

# **MEDITATION'S EFFECT ON THE PHYSICAL BODY:**

## **SCIENTIFIC PROOF OF THE MIND/BODY CONNECTION**

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Many of the most prestigious universities in this country now have departments and clinics devoted to studying the connection between our mind, body and emotions. As a result, today we now understand much more about how the mind, body and emotions are connected and just how profoundly they affect one another.

There is no doubt that our brains produce the emotions that we experience and that those emotions impact the cells in our bodies. Scientists now understand that a part of our brain called the hypothalamus produces a different chemical for each emotion we experience. These chemicals, neuropeptides and neurohormones, are released through the brain's pituitary gland and sent out into the blood stream. Each cell in the human body has thousands of receptor sites that neurohormones and neuropeptides lock into, triggering a biochemical event within the cell. Therefore, science no longer doubts that emotions directly affect our physical condition.

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This understanding is just one piece to the puzzle of how and why meditation can affect our overall physical health. Given that meditation helps manage emotions and stress levels, then it logically follows that the practice would have a positive impact on the physical body and that is precisely what an a growing body of work is showing. The National Institute of Health has now funded over 120 studies on the effect of meditation on various health issues and the outcomes have been almost uniformly positive.

Even health insurance companies are now getting into the game. A recent study by the health insurance giant Aetna found that its employees who participated in a meditation program incurred an average of \$2,000 less in annual health care costs.<sup>2</sup>

### **IMMUNE SYSTEM**

It has long been acknowledged that stress plays a role in our immune system function. A relatively recent study from the University of Wisconsin showed that meditation produced long-lasting beneficial changes in immune system function. Study participants were divided into a group that received eight weeks of meditation training and a control group.

As part of the study, researchers found 50 percent more electrical activity in the left frontal regions of the meditators' brains that are associated with positive emotions and anxiety reduction.

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<sup>2</sup> "Aetna Finds Mind Body Link to Health Care Costs", Hartford Business Journal On Line, January 14, 2011.

In order to test immune function, researchers administered a flu shot to both the meditating group and the control group. Those in the meditating group had an average of a five percent increase in antibodies two months with some having increases of up to 25 percent. The level of antibodies found was shown to corresponded directly to the level of increased brain wave activity from the meditation.

In summary, the higher the brain wave increase, the higher the antibodies. Therefore, the studied showed that meditation increased immune function.<sup>3</sup>

### **GENETIC PROFILE – YOU CAN CHANGE YOUR GENES**

However, it appears that the impact of meditation actually goes deeper than the immune system or even the cells. In a 2008 study by Dr. Herbert Benson's group at Harvard, researchers analyzed blood samples taken from three different groups. One group was comprised of long-term meditators. The second, group was made up of meditators who had meditated for 8 weeks. The third and final group was a control group.

The study found that more than 2,200 genes were activated differently in the long-time practitioners relative to the controls and 1,561 genes in the short-term practitioners as compared to the controls. Some 433 of the differently activated genes were shared among the long and short-term practitioners. In

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<sup>3</sup> "Alterations in Brain and Immune Function Produced by Mindfulness Meditation", *Psychosomatic Medicine* 65:564-570 (2003). *See Also*, "University of Wisconsin Study Reports Sustained Changes in Brain and Immune Function After Meditation", *Science Daily*, Feb 4, 2003.

particular, the study found that the genes that protect the body from pain, infertility, high blood pressure, and rheumatoid arthritis were switched on. Many of the genes that protect against a process called "oxidative stress" were activated as well. Oxidative stress on the body's cellular structure is known to be involved in a wide range of health problems from Parkinson's disease to heart issues to Alzheimer's.<sup>4</sup> Oxidative stress accelerates the aging of the body's cells.

Dr. Benson concluded, "We found a range of disease fighting genes that were active in the relaxation practitioners but not active in the control group."<sup>5</sup> In summary, the researchers discovered that in long-term practitioners, far more "disease-fighting genes" were active than in the control group and that in just under two months, the genetic profile of the short term meditators began to resemble those of the long term meditators. Therefore, it appears that meditation has the potential to actually alter our genetic structure and fight disease at the DNA level.

### **HEART AND BLOOD PRESSURE**

Over 200 men and women with narrowing of the arteries in their hearts were studied over nine years to determine the effects of meditation versus education and diet and exercise

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<sup>4</sup> "Meditation, Yoga Might Switch Off Stress Genes", *Washington Post*, July 2, 2008. *See also*, "Meditation, Yoga Might Switch Off Stress Genes", *ABC News, Go. Come*, July 3, 2009.

