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Clinical Applications for Meditation

A Review and Recommendations

Jane Hart, M.D.

Meditation has its roots in cultural, spiritual, and religious settings. It is an ancient practice that has been embraced by individuals throughout the world. One review of the subject estimated that there are 10 million meditation practitioners in the United States alone.[1] Through the centuries, a wide variety of types of meditation have evolved, and continue to evolve, in secular and health care settings. Transcendental Meditation™ (TM), the relaxation response, mindfulness-based meditation, breathing meditation, and walking meditation are just a few of the common types of meditation available to meet patients' interests and needs.

Today, meditation is also recognized as a practice that is used as a popular complementary and alternative medicine (CAM) therapy. The National Center for Complementary and Alternative Medicine (NCCAM) survey published in 2002 on the use of CAM in the United States showed that meditation was in the top 10 most commonly used practices used for CAM therapies.[2] People may practice meditation for a wide variety of reasons, including stress reduction, health promotion, relief of symptoms caused by chronic medical conditions, enhancement of spirituality, and other goals.

People who teach and practice meditation have made many claims about what regular meditation practice may foster, including joy, peace, equanimity, calm, greater ability to focus attention or concentrate, changes in states of consciousness, self-actualization, stability of emotions, forgiveness, love, compassion, improvements in physical health, improvements in mental health, and more.

Science has also demonstrated, particularly in the last 40 years, that meditation can have a positive effect on health and can alter human psychologic states and physiologic states such as heart and respiratory rates, brainwave patterns, and core body temperature. [1,3–5] Emerging evidence is also revealing the effects of meditation on the brain and how the practice can have both short- and long-term effects on human neurologic "wiring."[4,6]

There is much that remains unknown about meditation, but what is known is that science is only beginning to understand all of the potential clinical applications in medicine, psychology, and spirituality. Researchers are discovering that meditation has the potential to affect physical, emotional, mental, and spiritual well-being.

Defining Meditation

Mindfulness meditation and concentrative technique are the two main approaches in meditation discussed in this article.

Mindfulness meditation is defined simply as "moment-to-moment awareness"[7] by Jon Kabat-Zinn, Ph.D. (founder of the Center for Mindfulness at the University of Massachusetts Medical School in Worcester, Massachusetts). He stated that mindfulness meditation is about paying attention to the senses, thoughts, and body in a way that people do not usually do.[7]

Cahn and Polich described the concentrative meditation technique as "focusing on specific mental or sensory activity," such as a repeated sound, or mantra, or on the breath.[4] While thoughts and distractions come up during this process, the goal in concentrative meditation is to bring the attention back to the chosen area of focus, such as on the mantra or the breath. Herbert Benson, M.D. (director-emeritus of the Benson-Henry Institute for Mind Body Medicine, Chestnut, Hill, Massachusetts, and an associate professor of medicine at Harvard Medical School, Boston, Massachusetts), coined the term *relaxation response*, which is elicited by using a concentrative technique.[5]

Walsh and Shapiro noted that there is an overlap in both of these approaches toward a similar goal, stating that "the former (mindfulness meditation) requires the maintenance of attention in a state of open perceptivity, and the latter (concentrative technique) requires narrowing of attentional focus."[1]

Webster's Dictionary defines meditation as "to think deeply and quietly; ponder" or "to consider at length; contemplate."[8] Experts in the field of meditation might take issue with this definition, challenging the notion of thinking deeply as opposed to being with things as they are and letting thoughts come and go as in the case of mindfulness meditation, or having a heightened

ability to focus and concentrate as in the case of the concentrative technique.

In the literature, there a general agreement that the practice is about training attention. Walsh and Shapiro offer the following definition:

> The term meditation refers to a family of self-regulation practices that focus on training attention and awareness in order to bring mental processes under greater voluntary control and thereby foster general mental well-being and development and/or specific capacities such as calm, clarity, and concentration.[1]

Cahn and Polich defined meditation as "practices that self-regulate the body and the mind, thereby affecting mental events by engaging a specific attentional set."[4] Walsh and Shapiro observed that the contrast between meditation and other practices, such as visual imaging, is that meditation is about training attention whereas others are about altering content.[1]

In 2003, the Dalai Lama convened meditators and scientists in the field to explore the interface between Buddhism and neuroscience.

