

The Science of Meditation

Functional Medicine doctor meditating.

“Mindfulness is about being fully awake in our lives. It is about perceiving the exquisite vividness of each moment. We also gain immediate access to our own powerful inner resources for insight, transformation, and healing.” – Jon Kabat-Zinn, PhD

For thousands of years, cultures have recommended mindful practice to cultivate well-being, and over the last several years, incredible scientific advances have been made to confirm its benefits. While scientific understanding of meditation is still in its infancy, research suggests that mindfulness practice is a powerful modulator of structural and functional brain plasticity.¹⁻³

Two common types of meditation include focused attention (FA), including Himalayan yoga, mantra, and metta, and open-monitoring (OM) meditation, including zen, Isha yoga, shoonya yoga, and vipassana. Both types have been shown to enhance attention control, emotion regulation, and self-awareness, and improve cognitive control of conflict.² There is evidence that FA, OM, and Transcendental Meditation result in both long-term and short-term changes in the brain, including increases in the cortical thickness of regions like the prefrontal cortex and insula.² All forms of meditation result in significant changes in cortical and subcortical activity; however, different forms elicit activation in different regions of the brain.²

Beyond the brain, meditation has been found to influence physiological variables like heart rate, respiratory rate, systolic blood pressure, and diastolic blood pressure.⁴ In a 2012 study, the effect of short- and long-term Brahmakumaris Raja yoga meditation was shown to improve basic cardio-respiratory functions. Raja yoga shifted the autonomic balance in favor of the parasympathetic system in those who practiced it long-term (more than five years).⁴

In 2015, Raja yoga was studied again, and it was suggested that in long-term meditators, the shifting of the autonomic balance to the parasympathetic side may combat the ill effects of stress.⁵ Not just for patients, several studies have looked at the effectiveness of mindfulness-based interventions for clinicians,^{6,7} and have identified a range of beneficial physiological and psychological outcomes. For healthcare professionals, it is suggested that mindfulness meditation reduces stress, anxiety, and burnout, and enhances resilience.⁷

Poor stress-coping contributes to the development of chronic diseases, and a 2003 study in blood cells found that the mindfulness-based stress reduction (MBSR) program reduced cytokine secretion, oxidative stress, and DNA damage.⁸ Researchers in a 2014 study on gene expression found that after a meditative intervention, there was a decreased expression of pro-inflammatory genes (RIPK2 and COX2) in meditators compared with controls.⁹

Chronic work-related stress is a significant risk factor for cardiovascular and metabolic diseases and mortality.¹⁰ Meta-analysis concluded that work stress can increase the risk of myocardial infarction by 50%.¹¹ Management of stress and the sympathetic response not only affects hormonal systems but significantly affects neurological, biochemical, and other influences that play a role in pain and systemic metabolic functioning.¹² A study examining the effects of a meditative tai chi program in chronic heart failure participants showed that regular practice had a beneficial effect not only on health-related quality of life and resilience, but also on body mass index and blood pressure levels.¹²

Studies have also suggested that yoga can affect cardiac autonomic regulation.¹³ Although the mechanism by which yoga influences autonomic activity is not well understood, a 2016 study found that some yoga practices appear to directly stimulate the vagus nerve and enhance parasympathetic output, leading to parasympathetic dominance and enhanced cardiac function, mood, and energy states, as well as enhanced neuroendocrine, metabolic, cognitive, and immune responses.¹³

In Functional Medicine, mental, emotional, and spiritual balance form the center of the matrix and influence the other biological systems. Learn more about how to create and sustain lifestyle change at IFM's premier course, *Applying Functional Medicine in Clinical Practice (AFMCP)*.

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