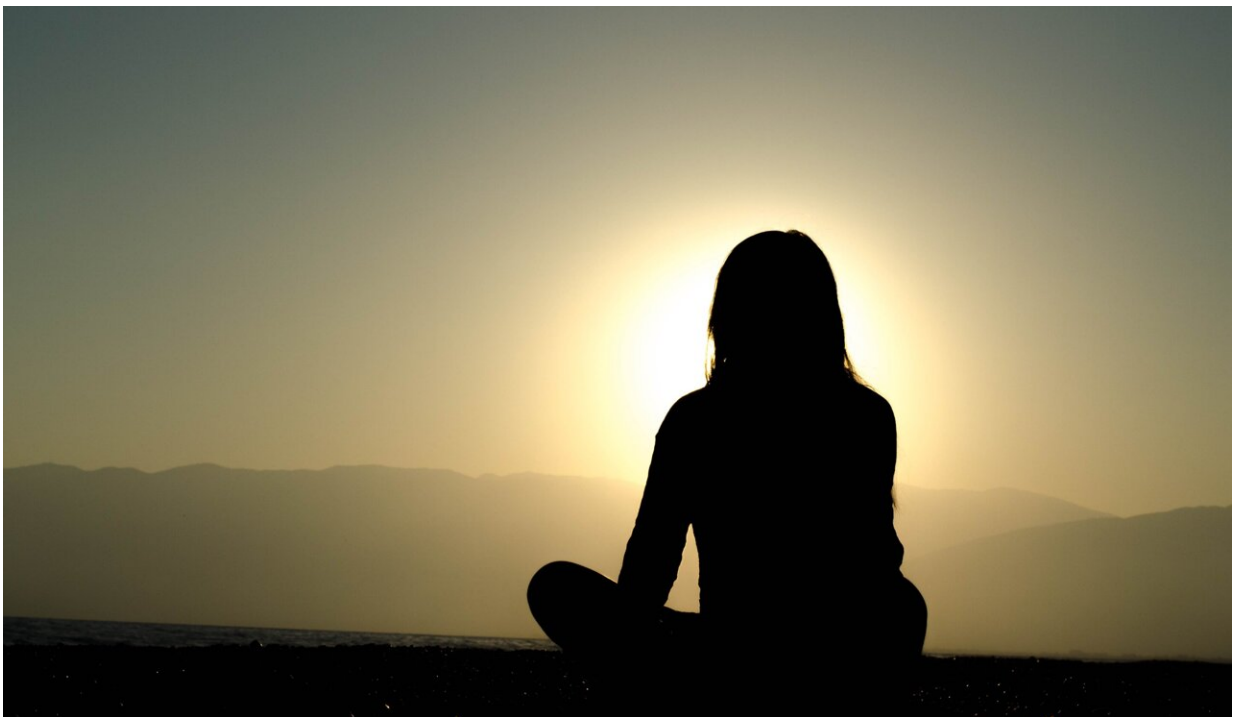


# **New research reveals an advanced form of meditation impacts the brain and is linked to aspects of well-being**

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Using advanced brain scanning technology, a team led by investigators at Massachusetts General Hospital (MGH), a founding member of Mass General Brigham (MGB), have revealed insights into what happens in the brain during an advanced form of meditation called jhana.

By uncovering distinct patterns of activity in different regions of the brain during jhana, the research suggests exciting possibilities for innovative therapies merging ancient [meditation](#) practices with modern neuroscience to improve well-being.

For the study published in [Cerebral Cortex](#), scientists conducted a form of ultra-high field [functional magnetic resonance](#) imaging on a volunteer who was an adept meditator with more than 25 years of meditation experience. Imaging data were collected during 27 sessions of jhana over five consecutive days.

The advanced absorptive meditation practice known as jhana is linked to self-transcendence, which is sometimes called ego-dissolution or insight into "no self," and also attentional capacities and internally-generated joy and equanimity—qualities that are important for well-being and often disrupted in various psychiatric disorders.

"This study used an ultra-high field strength 7T [magnetic resonance](#) imaging system for enhanced brain mapping precision that has never been used in any study of meditation, let alone advanced meditation. This technology enabled us to evaluate the activity, with high precision, of the cortex, subcortex, brainstem, and cerebellum during a form of advanced concentration meditation known as jhana," says senior author Matthew D. Sacchet, Ph.D., the director of the [Meditation Research Program](#) and an assistant professor of Psychiatry at MGH and Harvard Medical School.

"This allowed us to gain insights into the overall functioning of the whole brain in the context of jhana meditation, including the rarely studied brainstem and cerebellum."

Sacchet and his colleagues also observed correlations between [brain activity](#) during jhana and attention, jhanic qualities (including joy,

mental ease, equanimity and formlessness), and self-perception.

"This research is foundational for the development of cutting-edge interventions for supporting well-being and treating mental health conditions. These interventions could involve developing novel meditation-based therapies grounded in advanced meditation, such as jhana, which have received extremely limited attention from science," says Sacchet.

"Our neuroscientific insights may directly inform neurotechnology including neurofeedback and brain stimulation that may be applied to target specific brain systems implicated in advanced meditation. Our work holds significant and untapped promises in alleviating suffering and promoting human flourishing."

Sacchet and his team intend to develop an increasingly comprehensive science of advanced meditation through the development of a research center at MGH and HMS focused on this work. The group is currently collecting [brain](#) imaging data from additional meditators and is exploring additional methods to understand jhana and other forms of advanced meditation.

Additional authors include Winson F.Z. Yang, Avijit Chowdhury, Marta Bianciardi, Remko van Lutterveld, and Terje Sparby.

**More information:** Winson Fu Zun Yang et al, Intensive whole brain 7T MRI case study of volitional control of brain activity in deep absorptive meditation states, *Cerebral Cortex* (2023). [DOI: 10.1093/cercor/bhad408](https://doi.org/10.1093/cercor/bhad408)

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