**In Brief**

Mind-body interventions utilize the mind’s capacity to affect the body and its physiological responses. They thereby influence health. The response to stress (the “fight or flight” reaction) may be automatic, but recovery toward relaxed parameters (“the relaxation response”) can be learned through self-regulation and the regular use of mind-body interventions. Many of these interventions originate from Eastern healing practices. Western science has found some of them to be helpful as adjunct modalities in the treatment of disease, and their use is increasing.

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**Mind-Body Interventions**

Mind-body medicine focuses on the communication between mind and body and the powerful ways in which emotional, mental, social, and spiritual factors can directly affect health. Western, or allopathic, medicine tends to consider the scientific, or medical, model of medicine superior to mind-body therapies. It often has negated the fact that one’s mind has any affect on the body. But in the last generation, with the meeting of Eastern and Western healing practices, we have come to accept and understand that mind and body are powerfully related.

Between 1990 and 1997, the number of patients using alternative practices increased from 36 to 46%. Quality clinical research has grown steadily since 1970. The National Center for Complementary and Alternative Medicine (NCCAM), founded in 1998 as part of the National Institutes of Health, is now a vital organization for disseminating information and providing funding options for complementary or alternative medical research.

Mind-body interventions include relaxation, imagery, biofeedback, meditation, hypnosis, tai chi, yoga, and others. They often help patients experience healing for their illnesses in new and different ways.

A mind-body modality we often experience, many times unbeknownst to us, is the placebo response. It happens even without our planning or effort. In scientific studies, it has been shown to interfere with clinical outcomes. It is often looked upon as puzzling or confusing and unfortunately has thereby been undervalued. A positive placebo response typically improves a patient’s trust and hope for an affirmative outcome.

Mind-body therapies regard as essential an approach that acknowledges each person’s capacity for self-knowledge and self-care. It emphasizes the person’s openness to participate and his or her desire to succeed. It often has been said that mind-body medicine views illness not as an obstacle but as an opportunity for personal growth and transformation.

Further training of medical health professionals is needed to improve understanding of the benefits of the mind-body therapies. Likewise, practitioners of spirituality and mind-body interventions need to be more appreciative of the successes that the scientific practice of medicine has made available. Together, they can help augment clinical outcomes whenever possible.

Dean Ornish, M.D., a cardiologist and founder of the Preventive Medicine Research Institute in Sausalito, Calif., has done just that. He showed that comprehensive lifestyle changes (low-fat vegetarian diet, smoking cessation, stress-man-
mgagement training, and moderate exercise) for patients with heart disease can actually reverse coronary heart disease.3

Table 1 lists many of the mind-body therapies and offers a brief description of their potential physiological benefits.

How do these therapies work? What is the trigger? In many, if not all, methodologies, the basic dynamic feature is the “relaxation response.” Herbert Benson, M D, of the Mind-Body Medical Institute at Harvard University* coined the phrase “relaxation response” after carrying out research on the effects of meditation in collaboration with national and international scholars. The relaxation response is a state in which the body slows down and heart rate, blood pressure, and breathing slow down, facilitating the uptake of oxygen. The body achieves a sleep-like rest (an altered state of consciousness) in a brief period of time.

Conversely, the stress response, or the “fight or flight” response, includes increased levels of heart rate, breathing, blood pressure, blood glucose, and stress hormones. Excess stress-induced levels of adrenaline or cortisol may damage the blood vessels and also compromise the immune system.4,5

Keeping excess stress hormones in check with relaxation may help stabilize glucose levels and at the same time provide some protection for the heart.3 These are both very important issues for people with diabetes.

Mind-body therapies work for some people, but they may not work for everyone. Remember, we are dealing with two interdependent variables here, mind and body, which then have to interact with all the other bodily functions.

It is not easy to design research methodologies that produce significant outcomes in such challenging situations. Grant opportunities have been few compared to those available for drug research, reflecting the limited profit potential of complementary and alternative medicine research. The remainder of this article describes some of the therapies that have been researched and published in peer-reviewed journals. As expected, there are a variety of studies both with and without positive results regarding their effect on diabetes.

**Relaxation and Biofeedback-Assisted Relaxation Techniques**

Feelings of stress raise blood glucose levels in people with diabetes. This is because of an increased production of stress hormones,7 which reduces insulin action. In addition, patients under perceived stress may find that caring for their diabetes is less of a priority, leading to poor glycemic control, which further exacerbates the situation.

It is therefore important for diabetes health professionals to be aware of and to check with their patients about how stress may be affecting their lives. Health care professionals can then offer advice specific to their patients’ situation. Perhaps some additional lifestyle changes could be recommended for stress reduction. As noted earlier, decreasing stress reactions may lead to better glucose control and improvement in immune system function.

**Glucose Management.** With increased glycemic control, there is always a risk for hypoglycemia. When in a relaxed state, the body metabolizes carbohydrate more efficiently, thereby lowering blood glucose levels.8,9 Patients with type 1 diabetes may potentially develop hypoglycemia following relaxation.8,10 Therefore, such patients should be told of the possibility for low blood glucose levels after relaxation and instructed to promptly treat it as directed by their health care professional.

In published, peer-reviewed research studies featuring diabetes and blood glucose, the most common alternative treatment is relaxation training or biofeedback-assisted relaxation training. Many case and con-

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controlled studies using biofeedback-assisted relaxation training with type 1 diabetic patients showed significantly lower average blood glucose levels in experimental groups or at post-test in the instance of case studies. These differences could not be explained by increased insulin doses. It is suggested that stress management be considered as an adjunct to the medical management of people with type 1 diabetes.