History of Meditation: From Spirituality to Science

Dr. Benson popularized meditation in secular society via the relaxation response—which is elicited via a meditative approach that involves stilling the body in a quiet environment and repeating a word or a phrase quietly to oneself. Noting that the relaxation response "has been experienced throughout history,"[5] he stated that, for thousands of years, people, largely in spiritual or religious settings, have evoked a type of relaxation response via essentially all religions and other contemplative and meditative practices.

In fact, Bonadonna noted that Buddhist texts offer insight into *thousands of years* of "observation of the inner experience" of meditation.[3] Calling on or contemplating the name of God, repetitions of praise to God, contemplating the name of God or quiet prayer, are all examples of ancient meditative techniques.

In contemporary society, an emergence of research on the practice of meditation generally began in the 1960s when Dr. Benson, in his laboratory at Harvard Medical School, began studies of practitioners of TM, monitoring their heart and respiratory rates and core body temperatures.[5] Dr. Benson and other U.S. researchers were intrigued by reports from other countries of people who regularly meditated being able to bring bodily functions under voluntary control although these functions were previously thought to be only under autonomic control.

The Maharishi Mahesh Yogi also helped popularize meditation with his TM technique in the 1960s, and current estimates cite that at least 4 million people having learned TM during the last 40 years.[9] But, during this same time period, numerous important researchers and scholars in this country and around the world were uncovering the effects of meditation on the mind and the body.[1,2–5]

One such researcher was Jon Kabat-Zinn, Ph.D., who founded the Center for Mindfulness at the University of Massachusetts Medical School in Worcester, in 1979. Dr. Kabat-Zinn popularized mindfulness meditation and Mindfulness-Based Stress Reduction, or MBSR.[7]

Dean Ornish, M.D., founder of the Preventive Medicine Research Institute in Sausalito, California, also raised awareness of the potential benefits of using meditation to address chronic disease via his multi-interventional programs for people with cardiovascular disease (CVD). Dr. Ornish recommended significant lifestyle behavior changes in this population in the realms of nutrition, exercise, and stress reduction, including meditation, and demonstrated that such an approach can have a positive impact on the experience of chronic illness among patients with CVD.[10]

In 2003, the Dalai Lama convened meditators and scientists in the field to explore the interface between Buddhism and neuroscience.[11] In 2005, a conference entitled "Investigating the Mind 2005: The Science and Clinical Applications of Meditation" was held in Washington, D.C. This conference offered communication among the Dalai Lama, Buddhist contemplatives, and neuroscientists in the continued quest to understand meditation's role in health and disease.[11]

Clinical applications for meditation have been suggested widely in the literature. Researchers and proponents of meditation have suggested that meditation could be used to ameliorate disease states by reducing symptoms, reducing blood pressure, lowering heart-disease risk, providing stress reduction, and affecting other factors involved in illness.[1,3–5]

Programs for learning relaxation techniques, such as meditation, in hospitals and other health facility settings, are becoming more commonplace. Slowly, health care professionals are recommending meditation and other similar techniques to their patients as adjunctive CAM or behavioral treatments for a variety of health disorders.

Current Research in the Field

While documentation of thousands of years of meditation practice exists, contemporary research on meditation in today's society is increasing and is considered to be more "valid."[3] The short- and long-term effects of chronic stress on the body have been well described in the literature and will not be discussed in detail here.

Dr. Benson clearly described the flight-or-fight response and explained how this physiologic reaction can be altered via meditation, which elicits a hypometabolic state with attenuation of sympathetic and parasympathetic nervous-system reactions, and the hormonal cascade that follows acute and chronic stress.[5]

Other early and ongoing research has shown that bodily functions originally thought to be under autonomic control could come under voluntary control with regular and deep

meditation.[5] But while most individuals in the United States may not seek to gain this type of control, science is clearly demonstrating the potential physical and mental effects of meditation.

