary Medicine, 11*(6), 965–971.

Adams, K., Cohen, M., Eisenberg, D., & Jonsen, A. (2002). Ethical considerations of complementary and alternative medical therapies in conventional medical settings. *Annals of Internal Medicine, 137*, 660–664.

Anderson, J., Anderson, L., & Felsenthal, G. (1993). Pastoral needs for support within an inpatient rehabilitation unit. *Archives of Physical Medicine and Rehabilitation, 74*, 574–578.

Anderson, J., & Taylor, A. (2011, September). Effects of healing touch in clinical practice: A systematic review of randomized clinical trials. *Journal of Holistic Nursing, 29*(3), 221–228.

Astin, J. A., Harkness, E., & Ernst, E. (2000). The efficacy of "Distant Healing": A systematic review of randomized trials. *Annals of Internal Medicine, 132*(11), 903–910.

Bell, I., Baldwin, C., Schwartz, G., & Russek, L. (1998). Integrating belief systems and therapies in medicine: Application of the eight world hypotheses to classical homeopathy. *Integrative Medicine, 1*(3), 95–105.

Bell, I., Lewis, D., Lewis, S., Brooks, A., Schwartz, G., & Baldwin, C. (2004). Strength of vital force in classical homeopathy: Biopsycho-social-spiritual correlates within a complex systems context. *The Journal of Alternative & Complementary Medicine, 10*(1), 123–131.

Benor, D. (2002). Spiritual Healing: Scientific validation of a healing revolution, professional supplement. In *Healing research* (Vol. 1). Southfield, MI: Vision Publications.

Bhui, K. (2017). Treatment resistant mental illnesses. *The British Journal of Psychiatry, Access, 210*(6), 443–444.

Bodeker, G. (2001). Evaluating ayurveda. *Journal of Alternative and Complementary Medicine, 7*(5), 389–392.

Cheraghi, M., Hosseini, A., Gholami, R., & Bagheri, I. (2017). Therapeutic touch efficacy: A systematic review. *Medical-Surgical Nursing Journal, 5*(4), 52–59.

Clifford, T. (1990). *Tibetan Buddhist medicine and psychiatry: The diamond healing*. York Beach, ME: Samuel Weiser, Inc.

Clond, M. (2016, May). Emotional freedom techniques for anxiety: A systematic review with meta-analysis. *The Journal of Nervous and Mental Disease, 204*(5), 388–395.

Cohen, M. (1998). *Complementary and alternative medicine: Legal boundaries and regulatory perspectives*. Baltimore, MD: Johns Hopkins University Press.

Cohen, M., & Eisenberg, D. (2002). Potential malpractice liability associated with complementary and integrative medical therapies. *Annals of Internal Medicine, 136*, 596–603.

Curlin, F. A., Chin, M. H., Sellergren, S. A., Roach, C. J., & Lantos, J. D. (2006, May) The association of physicians' religious characteristics with their attitudes and self-reported behaviors regarding religion and spirituality in the clinical encounter. *Medical Care, 44*(5), 446–453.

Data-Franco, J., & Berk, M. (2012). The nocebo effect: A clinician's guide. *The Australian and New Zealand Journal of Psychiatry, 47*(7), 617–623.

Davidson, J. (1994). Psychiatry and homeopathy: Basis for a dialogue. *British Homoeopathic Journal, 83*, 78–83.

De Berardis, D., Orsolini, L., Serroni, N., Girinelli, G., Iasevoli, F., Tomasetti, C., et al. (2016). A comprehensive review on the efficacy of S-Adenosyl-L-methionine in Major Depressive Disorder. *CNS & Neurological Disorders Drug Targets, 15*(1), 35–44.

Denys, D., & de Haan, L. (2008). [25 years antipsychotics: back to the future?] [Article in Dutch] *Tijdschrift voor psychiatrie*, *50*:105–109.

Dixon, M., & Sweeney, K. (2000). *The human effect in medicine: Theory, research and practice*. Oxford: Radcliffe Medical Press.

Dossey, L. (1997). *Healing words: The power of prayer and the practice of medicine*. New York: HarperCollins.

Dubin, W. (2004). *Clinical practices that lead to treatment resistance* (Abstract 81D, Symposium 81). Paper presented at the annual meeting of the American Psychiatric Association, New York.

Ernst, E., & Resch, K. (1996). Clinical trials of homeopathy: A re-analysis of a published review. *Forschende Komplementärmedizin, 3*, 85–90.

Feinstein, D. (2003). Subtle energy: Psychology's missing link. *IONS Noetic Sciences Review, 64*, 1716–1735.

Flaherty, J., Perry, H., Lynchard, G., & Morley, J. (2000). Polypharmacy and hospitalization among older home care patients. *Journals of Gerontology, Series A: Biological Sciences and Medical Sciences, 55*(10), M554–M559.

Fournier, J. C., DeRubeis, R. J., Hollon, S. D., Dimidjian, S., Amsterdam, J. D., Shelton, R. C., et al. (2010). Antidepressant drug effects and depression severity: A patient-level meta-analysis. *JAMA, 303*(1), 47–53.

Gallagher, P. F., Barry, P. J., Ryan, C., Hartigan, I., & O'Mahony, D. (2008). Inappropriate prescribing in an acutely ill population of elderly patients as determined by Beers' Criteria. *Age and Ageing, 37*(1), 96–101.

Gallo, F. (1999). *Energy psychology: Explorations at the interface of energy, cognition, behavior and health*. Boca Raton, FL: CRC Press.

Gensini, G., Conti, A., & Conti, A. A. (2005). Past and present of "what will please the lord": An updated history of the concept of placebo. *Minerva Medica, 96*(2), 121–124.

Giroldini, W., Pederzoli, L., Bilucaglia, M., Caini, P., Ferrini, A., Melloni, S., et al. (2016). EEG correlates of social interaction at distance. *F1000Research 2016, 4*, 457.

Goleman, D. (2004). *Destructive emotions: How can we overcome them? A scientific dialog with the Dalai Lama*. New York, NY: Bantam Books.

Gouveia, B., Rijo, P., Goncalo, T., & Reis, C. (2015). Good manufacturing practices for medicinal products for human use. *Journal of Pharmacy & Bioallied Sciences, 7*(2), 87–96.

Green, J. (1996). Integrating conventional medicine and alternative therapies. *Alternative Therapies in Health and Medicine, 2*(4), 77–81.

Grinberg-Zylberbaum, J., Delaflor, M., & Goswami, A. (1994). The Einstein/Podolsky/Rosen paradox in the brain: The transferred potential. *Physics Essays, 7*(4), 422–428.

Hankey, A. (2004). Are we close to a theory of energy medicine? *Journal of Alternative and Complementary Medicine, 10*(1), 83–86.

Hartling, L., Abu-Setta, A. M., Dursun, S., Mousavi, S. S., Pasichnyk, D., & Newton, A. S. (2012). Antipsychotics in adults with schizophrenia: Comparative effectiveness of first-generation versus second-generation medications: A systematic review and meta-analysis. *Annals of Internal Medicine, 157*(7), 498–511.

Herrmann, N., Chau, S. A., Kircanski, I., & Lanctôt, K. L. (2011). Current and emerging drug treatment options for Alzheimer's disease: A systematic review. *Drugs, 71*(15), 2031–2065.

Hoenders, H., Appelo, M., van den Brink, E., Hartogs, B., & de Jong, J. (2011). The Dutch complementary and alternative medicine (CAM) protocol: To ensure the safe and effective use of complementary and alternative medicine within Dutch mental health care. *Journal of Alternative and Complementary Medicine, 17*(12), 1197–1201.

Joyce, J., & Herbison, G. (2015). Reiki for depression and anxiety. *Cochrane Database of Systematic Reviews*, (4), CD006833.

Kavirajan, H. C., Lueck, K., & Chuang, K. (2014). Alternating current cranial electrotherapy stimulation (CES) for depression. *Cochrane Database of Systematic Reviews,* (7), CD010521.

Kelley, J. (2010, March 2). *Antidepressants: Do they "work" or don't they?* [Internet]. New York, NY: Scientific American.

Kerridge, I., & McPhee, J. (2004). Ethical and legal issues at the interface of complementary and conventional medicine. *The Medical Journal of Australia, 181*(3), 164–166.

Kienle, G. S., & Kiene, H. (1996). Placebo effect and placebo concept: A critical methodological and conceptual analysis of reports on the magnitude of the placebo effect. *Alternative Therapies in Health and Medicine, 2*, 39–54.

Kienle, G. S., & Kiene, H. (1997). The powerful placebo effect: Fact or fiction? *Journal of Clinical Epidemiology, 50*, 1311–1318.

Kirsch, I., Deacon, B. J., Huedo-Medina, T. B., Scoboria, A., Moore, T. J., & Johnson, B. T. (2008). Initial severity and antidepressant benefits: A meta-analysis of data submitted to the Food and Drug Administration. *PLoS Medicine, 5*(2), e45.

Kirsch, I., Moore, T., Scoboria, A., & Nicholls, S. (2002). The emperor's new drugs: An analysis of antidepressant medication data submitted to the U.S. Food and Drug Administration. *Prevention and Treatment, 5*(23).

Kleijnen, J., Knipschild, P., & Riet, G. (1991). Clinical trials of homeopathy. *BMJ, 302*, 316–323.

Lake, J. (2004). The integration of Chinese Medicine and Western medicine: Focus on mental illness. *Integrative Medicine: Integrating Conventional and Alternative Medicine, 3*(4), 20–28.

Lake, J. (2017). Chapter 31.4: Complementary, alternative, and integrative approaches in mental health care. In B. J. Sadock, V. A. Sadock, & P. Ruiz (Eds.), *Kaplan & Sadock's comprehensive*

textbook of psychiatry (10th ed., pp. 2532–2554). Philadelphia, PA: Lippincott Williams & Wilkins.

Leucht, S., Hierl, S., Kissling, W., & Dold, M. (2012, February). Putting the efficacy of psychiatric and general medicine medication into perspective: Review of meta-analyses. *The British Journal of Psychiatry, Access, 200*(2), 97–106.

Lhundup, T., & Lake, J. (2018). Chapter 8: Integrating Asian healing traditions into biomedicine. In R. Moodley, T. Lo, & N. Zhu (Eds.), *Asian healing traditions in counseling and psychotherapy* (pp. 97–112). Thousand Oaks, CA: Sage.

Linde, C., Clausius, N., Ramirez, G., Melchart, D., Eitel, F., Hedges, L., et al. (1997). Are the clinical effects of homeopathy placebo effects? A meta-analysis of placebo-controlled trials. *Lancet, 350*, 834–843.

Mackay, N., Hansen, S., & McFarlane, O. (2004). Autonomic nervous system changes during Reiki treatment: A preliminary study. *Journal of Alternative and Complementary Medicine, 10*(6), 1077–1081.

Mayberg, H., Silva, J., Brannan, S., Takell, J., Mahurin, R., et al. (2002). The functional neuroanatomy of the placebo effect. *The American Journal of Psychiatry, 159*, 728–737.

McCaffrey, A., Eisenberg, D., Legedza, A., Davis, R., & Phillips, R. (2004). Prayer for health concerns: Results of a national survey on prevalence and patterns of use. *Archives of Internal Medicine, 164*, 858–862.

Moore, T., & Mattison, D. (2017). Adult utilization of psychiatric drugs and differences by sex age, and race. *JAMA Internal Medicine, 177*(2), 274–275.

Müller, H., Moeller, S., Lücke, C., Lam, A., Braun, N., & Philipsen, A. (2018). Vagus nerve stimulation (VNS) and other augmentation strategies for therapy-resistant depression (TRD): Review of the evidence and clinical advice for use. *Frontiers in Neuroscience, 12*, 239.

Oguamanam, C. (2006). Biomedical orthodoxy and complementary and alternative medicine: Ethical challenges of integrating medical cultures. *Journal of Alternative and Complementary Medicine, 12*(6), 577–581.

Orriols, L., Queinec, R., Philip, P., Gadegbeku, B., Delorme, B., Moore, N., et al. (2012). Risk of injurious road traffic crash after prescription of antidepressants. *The Journal of Clinical Psychiatry, 73*(8), 1088–1094.

Palm, U., Hasan, A., Strube, W., & Padberg, F. (2016). tDCS for the treatment of depression: A comprehensive review. *European Archives of Psychiatry and Clinical Neuroscience, 266*(8), 681–694.

Palmer, R., Katerndahl, D., & Morgan-Kidd, J. (2004). A randomized trial of the effects of remote intercessory prayer: Interactions with personal beliefs on problem-specific outcomes and functional status. *The Journal of Alternative and Complementary Medicine, 10*(3), 438–448.

Požgain, I., Požgain, Z., & Degmečić, D. (2014, June). Placebo and nocebo effect: A mini-review. *Psychiatria Danubina, 26*(2), 100–107.

Radin, D., Schlitz, M., & Bauer, C. (2015). Distant healing intention therapies: An overview of the scientific evidence. *Global Advances in Health and Medicine, 4*(Suppl), 67–71.

Radin, D., Taft, R., & Yount, G. (2004). Effects of healing intention on cultured cells and truly random events. *The Journal of Alternative and Complementary Medicine, 10*(1), 103–112.

Ramaekers, J. (2003, January). Antidepressants and driver impairment: Empirical evidence from a standard on-the-road test. *The Journal of Clinical Psychiatry, 64*(1), 20–29.

Ray, W., Fought, R., & Decker, M. (1992). Psychoactive drugs and the risk of injurious motor vehicle crashes in elderly drivers. *American Journal of Epidemiology, 136*(17), 873–883.

Roberts, L., Ahmed, I., & Hall, S. (2000). Intercessory prayer for the alleviation of ill health. *Cochrane Database of Systematic Reviews*, (2), CD000368.

Roe, C. A., Sonnex, C., & Roxburgh, E. C. (2015). Two meta-analyses of noncontact healing studies. *Explore (NY), 11*(1), 11–23.

Rotman, D. (2004, February). Re-writing Life: Can Pfizer deliver? *Technology Review*, 58–65. https://www.technologyreview.com/s/402459/can-pfizer-deliver/

Ruggio, M., & DeSantis, T. (2009). Complementary and alternative medicine: Longstanding legal obstacles to cutting edge treatment. *Journal of Health & Life Sciences Law, 2*(4), 137, 139–170.

Sanderson, C., Koczwara, B., & Currow, D. (2006). The "therapeutic footprint" of medical, complementary and alternative therapies and a doctor's duty of care. *The Medical Journal of Australia, 185*(7), 373–376.

Schroeder, M. J., & Barr, R. E. (2001). Quantitative analysis of the electroencephalogram during cranial electrotherapy stimulation. *Clinical Neurophysiology, 112*(11), 2075–2083.

Schwartz, G., & Russek, L. (1998). The plausibility of homeopathy: The systemic memory mechanism. *Integrative Medicine, 1*(2), 53–59.

Shannahoff-Khalsa, D. (2003). Kundalini Yoga meditation techniques in the treatment of obsessive compulsive and OC spectrum disorders. *Brief Treatment and Crisis Intervention, 3*, 369–382.

Shore, A. G. (2004). Long-term effects of energetic healing on symptoms of psychological depression and self-perceived stress. *Alternative Therapies in Health and Medicine, 10*(3), 42–48.

Sicher, F., Targ, E., Moore, D., & Smith, H. (1998). A randomized double-blind study of the effect of distant healing in a population with advanced AIDS. *Western Journal of Medicine, 169*(6), 356–363.

Smith, C. (2004). Quanta and coherence effects in water and living systems. *The Journal of Alternative & Complementary Medicine, 10*(1), 69–78.

Stafford, M. R., Mayo-Wilson, E., Loucas, C. E., James, A., Hollis, C., Birchwood, M., et al. (2015). Efficacy and safety of pharmacological and psychological interventions for the treatment of psychosis and schizophrenia in children, adolescents and young adults: A systematic review and meta-analysis. *PLoS One, 10*(2), e0117166.

Standish, L. J., Johnson, L. C., Kozak, L., & Richards, T. (2003). Evidence of correlated functional magnetic resonance imaging signals between distant human brains. *Alternative Therapies in Health and Medicine, 9*(1), 122–125.

Studdert, D., Eisenberg, D., Miller, F., Curto, D., Kaptchuk, T., & Brennan, T. (1998). Medical malpractice implications of alternative medicine. *Journal of the American Medical Association, 280*, 1610–1615.

Sussman, N. (2004, July). The "file-drawer" effect: Assessing efficacy and safety of antidepressants. *Primary Psychiatry, 11*(7), 12.

Tangrea, J., Adrianza, E., & Helsel, W. (1994). Risk factors for the development of placebo adverse reactions in a multicenter clinical trial. *Annals of Epidemiology, 4*, 327–331.

Thase, M. (2002). Antidepressant effects: The suit may be small, but the fabric is real. *Prevention and Treatment, 5*(32).

Thase, M. (2007). STEP-BD and bipolar depression: What have we learned? *Current Psychiatry Reports, 9*(6), 497–503.

Thorne, S., Best, A., Balon, J., Kelner, M., & Rickhi, B. (2002). Ethical dimensions in the borderland between conventional and complementary/alternative medicine. *Journal of Alternative and Complementary Medicine, 8*(6), 907–915.

Thrane, S., & Cohen, S. (2014). Effect of Reiki therapy on pain and anxiety in adults: An in-depth literature review of randomized trials with effect size calculations. *Pain Management Nursing, 15*(4), 897–908.

Vallance, A. (2007). A systematic review comparing the functional neuroanatomy of patients with depression who respond to placebo to those who recover spontaneously: Is there a biological basis for the placebo effect in depression? *Journal of Affective Disorders, 98*(1–2), 177–185.

Velligan, D. I., Weiden, P. J., Sajatovic, M., Scott, J., Carpenter, D., Ross, R., et al. (2009). Expert Consensus Panel on Adherence Problems in Serious and Persistent Mental Illness. The expert consensus guideline series: Adherence problems in patients with serious and persistent mental illness. *The Journal of Clinical Psychiatry, 70*(Suppl 4), 1–46.

Whitsitt, V., Beehner, C., & Welch, C. (2013). The role of good manufacturing practices for preventing dietary supplement adulteration. *Analytical and Bioanalytical Chemistry, 405*(13), 4353–4358.

Wiesendanger, H., Werthmuller, L., Reuter, K., & Walach, H. (2001). Chronically ill patients treated by spiritual healing improve in quality of life: Results of a randomized waiting-list controlled study. *Journal of Alternative and Complementary Medicine, 7*(1), 45–51.

Wirth, D. P., & Cram, J. R. (1994). The psychophysiology of nontraditional prayer. *International Journal of Psychosomatics, 41*(1–4), 68–75.

Zahourek, R. (2004). Intentionality forms the matrix of healing: a theory. *Alternative Therapies in Health and Medicine, 10*(6), 40–49.

Chapter 9
Integrative Management of Complex Patients with High Comorbidity

"As to diseases, make a habit of two things—to help, or at least, to do no harm."

—Hippocrates

Contents

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Integrative Management of Complex Patients Calls for New Methods and a New Model of Care

Serious mental health problems affecting mood, cognitive functioning, and behavior occur in complex patterns, change over time, and pose diagnostic and treatment challenges. Severe depressed mood, debilitating symptoms of anxiety, psychosis, bipolar disorder, post-traumatic stress disorder (PTSD), and other mental health problems often occur together (i.e., "are comorbid") with, and may be causally related to, substance abuse and medical problems. Actual rates of comorbidity in real-world populations are difficult to estimate and reported rates reflect disparate criteria used in different countries to classify symptoms into disorders (van Oudheusden, Meynen, & van Balkom, 2015). Complex presentations involving two or more serious mental health problems and comorbid substance abuse or a medical problem are often poorly responsive to pharmaceuticals and other Western medical treatments. Comorbid mental health problems, substance abuse, and medical problems interact on many levels and call for well thought out comprehensive integrative treatment strategies that may involve a team of collaborating health care providers.

