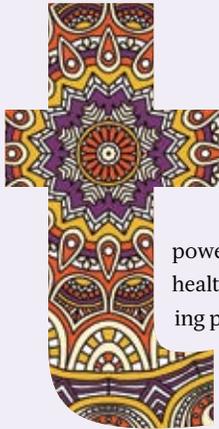


Smiling warmly in the newly opened Shaolin Institute in New Orleans' Gentilly neighborhood, kung fu grandmaster Shi Deru radiates the confident humility of the intrinsically powerful. He has been practicing meditation since growing up in China's Shaolin Temple, where kung fu, Zen (Chan), and meditation flow and blend together: "Kung fu is a way of Chan expression, a way of meditation to recover your true-self." Having completed both a medical degree in traditional Chinese medicine and an MA in exercise physiology in the U.S., he is particularly able to understand and explain the wellness benefits of meditation. Stress is key, and Deru points out that "Countless studies have shown the effect of stress on the body, both mentally and physically, and [how] it can manifest itself into different diseases such as high blood pressure or hypertension."



A Healthy State of





The idea that meditation is a healthy activity has been around, continuously and across the globe, since ancient times. (The word has the same etymological roots as “medical”—the Latin “mederi” meaning “to heal”.) Only recently, though, have biomedical scientists begun to understand the mechanisms underlying meditation’s beneficial effects, and the broad power of this simple practice to enhance health. The acceptance of meditation’s power to promote health is steadily growing among Western medical practitioners. Moreover, spurred by the burgeoning problem of chronic conditions like cardiovascular disease and diabetes, even health insurance companies have become interested in exploring this ancient practice.

Meditation is a single term for a variety of methods, some recently developed, some ancient, that involve quieting and focusing the mind in order to achieve mental and physical benefits.

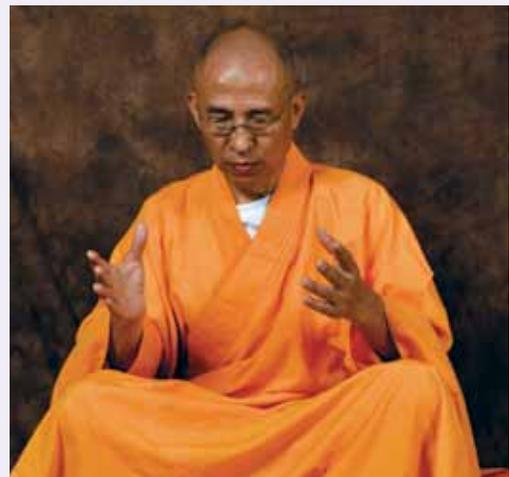
Two of the most popular and well-known meditation methods are concentrative meditation (a.k.a. focused attention meditation) and mindfulness meditation (a.k.a. open monitoring meditation).

Concentrative meditation, which includes transcendental meditation and guided imagery/visualization, focuses the mind through concentration on a repeated mantra, image, or idea.

Mindfulness meditation, which includes Zen meditation, is based on cultivating a sense of awareness of one’s thoughts, feelings, breath, and/or environment. Encouraging nonjudgmental awareness or observation of thoughts, emotions, and/or perceptions, this method is akin to a type of focused listening. Qi gong, tai chi, yoga, and walking meditation use movement as an additional point of focus to cultivate a meditative state.

What these different practices share is the achievement of a state of calm focus that both relaxes and energizes the body. This is not a sleepy or “zoned out” trance state. On the contrary, a recent EEG study of Zen meditation by German and Italian researchers Hauswald et al., suggest that it is a highly active state of mind. In the words of Shi Deru, “To meditate is to let [the life energy of the body] freely balance and flow.” One practitioner described it as the state you would want to be in if you were a samurai warrior—calm, focused, and highly aware; that is, not frenzied or agitated but not drowsy or lethargic, either.