Some of the cutting-edge studies that are emerging in the research involve meditation's effect on the central nervous system (CNS), specifically, in the realms of neuroelectricity and neuroimaging.[4,6] Neuroelectric and neuroimaging studies that evaluate neurophysiologic changes related to meditation and its effects on the brain are increasing in the literature.[4,6] A recent, thorough review, by Cahn and Polich, of electroencephalographic (EEG), cognitive event–related potentials (ERP), and neuroimaging studies related to meditation drew the following general conclusions:[4]

"People who manage stress are more resilient, experience fewer symptoms and experience an improved quality of life."

- In EEG studies, specific inferences cannot be drawn except for the fact that the electrical activity of the brain—specifically, theta and alpha band activity—seems to be affected by the meditation state and this may alter the long-term neuroelectric profile.
- In neuroimaging studies, the cumulative evidence seen on magnetic resonance imaging and positron electron tomography scans demonstrates some consistency of localization of meditation practice with activation of the brain's frontal and prefrontal areas.

This review and other studies have suggested that meditation may induce short- and long-term effects in the neurophysiologic state of an individual.[4,6]

Cahn and Polich also concluded that CNS function is clearly affected by meditation. Lutz, et al., observed that synchronization of neuronal activity in the brain plays a role in mental processes, such as learning, memory, and attention. These researchers also stated that "neural synchrony thus appears as a promising mechanism for the study of brain processes underlining *[sic]* mental training."[6]

It is not yet known how these findings and/or how meditation may affect or alter clinical and functional outcomes.[6] Cahn and Polich cautioned that none of the neuroelectric or neuroimaging studies to date have "yet isolated or characterized the neurophysiology that makes explicit how meditation induces altered experience of self." However, these authors noted that research findings in neuroelectric and neuroimaging studies are "becoming more cohesive and directed, even though a comprehensive empirical and theoretical foundation is still emerging."[4]

There are acknowledgments in review papers that meditation has been demonstrated to have positive effects on the following clinical conditions: stress, anxiety, pain, depression, immune functioning, symptom reduction, coping mechanisms, and quality of life in patients who have a variety of chronic diseases, including CVD, cancer, and skin disorders.[1,3–5,7]

As Bonadonna points out in her review on meditation and chronic illness, "stress is often a component of chronic illness."[3] She also noted that there is evidence that "people who manage stress are more resilient, experience fewer symptoms and experience an improved quality of life."[3] People with chronic disease not only seek relief of their symptoms but often need support between doctor appointments or after treatments have stopped, as in the case of cancer or after bypass surgery for heart disease. Meditation may serve as an adjunct and catalyst for improved coping, quality of life, and symptom reduction. There is also evidence that meditation may decrease appointments to doctors.[3]

While the results in the literature regarding the effects of meditation on chronic disease are conflicting, the cumulative evidence is suggestive of the ability of meditation to attenuate the experience of chronic illness positively.[1,3–5,9] Research findings on the effects of meditation on chronic disease include:

- Decreased stress, including demonstrated associations with decreased cortisol and catecholamine levels[3]
- Decreased blood pressure, although evidence suggests that meditation is not as effective alone as pharmacologic therapy[3]; a review by Canter and Ernst criticized the fact that many published studies relating meditation to decreased blood pressure have been on TM-treated subjects and were often written by authors affiliated with the TM organization; the authors also concluded that the cumulative body of literature on blood pressure and meditation is largely methodologically flawed, stated that there is insufficient evidence to conclude whether TM has a cumulative positive effect on blood pressure, and encouraged further research[9]
- Decreased depression and stress among health care workers[3]
- Decreased stress and mood disturbance among patients with cancer using MBSR[12]; a review on the effectiveness of MBSR cautioned, however, that, while the particular study cited here had promising results, more high-quality, randomized, controlled trials are needed to understand the effects of MBSR and chronic disease before general conclusions can be made[13]
- Demonstrated effects on immune function[3,4]; Davidson, et al., noted that, while negative psychosocial influences on immunity have been well-described, there is a paucity of high-quality research on the effects of positive interventions (such as meditation) on immune functioning[14]; this review discussed an RCT on the effects of mindfulness meditation on immune functioning, concluded that MBSR has a demonstrated in vivo effect on immune functioning, noted the study's limitations, including a small sample size, and recommended further research on MBSR.