I am assuming that the majority of practitioners who read this book will have already encountered complex cases involving two or more mental health problems and a comorbid medical problem or substance abuse. I am also assuming that most practitioners who provide mental health care do so within their scope of practice, whether it be psychotherapy, medication management or a particular CAM therapy, and refer patients to other health care providers when encountering problems outside of their scope of practice. Managing complex cases calls for multitiered treatment planning incorporating evidence from a wide range of Western medical and CAM modalities. Integrative treatment is most successful when modalities have beneficial synergistic effects that speed up response, enhance outcomes and improve cost-effectiveness.

Effective integrative strategies may include psychological therapies, Western medical and CAM modalities such as individual or group psychotherapy, psychotropic medications, natural supplements, mind–body practices or energetic therapies, and lifestyle advice. The most appropriate and effective strategy for your patient may include consultation with a Western physician, a CAM practitioner (or both) for collaborative treatment planning when a mental health problem is comorbid with substance abuse or a medical problem. The strategy may involve individual psychodynamic therapy, a 12-step group, a support group for depressed mood, or family therapy. In many cases, lifestyle changes such as improved nutrition or regular exercise play an important role in promoting patient autonomy and enhancing general well-being. As previously discussed, developing an appropriate and effective individualized care plan takes into account each patient's unique history, symptoms, preferences, and financial constraints (see Chap. 8).

Recent innovations in health care delivery are substantially improving outcomes. Complex patients with serious mental health problems and comorbid substance abuse or medical problems respond better and more rapidly when managed by a

team of practitioners using a collaborative care model. In collaborative care a team of primary care physicians and behavioral health practitioners consult with a patient during the same appointment in order to address medical and mental health problems concurrently (Lexicon, 2017). Greater use of a collaborative care model in existing primary care clinics may improve both medical and psychiatric treatment outcomes for severely mentally ill patients who frequently have serious comorbid medical problems. The result is more effective and more cost-effective solutions to complex mental health problems that frequently do not respond to available Western medical treatment and the current model of care.

Patterns of Comorbidity

This section reviews the epidemiology of three patterns of comorbidity frequently encountered by mental health practitioners and how they are treated from the perspectives of Western medicine and CAM. The comorbid patterns covered are as follows:

- Two or more primary mental health problems (i.e., "mental disorders").
- A mental health problem and a substance use problem.
- A mental health problem and a medical problem.

Comorbid Mental Health Problems

Patterns of psychopathological comorbidity vary significantly in different world regions reflecting differences in how individuals from disparate cultures experience distress and manifest psychological and psychosomatic symptoms (Krueger, Chentsova-Dutton, Markon, Goldberg, & Ormel, 2003). It is estimated that approximately one in four adults fulfill criteria for at least one mental disorder and almost one half of individuals with mental health problems have two or more disorders (Kessler, Chiu, & Demler, 2005). Large population surveys done in different world regions show high levels of mental illness and comorbidity. An analysis of survey data from Canada, Chile, Germany, the Netherlands, and the USA found that past-year prevalence and treatment rates of common mental disorders varied significantly between countries ranging from 17% in Chile to almost 30% in the USA. Significantly, in all countries surveyed most treatment goes to mild cases, and as many as two-thirds of severe cases receive no treatment (Bijl et al., 2003). Undertreatment of severe mental illness is correlated with young age, poor education and male gender. A face-to-face household survey of over 9000 adults conducted in the USA found high prevalence rates of many DSM-IV disorders (Kessler et al., 2005). Eighty percent of cases were classified as "mild," while 14% met criteria for moderate or severe pathology. Anxiety disorders were most commonly

identified (18% of respondents) but had the lowest proportion of serious cases. Mood disorders (9.5%) were the next most common category and had the highest proportion of serious cases. Impulse control disorders and substance use disorders had 12-month prevalence rates of 9% and 3.8%, respectively. 55% of cases carried a single diagnosis while over 40% were comorbid (i.e., individuals met criteria for two or more separate disorders).

Comorbid Mental Health Problems and Substance Abuse

Mental health problems and substance abuse are frequently comorbid. In industrialized countries the most common substances of abuse are depressants (e.g., alcohol, benzodiazepines, and opiates), stimulants (e.g., cocaine and methamphetamine), hallucinogens (e.g., mescaline, LSD, and MDMA (sometimes referred to as 'ecstasy')), and cannabis (Testa, Giannuzzi, Sollazzo, Petrongolo, & Bernardini, 2013). All of these substances can manifest as psychiatric symptoms. For example, intense anxiety or panic attacks are a frequent concomitant of stimulant use but also occur during withdrawal from stimulants or sedative-hypnotic medications. Stimulants and hallucinogens can result in acute psychosis that mimics the symptoms of schizophrenia and other psychotic disorders. The use of inappropriate high doses of many psychotropic medications can result in acute symptoms such as panic attacks, psychosis, severe depressed mood, mania, and insomnia. Individuals with substance induced mental disorders are frequently seen in emergency room settings. It is estimated that 4 out of 10 young adults diagnosed with a severe psychiatric disorder have a comorbid substance use disorder (Sheidow, McCart, Zajac, & Davis, 2012). Individuals diagnosed with bipolar disorder, major depressive disorder, anxiety and psychotic disorders or severe personality disorders frequently abuse substances. Individuals diagnosed with schizophrenia who are adherent to their antipsychotic medication are less likely to have a substance use disorder (Cooper, Moisan, & Gregoire, 2007).

In the conventional Western medical model of care individuals diagnosed with one or more psychiatric disorders who abuse a substance are labeled "dual diagnosis" patients and are treated concurrently for both conditions. The majority of individuals diagnosed with two or more psychiatric disorders first experience symptoms of mental illness by age 11 while the mean age of onset of substance abuse is 21 (Kessler, 2004). A 10-year study (Swendsen et al., 2010) found that individuals diagnosed with major depressive disorder or attention deficit hyperactivity disorder (ADHD) are at greater risk of abusing alcohol than the average population. Individuals diagnosed with borderline personality disorder and antisocial personality disorder are at increased risk of abusing any substance (Huang et al., 2009; Lenzenweger, Lane, Loranger, & Kessler, 2007).

Genetic and environmental factors play important roles when a mental health problem is comorbid with substance abuse (Kessler, 2004). For example, twins diagnosed with behavioral disorders during childhood (e.g., conduct disorder and

ADHD), or antisocial personality disorder in adulthood are at increased genetic risk of abusing alcohol or another substance, and twins diagnosed with major depressive disorder are at increased risk of becoming alcoholics (Kendler et al., 2011). Trauma can worsen substance abuse in individuals who already have a psychiatric disorder or increase risk of both conditions. Emotional neglect in childhood increases the risk of abusing multiple substances, violent or suicidal behavior, and psychosis (Martinotti et al., 2009). Individuals who report higher levels of childhood trauma have higher rates of PTSD and substance dependence, especially alcohol, cocaine, and cannabis (Khoury, Tang, Bradley, Cubells, & Ressler, 2010; Wu, Schairer, Dellor, & Grella, 2010). Patients diagnosed with bipolar disorder who were physically abused in childhood are at increased risk for abusing a substance (Gao et al., 2010) especially Cannabis.

The severity of cognitive, affective, and behavioral symptoms associated with comorbid substance abuse or another mental health problem makes treatment more challenging (Grella, Hser, Joshi, & Rounds-Bryant, 2001; Murthy & Chand, 2012). Dual diagnosis patients respond less well to treatment than individuals with a mental disorder or substance abuse alone (Daley & Moss, 2002). In this challenging population treatment strategies incorporating two or more modalities are often more effective than single treatment modalities (Baker, Hides, & Lubman, 2010; Mueser, Noordsy, Drake, & Fox, 2003). Conventionally used so-called "integrated" treatments of dual diagnosis patients emphasize psychotropic medications and group therapy, and seldom include CAM approaches. Individuals who stay in treatment longer are more likely to remain in recovery and have fewer and less severe symptoms. Unfortunately, individuals who have comorbid conditions are more likely to discontinue treatment compared to individuals who have only one mental health or substance use problem (Daley & Zuckoff, 1999).

Comorbid Mental Health Problems and Medical Illness

Mental health problems are frequently comorbid with medical disorders in all age groups and may significantly impact the clinical course of medical illness and response to treatment. Even as mental health problems can worsen medical disorders, numerous medical disorders manifest as disturbances in mood, cognitive functioning, or behavior. Following is a concise review of commonly occurring patterns of psychiatric-medical comorbidity.

Medical Comorbidity in Children and Adolescents

Children and adolescents often come to the attention of a health care provider with comorbid mental health and medical problems. Prevalence rates of chronic medical illnesses among children and adolescents have increased over the past several decades. It is estimated that almost 14% of US children have a diagnosis of one

chronic illness, and almost 10% have two or more chronic illnesses (National Survey of Children's health, 2007). Mental, emotional and behavioral problems are common among children and adolescents with chronic medical illnesses (Hysing, Elgen, Gillberg, Lie, & Lundervold, 2007; Immelt, 2006). Separation disorder, depressed mood, generalized anxiety, phobias, and panic disorder are more common among children and adolescents diagnosed with asthma, diabetes, cancer, HIV/AIDS, and other medical problems compared to the general population (Brown, Daly, & Rickel, 2007; Ortega, Huertas, Canino, Ramirez, & Rubio-Stipec, 2002; Williams, Laffelt, & Hood, 2009).

Medical Comorbidity in Adults

All disorders that directly or indirectly affect brain function can manifest as mental disorders of memory, language, executive functioning, attention, perception, and behavior. The type and severity of symptoms depends on the nature of the insult and the part of the brain affected. Primary disorders of the brain such as multiple sclerosis, Parkinson's disease, dementia, cerebrovascular accidents (i.e., "stroke"), and seizure disorders, can cause complex affective, cognitive and behavioral symptoms depending on the stage and severity of disease and brain regions involved. As reviewed in this section, heart disease, cancer, pulmonary disease, and endocrinological disorders affect brain function. The symptoms caused by these medical problems depend on how the disease process interferes with normal brain function (David & Kopelman, 2009).

Approximately one third of patients diagnosed with cancer meet diagnostic criteria for at least one psychiatric disorder, including major depressive disorder, anxiety disorders, adjustment disorders, sleep disorders, and delirium. Prevalence rates of psychiatric disorders are even higher in individuals with advanced cancer (Grassi, Caruso, Hammelef, Nanni, & Riba, 2014). Comorbid mental disorders reduce quality of life, interfere with treatment adherence and (in the case of depression) may affect the rate of cancer progression (Ciaramella & Spiegel, 2012). Psychotropic medications and psychotherapeutic interventions are widely used conventional modalities. Mind–body therapies, meditation, yoga, Tai Chi Chuan, acupuncture, massage, energy-based polarity therapy, and Reiki, and select natural products have beneficial effects on cancer-related stress (Chandwani et al., 2012).

Individuals with chronic obstructive pulmonary disease (COPD) are at increased risk of depressed mood and anxiety compared to the general population (Yohannes, Willgoss, Baldwin, & Connolly, 2010). These comorbid conditions are associated with significantly reduced quality of life and increased mortality. Depressed mood and cardiovascular diseases frequently occur together (Raic, 2017). It is estimated that between 20 and 45% of individuals with heart disease are depressed. Individuals who have had a heart attack are three times more likely to be depressed compared to the general population. The relationship between heart disease and depressed mood is multifactorial. Risk factors include dysfunction of the hypothalamic–pituitary–adrenal axis, increased proinflammatory activity, reduced omega-3 fatty acids, reduced heart rate variability, smoking, physical inactivity, and low self-esteem.

Chronic depressed mood may result from diabetes and other diseases that affect normal insulin secretion manifesting as dysregulation of the body's ability to metabolize carbohydrates (Musselman, Betan, Larsen, & Phillips, 2003). Diabetics who report severe symptoms of depressed mood tend to be less compliant with a specialized diabetic diet and oral hypoglycemic medications resulting in abnormal high serum glucose levels (i.e., hyperglycemia) and more medical complications of diabetes. Depressed diabetics are at higher risk of coronary heart disease (Forrest, Becker, Kuller, Wolfson, & Orchard, 2000). Successful treatment of depressed mood results in improved adherence to diabetic diets, normalization of blood sugar levels and fewer long-term medical complications of diabetes such as microvascular and macrovascular disease of the body and brain. Diabetes is also associated with significantly increased risk of cognitive decline, stroke and vascular dementia (Knopman et al., 2001; Strachan, Frier, & Deary, 2003). Chronic hypoglycemia caused by excess insulin secretion is often associated with intense anxiety and panic attacks. This condition can be caused by abnormal high insulin secretion from the pancreas or inappropriate high doses of insulin or oral hypoglycemic agents. Hypothyroidism, diseases of the liver, kidneys, heart, sepsis, starvation, alcohol abuse, and adverse effects of numerous medications may also manifest as generalized anxiety or panic attacks.

Hypothyroidism caused by dysregulation in the thyroid or the pituitary–thyroid "axis," is associated with impaired concentration, depressed mood, forgetfulness, physical and mental fatigue, and, in severe cases, auditory or visual hallucinations, and paranoia. Hypothyroidism occurs in up to one fourth of individuals diagnosed with "rapid cycling" bipolar disorder. In such cases adding thyroid hormone (i.e., thyroxine) to conventional treatment may reduce the frequency of cycling (Bowden et al., 2000). Because of the similarity in symptoms some patients with severe hypothyroidism may be misdiagnosed with schizophrenia. Cognitive, affective, and behavioral symptoms usually respond to thyroid hormone replacement (i.e., thyroxine) therapy however severe cognitive impairment associated with hypothyroidism that is undiagnosed or untreated for prolonged periods may persist in a milder form following thyroid hormone replacement. Abnormal high thyroid levels (hyperthyroidism) also manifest as disturbances of mood, cognition, and behavior. Chronic stress or an emotional crisis may precipitate hyperthyroidism in the form of Grave's disease, an autoimmune disorder. Individuals diagnosed with hyperthyroidism frequently report generalized anxiety, fatigue, restlessness, and irritability. Panic attacks and depressed mood can also accompany abnormal elevations in thyroid levels. Profound feelings of apathy and mental slowing may be more frequent among elderly patients.

Hyperparathyroidism is often accompanied by depressed mood, agitation, and confusion. Hypoparathyroidism (e.g., following thyroid surgery) can manifest as acute confusion, emotional lability, and impaired cognitive functioning.

Chronic malnutrition is often accompanied by profound fatigue, apathy, mental confusion, emotional lability, and memory problems. More than one-thirds of depressed individuals have abnormal low vitamin B12 levels. Folate deficiency is also a significant risk factor for depressed mood.

Methodology for Integrative Management of Complex Cases

Foundations

Currently there is no agreement within Western medicine or non-Western systems of medicine on how to manage complex cases with high comorbidity (Reeve et al., 2013). This is especially true in integrative mental health care where individualized treatment recommendations are based on the unique history, symptoms, circumstances, and preferences of each patient.

When working with highly comorbid patients it is of the utmost importance to promptly identify and implement a comprehensive care plan that is effective, affordable, and acceptable to the patient. The integrative practitioner's goal is to *translate pertinent information in the evidence tables into recommendations for assessment and treatment that adequately address each patient's unique symptoms while taking account of individual preferences and constraints*. Filling out evidence tables for managing complex cases is based on the same logic used to populate evidence tables for managing discrete mental health problems. The first step involves documenting all mental health, substance use, and medical problems. Relative priorities are then assigned to different problems in relation to the amount of distress or impairment in functioning they are causing. As described in Chap. 6, the practitioner then formulates questions and decides on key words and search strategies. The literature search is conducted and articles or chapters are retrieved and stored. The next step involves rating the evidence of assessment and treatment modalities and populating the evidence table. Evidence ratings are based on both the practitioner's clinical judgment and information obtained from the literature search. Depending on the complexity of the case and the urgency of developing a care plan, completing the evidence table may require one or several appointments. Once the evidence table is finalized the modalities together with their evidence ratings are entered into the algorithm. The practitioner and patient then review the algorithm and decide on an initial care plan incorporating specific assessment and treatment modalities taking into account the relative priority of treating different conditions, patient preferences, cost and availability. Figure 9.1 illustrates steps involved in populating the evidence table and using the algorithm when developing a care plan for a complex patient with high comorbidity.

It is important that the patient clearly understands and agrees to the rationale for all recommendations and has an opportunity to ask questions and voice his or her preferences as well as any concerns about safety or cost. A patient who discloses a serious mental health problem that may pose a life-threatening risk to himself or others should be referred immediately to the nearest emergency room. A patient who has a medical problem that is getting worse or is not being treated should be non-urgently referred to a Western trained physician.

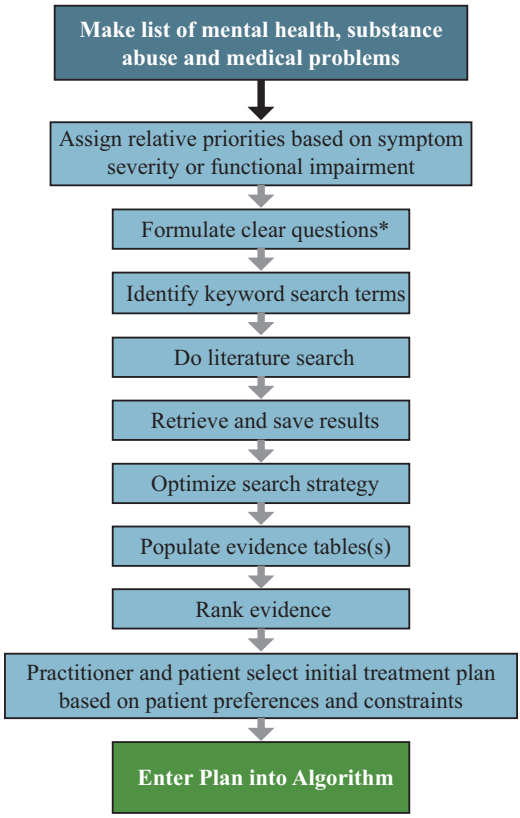

Fig. 9.1 Steps in literature search and populating evidence table (complex cases). ***Comment***: During the course of treatment new questions may lead to new search parameters or changes in Boolean strings to optimize search strategy *It is important to formulate questions that map onto Boolean strings corresponding to comorbidity (e.g., alcohol abuse and depression; anxiety and insomnia, etc.)

Assessment in Complex Cases

As discussed above, many individuals suffer from two or more primary symptom patterns (i.e. 'mental disorders'), or combinations of mental disorders, substance abuse, and medical problems. Since many medical problems mimic or cause mental health problems it is prudent to address mental health and substance abuse problems only when a patient is medically stable and all medical problems are being addressed. *The practitioner's task is to identify Western medical or CAM assessment approaches for evaluating mental health or substance abuse problems that remain after medical problems have been treated.*

In some cases, enough information is obtained during the intake interview to get to a clear understanding of underlying causes of a patient's problems and develop a treatment plan. In such cases there is no indication for formal assessment such as

laboratory studies or specialized CAM assessment. In cases where the history is vague and there is concern over an untreated or undertreated mental health, medical or substance use problem, it is prudent to recommend formal assessment. As discussed in Chap. 7 it is important to keep the principle of parsimony in mind when deciding whether formal assessment is needed to clarify the causes of symptoms. *The goal of parsimony is to come up with the simplest care plan that adequately addresses a patient's health problem(s).* This means that if formal assessment is unnecessary (i.e., for purposes of clarifying underlying causes of symptoms) it should not be done. Parsimony also has to do with recommending the minimum number of tests or outside referrals needed to clarify underlying causes of symptoms taking into account the preferences and financial constraints of your patient. Findings of a "parsimonious" test might provide useful information about a biochemical mechanism underlying more than one problem. For example, quantitative electroencephalography (QEEG) findings might point to abnormal brain electrical activity associated with both anxiety and depressed mood. Examples of practical assessment strategies are provided in the case vignette at the end of this chapter.

