

Study Shows Meditation Changes Brain Structure in Just 8 Weeks

By Suzannah Moss – Family Health Guide Senior Writer

Participants in an 8 week mindfulness meditation class experienced structural brain changes including increased grey-matter density in the hippocampus, known to be important for learning and memory, and in structures associated with self-awareness, compassion and introspection.

This is the first research to document meditation-produced changes in the brain.

Previous research has identified differences in brain activity and structure between practised meditators and non-meditators.

Researchers noted that long-term meditation alters brain-wave patterns, with greater activity in brain circuits involved in attention. They also found that brain regions associated with attention and sensory processing were thicker in meditators than in controls. The question was whether people with a thicker brain cortex in areas associated with awareness and sensory processing were more likely to meditate.

The current study is the first to document that these structural changes are in fact produced by meditation.

"This study demonstrates that changes in brain structure may underlie some of these reported improvements and that people are not just feeling better because they are spending time relaxing," said study author Sara Lazar, PhD, of the MGH Psychiatric Neuroimaging Research Program

During the study MR images of participants' brain structure were taken two weeks prior to and immediately following an eight week mindfulness based stress reduction programme. MR brain images were also taken of a control group over a similar time interval.

The meditation course consisted of weekly meetings including guided meditation and audio meditations to do at home on a daily basis. Analysis of MR images found increased grey-matter density in the hippocampus, known to be important for learning and memory, and in structures associated with self-awareness, compassion and introspection. Participant-reported reductions in stress also were correlated with decreased grey-matter density in the amygdala, which is known to play an important role in anxiety and stress.

"It is fascinating to see the brain's plasticity and that, by practicing meditation, we can play an active role in changing the brain and can increase our well-being and quality of life." says Britta Hölzel, PhD, first author of the paper and a research fellow at MGH and Giessen University in Germany.

The research will be published in the January 30 issue of Psychiatry Research: Neuroimaging

Further health benefits of meditation

Several studies designed specifically to understand the beneficial effects of meditation have shown that meditation helps to prevent heart disease, [reduce pain](#), reduce blood pressure, reduce cholesterol, decrease anxiety and help manage asthma².

Meditation has been shown to increase alpha waves (relaxed brain waves) and decrease production of the stress hormone cortisol. It appears that some of the positive physical changes associated with meditation have their roots in stress management.

Conditions benefitted by meditation

- **Pain:** There is a body of research work indicating that meditation can reduce chronic pain³. One notable study conducted at the Texas Tech University found that meditation in conjunction with traditional medicine enhances the effectiveness of western medical treatment. In another study published in the Journal of Behavioural Medicine, patients suffering from backache, chronic migraine and tension headaches were able to significantly reduce pain medication⁴. Another study found that people who meditate regularly find pain less unpleasant.⁵
- **HIV:** There is emerging evidence from other studies that shows that meditation and behavioral stress-management programs can buffer HIV declines in HIV-positive people⁶
- **High Cholesterol:** In two prospective, random assignment studies, meditation reduced total cholesterol over a relatively short period (three months)⁷ as well as a long period (11 months)⁸.
- **Anxiety and Depression:** Since the early sixties, scientists have speculated that meditation improves mental functioning. Meditation decreases oxygen consumption, heart rate, respiratory rate, and blood pressure, and increases the intensity of alpha, theta, and delta brain waves, the opposite of the physiological changes that occur during the stress response. •
- **Diabetes:** Meditation also aids in [controlling blood sugar](#) levels. Researchers at the University of Virginia have shown that following meditation, reduced stress levels correlate with a decrease in blood glucose levels.⁹
- **Hypertension:** Besides its role as a stress buster, meditation also reduces blood pressure¹⁰ and contributes to the overall reduction in risk of cardiovascular disease.

Meditation is more than just a way for us to get in touch with ourselves and calm a busy mind. It appears that meditation has a direct effect on the physical body, brain activity and underlying brain structure. So what are you waiting for? [Benefits of Meditation and How to Get Started](#)



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