Bonadonna's review covered the effects of different types of relaxation training on health. She found that a wide variety of types of relaxation techniques had demonstrated effectiveness including TM, breathing techniques, imagery, and others.[3] Var-

ious clinical trials are currently underway. These trials are examining the effects of different types of meditation on a number of medical conditions, including insomnia, menopause, cancer, cardiovascular disease, arthritis, and other conditions.[15] For further details about the effects of meditation on specific disease states, please see the review papers mentioned in this article.

Research Challenges

As noted, there is a large body of research on meditation. Unfortunately, much of that research is flawed or limited in its methodology.[16] Research challenges that lead to the limitations of existing research findings include varying definitions of meditation, individuality of the meditators, and use of a wide variety of types of meditation that make comparisons between studies difficult. The last challenge arises particularly when types of meditation used are not well-defined or when meditation is used as one component of a multi-interventional approach. These situations make it difficult to determine which factors are producing effects (e.g., meditation alone versus meditation along with group encounters or coupled with other therapies and/or medications).

One of the difficulties with studying chronic illness and meditation is that the effects and/or benefits to patients can be quite varied. Among patients with chronic pain, one might experience an increased ability to tolerate pain as a result of meditation, another might find a reduction in pain, and yet another might experience an increase in pain but may learn how to be more patient with it. Thus, the effects can be quite complex when they are analyzed collectively.

Nevertheless, researchers agree that high-quality research trials should continue to be developed to examine the role of meditation in health and illness.

Clinical Applications

In today's fast-paced world, people are encouraged to do anything but be still. They avoid, push past, and hurry by other people and things. Sitting still, indeed, may feel nonproductive or even counterproductive, in a productivity-oriented society. Yet, as noted above, evidence is emerging that sitting still may prove to be quite productive for physical and mental health.

Clinicians may have various questions when considering whether to discuss meditation with their patients including:

- When should a clinician recommend meditation?
- How does one get started?
- Is meditation safe?
- How long and how often should one meditate?
- Which resources on meditation are important?

The following sections consider each question from the author's own clinical experience.

When Should a Clinician Recommend Meditation?

As a practitioner and teacher of meditation, I recommend meditation to patients who suffer from stress-related conditions, including insomnia, anxiety, and depression, and to people with other chronic diseases who are suffering from stress as a result of their diseases. I recommend the practice strictly as an adjunct to conventional care for these disorders—not as a substitute.

I have observed that a consistent practice of daily, intentional relaxation seems to help set the intent for a day that could otherwise have its emphasis on stress. Intentional relaxation is a notion that I emphasize to patients who need to cope with today's stressful world. Meditation becomes a vehicle, one option among many others, as a way to relax intentionally. I believe it is important to view intentional relaxation as one would view the importance of exercise—we must strengthen our relaxation abilities to gain the benefits of decreases in uncomfortable and physiologic reactivity in a stressful world.

We must strengthen our relaxation abilities to gain the benefits of decreases in uncomfortable and physiologic reactivity in a stressful world.

How Does One Get Started?

I request that people who come to learn how to meditate commit to a minimum of six 1-hour sessions, spread out over 6–8 weeks, to receive an introduction and to learn the technique itself. The sessions cover what meditation is and its various types. Participants are guided through an initial progressive muscle-relaxation exercise at the beginning of every session and learn how to practice a concentrative meditation technique focusing on a word or the breath. Many people continue to come beyond the initial 6-week time period because they find it helpful to sit in silence with other people. These participants also can bring up their questions about meditation.

Having a teacher is a true benefit. While there are books and compact discs (CDs) that provide meditation instruction, there is great value in having a person available to answer questions and concerns that arise. Patients should be advised to ask potential teachers how long it will take to learn meditation, what the monetary investment will be, if any, and specifically what the training and background is of the person they are going to learn from. But if an instructor is not available there are helpful books, CDs, audiotapes, and digital versatile discs (DVDs) on meditation instruction.

Is Meditation Safe?

Meditation is considered to be a relatively safe practice. It is physically noninvasive, learned easily, and can be practiced independently. There are, however, things to consider about meditation to optimize its safety.