Table 9.1 lists representative assessment approaches to consider recommending to a complex patient with moderate depressed mood, severe generalized anxiety, insomnia, and chronic heavy alcohol abuse. Following the steps discussed above, the practitioner and patient assign relative priorities to assessment of different problems based on the degree of distress or impairment they are causing.

In the above hypothetical case high priority is assigned to assessment and treatment of three problems: severe generalized anxiety, severe insomnia, and chronic heavy alcohol abuse. Medium priority is assigned to depressed mood. Following the principle of parsimony serologic studies and QEEG brain mapping are logical choices as both assessment techniques yield findings that will help clarify underlying neurophysiological or metabolic causes of all four comorbid conditions. Furthermore, findings of both assessment approaches may point to Western medical and CAM treatment choices that will likely prove effective.

Moving from Assessment to Formulation and Treatment Planning

In cases where formal assessment studies have been done, the practitioner should first review findings before making a formulation and recommending treatment. In some cases, abnormal findings may point to underlying psychological, biological or postulated energetic causes of symptoms suggesting particular Western medical or CAM modalities that ameliorate them. In other cases, findings may definitively rule out a suspected cause of symptoms, rendering certain Western medical or CAM treatment modalities irrelevant. The formulation is a working model of known or hypothesized biological, psychological, cultural, social, and "energetic" causes and meanings of symptoms. Making a good formulation is an essential part of integrative care because clear understanding of the multiplicity of causes and meanings of symptoms will lead to treatment choices most likely to be effective. Elements of the

Table 9.1 Assessment approaches to consider when depressed mood is comorbid with generalized anxiety and alcohol abuse

Problem	Assessment technique	Priority	Comments
Depressed mood	Serologic studies	Medium	Low serum folate levels predict nonresponse to antidepressants and CAM treatments of depressed mood
			Characteristic abnormal QEEG findings in alcoholics may include high Beta (β), increased Alpha (α), and decreased Theta (θ) power
	Quantitative electroencephalography (QEEG brain mapping)		Specific qEEG findings predict differential response rates of depressed mood to both antidepressants and select CAM therapies
Anxiety	Serologic studies	High	Total serum cholesterol may be elevated in chronically anxious patients
			Deficiencies of niacin and vitamins B_6, C, and E, may be associated with generalized anxiety
			Deficiencies of magnesium, selenium, and phosphorus may be associated with chronic anxiety
			High urinary glutamate levels may be correlated with general anxiety
	QEEG brain mapping		Specific QEEG findings can be used to guide treatment selection in anxious patients, including psychotropic medications and EEG biofeedback training
Insomnia	Serologic studies	High	Deficiencies in vitamins C, E, B_{12}, and folic acid are associated with insomnia
	Chinese pulse diagnosis		Chinese pulse diagnosis provides clinically useful information about energetic imbalances that manifest as insomnia
Alcohol abuse	Serologic studies	High	The magnitude of serum deficiencies of vitamins A and C, many B vitamins, zinc, magnesium, and essential fatty acids is an indicator of the severity of malnutrition related to alcohol abuse
			Serum levels of folate, zinc, and magnesium are reliable clinical indicators of the severity of malnutrition in patients who drink heavily and do not take supplements
	QEEG brain mapping		QEEG assessment of alcoholics who have difficulty remaining sober may provide useful information for planning EEG-biofeedback or other biofeedback protocols addressing specific abnormal QEEG findings

formulation may change over time as new information is obtained from history or assessment findings, leading to new insights about underlying causes of symptoms and commensurate changes in treatment.

Identifying viable treatment choices always begins with an appraisal of the relative strength of evidence supporting different modalities, taking into account patient preferences, and constraints on cost and availability of treatment (including

qualified Western medical or CAM practitioners). As in the general methodology used for integrative treatment planning outlined in Chaps. 5 through 8, when managing complex patients with high comorbidity, modalities are selected based on the practitioner's judgment about the relative priority of treating different health problems in relationship to the amount of psychological distress or functional impairment they cause. This is the problem of determining the "precedence" of treatments taking into account the relative severity of co-occurring mental health, substance use, and medical problems.

Recommending One or More Than One Treatment Modality When Managing Complex Cases

In Chap. 5 a methodology was developed for determining whether to recommend two or more modalities at the same time (i.e., in parallel) or at different times (i.e., sequentially) when treating a single mental health problem. In Chap. 8 this methodology was applied to considerations of treatment planning addressing a single mental health problem. The same general methodology can be used when developing a care plan addressing complex cases involving comorbid mental health, substance use, and medical problems. However, additional considerations of safety, cost, and cost-effectiveness come into play when combinations of two or more modalities are used to treat comorbid conditions. These considerations have to do with the principle of "parsimony" or the goal of implementing the least cumbersome treatment plan that safely and adequately address all medical, mental health, and substance use problems, is cost-effective and accords with patient preferences and financial constraints. In some cases, a psychotropic medication or a natural supplement may be the most parsimonious approach because it adequately and affordably treats two comorbid mental health problems (e.g., an SSRI is sometimes effective for both depressed mood and anxiety; acupuncture is sometimes effective for both anxiety and insomnia). By the same token, different combinations of two or more Western medical or CAM modalities may significantly improve outcomes or accelerate treatment response in individuals who have comorbid mental health and medical problems (e.g., depressed mood and diabetes; or generalized anxiety and a cardiac arrhythmia). When managing a patient with high comorbidity the combined regimen may be more effective and thus more cost-effective, even when the total cost of treatment is significantly higher than any single treatment modality. This is especially true in cases where severe or complex symptoms respond more rapidly or more completely.

Many issues addressed in Chap. 8 apply to planning integrative care of complex patients with high comorbidity and are not reiterated in detail here. These include the following:

- Determining the most appropriate realistic treatment plan for a unique patient.
- Considerations when recommending one or more than one treatment.

- Reducing the risk of potentially unsafe interactions by recommending only one biological (Western medical or CAM) treatment modality at a time.
- Evaluating compatibility when recommending more than one treatment.
- Enhancing outcomes through synergistic effects.
- Making inferences about compatibility when mechanisms of action are unknown.
- Considerations when combining intuitive and empirically based treatment modalities.

These are the essential principles of integrative mental health care and if you have not already done so I strongly recommend reading Chap. 8 in its entirety before continuing.

When managing a complex patient in whom a mental health problem and comorbid substance abuse or a medical problem are causing distress or interfering with social, academic or occupational functioning it is prudent to initiate treatment addressing both problems concurrently. However, in a patient with chronic mild depressed mood and a comorbid serious medical problem or substance abuse that are impairing day to day functioning, it is prudent to first treat the substance abuse or medical problem, and to reevaluate symptoms of depressed mood when the substance abuse or medical problem is under better control. In such cases it may be appropriate to refer the patient to a Western medical or CAM practitioner for formal evaluation and treatment. I am assuming that most readers do not have the depth of training in both Western medicine and CAM to competently manage patients who present with complex medical, substance abuse and mental health problems. I am also assuming that practitioners who manage complex patients routinely make referrals to Western medical or CAM practitioners for the purpose of obtaining specialized assessment and treatment addressing a particular mental health, substance use or medical problem that is outside of their scope of practice. In such cases communication between practitioners about patient care is important for coordinating a multitiered plan and helping the patient adhere to a variety of treatments addressing different problems.

Making Changes Along the Way

As treatment progresses new entries are made in the evidence table reflecting changes in the type and severity of symptoms being managed, and new research findings pertaining to Western medical or CAM modalities. New research findings may result in changes in the relative strength of evidence for a specific Western medical, CAM or integrative approach compared to other modalities included in the evidence table. In cases where new research findings provide stronger evidence for a particular Western medical or CAM modality, that modality is retained in the evidence table and assigned to a higher level of evidence. In cases where new findings do not support previous claims of effectiveness the practitioner decides whether to delete that modality from the evidence table, or merely assign it to a lower level.

If a significant new safety concern comes to light for a particular Western medical or CAM modality, that modality is excluded from further consideration and deleted from the evidence table.

Follow-up appointments are important opportunities for assessing the patient's response to treatment, addressing concerns about adverse effects, reviewing changes in evidence and modifying the evidence table. The practitioner and patient work together on an ongoing basis to change the care plan reflecting changes in the evidence table keeping in mind the patient's preferences, financial constraints, and local availability of any new modalities being considered. The algorithm is changed accordingly. The practitioner refers to the algorithm when recommending treatment or making referrals to a Western medical or CAM practitioner in cases where a mental health problem, substance abuse, or a medical problem is outside the practitioner's scope of practice. This process continues in iterative fashion until an "optimal" integrative care plan is implemented that reflects the patient's unique needs, preferences and constraints and leads to sustained improvement in target symptoms.

In broad overview, developing an integrative care plan addressing complex cases involving comorbid mental health problems, substance abuse, and/or medical problems entails the following steps:

- Document history of mental health, substance abuse, and medical problems including responses to previous Western medical and CAM treatments.
- Document all current treatments of all mental health, substance abuse, and medical problems.
- Refer patients with severe or life-threatening mental health or medical problems to an urgent care clinic or the nearest emergency room.
- Refer patients with untreated or progressive medical problems to a Western medical or CAM practitioner for non-urgent evaluation and treatment.
- Populate the evidence table with information on reasonable CAM modalities addressing mental health and substance abuse problems.
- Prioritize treatment of problems that cause the greatest distress or impairment in functioning.
- Decide on initial care plan including precedence of treatment(s) addressing different problems according to treatment priorities, recommending one or more than one treatment, etc.
- Modify care plan if needed taking account of patient preferences and constraints on cost and availability.
- Modify evidence table and algorithm on ongoing basis as new research findings are reported, new problems emerge, or when current treatment is not effective.

Blank evidence tables and algorithms can be downloaded from the companion website www.IntegrativeMentalHealthPlan.com and filled in with pertinent information to address the history, symptoms, preferences and constraints of a unique patient.

Figure 9.2 illustrates the logical steps built into the algorithm used to develop an individualized care plan for complex highly comorbid patients. The algorithm is modified over time taking account of changes in symptoms, the history of response *or non-response* to previously tried treatments, and (any) new assessment findings.

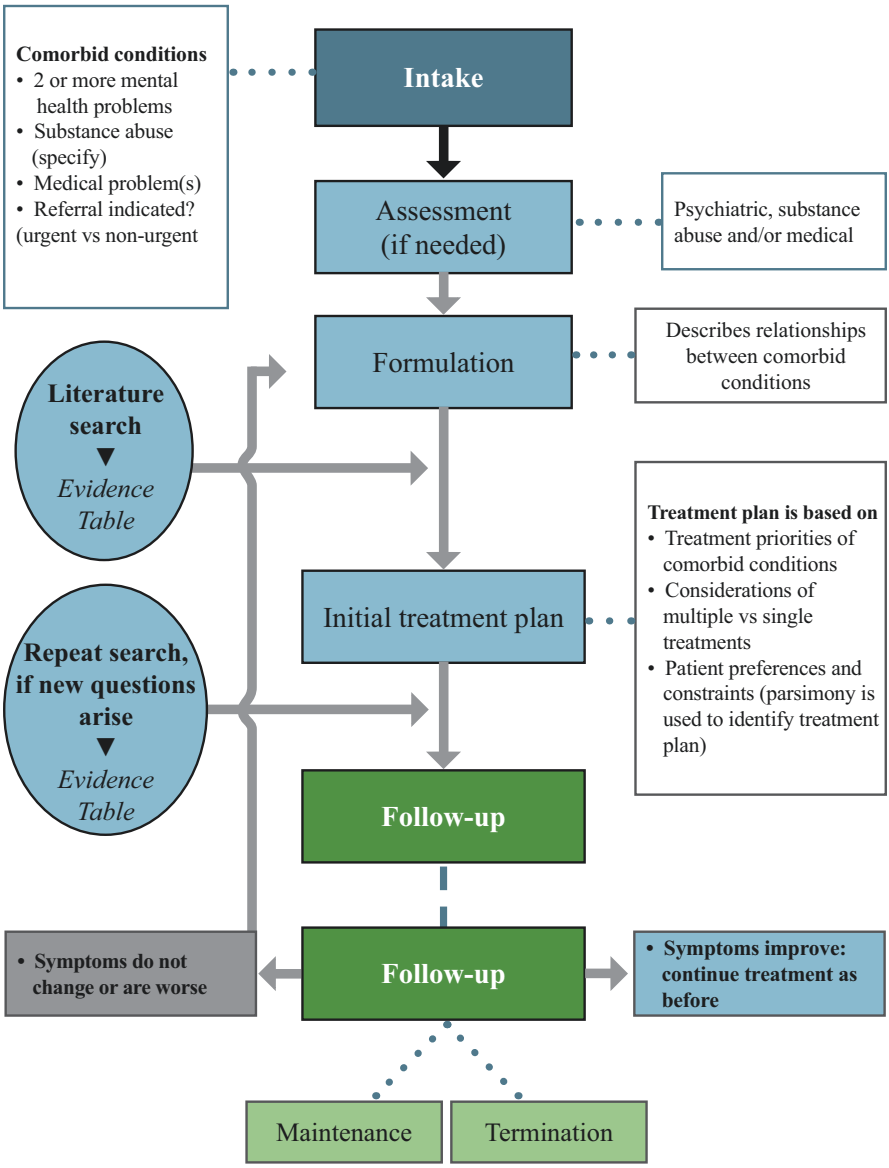

Fig. 9.2 Logic of algorithm for planning integrative mental health care (complex cases). ***Comment***: Steps are repeated until all conditions are addressed, the patient is stable and continues in treatment (i.e. maintenance therapy) or the patient decides to end treatment

Clinical Applications

Integrative Management of Two or More Comorbid Mental Health Problems

When approaching a patient with two or more mental health problems, the practitioner makes a provisional formulation and assigns relative priorities to treating disparate mental health, substance use or medical problems depending on the amount of distress or impairment in functioning they are causing. The next step involves determining whether formal assessment is needed, ordering laboratory studies or making referrals to a Western medical or CAM practitioner for specialized testing. A patient who is suicidal, homicidal or gravely disabled by a psychotic disorder should be referred to the nearest emergency room. Following the principle of parsimony (above) the practitioner identifies the fewest treatments that adequately address comorbid mental health problems. For example, some antidepressants and natural supplements have beneficial effects on depressed mood, anxiety, and insomnia. As discussed earlier, whether or not to recommend one treatment only or a combined regimen including, for example, psychotropic medications, natural supplements, a mind–body or mindfulness practice, an energy therapy, regular exercise, dietary changes, or other Western or CAM modalities, depends on symptom severity, the patient's history of response to previous treatments, motivation, and patient preferences.

Integrative Management of Comorbid Mental Health and Substance Use Problems

Mainstream approaches used to treat individuals with comorbid mental illness and substance use problems (i.e., "dual diagnosis" patients) often include both pharmacologic and behavioral interventions to reduce craving and reinforce behavioral changes that promote long-term stability and recovery. A review of clinical practices addressing complex cases involving a primary mental health problem and substance abuse concluded that combinations of disparate modalities have synergistic effects on multiple symptoms and are generally more effective than single treatment modalities (Kelly, Daley, & Douaihy, 2012). Individuals afflicted with a psychotic disorder and a comorbid substance use disorder are most likely to abuse cannabis, alcohol, or cocaine (Green, Young, & Kavanagh, 2005). Such individuals should be strongly encouraged to closely adhere to their antipsychotic medication and remain abstinent to reduce the risk of symptomatic worsening. A large study found that a combined approach employing motivational interviewing, cognitive behavioral therapy (CBT) and family therapy can significantly reduce the risk of substance abuse in individuals diagnosed with schizophrenia (Barrowclough et al., 2010).

In Western medicine selective serotonin reuptake inhibitor (SSRI) antidepressants are often used in combination with cognitive behavioral therapy (CBT) to treat comorbid depressed mood and alcohol abuse (Moak et al., 2003). Interpersonal and Social Rhythm Therapy (IPSRT) is a behavioral treatment of bipolar disorder (Frank, Swartz, & Kupfer, 2000) that stabilizes the individual's circadian rhythms through highly structured daily routines. IPSRT is more effective for preventing relapse, improving functioning, and increasing life satisfaction than medication management alone (Miklowitz et al., 2007). Integrated group therapy (IGT) is another specialized kind of cognitive behavioral therapy that may be more effective for stabilizing mood and reducing substance abuse than CBT or medication management alone (Weiss et al., 2004, 2009). However, CBT and psychosocial approaches are not very effective for reducing relapse risk (Bottlender, Köhler, & Soyka, 2006). There are no effective conventional Western medical treatments of cocaine addiction, and recovering alcoholics engaged in 12-step programs experience high relapse rates.

Cognitive behavioral therapy (CBT) as practiced by Western trained mental health providers is a highly effective treatment of many anxiety disorders (Hofmann & Smits, 2008; Stewart & Chambless, 2009). Imaginal exposure therapy is an established conventional treatment of PTSD. Adults who struggle with social anxiety are more prone to abuse alcohol than other substances (Schneier et al., 2010) however anxious adolescents may be more likely to abuse cannabis because it is more easily available than alcohol. CBT has been used successfully to treat individuals with comorbid alcohol abuse and social anxiety (Randall, Thomas, & Thevos, 2001). Individuals diagnosed with obsessive-compulsive disorder (OCD) are prone to substance abuse to "self-treat" their anxiety symptoms but may seldom disclose substance use to their provider (Fals-Stewart & Schafer, 1992). CBT is also an effective intervention for individuals with comorbid OCD and a substance use disorder.

PTSD and substance use disorders are highly comorbid with an estimated prevalence rate between 14 and 41% (Schafer & Najavits, 2007). Symptoms of PTSD are generally more severe in individuals with comorbid substance abuse compared to individuals with either condition alone (Jacobsen, Southwick, & Kosten, 2001). A review of studies on exposure therapy in individuals with comorbid PTSD and a substance use disorder found that individuals who experienced transient worsening of PTSD symptoms during exposure therapy reported increased craving and were at greater risk of relapse (Tiet & Mausbach, 2007). The authors recommend that patients with both disorders should engage in exposure therapy only after their substance abuse is under control. Exposure therapy is also an effective treatment of panic attacks and improves depressed mood that often accompanies substance abuse or craving (Otto, Smits, & Reese, 2004). Regular attendance of 12-step groups helps individuals diagnosed with a mood disorder maintain abstinence while improving emotional and psychological functioning (Aase, Jason, & Robinson, 2008).

The above findings support that combined treatment regimens are often more effective than single treatment modalities for individuals who struggle with more than one mental health problem. Guidelines have been developed for an optimal healing environment for the treatment of substance abuse in response to concerns

about the limited effectiveness of conventional approaches (Wesa & Culliton, 2004). This concept incorporates conventional Western medical and CAM treatments in the context of a holistic environment that emphasizes the role of spirituality in recovery.