For those of us who hold no ambitions to be samurai, kung fu temple defenders, or any other kind of warrior, though, is it worth the effort to cultivate this state? Is this really a practice for ordinary



“To meditate is to let [the life energy of the body] freely balance and flow.”

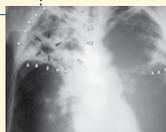
– Master Shi Deru

1896

Improving on Hale’s manometer, S. Riva Ricci invents the sphygmomanometer for measuring blood pressure.

1900

Chest x-rays allow for early diagnosis of tuberculosis



c. 1905

Radiology becomes a sub-specialty





Tulane associate professor **Nereida Parada, MD**, medical director of Balance Integrative Health

folks living in 21st Century Louisiana? Tulane associate professor Nereida Parada, MD, is emphatic that it is. The medical director of Balance Integrative Health, a multi-faceted wellness center in the New Orleans Garden District, she has also co-founded the Mind Body Center of Louisiana- a non-profit that focuses on teaching and raising awareness of the benefits of mind-body medicine. She asserts that the common health concerns of Louisianans, such as heart disease, obesity, diabetes, allergies, and asthma, are largely due to poor wellness practices in the areas of relaxation, nutrition, and exercise. While she believes that exercise is the most important of these three in the Louisiana patient population, relaxation, which meditation can help to achieve, is also vital.

Many chronic diseases commonly seen in our culture and time are largely the products of an imbalance between activation of the parasympathetic and sympathetic nervous systems. These systems, essentially physiological opposites, complement each other to respond to different survival needs. The parasympathetic system is responsible for functions like digestion, repair and healing, and sex— sometimes called the “rest and digest” or “feed and breed” response. These “peacetime” functions are all needed for optimal survival during times of safety.

During times of danger, though, the sympathetic system kicks in, with the “fight or flight”, or stress, response—increasing heart rate and contraction force, dilating the bronchioles in the lungs, and inhibiting those

“rest and digest” parasympathetic functions. Blood vessels in skeletal muscle dilate while those in gastrointestinal organs, kidney, and skin constrict, diverting the body’s resources to maximize defense in the face of a threatening force. Whereas our bodies evolved to move into the sympathetic state while in danger, and then move back to the parasympathetic state, the pressures and complexities of modern life can lead to staying in the sympathetic state for unnaturally long stretches.

Dr. Parada asserts that while a state of “sympathetic overdrive” might accelerate productivity and performance in the short-term, it is harmful in the long-term. When in a constant state of stress, the body is not allowed enough parasympathetic time, and processes like repair and healing suffer. It also leads to maladaptive immune system activation. Chronic stress leads to chronic inflammation, and stress is associated with a broad range of health problems, as different as cardiovascular disease, asthma, and irritable bowel syndrome. First described by Dr. Herbert Benson, the relaxation response is essentially the opposite of the fight-or-flight/stress response. The wellness idea behind meditation is to counter the sympathetic overdrive of chronic stress by inducing this relaxation response.

Benson’s idea of the relaxation response is strikingly parallel to the traditional Chinese medicine (TCM) idea of how meditation works, as explained by Shi Deru. The Chinese model is centered on the idea of “Qi”, which could be roughly conceptualized as life energy flow. Translating this idea into the Western physiology view, Qi

1906

Dye or contrast is used in x-rays to help visualize blood vessels, gastro-intestinal systems, and other internal systems for the first time.



Wilhelm Einthoven invents a device to measure and record the electric signature of the heart—the first electrocardiograph (ECG).

1906

1910

The diagnosis of gastrointestinal disease is improved by the use of barium sulfate.



The Chinese character for Qi



With respect to meditation, yin and yang Qi in the TCM system essentially correspond to the parasympathetic and sympathetic nervous systems of the autonomic nervous system.

corresponds to the sum of all of the hormones, nerve impulses, blood flow, etc., that work together to carry out a unified physiological function; the unified working of a biologically functional system.