Meditation should be used in a clinical setting only as an adjunct to conventional treatments. If, for instance, meditation is being used to help treat high blood pressure, a patient must be informed that he or she cannot assume that medications can be stopped. Meditation may help reduce the need for medications, but the patient's blood pressure will have to be monitored over time. Meditation is also user-dependent—the effects may stop rather quickly if it is stopped.

Meditation should not be used as a substitute for seeking medical care for symptoms and signs that patients experience—it is important to emphasize this when discussing meditation with them.

Meditation may not be advisable for people who experience hallucinations or have psychoses, such as patients with unstable bipolar disease or schizophrenia, because meditation could potentially amplify these effects.[17] More research about the effects of meditation on these conditions is definitely needed in this area, however.

People who have tried to meditate in the past but currently say that they cannot meditate often say something like the following: "The teacher told me to make my mind a black box or wipe out all of my thoughts but I couldn't do it!" Trying to block reality out—making one's mind a black box—is not only impossible but is also *not safe*. The effects of meditation should make patients more comfortable with reality instead of blocking or masking reality. Meditation should not be used to dull the senses or to make people act indifferently. In fact, if meditation is having positive effects on a *practitioner*, it should in fact make that person's senses more heightened, more alert, and more engaged in the environment.

A teacher of meditation can be dangerous if that teacher believes that his or her methodology is "the only way." It is also unsafe when a teacher creates a teacher–student relationship to make the teacher's needs and interests the focus of the relationship rather than the learning of a practice.

One should never work with a meditation teacher who says there is only one way to meditate as that one way is often that person's way. There are many types of meditation and each patient must be able to find the practice that is the most comfortable. When recommending that patients get interested in learning meditation, clinicians should tell their patients to inquire about a teacher's qualifications, certification if applicable, experience, and beliefs before signing up with that individual.

This next item sounds so obvious, but, interestingly, it comes up quite often. Patients should be told not to listen to meditation tapes or CDs in their cars. The tendency is to relax too much or to fall asleep. Meditation tapes or CDs should be listened to in a quiet, safe environment where no machinery or cars are being operated.

It is important to emphasize to patients that the full effects of meditation on the mind and the body are not known.

There is a lack of information about the potential adverse effects of meditation and, while some were addressed here, further research on this is needed. Patients who experience any adverse effects should be encouraged strongly to share this information with their health care providers.

In more than 25 years of meditation practice, I have not experienced any adverse effects and have not seen any adverse effects in my patients. I do make myself available to answer questions about it and to address any issues that arise. Some patients mention symptoms that they become more aware of during meditation, such as headaches or other pains. I refer these patients to internists for evaluation of such symptoms. So far, none of these patients' symptoms were related to meditation in the patients' final evaluations.

How Long and How Often Should One Meditate?

There is a general consensus that 10–20 minutes per day initially is a reasonable amount of time to meditate. This may vary greatly from individual to individual, however. A person with high anxiety may not be able to sit still that long at first. Other people may have conditions or disabilities that affect their ability to concentrate or to sit or lie still for very long.

However, for the general population engaging in meditation for health purposes, 8 hours of meditation per day is not necessarily better than 20 minutes. One should not be consumed by meditation practice. Research has suggested that, to see health benefits, a person should meditate a minimum of 3 times per week, and results from meditation may increase after practice for 1 year.[3]

Which Resources on Meditation Are Important?

The references cited in this article are good sources. In addition there are three key websites that are worth a visit for learning about meditation as well as about teaching oneself or staff members about it. The websites are:

- Center for Mindfulness in Medicine, Healthcare and Society, University of Massachusetts Medical School—www.umassmed.edu/cfm/index.aspx
- Mind Body Medical Institute—www.mbmi.org/home/
- Meditation for Health Purposes on the NCCAM site—http://nccam.nih.gov/health/meditation/

Conclusions

Science may never capture fully the intimate experience of meditation for the individual. But important research continues to emerge suggesting that meditation can have clinically significant effects on the health of the mind and the body. Additional quality research to understand the potential benefits of such a practice is warranted. □

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Jane Hart, M.D., a board-certified internist, is a clinical instructor at Case Western Reserve University School of Medicine, Cleveland, Ohio, and was recently named Chair of the Committee on Integrative, Complementary and Alternative Medicine at the School of Medicine.

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