Select natural supplements and other CAM modalities have been shown to reduce symptoms associated with alcohol abuse and may be safely combined with medications or specialized forms of therapy. Supplementation with select amino acids ameliorates symptoms associated with alcohol abuse and dependence. For example, taurine may reduce alcohol withdrawal symptoms, and L-tryptophan may reduce alcohol craving. There is evidence that the amino acid acetyl-L-carnitine (ALC) may improve cognitive functioning in abstinent alcoholics. L-tryptophan and ALC are sometimes beneficial for depressed mood, anxiety, and insomnia which often accompany alcohol abuse. SAM-e (*S*-adenosyl methionine), a methyl-donor essential for serotonin synthesis, may reduce alcohol intake. Simple dietary changes such as reducing caffeine and refined sugar in the diet and increasing foods rich in omega-3's may reduce relapse risk in abstinent alcoholics.

In individuals who are unable to control drinking the antioxidant vitamins such as ascorbic acid (i.e., vitamin C) taken before heavy drinking may reduce the severity of hangover symptoms. The B vitamin nicotinic acid may reduce the risk of developing alcohol dependence in chronic drinkers. There is evidence that taking magnesium and zinc supplements may mitigate the long-term neuropsychological consequences of chronic alcohol abuse. The regular practice of relaxation may reduce withdrawal symptoms following discontinuation of sedative–hypnotic drugs including benzodiazepines.

In addition to nutraceuticals, mindfulness, mind–body practices, and energy therapies also have beneficial effects in individuals who abuse alcohol or narcotics. The regular practice of yoga, meditation, or mindfulness training probably improves overall social and psychological functioning in alcoholics, may reduce the rate of relapse in abstinent alcoholics and addicts, and also has general beneficial effects on anxiety and depressed mood—conditions that are frequently comorbid with substance abuse. There is evidence that transcranial electrical stimulation may reduce the severity of alcohol and opiate withdrawal and improve symptoms of anxiety that accompany withdrawal. Electroencephalography (EEG) biofeedback using an alpha–theta training protocol may reduce the rate of relapse in abstinent alcoholics. EEG biofeedback is also an effective CAM therapy for generalized anxiety, ADHD, and PTSD, conditions that are frequently comorbid with alcohol abuse. Finally, some acupuncture protocols may reduce symptoms of withdrawal when alcohol or cocaine use is discontinued following chronic abuse.

Developing an integrative treatment plan for a patient who has both a substance abuse problem and a mental health problem takes into consideration the strength of research evidence for Western medical and CAM modalities, prioritizes treatment of conditions that cause the greatest degree of distress or functional impairment, and takes into account patient preferences and constraints on cost and availability.

Table 9.2 is an evidence table showing representative CAM and integrative approaches to consider when developing a care plan for a complex patient with high

Table 9.2 Evidence table: representative CAM treatment approaches to consider in a complex patient with depressed mood, anxiety, insomnia, and alcohol abuse

Problem	Treatment	Priority	Comments
Depressed mood	Dietary changes	Medium	Restricting caffeine and refined sugar and increasing consumption of fatty fish and whole foods rich in B vitamins may improve depressed mood and reduce the risk of becoming depressed
			The B vitamin folate especially in its active form (l-methylfolinic acid) at doses up to 15 mg/day increases the antidepressant effects of antidepressants and *S*-adenosyl methionine (SAM-e)
			5-hydroxytryptophan (5-HTP) 300 mg/day is probably as effective as antidepressants for moderate depressed mood
			Note: Some cases of treatment-refractory depression improve when 5-HTP 300–600 mg/day is combined with an antidepressant
	Vitamins and minerals		l-tryptophan 2 g/day improves the effectiveness of the antidepressant fluoxetine (Prozac™) and improves sleep quality in depressed individuals
			l-tryptophan 1–2 g/day combined with bright light therapy is more effective than either approach alone in seasonal depressed mood
			Note: *l-tryptophan is sedating and should be taken at bedtime only*
	Amino acids		Mindfulness training is probably as effective as cognitive therapy for moderate depressed mood
	Mindfulness training and meditation		Combining mindfulness training or guided imagery with an antidepressant is more effective than medication alone
	Acupuncture		Some acupuncture points and protocols are probably more effective than others in reducing symptoms of alcohol withdrawal
	Exercise		Regular exercise at least 30 min 3 times a week is probably as effective as antidepressants, St. John's wort (*Hypericum perforatum*), and cognitive therapy for moderate depressed mood
	Transcranial direct current stimulation (tDCS)		Transcranial direct current stimulation (tDCS) may have antidepressant effects

(continued)

Table 9.2 (continued)

Problem	Treatment	Priority	Comments
Anxiety	Dietary modification	High	Avoiding refined sugar and caffeine and increasing protein and foods containing tryptophan may reduce symptoms of generalized anxiety and panic
	Amino acids		l-tryptophan 2–3 g/day or 5-HTP 25–100 mg up to 3 times a day reduces the severity of generalized anxiety
			5-HTP may prevent panic attacks in some patients
	Exercise		Regular aerobic or strengthening exercise reduces generalized anxiety symptoms and may reduce the frequency and severity of panic attacks
	Acupuncture		Some acupuncture and electroacupuncture protocols reduce symptoms of generalized anxiety
	Biofeedback training		Heart rate variability (HRV) biofeedback reduces symptoms of generalized anxiety
	Music		Regular listening to soothing music or certain binaural sounds can significantly reduce generalized anxiety
Insomnia	Dietary changes	High	Avoiding caffeine in beverages or medications improves insomnia
	Vitamins and mineral		Supplementation with folate, thiamine, iron, zinc, and magnesium in deficient individuals improves sleep quality
	Amino acids		Supplementation with 5-HTP and l-tryptophan improves mild or situational insomnia
	Somatic therapies		Combining l-tryptophan 2 g with an antidepressant improves sleep quality
			Progressive muscle relaxation, massage, and physical exercise improve sleep quality and duration
			Meditation and guided imagery are as effective as sedative-hypnotics for mild and moderate insomnia
	Mindfulness and meditation		Regular early morning bright light exposure improves sleep quality in individuals with circadian rhythm sleep disorders
	Light exposure		Cranioelectrotherapy stimulation (CES) may be beneficial in some cases of chronic insomnia
	Microcurrent electrical stimulation		Patients who report improved sleep following CES treatment exhibit increased “delta sleep” that continues months after treatment ends
	Biofeedback		Some EEG-biofeedback protocols, especially a technique called sensory–motor rhythm (SMR) aimed at rebalancing the ratio of alpha to theta frequencies, are effective treatments of chronic insomnia
	Acupuncture		Some acupuncture and auriculotherapy protocols reduce the severity of sleep disturbances, including insomnia related to a primary mental or emotional problem

(continued)

Table 9.2 (continued)

Problem	Treatment	Priority	Comments
Alcohol abuse	Dietary modification	High	Alcoholics who improve their diets, including reduced intake of refined sugar and caffeine and increased intake of omega-3 fatty acids and protein, may maintain sobriety longer
	Vitamins and minerals		Thiamin may reduce alcohol craving, nicotinic acid may reduce the risk of alcohol dependence in chronic drinkers, taking antioxidant vitamins soon before drinking may reduce severity of hangover symptoms
			Supplementation of chronic alcoholics with magnesium and zinc may improve global neuropsychological functioning and protect the brain against free radical damage
			Note: Alcoholics may have a general brain serotonin deficit. Supplementation with the amino acids l-tryptophan and 5-HTP may increase brain serotonin levels resulting in general beneficial effects on brain function
	Amino acids		l-tryptophan may reduce alcohol craving
			Taurine may reduce the severity of alcohol withdrawal
	Essential fatty acids		Acetyl-l-carnitine (ALC) may enhance cognitive performance in abstinent alcoholics
			Supplementation with omega-3 and omega-6 fatty acids may reduce the severity of alcohol withdrawal
	Mindfulness training		Abstinent alcoholics who engage in a regular mindfulness practice or meditation probably have a reduced risk of relapse
			Spiritually focused support groups probably reduce relapse risk
			Note: Transcendental meditation may be more effective at reducing the risk of relapse compared with other meditation styles
	Exercise		Regular aerobic exercise or strength training in abstinent alcoholics may improve general emotional well-being
	Transcranial direct current stimulation (tDCS)		Transcranial direct current stimulation (tDCS) may reduce symptoms of alcohol withdrawal
			TDCS may reduce anxiety and improve cognitive functioning in alcoholics
			Note: Optimum therapeutic benefits are achieved when specific treatment protocols are employed
	Biofeedback		Electromyography (EMG) biofeedback may reduce the risk of relapse in abstinent alcoholics
			EEG-biofeedback training using alpha-theta training induces a relaxed, calm state that may reduce the urge to drink
	Light exposure		Regular early morning exposure to dim light (250 lux) may reduce the risk of relapse in abstinent alcoholics who report seasonal mood changes
	Acupuncture		Some acupuncture points and protocols are probably more effective than others in reducing symptoms of alcohol withdrawal

comorbidity including moderate depressed mood, severe generalized anxiety, chronic insomnia, and chronic heavy alcohol abuse.

Treatment planning follows the same general logic used to plan assessment. In this case high priority is assigned to the treatment of anxiety, insomnia and alcohol abuse as all of these problems are causing severe distress or severely impairing functioning. Lower priority is assigned to the treatment of depressed mood because it is of moderate severity, that is, it is not causing severe distress or impairment in functioning. Following the principle of parsimony CAM modalities that address more than one condition are identified as reasonable candidates for the initial care plan. These include lifestyle changes such as dietary modification, regular exercise and mindfulness or meditation, as well as supplementation with B vitamins and select amino acids. All of these approaches may be safely used in combination with psychotropic medications including antidepressants, antianxiety drugs, and sedative hypnotics in some cases improving response and speeding up response rate. Following the principle of parsimony, microcurrent electrical stimulation and EEG biofeedback should also be considered, as each modality has beneficial effects on 3 out of 4 comorbid problems being treated in this case. Further, both approaches may be safely used in conjunction with psychotropic medications, supplements, and lifestyle advice, potentially improving outcomes and speeding up response.

Blank templates for populating evidence tables and algorithms with information when planning integrative care of single mental health problems and complex patients with high comorbidity are available as downloads on the companion website www.IntegrativeMentalHealthPlan.com and in the appendix of the e-book.

Case Vignette

This chapter concludes with a case vignette illustrating the step-by-step management of a complex case with high comorbidity including mental health problems, substance abuse and medical problems. The vignette is fictional however the complex mental health, substance abuse, and medical problems described are frequently encountered in real patients. As in this hypothetical case, many patients consider using CAM or integrative approaches only after working with a physician or other conventionally trained health care providers for many years. The vignette is followed by evidence tables summarizing pertinent information on assessment and treatment approaches that were considered or actually used in this case. Text boxes accompanying the vignette comment on important aspects of integrative care and are reflected in the algorithm (Fig. 9.3) following the vignette. Tables 9.3 and 9.4, respectively, list assessment and treatment approaches that are being considered or recommended by the practitioner.

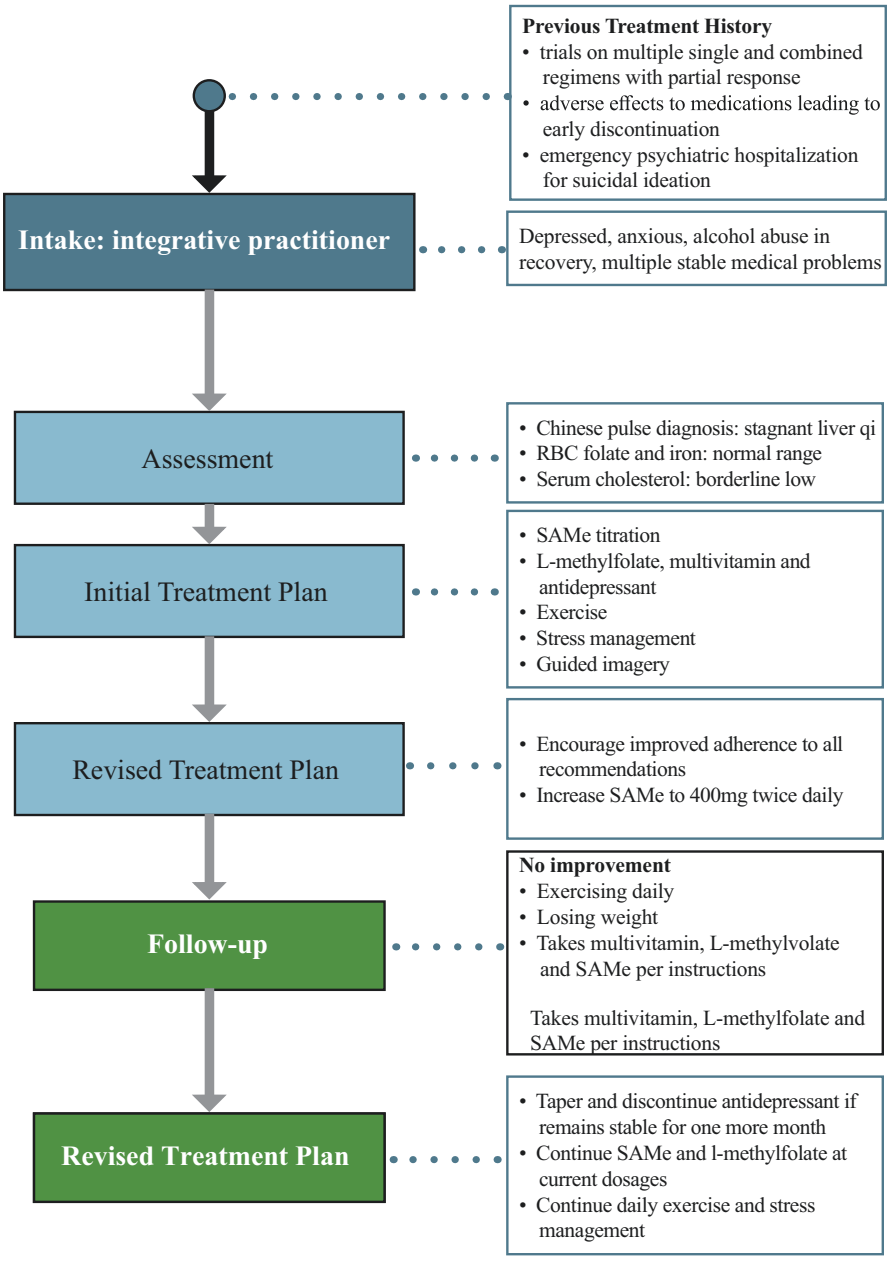

Fig. 9.3 Algorithm for case vignette

Intake

Mike is a 67-year-old retired accountant with a complicated medical history, including coronary artery disease, high blood pressure, and adult onset non-insulin-dependent diabetes. He recently started taking a statin (i.e., a cholesterol lowering drug) for elevated cholesterol. He is a recovering alcoholic and at the time of the intake has been sober for 10 years. Recently, Mike has felt "less interested" in life and seldom socializes. He has three grown children and four grandchildren who live a thousand miles away. Mike first felt depressed as a teenager and first experienced severe depressed mood at the age of 21. At that time his symptoms included feelings of hopelessness and worthlessness, severe daytime fatigue, loss of appetite, and frequent thoughts of suicide.

Diabetes and heart disease are frequently comorbid with depressed mood. Chronic alcohol abuse can cause depressed mood however alcohol is also widely used to self-medicate symptoms of depression.

Mike recalls "gutting it out," and eventually feeling better after several months. He continued to drink and his mood was "OK" for about 3 years, when he again experienced severe depressed mood and suicidal thoughts. Mike eventually sought help from a psychiatrist who provided psychotherapy and medication management during monthly 1-h sessions. He was still drinking heavily at that time and the psychiatrist encouraged him to face his drinking problem. During the intake interview the psychiatrist assessed symptoms of alcohol abuse using a standardized questionnaire (CAGE questionnaire).

When there is a history of alcohol abuse it is important to determine whether the patient is drinking or in recovery. It is also important to clarify whether alcohol abuse (including withdrawal) may be contributing to mental health problems. The "CAGE" questionnaire consists of four questions aimed at eliciting clinically pertinent information about alcohol abuse.

Mike has never used Cannabis (i.e., marijuana), stimulants such as amphetamine or cocaine, or other substances. There was no evidence of mania or psychosis consistent with a diagnosis of bipolar disorder or schizophrenia. Based on a score of 30 on the Beck Depression Inventory the psychiatrist made a diagnosis of major depressive disorder and started Mike on fluoxetine (Prozac™) 20 mg/day. After 6 weeks Mike's mood improved dramatically, but he experienced adverse effects including dizziness, diminished libido, and weight gain. Although he felt consistently better, Mike discontinued Prozac after 1 year because of these adverse effects.

Before diagnosing a patient with major depressive disorder, it is important to first rule out bipolar disorder. A history of only one manic or hypomanic episode qualifies for a diagnosis of bipolar disorder. This is an important distinction as taking an antidepressant increases the risk of mania in a bipolar patient. The Beck Depression Inventory (BDI) is a self-administered questionnaire widely used to assess the severity of depressed mood. During the course of treatment, the BDI is periodically repeated to assess treatment response. At the time of the intake Mike's score (30) is at the border between moderate and severe. Many depressed individuals who take antidepressants initially experience improvements in mood which decrease over time resulting in relapse. As in this case a significant percentage of individuals who respond to an antidepressant eventually choose to discontinue it because of adverse effects.

A few months after the intake Mike entered a 1-month day treatment program on his psychiatrist's advice and was soon able to moderate his drinking, and then stop drinking all together. He started attending Alcoholics Anonymous (AA) meetings "some nights but I didn't get much out of them, and I stopped going."

Two years later Mike became severely depressed again and had frequent thoughts of suicide. His psychiatrist started him on another SSRI antidepressant, sertraline (Zoloft™) 100 mg, but his mood continued to worsen. Mike felt "even more nervous than usual" and was soon hospitalized on an involuntary 72-h "hold" because of intrusive suicidal thoughts. While hospitalized, Mike was started on lithium carbonate and continued on sertraline, which was further increased to 200 mg/day.

A severely depressed individual who is contemplating suicide should be urgently referred to the nearest emergency room and if necessary for their safety, hospitalized on an involuntary basis. During emergency psychiatric hospitalization a thorough medical and psychiatric evaluation takes place. Depending on findings, medical and psychiatric problems are treated. Individuals who are taking psychotropic medications at the time of hospitalization may be advised to make adjustments in doses of ongoing medications or start one or more new medications. Individual and group therapy are available in most psychiatric inpatient units. A social worker coordinates a discharge plan to ensure close follow-up care after discharge. Lithium "augmentation" is a frequently used pharmacologic strategy for treating severe depressed mood that does not respond to an antidepressant alone.

Following discharge, Mike continued to feel depressed but was no longer suicidal. He experienced a 30-lb weight gain during the first 3 months on lithium, and "the tremor and nausea were incredibly annoying." After 6 months on this regimen, against his psychiatrist's advice, Mike decided to stop taking lithium, but continued taking sertraline.

Although adding lithium to an antidepressant often results in beneficial synergistic antidepressant effects, many patients experience significant weight gain and other adverse effects such as tremor and thyroid problems that ultimately lead to the decision to stop taking lithium despite its benefits.