In studies of patients with type 2 diabetes, no significant lowering of glycemic levels were observed at post-test. However, with relaxation training, patients may have experienced other benefits, such as increased self-management abilities, improved sense of well-being, increased coping skills, lowered incidence of depression, and less perceived stress. Some studies have not been designed to provide statistically significant results for more than one or two variables.

Depression. Depression is a frequent comorbidity of chronic illness and diabetes. People with diabetes who suffer from depression or anxiety struggle more to control their blood glucose levels, even if they are taught to self-regulate peripheral temperature (increased blood flow to the feet), 14 out of the 16 ulcers, or 43.75%, healed. In the control group, 7 out of 16 ulcers, or 43.75%, healed (P < 0.009).

Neuropathy pain. Diabetic peripheral neuropathy affects the sensory nerves in the feet with pain and, later, with loss of feeling. The additional oxygenation and available nutrients to the tissues following the effects of relaxation provide improved sensory function in the nerve fibers that correspond to touch. This was shown by measuring the Current Perception Threshold (CPT) levels by electrical stimulation of the great toe. The change in CPT levels pre-to post-intervention indicated a significant difference between the experimental and control groups. A significant improvement (increased sensation in the feet) was noted in the large myelinated nerve fiber functioning in the experimental groups, which used biofeedback-assisted relaxation, compared to the control groups who did not (P < 0.02).

In another study by Fiero et al., it was suggested that diabetic neuropathy might interfere with the ability to self-regulate peripheral temperature and that assessing neuropathic status may be important before prescribing thermal biofeedback. On the other hand, in mind-body therapies, “thinking of warmth” may surpass or be more accurate than “feeling warmth.”

The beneficial effects of thermal biofeedback-assisted relaxation have been demonstrated for several additional vascular disorders, including hypertension, migraine, and Raynaud’s syndrome.

Caudication. This is a disease process involving inadequate peripheral blood flow. Thermal biofeedback has been tested as a therapy to improve vascular flow and walking tolerance in patients with peripheral vascular disease. Improvements were seen in ankle-brachial index, walking distance, walking speed, and stair climbing. Thermal biofeedback provided an improved vascular and ambulatory function for a diabetic patient with claudication.

Another case study of a patient with diabetes reported that attacks of intermittent claudication were reduced to zero after 12 sessions of thermal biofeedback. The patient’s daily walking distance increased by about a mile over the course of the treatment. Thus, it appears that thermal biofeedback and autogenic training are potentially promising therapies for people with diabetes and peripheral vascular disease.

Hypnosis

This modality has been used to help people with eating disorders and those in need of assistance with smoking cessation and other lifestyle changes. Adolescents with type 1 diabetes have been reported to have a nonadherence rate of ~20% to diet, exercise, and other self-care behaviors. In a hypnosis study, six adolescents served as their own controls, and no changes were made in insulin, diet, or exercise for 6 months. Then hypnosis, administered individually, was added with all of the usual modalities for 6 months. Posttreatment tests showed that average HbA1c dropped from 13.2 to 9.7%, and average fasting blood glucose (FBG) dropped from 426 to 149 mg/dl.

Yoga

In yoga, people with diabetes may have found an important “new” tool that is thousands of years old. Research has shown Hatha yoga (physical movements and postures) and meditation to be excellent examples of the mind-body connection at
Practitioners and providers who want to incorporate mind-body interventions may need to educate their hospital and clinic administrators about these therapies. They need to see and be convinced by positive results when mind-body therapies are used in clinical applications. These therapies could be made available to their patients. Mindfulness meditation as a form of stress management therapy has made inroads in many health systems.

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**Table 2. Resources for Reference and Training in Mind-Body Interventions**

**Center for M Ind-Body M edicine**

James Gordon, M D, Director
5225 Connecticut Ave., N W, Suite 414 Washington, DC 20015
Phone: 202-966-7338
Fax: 202-966-2589
E-mail: center@cmcb.org
Website: www.cmcb.org

**The Center for M Indfulness in M edicine**

Jon Kabat-Zinn, PhD
Professional Training Information Center for M Indfulness
University of M assachusetts M edical Center
419 Belmont Ave., 2nd floor Worcester, M A 01604
Website: www.mindfulnessstapes.com

**San Francisco Preventive M edicine Institute**

Dean Ornish, M D
900 Bridgeway, Suite #1 Sausalito, CA 94965
or New M edicine Tapes
1308 Gilman St. Berkeley, CA 94706
Phone: 510-527-3600
E-mail: info@newmed.com
Website: www.ccnet.com/~newmed/ornish.htm

**Life Sciences Institute of M ind-Body M edicine**

Health
2955 SW W anamaker Dr. Topeka, KS 66614
Phone: 785-271-8686
Fax: 785-271-8968
E-mail: lifesci@cjnetworks.com

For insurance companies, covering mind-body therapies can be financially beneficial because these therapies are cost-effective, nonpharmacological, noninvasive, and safe. Naparstek and Rice et al. have shown how relaxation and imagery have increased healing in clinical application. Educated clients become more prevention-oriented and stay healthier.
Lane JD, McCaskill CC, Ross SL, Feinglos MN, Surwit RS: Relaxation training for NIDDM: predicting who may benefit. Diabetes Care 16:1087–1094, 1993


Fahriorn S: Hypertension and biofeedback. Primary Care 3:663–682, 1991


Crockett D, Bilsker D: Bringing the feet in from the cold: thermal biofeedback training of foot warming in Raynaud’s syndrome. Biofeedback Self-Regulation 4: 431–438, 1984


Birgitta I. Rice, M S, RPh, CH ES, is an intervention specialist at The Epidemiology Clinical Research Center, School of Public Health, University of Minnesota in Minneapolis.