Yin and yang are opposite manifestations of Qi that must work together and balance each other. With respect to meditation, yin and yang Qi in the TCM system essentially correspond to the parasympathetic and sympathetic nervous systems of the autonomic nervous system. In the TCM view, if yin and yang Qi are not in balance, sickness will result. The corresponding, emerging Western biological hypothesis is that the fight-or-flight response must be in balance with the relaxation response, and that an imbalance between the two is responsible for many of the “first world” chronic diseases commonly seen today.

A growing body of clinical evidence supports the usefulness of meditation for not only chronic diseases, but also management of conditions like multiple sclerosis, cancer, pain, and psychological disorders. Traditionally, it has also been used to enhance and direct the body’s own healing, including wound healing. In a particularly dramatic example of this, Shi Deru sustained extensive injuries when a crowd of over 100 villagers, mistakenly associating him with government officials who had taken their land, attempted to beat him to death. (As a Buddhist, he refused to fight back with any techniques that could have hurt any of the villagers.) To recuperate from the injuries he sustained, he “spent at least 26 hours meditating” and doing Qi Gong, a traditional Chinese moving meditation practice that seeks to cultivate and balance Qi.

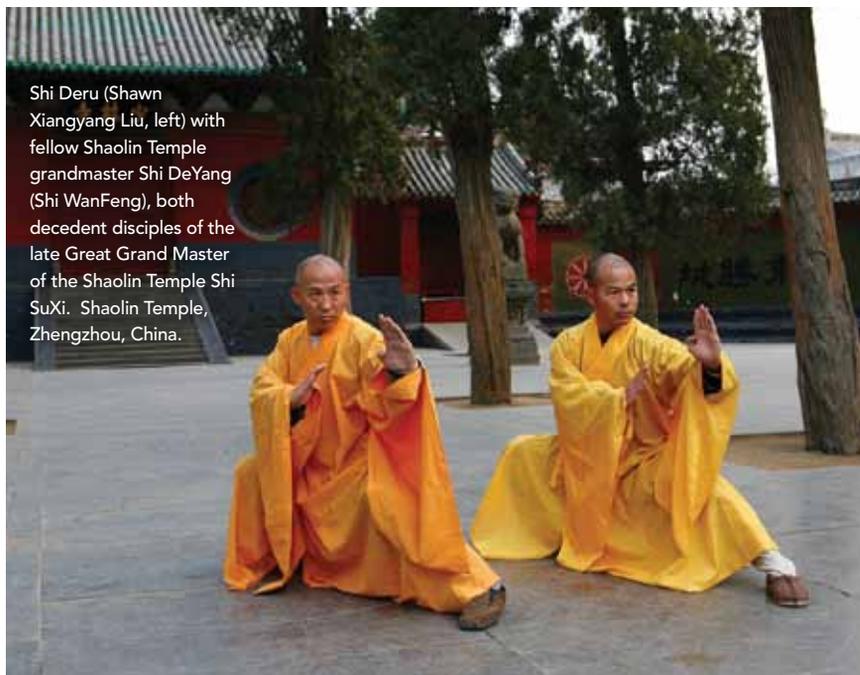
“Your body can be the most effective factory to produce the most effective drug in the world,” he explains, “One just needs the recipe found within the genes. The information can be accessed at any time, but only after having ridden oneself of both social and cultural interference through deep breathing and quiet meditation.” His ideas are supported by University of Wisconsin

researchers Davidson et al., who found that mindfulness meditation significantly increased antibody titers after influenza vaccination, compared with non-meditating controls.

As to the question of mechanisms underlying meditation’s diverse effects, one study is particularly illuminating. A collaborative team, Bhasin et al., looked at the transcripts of study subjects to characterize gene expression changes associated with meditation. Two groups of study participants were included: one group of long-term practitioners of meditation and other relaxation response-inducing practices, such as yoga and Qi Gong, and one group of novices, who had never tried any such techniques. The novices then underwent an 8-week training session in the techniques. During relaxation response-inducing test sessions, blood samples were collected from the long-term practitioners, novice practitioners before training, and novice practitioners after training.