After trying several diets, Mike was unable to lose weight and 6 months ago was diagnosed with non-insulin-dependent diabetes and started on an oral hypoglycemic agent called metformin. Over a 2-year period, his psychiatrist tried different antidepressants including paroxetine (Paxil™), nefazadone (Serzone™), bupropion (Wellbutrin™), venlafaxine (Effexor™), and a combined regimen that included trazodone (Desaryl™) at bedtime and citalopram (Celexa™) in the morning. Mike discontinued venlafaxine after trying it for only a few days because of severe unremitting headaches and increased blood pressure. He discontinued the other antidepressants following brief trials because of side effects (e.g., bupropion caused "nervousness," trazodone "made me feel like a zombie in the morning," and serzone "took away my desire to be with a woman"). Most recently, Mike was started on mirtazapine (Remeron™), which has helped with sleep but has led to intense carbohydrate craving, "I can't stop eating sweets and the weight is piling on." Mike disclosed feelings of intense frustration to his psychiatrist "I'm tired of antidepressants working for a while…then petering out. …" At about that time he was offered treatment with transcranial magnetic stimulation but refused, "I don't want to have my brain zapped." Mike had read about ketamine infusion therapy and asked his psychiatrist for a referral to a clinic offering this therapy. Small doses of ketamine delivered intravenously are sometimes effective in severely depressed patients who have not responded to multiple antidepressants. After reading a few articles, Mike learned that ketamine infusion therapy is still regarded as experimental and controversial. He also learned that his health insurance plan does not cover this therapy. For these reasons Mike decided to not go forward with ketamine therapy.

Initial improvement in depressed mood followed by "petering out" is frequently reported by patients treated with antidepressants and other psychotropic medications. As discussed in this book, although many Western medical and CAM treatments are recommended to patients with "treatment refractory" depressed mood there is no consensus in mainstream psychiatry on "best practices" when managing this challenging mental health problem. Conventionally trained psychiatrists and other mental health providers recommend a variety of treatments including combinations of two or more psychotropic medications, psychotherapy, electroconvulsive therapy, transcranial magnetic stimulation, ketamine infusion therapy, and others depending on their clinical experience, insurance coverage and patient preferences. Such challenging cases invite consideration of novel pharmacologic, psychotherapeutic, and CAM modalities that have a reasonable chance of working and have not been previously tried.

One year ago, Mike chose to retire "it's just too hard. I need to leave the fast lane." At about that time he revealed to his psychiatrist, "sometimes I get very nervous and my heart starts pounding for no reason."

Mike is describing classic symptoms of panic attacks. However, similar symptoms often accompany episodes of hypoglycemia in diabetics, alcohol withdrawal, cardiac arrhythmias or adverse effects to medications. One or more of these medical problems may explain Mike's anxiety and they should be ruled out before making a presumptive diagnosis of panic disorder or starting treatment.

Mike agreed to see his family doctor who "ran some tests and told me I didn't have any medical problems that explain the anxiety, but he told me to work on my diet and take more time to relax."

Mike recently heard about an integrative mental health clinic in his city and after frustrating experiences with prescription medications he is open to trying something new.

Making the Transition from Conventional to Integrative Care

Elizabeth is a nurse practitioner (NP) trained in both psychiatry and acupuncture. She takes a thorough medical, psychiatric, and social history, does a detailed review of Mike's previous responses to antidepressants including both positive responses and adverse effects to specific psychotropic medications. Mike confirms that the most recent episode of severe depressed mood was about 2 years ago, and since then he has felt moderately depressed most of the time but no longer thinks about suicide. At the time of the intake Mike has been sober 10 years, attends alcoholics anonymous (AA) meetings "some of the time," but stays in frequent contact with his sponsor, and says he *does not* crave alcohol "so I don't need to keep going to the meetings all the time." There have been no medical complications of alcohol abuse such as fatty liver disease, kidney problems, ulcers, or delirium tremens, a potentially fatal complication of abrupt alcohol withdrawal following chronic heavy drinking that is accompanied by seizures and hypertension.

Elizabeth uses her training in Chinese medicine to examine Mike's tongue and eyes and performs a pulse diagnosis, which confirms *stagnant liver qi* as a probable underlying energetic cause of depressed mood.

Chinese pulse diagnosis is a highly evolved approach to energetic diagnosis in which a skilled diagnostician makes inferences about energetic abnormalities in qi (i.e., vital energy) flowing through energetic channels (i.e., meridians) reflecting imbalances in organs. Certain energetic abnormalities or *imbalances* manifest as chronic feelings of sadness. Stagnant liver qi—a manifestation of deficient qi—is often associated with a symptom pattern in Chinese medicine that bears phenomenological resemblance to the Western medical diagnosis of major depressive disorder.

Mike tells Elizabeth about his recent weight gain since starting mirtazapine 15 mg which he takes at bedtime. He is concerned that he has been eating too many sweets, which have been increasing his blood sugar readings and worsening his diabetes. Mike describes feelings of intense anxiety over "my existential issues" and discloses that he has been thinking about trying "some kind of mind–body thing" to address these concerns. At the end of the intake interview Elizabeth assesses Mike's mood as moderately depressed according to DSM-V criteria, consistent with his Chinese medical diagnosis of *qi deficiency due to stagnant liver qi*. She orders some laboratory tests to rule out possible medical problems that may be contributing to Mike's experience of chronic depressed mood. These include serum total cholesterol and triglycerides, red blood cell (RBC) iron and folate levels, and thyroid studies.

Laboratory studies often provide useful information about physiological abnormalities that may contribute to depressed mood and other mental health problems. Chronically depressed individuals tend to have abnormal low blood levels of cholesterol. Anemia, often associated with chronic drinking, can cause or worsen depressed mood and manifest as chronic feelings of lethargy. As described in the first part of this chapter, hypothyroidism (less commonly hyperthyroidism) often manifests as depressed mood. All of these studies are routinely ordered by physicians to rule out common physiological causes of depressed mood that can be corrected using Western medical treatments.

Elizabeth explains to Mike why she is ordering these tests and takes a few minutes to describe possible mood worsening side effects of the antihypertensive medication (propranolol) that Mike is taking.

Propranolol and other "beta blockers" are widely used Western medical treatments for high blood pressure. Psychiatrists prescribe the same medications at lower doses to treat symptoms of anxiety. Beta blockers may cause or worsen depressed mood resulting in suboptimal response to antidepressant treatment. Anyone who is depressed and taking a beta blocker for hypertension or anxiety should be advised of the risk of worsening mood with this therapy.

Mike expresses deep frustration over his poor response to antidepressants and his problems with many adverse effects over the years "no matter what I try the downside always seems worse than the upside." Elizabeth affirms Mike's disappointing experiences with antidepressants and tries to encourage him by describing non-medication approaches he has not yet tried addressing both depressed mood and anxiety. Among others Elizabeth mentions the importance of regular exercise, improved sleep, a mindfulness or mind–body practice such as yoga, acupuncture, and select natural supplements. Elizabeth tells Mike that research studies have demonstrated antidepressant benefits of these approaches when tried alone or together with antidepressants in some cases improving response.

Lifestyle changes such as exercise, improved nutrition, sleep hygiene and stress management are effective treatments of moderate depressed mood. All patients struggling with depression and anxiety should be encouraged to engage in regular physical activity (i.e., unless there are medical risks to doing so), make a concerted effort to eat healthy food and get enough rest on a regular basis, and engage in a relaxation or a mindfulness practice such as deep breathing, guided imagery or sitting meditation. These approaches are also helpful for maintaining optimal well-being after depressed mood has improved.

Mike is skeptical about Chinese medicine and anxious at the thought of "being stuck with needles." Although there is research evidence for antidepressant effects of acupuncture Elizabeth decides to *not* recommend this approach. Mike expresses interest in trying natural supplements "it's like taking vitamins, right?" Elizabeth briefly comments on the evidence for *S*-adenosyl methionine (SAM-e), the amino acid 5-hydroxytryptophan (5-HTP), and the B vitamin L-methyl-folate for depressed mood.

Each of these natural supplements may be taken alone or in combination with an antidepressant resulting in beneficial synergistic effects in some cases improving response and speeding up response rate. There are potential safety risks when combining SAM-e or 5-HTP with antidepressants that increase brain serotonin levels and the practitioner should review these issues with the patient and document informed consent before recommending specific combined treatment regimens.

At the end of the session Elizabeth and Mike agree on a care plan that includes continuing the current dose of mirtazapine (Remeron™), starting a gradually escalating dose on *S*-adenosyl methionine (SAM-e), taking 15 mg of L-methyl-folinic acid, starting a daily exercise program (i.e., with his family doctor's approval), improving his eating habits, and practicing deep breathing and guided imagery a

few times a day for anxiety. Elizabeth consults a standard reference and confirms that SAM-e may be safely used by patients who have heart disease and tells Mike about possible side effects such as mild nervousness or sedation, and gastrointestinal distress, especially during the first days or weeks of treatment. Using her tablet computer, Elizabeth searches an expert database on natural products and confirms that there are no documented unsafe interactions between SAM-e, mirtazapine, and Mike's other medications. They agree on a trial of SAM-e starting at a dose of 200 mg daily, gradually increasing the dose to the recommended therapeutic range (between 800 and 1600 mg/day in two separate doses) while monitoring for side effects. In addition, Elizabeth recommends taking a high potency multivitamin and L-methyl-folate 15 mg/day. She explains the multivitamin will help "make up for" Mike's erratic eating habits and that the l-methyl-folate works together with SAM-e and mirtazapine to enhance their antidepressant effects.

Research finding support that combined regimens consisting of SAM-e and an antidepressant or an antidepressant and L-methyl-folate are safe and yield synergistic antidepressant effects that may be superior to an antidepressant or either supplement taken alone.

Elizabeth writes a note in Mike's chart documenting that she has carefully gone over potential benefits and risks of the new treatment plan and Mike has consented to start treatment. She recommends a reputable brand of SAM-e and tells Mike where he can find it. Mike seems motivated to follow through with the recommended care plan and signs a consent form and a release authorizing Elizabeth to contact his psychiatrist.

Because Mike has been sedentary for years Elizabeth advises him to consult with his family physician to obtain a medical release before starting to exercise. After the session ends, Elizabeth adds a brief comment in her note that Mike is not psychologically minded, and on this basis does *not* refer him to a psychotherapist.

Although individual psychotherapy is often a beneficial treatment of depressed mood, not everyone has the psychological skills or motivation to pursue psychotherapy. Nevertheless, some patients who are resistant to the idea of doing psychotherapy may eventually decide to try this approach, and many are surprised at how helpful it turns out to be.

Elizabeth gives Mike a handwritten note outlining the treatment plan. An initial follow-up appointment is scheduled in 3 weeks. Mike is invited to call or e-mail to schedule a sooner appointment if he encounters problems with side effects along the way or his symptoms worsen.

Follow-Up

Three weeks later Mike returns feeling very frustrated, "nothing is working…I'm going downhill fast." He still feels sad most of the time, continues to crave sweets, and overeating and weight gain are still problems. Mike denies suicidal thoughts, but he is demoralized and appears anxious. He has not kept up a regular exercise program, but enjoys listening to music several times a day and has been working in his garden. He has started taking a multivitamin, but he has not purchased the other recommended supplements. His RBC iron level is normal. His RBC folate level is in the low–normal range. His serum total cholesterol level is also in the low normal range at 155 mg/dL. Thyroid studies are in the normal range. Elizabeth tells Mike about recent studies showing the relationship between abnormal low total cholesterol and the severity of depressed mood and suggests that he discuss lowering the dose of his statin with his family doctor. On reviewing the events of the previous few weeks, Elizabeth learns that Mike has not purchased a reputable brand of SAM-e and has not gradually increased the dose in keeping with her recommendations. After 3 weeks Mike still takes only 200 mg of SAM-e in the morning and 200 mg in the afternoon. So far, there are no reports of adverse effects to SAM-e. Elizabeth reminds Mike that when he reaches a "therapeutic dose" of SAM-e, assuming there are no significant adverse effects and his mood improves, it will be reasonable to consider discontinuing the mirtazapine in consultation with his psychiatrist, and that doing so will probably eliminate his nighttime cravings and help him achieve his goals of weight loss and improved control of diabetes.

This case illustrates "start-up" problems often encountered when a patient begins a new treatment plan involving therapies that are unfamiliar. Many individuals simply "forget" to gradually increase the dose of a medication or supplement or may be confused about the appropriate timing for doing so. Mike is understandably concerned that craving sweets will result in continued weight gain and worsening of his diabetes but he may not feel "safe" discontinuing a medication he has been taking. By telling Mike that further increasing the SAM-e may make it easier to discontinue the antidepressant medication (resulting in reduced craving for sweets and weight loss), Elizabeth is using a motivational technique aimed at enhancing Mike's sense of autonomy and general well-being and giving him "permission" to stop taking a treatment (i.e., mirtazapine) about which he may have strong ambivalent feelings.

Two weeks later, Mike's mood is brighter and he is more rested. He seems calmer and has lost some weight. Mike smiles as he explains that his family doctor has given him "a clean bill of health" to exercise, and he has been riding a bicycle almost every day. His family doctor reviewed his lab findings (above) and recommended lowering the dose of his statin. His total cholesterol level is now 180 mg/dL, and Mike remarks "but the LDL [low-density lipoprotein] to HDL [high-density

lipoprotein] ratio is still in the safe zone." Mike has been taking the L-methylfolate and a multivitamin daily "I think they give me more energy." He has found a reputable brand of SAM-e and has been titrating the dose as instructed. At 400 mg/day Mike experienced mild restlessness, but this went away after a few days while continuing on that dose. Mike currently takes SAM-e 400 mg on an empty stomach before breakfast and again before lunch as instructed for optimal absorption and has not experienced any further adverse effects. Importantly, Mike tells Elizabeth that he started to experience consistent lessening in depressed mood after staying on this dose (400 mg twice daily) for about 1 week.

This follow-up appointment marks an important shift in "momentum" for Mike who reports improvement in depressed mood after reducing his cholesterol-lowering medication in consultation with his family doctor (resulting in return of his serum total cholesterol to a healthier level), engaging in regular exercise, taking L-methyl-folate and a multivitamin, and starting a quality brand of SAM-e and taking it at the recommended dose.

About a week ago Mike met with his psychiatrist, who agreed that it is now reasonable to discontinue the mirtazapine if his mood responds consistently to the new regimen for at least 1 month. Over the past 3 weeks Mike has exercised daily and has lost 5 lb. His most recent blood pressure reading was somewhat lower than before, and his family doctor is considering taking him off his diabetes medication (i.e., oral hypoglycemic agent) if he continues to exercise and lose weight. Mike enjoys music every day and has started to play golf again. He is comfortable with Elizabeth's suggestion of follow-up appointments every 2 months for the next 6 months. He is motivated to continue taking SAM-e at his current dose together with the other supplements. After scheduling an appointment Elizabeth asks Mike to call or e-mail her and his psychiatrist with an update about 1 month after he stops taking the mirtazapine under his psychiatrist's supervision.

Follow-up appointments are spaced further apart when a patient is adherent to a treatment plan and lifestyle changes that result in sustained improvement, and adverse effects are not interfering with good treatment adherence. It is prudent to invite a patient who is responding well to treatment to "check in" as needed before a scheduled follow-up appointment. If Mike continues to respond to his current regimen of supplements, medications and lifestyle changes it will soon be appropriate to discuss the pros and cons of ongoing maintenance therapy (including Western medical and CAM treatments) and lifestyle changes aimed at optimal wellness, versus termination of a formal treatment plan. As discussed in this chapter, clinical recommendations pertaining to ongoing maintenance therapy and a wellness plan versus termination of care depend on response to treatment over a period of time, the patient's motivation, symptom severity, and comorbid substance use-related and medical problems.

Tables 9.3 and 9.4 list assessment and treatment approaches that are being considered or recommended in the case vignette, show relative priorities assigned to assessment or treatment of different mental health, substance use, or medical problems, and comment on reasons why different modalities are being considered.

Table 9.3 Evidence table showing assessment techniques considered or recommended in vignette

Problem	Assessment technique	Priority	Comments
Chronic depressed mood	Beck Depression Inventory	High	Score of 30 = moderately to severely depressed
	Red blood cell (RBC) iron and folate, serum cholesterol thyroid studies		Anemia can manifest as fatigue and depressed mood
			Abnormal low cholesterol level may contribute to depressed mood
			Hypothyroidism is a frequent cause of depressed mood
	TCM pulse analysis		Stagnant liver qi—a manifestation of deficient qi—is often associated with a symptom pattern in Chinese medicine that resembles the Western medical diagnosis of major depressive disorder
Alcohol abuse	CAGE questionnaire	Medium	When there is a history of alcohol abuse it is important to determine whether the patient is drinking or in recovery. It is also important to clarify whether alcohol abuse (including withdrawal) may be contributing to mental health problems. The "CAGE" questionnaire consists of four questions aimed at eliciting clinically pertinent information about alcohol abuse
Anxiety (panic attacks)	Clinical interview	Medium	Panic attacks sometimes accompany episodes of hypoglycemia in diabetics, alcohol withdrawal, cardiac arrhythmias, or adverse effects to medications. All of these medical causes should be ruled out before initiating treatment for a presumptive diagnosis of panic disorder
	EKG, serum glucose		
	Chinese pulse diagnosis		
Medical problems Heart disease Diabetes High blood pressure Elevated cholesterol	EKG, HgA1c, regular blood pressure readings, regular labs checking serum cholesterol	High	Diabetes and heart disease are frequently comorbid with depressed mood
			It is important to identify and treat underlying medical problems when treating depressed mood
			Abnormal (high or low) serum cholesterol can manifest as anxiety or depressed mood, respectively

Table 9.4 Evidence table showing treatment modalities considered in vignette

Problem	Treatment modality	Priority	Comments
Chronic depressed mood	Trials on multiple single and combined psychotropic regimens including SSRI, SNRI, atypical agents, and lithium augmentation	High	Many individuals who take antidepressants report initial improvement which decreases over time
	Electroconvulsive therapy (recommended but patient refused)		Many individuals who respond to antidepressants discontinue them because of adverse effects
	Transcranial magnetic stimulation (recommended but patient refused)		Adding lithium to an antidepressant often results in synergistic antidepressant effects; however, many patients experience significant weight gain and other adverse effects such as tremor and thyroid problems that ultimately lead to the decision to stop taking lithium despite its benefits
	Ketamine infusion (recommended by patient refused)		Electroconvulsive therapy, transcranial magnetic stimulation, and ketamine infusion therapy are frequently recommended for treatment refractory severe depressed mood
	Regular exercise Nutritional advice for weight loss and diabetes		Lifestyle changes such as regular exercise, improved nutrition, and sleep hygiene are effective treatments of moderate depressed mood
	SAM-e, l-methyl-folinic acid + antidepressant		Combined regimens of an antidepressant plus SAM-e or l-methyl-folate are generally safe and yield synergistic antidepressant effects that may be superior to an antidepressant or either supplement alone
	Reduce statin dose (i.e., after finding out serum cholesterol level is abnormally low)		Abnormal low total serum cholesterol levels may increase the risk of depressed mood or interfere with optimal treatment response. Lowering the dose of a statin drug may result in increased total serum cholesterol, and subsequent improvement in depressed mood
	Lifestyle changes: regular exercise, improved nutrition, sleep hygiene		Lifestyle changes are often beneficial in depressed mood
Alcohol abuse	30-day residential rehabilitation program	High	Chronic alcohol abuse can cause depressed mood; however, alcohol is also widely used to self-medicate symptoms of depression

(continued)

Table 9.4 (continued)

Problem	Treatment modality	Priority	Comments
Anxiety (panic attacks)	Meditation	Medium	Generalized anxiety and panic attacks often accompany episodes of hypoglycemia in diabetics, alcohol withdrawal, cardiac arrhythmias, or adverse effects to medications. All of these medical causes should be ruled out before initiating treatment for a presumptive diagnosis of panic disorder
	Guided imagery		
Medical problems Diabetes Heart disease Elevated cholesterol High blood pressure	Refer patient to appropriate Western medical specialists	High	Diabetes and heart disease are frequently comorbid with depressed mood. Many patients report improved mood when successfully treated for these medical problems
	Prescription medications		Many prescription medications can cause or exacerbate depressed mood, anxiety, and other mental health problems. Lowering doses or stopping medications that are no longer necessary (i.e., under medical supervision from a family physician) may significantly improve mood

Key Points

- Depressed mood, anxiety, psychosis, bipolar disorder, post-traumatic stress disorder (PTSD), and other mental health problems often occur together (i.e., "are comorbid") with substance abuse and medical problems.
- Complex presentations involving two or more serious mental health problems and comorbid substance abuse or a medical problem are often poorly responsive to pharmaceuticals and other Western medical treatments.
- Managing complex cases calls for multitiered treatment planning incorporating evidence from a wide range of Western medical and CAM modalities.
- Complex patients with serious mental health problems and comorbid substance abuse or medical problems respond better and more rapidly when managed by a team of practitioners using a collaborative care model.
- Patterns of psychopathological comorbidity vary significantly in different world regions reflecting differences in how individuals from disparate cultures experience distress and manifest psychological and psychosomatic symptoms.
- Mental health problems and substance abuse are frequently comorbid.
- Treatment strategies incorporating two or more modalities are often more effective in dual diagnosis patients than single treatment modalities.
- Conventionally used "integrated" treatments of dual diagnosis patients emphasize psychotropic medications and group therapy, and seldom include CAM approaches.
- Mental health problems are frequently comorbid with medical disorders in all age groups and may significantly impact their clinical course and response to treatment.
- Mental health problems can worsen medical disorders, and numerous medical disorders manifest as disturbances in mood, cognitive functioning, or behavior.