<sup>5</sup> "Can Meditation Switch on Genes that Fight Disease", *Family Health Guide.Co.UK* *See also*, "Relax- It's Good for You", *Sydney Morning Herald*, August 20, 2009.

modifications. All participants in the study continued with their previously prescribed medications and conventional health care. The study found a 47 percent reduction in death, heart attack and stroke in those patients that meditated. Those who meditated also had clinically significant reduction in blood pressure and psychological stress.<sup>6</sup> This study alone showed the significant potential for meditation to address heart and blood pressure issues, however, there is actually a wealth of research in this area.

However, an article summarizing various studies on the impact of meditation on cardiovascular disease reported on two studies of particular additional interest. The first study investigated the health insurance records of over 2,000 individuals practicing meditation over a five year time frame found significantly less healthcare expenditures for all major disease categories when compared to groups of similar age, sex, profession and insurance. Specifically, with regards to heart disease, those who meditated had 87% lower hospitalization. The second study was a randomized control study of meditators verses nonmeditators and found a decrease in cardiovascular mortality of 30%.<sup>7</sup>

Similarly, a 2007 pilot study from the University of Pennsylvania showed that meditation could significantly reduce the severity of congestive heart failure. The

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<sup>6</sup> "Transcendental Meditation helped Heart Disease Patients Lower Cardiac Disease Risks by 50 Percent", Science Daily, November 17, 2009.

<sup>7</sup> "Cardiovascular Disease Prevention and Health Promotion with the Transcendental Meditation Program and Maharishi Consciousness-Based Health Care", NIH Public Access, March 17, 2008 pg. 7.

studies' authors believed that the meditation most likely improved heart failure by reducing sympathetic nervous symptom activation associated with stress that is known to contribute to the failing heart. These findings were consistent with research demonstrating that meditating can reduce risk factors that contributed to congestive heart failure such as high blood pressure, stress, metabolic syndrome, enlargement of the heart and hardening of the arteries.<sup>8</sup>

The Benson-Henry Institute for Mind Body Medicine and Massachusetts General Hospital conducted a three months study with patients who were not able to control their blood pressure with traditional medication. Two thirds of those who participated in the study or 40 of 60 patients were able to reduce their blood pressure with meditation and even drop some of their medication. The study determined that meditation helped increase the formation of a compound called nitric oxide, which caused blood vessels to open up thereby lowering blood pressure.<sup>9</sup>

## **CANCER**

Although the research is not yet complete with regards to whether meditation may improve cancer survival rates, the American Cancer Society already supports the use of meditation as a compliment to traditional cancer therapy. Current studies show that it appears

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<sup>8</sup> "Penn Study Shows Transcendental Meditation Can Help Combat Congestive Heart Failure", Penn Medicine News Release, March 12, 2007.

<sup>9</sup> "To Lower Blood Pressure, Open Up and Say 'Om'." NPR, August 21, 2008.

meditation adds to the body's ability to fight cancer by boosting the immune system and also managing the side effects of cancer treatment.<sup>10</sup>

A Canadian study used Mindfulness Meditation taught to patients ranging in age from 25 to 76 and having a wide variety of types and stages of cancer. Patients meditated for approximately 30 minutes a day for seven weeks. The study reported an overall reduction in Total Mood Disturbance of 65%, with a 31% reduction in Symptoms of Stress. The treatment group had significantly lower scores with regards to depression, anxiety, anger and confusion and more vigor than control subjects. Additionally the meditation group had fewer overall symptoms of stress, cardiopulmonary and gastrointestinal symptoms, less emotional irritability, depression and cognitive disorganization and fewer habitual patterns of stress. The results caused the scientists to conclude that the meditation program was effective in decreasing mood disturbance and stress symptoms in both male and female patients with a wide variety of cancer diagnoses, stages of illness and ages.<sup>11</sup>

A similar Japanese study found that mindfulness-based meditation therapy was effective for treating anxiety, depression and pain in cancer patients.<sup>12</sup>

A Harvard study on prostate cancer found that study participants who were given a regimen of diet, exercise, meditation, yoga based stretching and relaxation exercises to do for a total of an hour a day had significantly different outcomes after a year. Blood samples taken from the meditating group showed that their cancer cell growth had been inhibited by 70% while samples from the control group who received only traditional care had inhibited growth by only 9%.<sup>13</sup>

## **HIV**

UCLA's Cousins Center for Psychoneuroimmunology looked at whether mindfulness meditation could delay the progression of HIV, the immune system destroying virus that causes AIDS. The study found that by conducting an eight-week mindfulness meditation stress-management training program, those who completed the training had more CD-4 T Cells as compared to those who did not participate in the program. CD-4 T cells are attacked by HIV, causing a decline in the immune system. The study concluded that the stress-relieving effects of meditation protected these cells and the progression of the disease was thereby slowed by meditation.<sup>14</sup>

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<sup>10</sup> [www.Cancer.org/treatment/treatments and Side Effects/Complementary and AlternativeMedicine/MindBodyandSpirit/meditation](http://www.Cancer.org/treatment/treatments and Side Effects/Complementary and AlternativeMedicine/MindBodyandSpirit/meditation).