Comparing both long term practitioners and trained novices to the novices before training, expression changes were documented in a wide array of genes, with some genes up- or downregulated only in long-term practitioners, but many also in the novices after just 8 weeks of training. Genes with upregulated expression were linked to pathways responsible for energy metabolism, the electron transport chain, biological oxidation, and insulin secretion, implying that meditation may work to enhance the efficiency of oxidation–reduction reactions in the cell, and thereby reduce oxidative stress. Downregulated genes included NF-kB and other transcription factors involved in inflammation. Decreased expression of these genes would be expected to reduce oxidative stress, insulin resistance, and apoptosis, which could reduce the likelihood of hypertension, obesity, insulin resistant diabetes mellitus, and hyperlipidemia. The long-term practitioners also showed increased expression of telomerase and other genes important for slowing cellular aging and

MEDITATION



Shi Deru (Shawn Xiangyang Liu, left) with fellow Shaolin Temple grandmaster Shi DeYang (Shi WanFeng), both decedent disciples of the late Great Grand Master of the Shaolin Temple Shi SuXi. Shaolin Temple, Zhengzhou, China.

maintaining genomic stability.

In addition to the Bhasin et al. transcriptome study, several other reports have found a reduction in oxidative stress in response to meditation. One such study looked at Kouksundo, a traditional Korean mind-body practice that is similar to yoga but emphasizes deep-breathing meditation. After practicing Kouksundo for an average of about 3 years, participants had significantly lower reactive oxygen species, as well as significantly lower nitric oxide and malondialdehyde levels, all markers of oxidative stress, and reduced levels of the stress hormones cortisol and norepinephrine.

Another body of research has examined neural changes associated with meditation.

Structural changes seen in long-term meditators include increased cortical thickness in a number of areas, increased gray matter density, increased hippocampal volume, and reduced age-related loss of gray matter. Changes in white matter can already be detected after just short-term meditation training. In terms of outcomes, mind-body techniques like meditation have been shown to be effective against a range of mental health disorders, from depression to PTSD, while significantly reducing perceived stress.

The use of meditation in the hospital is also growing. However, “we tend to do this very late in disease,” states Dr. Parada. “Cardiac rehabilitation, pulmonary rehabilitation...we tend to do it very late in the

spectrum of the disease, but we really should start these things as young as possible.” According to Dr. Parada, most people don’t realize how much stress they are under and what a profound effect it can have. “You have to motivate people very kindly to become aware that they do have stress in their lives,” she says, adding that stress can take many different forms, and that there are good stressors and bad stressors. “There can be family tensions, work tensions, relationship tensions, and financial stress, which can be a very big one”, but “even good changes in life, like a new job or a new child, can have an effect on the body physiologically.” Meditation, as well as other tools like biofeedback, can help foster this kind of awareness and help induce the relaxation response needed to balance the stress.

While the scientific study of meditation is in its infancy, the belief in its power for well-being is far from new. “Half an hour’s meditation each day is essential, except when you are busy. Then a full hour is needed.” This prescription, made way back in the Renaissance by Catholic priest Saint Francis de Sales, concurs with the beliefs of contemporary Buddhist leaders like Thich Nhat Hanh and the Dalai Lama. Sufi and mystic Jewish traditions have also embraced the value of meditation, as have Hindu practices predating the Buddha by over 1,000 years. Now, it’s science’s turn, and an expanding body of data is supporting meditation’s potential as a tool for healing, preventative medicine, and well-being. ■

1945

First visualization of the coronary arteries.

1955

The x-ray image intensifier allows dynamic x-ray imaging that can be shown on television screens.

1946

Development of the film cassette changer by George Schoenander allows for a series of cassettes to be exposed at a rapid rate.