- There is no agreement within Western medicine or non-Western systems of medicine on how to manage complex cases with high comorbidity.
- The integrative practitioner's goal is to *translate pertinent information in the evidence tables into recommendations for assessment and treatment that adequately address each patient's unique symptoms while taking account of individual preferences and constraints*.
- A patient who discloses a serious mental health problem that may pose a life-threatening risk to himself or others should be referred immediately to the nearest emergency room.
- A patient who has a medical problem that is getting worse or is not being treated should be non-urgently referred to a Western trained physician.
- Many medical problems mimic or cause mental health problems; therefore, it is prudent to address mental health and substance abuse problems only when a patient is medically stable and all medical problems are being addressed.
- In cases where the history is vague and there is concern over an untreated or undertreated mental health, medical, or substance use problem, it is prudent to recommend formal assessment.
- *The goal of parsimony is to come up with the simplest care plan that adequately addresses a patient's health problem(s).*
- If formal assessment is unnecessary (i.e., for purposes of clarifying underlying causes of symptoms) it should not be done.
- Making a good formulation is an essential part of integrative care because clear understanding of the multiplicity of causes and meanings of symptoms will lead to treatment choices most likely to be effective.
- When managing complex patients with high comorbidity, modalities are selected based on the practitioner's judgment about the relative priority of treating different health problems in relationship to the amount of psychological distress or functional impairment symptoms cause.
- Whether to recommend one treatment only or a combined regimen depends on symptom severity, the patient's history of response to previous treatments, motivation, and patient preferences.
- Following the principle of parsimony CAM modalities that address more than one condition are identified as reasonable candidates for the initial care plan.
- As treatment progresses new entries are made in the evidence table reflecting changes in the type and severity of symptoms being managed and pertinent new research findings.

References

Aase, D. M., Jason, L. A., & Robinson, W. L. (2008). 12-step participation among dually-diagnosed individuals: A review of individual and contextual factors. *Clinical Psychology Review, 28*, 1235–1248.

Baker, A. L., Hides, L., & Lubman, D. I. (2010). Treatment of cannabis use among people with psychotic or depressive disorders: A systematic review. *Journal of Clinical Psychiatry, 71*, 247–254.

Barrowclough, C., Haddock, G., Wykes, T., Beardmore, R., Conrod, P., Craig, T., et al. (2010). Integrated motivational interviewing and cognitive behavioural therapy for people with psychosis and comorbid substance misuse: Randomized controlled trial. *British Medical Journal, 341*, c6325.

Bijl, R., de Graaf, R., Hiripi, E., Kessler, R., Kohn, R., Offord, D. R., et al. (2003). The prevalence of treated and untreated mental disorders in five countries. *Health Affairs, 22*(3), 122–133. Chevy Chase.

Bottlender, M., Köhler, J., & Soyka, M. (2006). [The effectiveness of psychosocial treatment approaches for alcohol dependence—A review]. [Article in German]. *Fortschritte der Neurologie-Psychiatrie, 74*(1), 19–31.

Bowden, C., Lecrubier, Y., Bauer, M., Goodwin, G., Greil, W., Sachs, G., et al. (2000). Maintenance therapies for classic and other forms of bipolar disorder. *Journal of Affective Disorders, 59*(Suppl 1), S57–S67.

Brown, R. T., Daly, B. P., & Rickel, A. U. (2007). *Chronic illness in children and adolescents*. Cambridge, MA: Hogrefe & Huber.

Chandwani, K. D., Ryan, J. L., Peppone, L. J., Janelsins, M. M., Sprod, L. K., Devine, K., et al. (2012). Cancer-related stress and complementary and alternative medicine: A review. *Evidence Based Complementary and Alternative Medicine, 2012*, 979213.

Ciaramella, A., & Spiegel, D. (2012). Chapter 33: Psychiatric disorders among cancer patients. In T. E. Schlaepfer & C. B. Nemeroff (Eds.), *Handbook of clinical neurology, Vol. 106 (3rd series): Neurobiology of psychiatric disorders*. Amsterdam: Elsevier B.V..

Cooper, D., Moisan, J., & Gregoire, J. P. (2007). Adherence to atypical antipsychotic treatment among newly treated patients: A population-based study in schizophrenia. *Journal of Clinical Psychiatry, 68*(6), 818–825.

Daley, D. C., & Moss, H. M. (2002). *Dual disorders: Counseling clients with chemical dependency and mental illness* (3rd ed.). Center City, MN: Hazelden.

Daley, D. C., & Zuckoff, A. (1999). *Improving treatment compliance: Counseling and systems strategies for substance abuse and dual disorders*. Center City, MN: Hazelden.

David, A., & Kopelman, M. (2009). Chapter 2: Neuropsychology in relation to psychiatry. In A. S. David, S. Fleminger, M. D. Kopelman, S. Lovestone, & J. D. C. Mellers (Eds.), *Lishman's Organic psychiatry: A textbook of neuropsychiatry* (4th ed.). Oxford: Wiley-Blackwell.

Fals-Stewart, W., & Schafer, J. (1992). The treatment of substance abusers diagnosed with obsessive-compulsive disorder: An outcome study. *Journal of Substance Abuse Treatment, 9*(4), 365–370.

Forrest, K., Becker, D., Kuller, L., Wolfson, S., & Orchard, T. (2000). Are predictors of coronary heart disease and lower-extremity arterial disease in type 1 diabetes the same? A prospective study. *Atherosclerosis, 148*(1), 159–169.

Frank, E., Swartz, H., & Kupfer, D. (2000). Interpersonal and social rhythm therapy: Managing the chaos of bipolar disorder. *Biological Psychiatry, 48*(6), 593–604.

Gao, K., Chan, P. K., Verduin, M. L., Kemp, D. E., Tolliver, B. K., Ganocy, S. J., et al. (2010). Independent predictors for lifetime and recent substance use disorders in patients with rapid-cycling bipolar disorder: Focus on anxiety disorders. *American Journal of Addiction, 19*(5), 440–449.

Grassi, L., Caruso, R., Hammelef, K., Nanni, M., & Riba, M. (2014, February). Efficacy and safety of pharmacotherapy in cancer-related psychiatric disorders across the trajectory of cancer care: A review. *International Review of Psychiatry, 26*(1), 44–62.

Green, B., Young, R., & Kavanagh, D. (2005). Cannabis use and misuse prevalence among people with psychosis. *British Journal of Psychiatry, 187*, 306–313.

Grella, C. E., Hser, Y. I., Joshi, V., & Rounds-Bryant, J. (2001). Drug treatment outcomes for adolescents with comorbid mental and substance use disorders. *Journal of Nervous and Mental Disease, 189*(6), 384–392.

Hofmann, S. G., & Smits, J. A. (2008). Cognitive-behavioral therapy for adult anxiety disorders: A meta-analysis of randomized placebo-controlled trials. *Journal of Clinical Psychiatry, 69*, 621–632.

Huang, Y., Kotov, R., deGirolamo, G., Preti, A., Angermayer, M., Beniet, C., et al. (2009). DSM-IV personality disorders in the WHO World Mental Health Surveys. *British Journal of Psychiatry, 195*(1), 46–53.

Hysing, M., Elgen, I., Gillberg, C., Lie, S. A., & Lundervold, A. J. (2007). Chronic physical illness and mental health in children. Results from a large-scale population study. *Journal of Child Psychology and Psychiatry, 48*(8), 785–792.

Immelt, S. (2006). Psychological adjustment in young children with chronic medical conditions. *Journal of Pediatric Nursing, 21*(5), 362–377.

Jacobsen, L. K., Southwick, S. M., & Kosten, T. R. (2001). Substance use disorders in patients with posttraumatic stress disorder: A review of the literature. *American Journal of Psychiatry, 158*, 1184–1190.

Kelly, T. M., Daley, D. C., & Douaihy, A. B. (2012). Treatment of substance abusing patients with comorbidpsychiatric disorders. *Addictive Behaviors*, (37), 11–24. [PubMed: 21981788].

Kendler, K. S., Aggen, S. H., Knudsen, G. P., Roysamb, E., Neale, M. C., & Reichborn-Kjennerud, T. (2011). The structure of genetic and environmental risk factors for syndromal and subsyndromal common DSM-IV Axis I and Axis II disorders. *American Journal of Psychiatry, 168*(1), 29–39.

Kessler, R. C. (2004). The epidemiology of dual diagnosis. *Biological Psychiatry, 56*, 730–737.

Kessler, R., Chiu, W., & Demler, M. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62*(6), 617–627.

Khoury, L., Tang, Y. L., Bradley, B., Cubells, J. F., & Ressler, K. J. (2010). Substance use, childhood traumatic experience, and Posttraumatic Stress Disorder in an urban civilian population. *Depression and Anxiety, 27*(12), 1077–1086.

Knopman, D., Boland, L., Mosley, T., Howard, G., Liao, D., Szklo, M., et al. (2001). Atherosclerosis Risk in Communities (ARIC) Study Investigators. Cardiovascular risk factors and cognitive decline in middle-aged adults. *Neurology, 56*(1), 42–48.

Krueger, R., Chentsova-Dutton, Y., Markon, K., Goldberg, D., & Ormel, J. (2003). A cross-cultural study of the structure of comorbidity among common psychopathological syndromes in the general health care setting. *Journal of Abnormal Psychology, 112*(3), 437–447.

Lenzenweger, M. F., Lane, M. C., Loranger, A. W., & Kessler, R. C. (2007). DSM-IV personality disorders in the National Comorbidity Survey Replication. *Biological Psychiatry, 62*(6), 553–564.

Lexicon. (2017, June 16). *What do we mean by "behavioral health integrated with primary care"?* [Internet]. Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from http://integrationacademy.ahrq.gov/lexicon

Martinotti, G., Carli, V., Tedeschi, D., Di Giannantonio, M., Roy, A., Janiri, L., et al. (2009). Mono- and polysubstance dependent subjects differ on social factors, childhood trauma, personality, suicidal behaviour, and comorbid Axis I diagnoses. *Addictive Behaviors, 34*(9), 790–793.

Miklowitz, D. J., Otto, M. W., Frank, E., Reilly-Harrington, N. A., Kogan, J. N., Sachs, G. S., et al. (2007). Intensive psychosocial intervention enhances functioning in patients with bipolar depression: Results from a 9-month randomized controlled trial. *American Journal of Psychiatry, 164*, 1340–1347.

Moak, D. H., Anton, R. F., Latham, P. K., Voronin, K. E., Waid, R. L., & Durazo-Arvizu, R. (2003). Sertraline and cognitive behavioral therapy for depressed alcoholics: Results of a placebo-controlled trial. *Journal of Clinical Psychopharmacology, 23*, 553–562.

Mueser, K. T., Noordsy, D. L., Drake, R. E., & Fox, L. (2003). *Integrated treatment for dual disorders: A guide to effective practice*. New York, NY: Guilford Press.

Murthy, P., & Chand, P. (2012). Treatment of dual diagnosis disorders. *Current Opinion in Psychiatry, 25*(3), 194–200.

Musselman, D., Betan, E., Larsen, H., & Phillips, L. (2003). Relationship of depression to diabetes types 1 and 2: Epidemiology, biology, and treatment. *Biological Psychiatry, 54*(3), 317–329.

National Survey of Children's Health. (2007). Retrieved from https://pdfs.semanticscholar.org/2810/0849f76eca44b8685af6cb2ce6709c3b30eb.pdf

Ortega, A. N., Huertas, S. E., Canino, G., Ramirez, R., & Rubio-Stipec, M. (2002). Childhood asthma, chronic illness and psychiatric disorders. *The Journal of Nervous and Mental Disease, 190*(5), 275–281.

Otto, M. W., Smits, J. A., & Reese, H. E. (2004). Cognitive-behavioral therapy for the treatment of anxiety disorders. *Journal of Clinical Psychiatry, 65*, 34–41.

Raic, M. (2017). Depression and heart diseases: Leading health problems. *Psychiatria Danubina, 29*(Suppl. 4), 770–777.

Randall, C. L., Thomas, S., & Thevos, A. K. (2001). Concurrent alcoholism and social anxiety disorder: A first step toward developing effective treatments. *Alcoholism, Clinical and Experimental Research, 25*, 210–220.

Reeve, J., Blakeman, T., Freeman, G. K., Green, L. A., James, P. A., Lucassen, P., et al. (2013). Generalist solutions to complex problems: Generating practice-based evidence-the example of managing multimorbidity. *BMC Family Practice, 14*, 112–120.

Schafer, I., & Najavits, L. M. (2007). Clinical challenges in the treatment of patients with posttraumatic stress disorder and substance abuse. *Current Opinion on Psychiatry, 20*, 614–618.

Schneier, F. R., Foose, T. E., Hasin, D. S., Heimberg, R. G., Liu, S. M., Grant, B. F., et al. (2010). Social anxiety disorder and alcohol use disorder comorbidity in the National Epidemiologic Survey on Alcohol and Related Conditions. *Psychological Medicine, 40*, 977–988.

Sheidow, A. J., McCart, M., Zajac, K., & Davis, M. (2012). Prevalence and impact of substance use among emerging adults with serious mental health conditions. *Psychiatric Rehabilitation Journal, 35*(3), 235–243.

Stewart, R. E., & Chambless, D. L. (2009). Cognitive-behavioral therapy for adult anxiety disorders in clinical practice: A meta-analysis of effectiveness studies. *Journal of Consulting and Clinical Psychology, 77*, 595–606.

Strachan, M., Frier, B., & Deary, I. (2003). Type 2 diabetes and cognitive impairment. *Diabetic Medicine, 20*(1), 1–2.

Swendsen, J., Conway, K. P., Degenhardt, L., Glantz, M., Jin, R., Merikangas, K. R., et al. (2010). Mental disorders as risk factors for substance use, abuse and dependence: Results from the 10-year follow-up of the National Comorbidity Survey. *Addiction, 105*(6), 1117–1128.

Testa, A., Giannuzzi, R., Sollazzo, F., Petrongolo, L., & Bernardini, L. (2013). Psychiatric emergencies (part II): Psychiatric disorders coexisting with organic diseases. *European Review for Medical and Pharmacological Sciences, 17*(Suppl. 1), 65–85.

Tiet, Q. Q., & Mausbach, B. (2007). Treatments for patients with dual diagnosis: A review. *Alcoholism: Clinical and Experimental Research, 31*, 513–536.

van Oudheusden, L., Meynen, G., & van Balkom, A. (2015). [Psychiatric comorbidity: Theoretical and clinical dilemmas]. *Tijdschrift voor Psychiatrie, 57*(9), 664–671.

Weiss, R. D., Griffin, M. L., Jaffee, W. B., Bender, R. E., Graff, F. S., Gallop, R. J., et al. (2009). A "community friendly" version of integrated group therapy for patients with bipolar disorder and substance dependence: A randomized controlled trial. *Drug and Alcohol Dependence, 104*(3), 212–219.

Weiss, R. D., Kolodziej, M., Griffin, M. L., Najavits, L. M., Jacobson, L. M., & Greenfield, S. F. (2004). Substance use and perceived symptom improvement among patients with bipolar disorder and substance dependence. *Journal of Affective Disorders, 79*(1–3), 279–283.

Wesa, K., & Culliton, P. (2004). Recommendations and guidelines regarding the preferred research protocol for investigating the impact of an optimal healing environment on patients with substance abuse. *Journal of Alternative and Complementary Medicine, 10*(Suppl. 1), S193–S199.

Williams, L. B., Laffelt, L. M., & Hood, K. K. (2009). Diabetes-specific family conflict and psychological distress in paediatric type 1 diabetes. *Diabetic Medicine, 26*(9), 908–914.

Wu, N. S., Schairer, L. C., Dellor, E., & Grella, C. (2010). Childhood trauma and health outcomes in adults with comorbid substance abuse and mental health disorders. *Addictive Behaviors, 35*(1), 68–71.

Yohannes, A., Willgoss, T., Baldwin, R., & Connolly, M. (2010, December). Depression and anxiety in chronic heart failure and chronic obstructive pulmonary disease: Prevalence, relevance, clinical implications and management principles. *International Journal of Geriatric Psychiatry, 25*(12), 1209–1221.

Chapter 10
The Future of Mental Health Care: Trends and Forecast

"Ars longa, vita brevis" ("Life is short, the art long.")
—Hippocrates

Contents

Trends Driving Change in Mental Health Care

Advances in the basic sciences are gradually transforming Western medicine into a more *complete* paradigm that is embracing advanced technologies and insights from the world's great healing traditions. Nonclassical paradigms, including complex systems theory and quantum brain dynamics, are leading to more complete explanations of subtle interrelationships between complex factors that affect emotional and mental functioning.

In this context new understandings of normal and abnormal mental functioning are emerging from research on consciousness from the perspectives of quantum mechanics and quantum field theory (Elitzur, Dolev, & Kolenda, 2005; Lorimer, 2004; Nadeau & Kafatos, 1999; Yasue, Jibu, & Senta, 2001). This work will soon yield testable hypotheses about the role of intention in health and healing clarifying postulated nonlocal mechanisms associated with spiritual and mind–body practices including meditation, yoga, energy medicine, and prayer.

Innovations in assessment and treatment of mental health problems are being shaped by progress in neuroscience, genetics, artificial intelligence and advanced technologies. Novel research methodologies will soon make it possible to confirm postulated mechanisms of action underlying widely used Western medical and

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CAM modalities and multicomponent interventions that until now have eluded rigorous scientific study. Government, industry, and academic institutions are working together to develop collaborative research programs on a broad range of modalities that will lead to more effective, safer, and more cost-effective treatment choices.

Collectively, these trends are resulting in increasing openness to new ways of thinking about mental *health* and mental *illness* among both practitioners and patients. The result is a rapidly emerging *integrative* model of mental health care that draws evidence from biomedical psychiatry and CAM. In this context CAM is evolving from the use of "herbs and vitamins" to a sophisticated research-driven model of integrative medicine based on individualized treatments incorporating biological, mind–body, and technology-based therapies that target complex multifactorial *causes* and *meanings* of mental illness. Expert resources and technology-based therapies are becoming widely available through global access to the Internet. Artificial intelligence (AI) software is changing the way physicians work with patients and will soon affect how patients obtain care for medical and mental health problems. Novel therapeutic uses of light, weak electrical stimulation, magnetic fields, and biofeedback are being investigated. Progress in functional brain imaging research is steadily yielding important insights about normal brain function as well as the causes of mental illness. Brain-computer interface (BCI) technologies are rapidly emerging as effective and safe treatments of neurologic and psychiatric disorders.