<sup>11</sup> "A Randomized, Wait-List Controlled Clinical Trial: The Effect of a Mindfulness Meditation-Based Stress Reduction Program on Mood and Symptoms of Stress in Cancer Outpatients", *Psychosomatic Medicine* 62:613-622 (2000).

<sup>12</sup> "The Efficacy of Mindfulness-Based Meditation Therapy on Anxiety Depression and Spirituality in

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Japanese Patients with Cancer", *Journal of Palliative Medicine*, Vol12, No. 12 (2009).

<sup>13</sup> "Lifestyle Therapy for Prostate Cancer: Does It Work?" Harvard Medical School Family Health Guide, 2006.

<sup>14</sup> "Practice of Mindfulness Meditation Slows the Progression of HIV, Study Shows", UCLA Newsroom, November 29, 2010.

## **MULTIPLE SCLEROSIS**

Research out of Switzerland has shown that meditation can help MS patients with many of the symptoms they face and support them in avoiding some of the side-effect producing medication that has been traditionally prescribed. Two thirds of MS patients report feeling fatigued and half of MS patients indicate that fatigue is actually their most disabling symptom. Researchers in Switzerland assigned 150 patients to either an eight-week meditation program of a control group. Those who participated in the meditation program saw their depressive symptoms drop by more than 30 percent and showed improvement in almost all measures of fatigue, depression, anxiety and quality of life.<sup>15</sup>

## **EATING DISORDERS**

A study published in the journal of Health Psychology reported significant success with a meditation-based intervention with binge eating disorder patients. Participants in the study reported a noticeable decrease in the number and proportion of binge eating episodes. Additionally, they reported a significant increase in the patient's sense of control, mindfulness, awareness of hunger and satiety cues. The study also found that the average levels of anxiety, depression, dysphoria and other sensations that usually accompany eating disorders all fell to non-clinical levels.<sup>16</sup>

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<sup>15</sup> "Meditation Soothes MS Patients," MedlinePlus: Trusted Health Information for You, October 14, 2010.

<sup>16</sup> "An Exploratory Study of a Meditation-Based Intervention for Binge Eating Disorder," Journal of Health Psychology, 4 Vol. (3), 1999: 357-363.

## **FIBROMYALGIA**

Research conducted at the University of Louisville on fibromyalgia patients indicates that meditation can help ease the depression associated with fibromyalgia. The team tracked patients' cortisol levels when they medicated in order to serve as a physical measure of stress. Cortisol levels have been found to follow a different flow in fibromyalgia patients than normal patients who do not have the disease. Study participants were asked to follow a six-week meditation program. The cortisol levels in patients that meditated were found to be significantly lower.<sup>17</sup>

## **DIABETES**

In a 2006 study published in the Archives of Internal Medicine 84 patients with coronary heart disease reduced their blood pressure and insulin resistance with just 16 weeks of meditation practice.<sup>18</sup> Insulin resistance refers to a situation where the body is unable to use insulin as effectively as normal and often occurs in the early stages of Type II diabetes.

Additionally, Initial evidence from an ongoing 1.6 million dollar study shows significant improvement in Native American diabetics who have been placed on a meditation program. This two-year

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<sup>17</sup> Mindfulness Meditation for the Pain of Fibromyalgia, MSN, December 28, 2010.

<sup>18</sup> Effects of a Randomized Controlled Trial of Transcendental Meditation on Components of the Metabolic Syndrome in Subjects with Coronary Heart Disease, Arch Intern Med/Vol. 166, June 12, 2006.

study funded is being funded in part by the US Government's Indian Health Services Department. Researchers involved in the study believe that meditation may be working to control diabetes because of its ability to reduce the levels of stress hormones such as cortisol and adrenaline that are known to negatively impact insulin and blood glucose levels.<sup>19</sup>

## **SUMMARY**

Although the science behind the ancient art of meditation is relatively recent, the results are compelling that meditation may offer the most promising approach for a society in need of health care that does not harm the body or break the bank. With the large number of studies currently underway, there is no doubt that the data on meditation will continue to grow. At this point, science appears to be on the brink of proving that meditation may be just what the doctor should be ordering.

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<sup>19</sup> Transcendental Meditation: A New Way to Manage Diabetes, Diabetes 1.Org, December 4, 2009.