In the context of rapid progress in science and technology, the health care marketplace will soon encompass safe high-purity nutraceuticals and technology-based modalities substantiated by research findings. This evolutionary process will yield increasingly diversified health care choices, growing coverage of CAM and integrative therapies by private insurances and Medicare, and parity between select CAM modalities and established Western medical treatments. The conceptual boundary between CAM and Western medicine is becoming increasingly blurred. Soon there will no longer be a strict dichotomy between conventional medicine and CAM, but a continuum of treatment choices supported by more evidence or less evidence.

Collectively, the above innovations are transforming the theoretical foundations, clinical therapeutics, and the practice of mental health care. An important practical consequence will be *more effective* and *more compassionate* "whole person" mental health care taking into account the complex biological, psychological, social, cultural, spiritual, and postulated energetic causes and meanings of mental illness. How rapidly and in which countries these trends take place will depend on social, economic and geopolitical factors that are difficult to predict.

Near-Term Forecast

Improvements in the pharmacological management of mental illness and advances in manufacturing and quality assurance of vitamins, herbals, amino acids, and other natural supplements will result in more efficacious and safer conventional and CAM treatment choices. Future studies will examine synergistic combinations of

psychotropic medications and supplements to determine optimal formulas and dosing strategies addressing depressed mood, anxiety, substance abuse, dementia and other common mental health problems. The use of select natural products including highly purified nutrients (i.e., nutraceuticals) and botanicals in combination with psychotropics will improve outcomes, permit lower effective doses of medications, and reduce the risk of adverse effects resulting in improved treatment adherence. In addition to progress in nutraceutical research, future studies will further elucidate the mechanisms and therapeutic benefits of mindfulness and "energetic" therapies for maintaining optimal wellness and treating discrete mental health problems. These trends will continue, resulting in movement away from the current dominant biomedical paradigm toward a more inclusive paradigm embraced by integrative mental health care.

Improved understanding of genetic factors that mediate mental illness will accrue from analysis of the genetic library available in the Human Genome Project. Gene editing will be used to modify the expression of genes known to contribute to discrete psychiatric disorders. Research in biomedical psychiatry will increasingly take into account the role of genetic and biochemical variability in mental illness. Treatment protocols incorporating validated mind–body and energy therapies will become widely used preventive strategies for maintaining optimal mental and emotional functioning in healthy populations and will be frequently "prescribed" for the treatment of depressed mood, bipolar disorder, anxiety, ADHD, psychosis, and other mental health problems.

Advances in artificial intelligence (AI), electronic health records, user-friendly database architectures, and literature research methods will make it easier for practitioners to obtain up-to-date reliable information about a broad range of Western medical and CAM treatment choices in a user-friendly format.

Many studies have established that cognitive-behavioral therapy (CBT) delivered via videoconferencing is as effective as face-to-face CBT in patients with both panic disorder and agoraphobia. Broadband videoconferencing is rapidly emerging as a cost-effective alternative mode of treatment delivery to home-bound patients impaired by panic disorder, agoraphobia, phobias, PTSD, and other severe anxiety disorders. Virtual reality graded exposure therapy (VRGET) tools, widely used by psychologists and already available over the Internet, permit mental health professionals to guide patients in the use of computer-based exposure protocols through real-time videoconferencing anywhere broadband Internet access is available. Use of VRGET to treat anxiety disorders will steadily increase as more mental health providers learn how to use this technology.

In the near future, wearable devices based on existing computer technology, and rapid growth in wireless broadband Internet access will make technology-based modalities available and affordable to patients both at home and in work environments. Within the next decade, as widespread availability of broadband Internet access increases and technologies become more affordable and portable, mental health practitioners will rely increasingly on machines that integrate VRGET, biofeedback, microcurrent electrical stimulation, and other technology-based modalities to treat phobias, panic attacks, and other severe anxiety disorders.

Progress in artificial intelligence (AI) and advanced technologies will soon yield effective, safe non-pharmacological treatments for major depressive disorder, bipolar disorder, anxiety disorders, and other serious psychiatric disorders for which current pharmacologic therapies are often ineffective. Augmented reality (AR) software is being developed to assist individuals diagnosed with autism to interpret facial expressions and provide virtual coaching to individuals diagnosed with anxiety disorders. Machine learning and artificial neural networks are already being used to create expert systems (i.e., clinical decision support systems) designed to help mental health providers make optimal decisions in the face of complex, ambiguous information. This trend will continue and accelerate. These tools will soon lead to AI "therapist avatars" for individuals who do not have access to human therapists or who prefer to interact with intelligent machines. AI-supported therapist avatars will be capable of simulating human empathy, empathically responding to patients' emotions, providing expert factual knowledge about Western medicine and CAM, and making therapeutic interventions in response to each patient's unique symptoms, circumstances, and preferences. Wearable sensors will give therapists the capability to track the emotional states of patients who cannot be seen for prolonged periods. Collectively, these technologies will permit geographically isolated individuals to interface with human therapists or AI-supported therapist avatars to obtain cognitive-behavioral therapy (CBT) and expert treatment advice.

Long Term Forecast

Well before the end of the twenty-first century technology-based interventions will become widely used *conventional* treatments for improving depressed mood, reducing the severity of anxiety, modifying behavior in desirable ways, enhancing memory, attention, and cognitive functioning, and helping individuals achieve optimal states of well-being.

Brain–computer interface (BCI) is a frontier technology that is rapidly emerging from the new field of neural engineering. This technology permits direct communication between brain centers that control movement and robotized prosthetic devices and will soon enable paralyzed individuals to regain use of their limbs. In the coming decades progress in BCI technology will lead to neuroprosthetic devices that will permit individuals diagnosed with psychiatric disorders to regulate behavior, mood, and cognitive functioning, and to enhance functioning in all of these areas (Krusienski et al., 2011). By the year 2050 noninvasive neuroprosthetic devices will be widely used to effectively and safely treat serious psychiatric disorders that are poorly responsive to psychotropic drugs including bipolar disorder, severe depressed mood, and dementia. By the closing decades of the century, miniaturized brain implants designed to enhance well-being and treat discrete psychological and neurocognitive disorders will become commonplace. Programmable implants and other neurotechnologies, and swarm robots incorporating biologically compatible nanotechnologies will permit users to interface with implants in other humans or

AI-assisted devices remotely via the Internet. These implantable technologies will permit individuals to directly benefit from or influence therapeutic neuromodulation in another person or a group.

Gene editing therapies and technology-based interventions will become so effective that severe psychiatric disorders will be eradicated in all but the least developed world regions. At that time the current widespread use of psychotropic medications and other marginally effective treatments of mental illness will be regarded as an unfortunate historical footnote and relics of "early days" when psychiatry lacked coherent explanatory models, had few safe and effective treatments, and was dominated by market interests of large pharmaceutical firms. Long before the end of this century psychiatric hospitalization will no longer be needed. The result will be a renewal and humanization of the paradigm and practices of mental health care and a radical shift from emphasis on *treatment* of mental illness to emphasis on *optimizing* emotional, cognitive, and behavioral functioning.

Final Thoughts

Mental health care as practiced today is in urgent need of new ideas, and safer, more effective, more affordable, and more compassionate approaches to maintaining optimal wellness and preventing and treating mental illness. The future of mental health care is being shaped by advances in basic sciences and technology, increasing openness to non-Western systems of medicine, changing practitioners' attitudes and most of all growing public demand for better, more personalized, and more compassionate care.

In the twenty-first century the theories and methods of Western medicine and psychiatry will probably follow one of two trajectories: conservative change or radical transformation. The *conservative* pathway will not entail the violation of orthodox scientific models however it *does assume* that future directions in medical research and theory building will not be *completely* determined by currently entrenched economic, institutional, or ideological dogmas that define academic medicine, professional medical societies, and regulatory agencies. The more radical pathway is one in which the conceptual framework of Western medicine will embrace novel ideas in physics and neuroscience and investigate concepts from non-Western systems of medicine. If in the coming decades, ideological, political, and economic trends favor the more radical pathway, a new paradigm in medicine—and by extension psychiatry—will emerge based on fundamentally *new ways of understanding and treating* human illness. The new paradigm will bear little resemblance to the theories and clinical therapeutics of mental health care as it exists in the early twenty-first century.

Irrespective of whether change turns out to be conservative or radical, gradual or rapid, advances in Western medicine and CAM will inevitably lead to innovations in mental health care resulting in a broader range of treatment choices and improvements in the current model of care. Psychiatry will transition away from pharmacology

as the dominant mode of treatment toward increasing reliance on advanced technologies for promoting optimal wellness and for assessing and treating mental illness. There will no longer be a rigid dichotomy between Western medical therapies and CAM modalities, and the terms "biomedicine" and "CAM" will no longer be used. Instead there will be "new medicine" and "old medicine." New medicine, informed by advanced technologies, AI software, and broadband Internet connectivity, will arise in developed world regions. Old medicine will continue as before in less developed world regions but will gradually evolve into "new medicine" as affordable technologies lead to migration of medical knowledge across geopolitical boundaries.

Key Points

- In the coming decades advances in the basic sciences will transform Western medicine into a more *complete* paradigm that will embrace advanced technologies and insights from the world's great healing traditions.
- Innovations in assessment and treatment of mental health problems will be shaped by progress in neuroscience, genetics, artificial intelligence, and advanced technologies.
- Increasing openness to new ways of thinking about mental health among both practitioners and patients will lead to a more *integrative* model of mental health care that will draw evidence from biomedical psychiatry and CAM.
- Artificial intelligence (AI) software will change how physicians and CAM practitioners work with patients and how patients obtain care for mental health problems.
- The health care marketplace will change to encompass safe high-purity nutraceuticals and a wide range of technology-based modalities substantiated by research findings.
- The conceptual boundary between CAM and Western medicine will become increasingly blurred and there will no longer be a strict dichotomy between conventional medicine and CAM.
- Mental health care will transform into individualized "whole person" care and will address complex biological, psychological, social, cultural, spiritual, and postulated energetic causes and meanings of mental illness.
- Progress in artificial intelligence (AI) and advanced technologies will soon yield effective, safe non-pharmacological treatments for major depressive disorder, bipolar disorder, anxiety disorders, and other serious psychiatric disorders.
- Increased broadband Internet access will permit geographically isolated individuals to interface with human therapists or AI-supported therapist avatars to obtain cognitive-behavioral therapy (CBT) or expert treatment advice.
- By the year 2050 noninvasive neuroprosthetic devices will be widely used to effectively and safely treat serious psychiatric disorders that are poorly responsive to psychotropic drugs including bipolar disorder, severe depressed mood, and dementia.
- Well before this century's end psychotropic medications will no longer be needed as they will be obviated by technology-based interventions and gene editing.

- Changes that take place in this century will radically shift the paradigm of mental health care from emphasis on *treatment* of mental illnesses to emphasis on *optimizing* emotional, cognitive, and behavioral functioning.

References

Elitzur, A., Dolev, S., & Kolenda, N. (Eds.). (2005). *Quo Vadis quantum mechanics?* New York and Berlin: Springer.

Krusienski, D., Grosse-Wentrup, M., Galan, F., Coyle, D., Miller, K., Forney, E., et al. (2011). Critical issues in state-of-the-art brain-computer interface signal processing. *Journal of Neural Engineering, 8*(2), 025002.

Lorimer, D. (2004). *Science, consciousness and ultimate reality*. Exeter: Imprint Academic.

Nadeau, R., & Kafatos, M. (1999). *The non-local universe: The new physics and matters of the mind*. Oxford: Oxford University Press.

Yasue, K., Jibu, M., & Senta, T. (2001). No matter, never mind: Proceedings of Toward a Science of Consciousness—Fundamental approaches. In *Advances in consciousness research* (Vol. 13). Philadelphia: John Benjamins.

Appendices

There are three appendices.

Appendix A contains links to resources on both Western medicine and CAM, including resources on many specific CAM modalities. You can get to the websites by clicking on the title. Appendix A also includes a list of textbooks on integrative mental health care.

Appendix B contains links to the author's main website and a series of ten short books on integrative mental health care.

Appendix C describes ongoing projects aimed at developing apps as well as advanced software for integrative mental health care.

- **A. Resources on Western medicine and CAM**
  - **Web resources on Western medicine and CAM**
  - **Web resources on specific CAM therapies**
  - **Textbooks on CAM and integrative mental health care**
- **B. Links to the author's websites and books**
  - **Progressive Psychiatry**
  - **Book companion website**
- **C. Software for integrative mental health care**

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Appendix A

Web Resources on Western Medicine and CAM

- Resources on Western medical treatments
- Resources on complementary and alternative medicine (CAM)
- Resources on both Western medicine and CAM
- Resources for monitoring research in Western medicine and CAM
- Resources for evaluating safety and effectiveness of natural supplements and selecting quality brands
- Identifying qualified CAM practitioners

Websites on Specific CAM Therapies

- Biological therapies
- Whole body and mind–body therapies
- Therapies based on forms of energy validated by current science
- Therapies based on postulated forms of energy not validated by current science

Textbooks on Complementary, Alternative, and Integrative Mental Health Care

- **Safety in CAM**
- **Complementary, alternative, and integrative mental health care**

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Resources on Western Medicine

- Drugs@FDA is a resource for obtaining Food and Drug Administration (FDA) research studies and meta-analyses pertaining to psychotropic medications. Information about FDA-approved brand name and generic prescription and over-the-counter human drugs and biological therapeutic products. The database includes most of the drug products approved by the FDA since 1939, and most patient information, labels, approval letters, reviews, and other information are available for drug products approved since 1998.
- Cochrane database of systematic reviews (CDSR) is regarded as the leading resource for systematic reviews in health care. The CDSR includes Cochrane Reviews as well as editorials. The CDSR is updated regularly as monthly Cochrane Reviews.
- http://www.guideline.gov/ is a service of the US Department of Health and Human Services, Agency for Healthcare Research and Quality. This site contains summaries of, and links to, over 50 different sets of practice guidelines covering a range of mental health diagnoses and issues.
- Psychguides.com contains practical clinical recommendations on Western medical treatments of common mental health problems based on expert consensus. While the guidelines are comprehensive, they emphasize medications over psychotherapy and generally omit CAM.
- American Psychiatric Association practice guidelines include full texts of many (but not all) of the practice guidelines developed by this organization. Topics include psychiatric evaluation of adults, bipolar disorder, major depressive disorder in adults, eating disorders, substance-use disorders (alcohol, cocaine, opioids), Alzheimer's disease and other dementias of late life, schizophrenia, and nicotine dependence.

Resources on Complementary and Alternative Medicine (CAM)

- **National Center for Complementary and Integrative Health (NCCIH)** The National Center for Complementary and Integrative Health (NCCIH) is 1 of the 27 institutes and centers that make up the National Institutes of Health (NIH). NCCIH is dedicated to exploring complementary and alternative healing practices in the context of rigorous science, training complementary and alternative medicine (CAM) researchers, and disseminating authoritative information to the public and professionals. The site includes a database of clinical trials pertaining to CAM.
- Office of Dietary Supplements National Library of Medicine PubMed includes citations related to vitamins, minerals, phytochemicals, botanical, and herbal supplements in human nutrition and animal models.
- **Search CAM on PubMed** NCCAM and the National Library of Medicine (NLM) have partnered to create a subset of the National Library of Medicine's PubMed. A literature search from this website will automatically be limited to

the subset of PubMed pertaining to nonconventional medicine. PubMed provides access to citations from the MEDLINE database and additional life science journals. It also includes links to many full-text articles at journal websites and other related Web resources.

- **Natural Medicines** is an excellent resource covering the range of CAM modalities. *Natural Standard* is an international research collaboration that aggregates and synthesizes data on nonconventional therapies. The goal of this collaboration is to provide objective, reliable information that aids clinicians, patients, and health care institutions in making more informed and safer therapeutic decisions.
- **Alt Health Watch** provides a gateway to full-text searches of over 100 serials on all major nonconventional medical approaches. The list is maintained by EBSCO Publishing a leading provider of popular secondary databases such as CINAHL, PsycINFO, and others. Extensive use of linking enables users to access full text information from virtually all library holdings.
- **Focus on Alternative and Complementary Therapies** FACT is a quarterly review journal that aims to present the evidence on CAM in an analytical and impartial manner. *Focus on Alternative and Complementary Therapies* (FACT) systematically searches the world literature to uncover key articles in CAM research. The most important factual papers found worldwide are summarized and then critically appraised in FACT. They are followed by an expert commentary written by a member of FACT's international editorial board and include a reply from the author of the original paper. All FACT summaries and commentaries are evidence-based, reporting clinical trials, systematic reviews or meta-analyses, compiling, interpreting, and disseminating the up-to-date evidence for or against complementary medicine.
- **Cochrane field on complementary medicine** is coordinated by an international group of individuals dedicated to creating systematic reviews of randomized clinical trials in diverse areas of CAM including acupuncture, massage, chiropractic, herbal medicine, homeopathy, mind–body therapy, and other modalities. The Cochrane complementary medicine field was founded in 1996 and is coordinated by the University of Maryland Center for Integrative Medicine.
- **Allied and Complementary Medicine Database** (AMED) produced by the Medical Information Centre of the British Library and contains over 100,000 references including 400 biomedical journals. Many of the journals included in AMED are not indexed by other biomedical sources. This bibliographic database is designed for physicians, therapists, medical researchers, and clinicians looking to learn more about alternative treatments. The scope of coverage within this resource is mainly European and is updated with new content on a monthly basis.

Resources on Western Medicine and CAM

- **Bandolier - Evidence based thinking about health care***Bandolier* is an independent journal about evidence-based health care written by Oxford University scientists. The journal first appeared in February 1994. It is directed at both

health care professionals and patients. The e-journal provides information about evidence of effectiveness in bullet format based on critical analysis of systematic reviews, meta-analyses, and single randomized controlled trials drawn from the Cochrane Library and PubMed. The electronic version of Bandolier has over one million visitors each month from all over the world. Many visitors are health care professionals however Bandolier is also a source of useful information for patients.

- **Trip Database Plus** The TRIP (Turning Research into Practice) Database started in 1997 as a small search engine with a focus on evidence-based medicine. The goal of the TRIP Database is to allow health professionals to easily find the highest-quality material available on the web on a range of conventional and CAM practices. Typically 300–400 new articles are added monthly. The content of the TRIP Database is separated into a number of categories: evidence-based medicine; guidelines; query-answering; medical images; e-textbooks; patient information leaflets; and peer-reviewed journals.
- **Embase** Created and managed by Elsevier this website is a gateway to biomedical and pharmacological information pertaining to both conventional and non-conventional treatments. Approximately 2000 records are added daily and 600,000 articles are added annually. It includes many search tools quick to facilitate rapid identification of relevant clinical or research information, and the user can generate table-of-content alerts to keep up to date with significant emerging findings.
- **The Cochrane Health Technology Assessment (HTA) Database** includes cites of completed and ongoing health technology assessments from around the world. The data set includes health technology assessments from which it is possible to estimate cost-effectiveness of specific CAM modalities with respect to a specified psychiatric disorder.
- **The Cochrane NHS Economic Evaluation Database** (EED) intended for use in clinical decision making is a catalog of economic evaluations of modalities from around the world, including appraisals of quality and comments on their relative strengths and weaknesses.
- **Cochrane Database of Abstracts of Reviews of Effectiveness** (DARE) contains details of systematic reviews that evaluate the effects of health care interventions and the delivery and organization of health services. DARE includes citations of both Cochrane and non-Cochrane reviews for comparison.
- Cochrane Collaborative Review Groups (CRGs) are formed around professional reviewers who systematically examine published and unpublished studies pertaining to specific medical or psychiatric illnesses. Cochrane CRGs collect information on emerging evidence for treatments of depression, anxiety, dementia, cognitive impairment, and schizophrenia. A CRG called “Brain, Nerves and Mind” includes podcasts on topics of interest and feature reviews of important therapies.

Resources for Monitoring Research in Western Medicine and CAM

- **NCCIH Extramural Awards** provides citations of publications by NCCIH grantees. It covers the results of NCCIH-funded research. Publications are continuously added to this database. Specific citations can be found by the principal investigator's last name, title of article, journal name, grant mechanism, or grant number. Searches can also be done by keyword or phrase contained in the title of the article.
- Clinicaltrials.gov includes mostly government-sponsored studies and is the most comprehensive clinical trials directory on the internet. The site provides regularly updated information about federally funded and some privately supported human clinical trials that are currently in progress and includes studies on some CAM modalities. Data include the purpose of the study, who may participate, locations, and contact information for those interested in finding out more details.
- CenterWatch is a useful resource for identifying studies sponsored by the pharmaceutical industry or private institutions. The site provides proprietary data and information analysis on clinical trials through a variety of newsletters, books, databases, market research, benchmark reports, and information services used by all industry professionals involved in the management and conduct of clinical trials. The site lists thousands of active industry and government-sponsored clinical trials on drugs and CAM modalities, as well as new drug therapies in research and those recently approved by the FDA. Patients interested in participating in clinical research can make enquiries about specific ongoing trials. A section of the site includes a listing of CAM research trials actively recruiting patient volunteers.

Evaluating Safety and Effectiveness of Natural Supplements and Selecting Quality Brands

- Natural Medicines Comprehensive Database (subscription fee). This website is a valuable resource for both practitioners and patients. The Natural Medicines Comprehensive Database was released in 1999 and is updated daily. The mission of the research and editorial team is to critically evaluate the literature to produce an objective resource designed for health care professionals. The Database provides a comprehensive listing of brand name natural product ingredients and includes detailed monographs on the particular ingredients. Thousands of new references are added each year, and new interactions and safety concerns are added as soon as they are recognized. Effectiveness ratings are raised or lowered based on emerging research findings. There is an interface that permits identification of potential interactions between a specified natural product supplement, other natural products, and prescription drugs. A consumer version of the database has been created specifically for patients with the goal of providing patient-friendly wording on natural medicines. Sections of the patient database can be printed for patients during sessions.

- ConsumerLab.com (subscription fee) provides independent test results and information to help consumers and health care professionals evaluate health, wellness, and nutrition products. It publishes results on its website and technical reports covering a range of supplements. ConsumerLab is a certification company and enables companies of all sizes to have their products voluntarily tested for potential inclusion in its list of Approved Quality products and bear its seal of approval. Products tested and rated include herbal products; vitamins and minerals; other natural product supplements sports and energy products; functional foods; foods and beverages; and personal hygiene products.
- Herb Research Foundation includes expert compilations on specific herbals that contain carefully selected articles, studies, and discussions by experts that are available as downloads or in print form. The work of the Herb Research Foundation is based on its dedicated holdings of more than 300,000 scientific articles on thousands of herbs.
- The United States Pharmacopeia Convention (USP) is the official public standards-setting authority for all prescription and over-the-counter medicines, dietary supplements, and other health care products manufactured and sold in the USA. USP is an independent, science-based public health organization. USP sets standards for the quality of these products and works with health care providers to help them reach the standards. USP's standards are recognized and used in many other countries outside the USA. Prescription and over-the-counter medicines available in the USA must, by federal law, meet USP's public standards, where such standards exist. USP disseminates its standards to pharmaceutical manufacturers, pharmacists, and other users through publications, official USP Reference Standards materials, and courses. USP also conducts verification programs for dietary supplement ingredients and products. These programs involve independent testing and review to verify ingredient and product integrity, purity, and potency for manufacturers who choose to participate.
- NSF International is a not-for-profit, nongovernmental organization, devoted to standards development, product certification, education, and risk management for public health and safety, that has been in existence for over 60 years and provides services for manufacturers in 80 countries. NSF provides third-party conformity assessment services. NSF has earned the Collaborating Center designation by the World Health Organization (WHO) for Food and Water Safety and Indoor Environment. The site includes a section aimed at educating consumers on identifying and selecting supplements that are safe and effective.

Identifying Qualified CAM Practitioners

- ByRegion Community Directory lists registered CAM practitioners by specialty area and geographic region. This site is a useful tool for identifying practitioners who use a wide range of CAM approaches. The vast majority of listings are in the USA, Canada, and Western Europe.

- The Academy of Integrative Health and Medicine (AIHM) is a professional organization for physicians who practice holistic medicine. The site includes a search engine for identifying AHMA members when looking for appropriate referrals in your area. The vast majority of listings are in the USA and Canada.
- ***Note that qualified CAM practitioners can also be identified through many websites included in the following sections.***

CAM Biological Therapies

- **Office of Dietary Supplements Database** (subscription fee). This site is the official website of the Office of Dietary Supplements, National Institutes of Health. The database provides access to the subset of citations in the National Library of Medicine, NIH, on the range of dietary supplements.
- **Phytochemical and Ethnobotanical Databases**. This site was created by Dr. Jim Duke, noted ethnobotanist, and the Agricultural Research Service of the US Department of Agriculture. It is a valuable clinical resource that includes links to many phytochemical and ethnobotanical, and nutritional databases, and is intended primarily for researchers. Dr. Duke's Phytochemical and Ethnobotanical databases facilitate in-depth plant, chemical, bioactivity, and ethnobotany searches using scientific or common names. Search results can be downloaded in PDF or spreadsheet form. The site includes an online dictionary of ethnobotany.
- **Phytotherapies.org** (free service for registered users). Although this site is the product of an herbal company based in Australia, it is a valuable resource for herbal practitioners and conventionally trained medical practitioners interested in learning more about herbal medicine. The site is updated weekly and includes editorial content, articles and an extensive searchable and hyperlinked herbal database that includes monographs on current herbal therapeutics. Online enquiries can be submitted to experienced herbalists.
- **The Institute for Functional Medicine** (IFM) (subscription fee). The mission of the IFM is to improve patient outcomes through prevention, early assessment, and comprehensive management of complex, chronic disease through developing the functional medicine knowledge base as a bridge between research and clinical practice; teaching physicians and other health care providers the basic science and clinical applications of functional medicine; and working with policy makers, practitioners, educators, researchers, and the public to disseminate the functional medicine knowledge base more widely.
- **HerbMed** is an interactive, electronic herbal database and provides hyperlinked access to the scientific data underlying the use of herbs for the range of medical and mental health problems. It is an evidence-based information resource about herbal medicines provided by the Alternative Medicine Foundation, Inc., a nonprofit organization. A limited free version of the database contains information on 75 common herbs, and a fee-based professional version, HerbMedPro, pro-

vides access to the entire database. The site makes extensive use of hyperlinks to cross-reference an extensive bibliographic collection on all aspects of herbal medicine. The databases are updated on a regular basis. Subscribers can request searches on specific herbs or particular clinical applications. The website is linked to numerous medical, scientific, and health-related websites, including the National Library of Medicine and many others.

- **Herb Research Foundation—Herbs and Herbal Medicine for Health** (subscription fee). This site includes expert compilations on specific herbals that contain carefully selected articles, studies, and discussions by experts that are available as downloads or in print form. The work of the Herb Research Foundation is based on its dedicated holdings of more than 300,000 scientific articles on thousands of herbs.
- **American Botanical Council—Herbal Medicine** (subscription fee). Established in 1988, the American Botanical Council (ABC) is the leading independent, nonprofit, international member-based organization providing education using science-based and traditional information to promote the responsible use of herbal medicine. The site includes databases on safety, use conditions for specific herbals, and searchable monographs depending on the level of membership.
- **NAPRALERT Database** (subscription fee). The NAPRALERT File (NAtural PRoducts ALERT) contains bibliographic and factual data on natural products, including information on the pharmacology, biological activity, taxonomic distribution, chemistry of plant, microbial, and animal (including marine) extracts as well as ethnomedicine use records. In addition, the database contains information on the chemistry and pharmacology of secondary metabolites that are derived from natural sources and that have known structure. NAPRALERT contains records from 1650 to the present; however, roughly half of the content comes from systematic literature reviews from 1975 to the present. Napralert is a valuable information research tool for practitioners interested in the history and basic science of natural product-derived medicines.

Whole-Body and Mind–Body Approaches

- **F E D E R A T I O N _ M B S** This is the website of the federation of massage, body work and somatic practice organizations, a nonprofit membership organization in the massage, bodywork, and somatic practice field. The site is a gateway to websites of organizations related to different somatic approaches including massage, rolfing, Feldenkrais, the Alexander technique, and others.
- **TRI Homepage** The Touch Research Institute is dedicated to studying the effects of touch therapy. The TRI have researched the effects of massage therapy at all stages of life, from newborns to senior citizens. The site includes summaries of studies conducted through the TRI as well as abstracts of studies on Tai Chi, yoga and acupuncture.

- **Journal of Bodywork & Movement Therapies** The site provides access to the electronic version of *Journal of Bodywork and Movement Therapies* which covers therapeutic advances using bodywork including: Alexander technique, chiropractic, cranial therapy, dance, Feldenkrais, massage therapy, osteopathy, Shiatsu and Tui Na massage, Tai Chi, Qigong, and yoga.
- **AMTA Foundation | Research Database** This is the website of the Massage Therapy Foundation and the Massage Therapy Research Database SM. The mission of the Foundation is to chart an agenda for research on health benefits of massage therapy. The initial version of the database was compiled in 2000 and is updated quarterly. There are currently more than 4700 citations of articles and books about massage therapy. All Citations are reviewed by a committee of massage therapists, physicians, and researchers. There is no subscription fee, and the Database is available only through the Foundation's website.

CAM Therapies Based on Forms of Energy Validated by Current Science

- **American Music Therapy Association** The mission of the American Music Therapy Association is to advance public awareness of the benefits of music therapy and increase access to quality music therapy services in a rapidly changing world.
- Global Virtual Reality Association seeks to educate consumers, governments, and industry about VR's potential and to promote the worldwide growth and development of the VR industry. The Association hosts international discussions on important topics in VR to shape the public discussion on the technology.
- Association for Applied Psychophysiology and Biofeedback is a nonprofit organization established to promote understanding of biofeedback and advance the methods used in this practice. AAPB's mission is to advance the development, dissemination, and utilization of knowledge about applied psychophysiology and biofeedback to improve health and the quality of life through research, education, and practice.
- **The USC Institute of Creative Technologies** provides research updates on studies done at USC on advanced VR technologies and their applications in medicine and mental health care. The site includes links to an extensive list of research publications.

CAM Approaches Based on Postulated Forms of Energy Not Validated by Current Science

- **The Samueli Institute** is a nonprofit research organization dedicated to investigating the safety, effectiveness, and integration of healing oriented practice. Development of objective and clinically relevant measures is a key focus of the program. These measurements include patients' quality of life, changes in health, effects on brain function, cell and gene changes, and the overall risks, benefits

and costs associated with delivery of spiritual and energy healing practices in health care.

- **Acubriefs** provides a comprehensive online database of English languages references on acupuncture. The site plans to eventually incorporate non-English references depending on funding.
- Society for Acupuncture Research (SAR) promotes scientifically rigorous research in acupuncture and other modalities used in Asian medicine. SAR publishes monthly evidence-based assessments of newly published research articles and includes extensive links to other websites on acupuncture.
- **British Acupuncture Council** represents professional acupuncturists who have extensive training in acupuncture and the biomedical sciences. The Acupuncture Research Resource Centre has produced a valuable set of Briefing Papers reviewing the evidence of effectiveness of acupuncture in the treatment of specific medical and mental health conditions including addiction and substance abuse, anxiety and depression, stroke, menopause, migraine, and others. The briefing papers are available as free downloads in PDF format.
- The National Acupuncture Detoxification Association (NADA) is a not-for-profit training and advocacy organization that promotes improved understanding of the principles of both Chinese medicine and chemical dependency. It encourages community wellness through the use of a standardized auricular acupuncture protocol for behavioral health, including addictions, mental health, and disaster and emotional trauma. More than 500 clinical sites in the USA, Europe, Australia and the Caribbean currently utilize NADA protocols for the management of detoxification in alcohol and drug abuse. The protocols are promoted through public education about acupuncture as a recovery tool, training and certification of professionals in use of the techniques, consultation with local organizations in setting up treatment sites, and the distribution of NADA-approved literature, audiotapes, and videotapes.
- **British Homeopathic Association** (https://www.britishhomeopathic.org/) promotes and develops the study and practice of homeopathy and advances education and research in the theory and practice of homeopathy.
- **The Homeopathic Pharmacopoeia of the United States** provides online information on homeopathic remedies that are regulated by the FDA and listed in the Homeopathic Pharmacopoeia of the USA.
- **Healing Touch International** is an organization dedicated to disseminating information about Healing Touch and supporting member practitioners. The site is a gateway to classes, research information, and other resources on Healing Touch.
- **The International Society for the Study of Subtle Energies and Energy Medicine** was established to explore the application of subtle energies to the experience of consciousness, healing, and human potential and is designed as a bridging organization for scientists, clinicians, therapists, healers, and laypeople. ISSSEEM encourages open-minded exploration of phenomena associated with the practice of energy healing. The site includes abstracts and contents of the

Subtle Energies and Energy Medicine Journal. Links to conferences on subtle energy healing, Shamanic healing, and consciousness research are provided.
- Earl E Bakken Center for Spirituality and Healing (https://www.csh.umn.edu/) at the University of Minnesota has the goal of integrating biomedical, CAM, cross-cultural, and spiritual care. The center provides interdisciplinary education, clinical care and outreach while integrating evidence-based research to renew, enhance, and transform health care practice, health sciences education, and clinical care.

Textbooks on Safety in CAM

- Mosby's Handbook of Drug-Herb and Drug-Supplement Interactions, Harkness, Mosby (2003)
- Mosby's Handbook of Herbs and Natural Supplements, Skidmore-Roth, Mosby (2009)
- Natural Standard Herb and Supplement Handbook, Basch & Ulbricht, Elsevier, (2004)
- Natural Medicines Comprehensive Database www.naturaldatabase.com
- Herb, Nutrient and Drug Interactions, Stargrove, Treasure and McKee (2008), Mosby
- A-Z Guide to Drug-Herb-Vitamin Interactions, Gaby, Healthnotes (2006)

Textbooks on Complementary, Alternative, and Integrative Mental Health Care

- Chinese Medical Psychiatry: A Textbook and Clinical Manuel, Lake, J. & Bob Flaws, (2001), Blue Poppy Press, Boulder, CO.
- Complementary and Alternative Treatments in Mental Health Care (2006), Lake & Spiegel Eds, American Psychiatric Publishing, Inc., Washington, DC.
- Complementary and Integrative Treatments in Clinical Practice, (2017) Eds. Gerbarg, Muskin and Brown, APA Publishing, Arlington, VA.
- Healing and Wholeness: Complementary and Alternative Therapies for Mental Health (2008), Fredricks, R. (Ed), All Things Well Publications, San Jose, CA.
- Integrative Mental Health Care: A Therapist's Handbook, Lake, J. (2009) Norton, New York, NY.
- Integrative Psychiatry and Brain Health, 2nd edition, Monti, D. & Newberg A. Eds, (2018) Oxford Univ Press, New York, NY.
- Integrative Therapies for Depression: Redefining Models for Assessment, Treatment and Prevention Greenblatt & Brogan Eds. (2016) CRC Press, Boca Raton, FL.
- Mental Health for the Whole Child: Moving Young Clients from Disease and Disorder to Balance and Wellness (2013), Shannon, S., Norton, New York, NY.

- Mental Health Naturally: The Family Guide to Holistic Care for a Healthy Mind and Body, Kemper (2010), American Academy of Pediatrics, Elk Grove Village, IL.
- Nutrition and Mental Health, Leyse-Wallace (2013) CRC Press, Boca Raton, FL.
- Nutrition Essentials for Mental Health: A Complete Guide to the Food-Mood Connection, Korn, L., (2016), Norton, New York, NY.
- Textbook of Integrative Mental Health Care, Lake, J. (2006), Thieme Medical, New York, NY.

Appendix B: The Author's Websites

Progressive Psychiatry

This site includes a blog, select full-text articles, presentations, and links to useful web resources.

The Integrative Mental Health Solution

This was created to accompany a series of ten self-published books written by the author. The book were written to provide a practical and affordable resource on safe and effective treatments of common mental health problems that go *beyond* conventional prescription medications and psychotherapy.

- Depression (including moderate and severe forms).
- Anxiety (including generalized anxiety, panic attacks, phobias).
- Substance abuse (including alcohol, cocaine, methamphetamine, marijuana, and others).
- Psychotic disorders including schizophrenia and others.
- Bipolar disorder (includes hypomania and full mania).
- Post-traumatic stress disorder.
- Dementia and mild cognitive impairment.
- Attention-deficit hyperactivity disorder.
- Insomnia.

The books are designed to guide practitioners and patients working together to develop an individualized care plan. The first book is a concise introduction to integrative mental health care and is available through the author's website at no cost. The other books in the series provide detailed information about CAM and integrative approaches aimed at preventing and treating many common mental health problems. All books can be purchased in electronic or print format at http://theintegrativementalhealthsolution.com/.

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Appendix C: Software for Integrative Mental Health Care

As this book is going to press efforts are ongoing to develop a series of Apps for planning integrative mental health care. The Apps will help practitioners and patients develop individualized care plans addressing common mental health problems such as depressed mood, anxiety and many others.

A long-term project aimed at developing sophisticated software using advanced machine learning algorithms and natural language processing is in the early stages. When finished that software will automate the literature research process, generate individualized evidence tables and algorithms for integrative treatment planning on a case-by-case basis, and guide the integrative practitioner through all steps involved in developing and refining an integrative care plan based on the best available evidence. Incorporating the methods discussed in this book, the software will provide practitioners with a set of AI tools for developing individualized care plans addressing the complex needs, preferences and constraints of unique patients. The software will permit integrative practitioners to evaluate the benefits and limitations of disparate treatment choices with respect to the needs and preferences of a unique patient, determine the most effective and cost-effective treatment strategy, and identify treatment combinations most likely to have beneficial synergistic effects on target symptoms. As envisioned the software will do the following:

- Identify high quality online resources and optimize literature research strategies.
- Automate literature research and seamlessly update the relevant evidence tables on an ongoing basis.
- Customize the content of evidence tables with respect to the unique history and symptoms of each unique patient.
- Populate the evidence tables with the most relevant and high-value findings from the medical literature, and modify content on an ongoing basis in light of significant new research findings.
- Rate the quality of evidence for different modalities and adjust comparative ratings on an ongoing basis in light of emerging research findings.

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- Guide the practitioner in assigning relative priorities to disparate problems being addressed when managing complex patients with high comorbidity.
- Automatically incorporate content from the relevant evidence tables into appropriate steps in the algorithm and making changes in content in the algorithm in light of emerging research findings.
- Identify the most parsimonious care plan that adequately and cost-effectively addresses the symptoms of each patient.
- Generate a *realistic* individualized integrative care plan taking into account each patient's unique history, preferences and constraints on cost and availability of medical resources.

Updates

Updates on the Apps and the machine learning software project will be posted here on an ongoing basis.

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