Chemical Benefits of Meditation

What happens inside you when you sit, breathe and attend

Every time you sit down to meditate, your body responds. Breathing slows, muscles soften and your nervous system shifts out of alarm. Researchers have spent decades measuring what changes inside the body, and the picture keeps growing richer. Some early claims have held up well, and some turned out to be more modest than hoped.

Here is what the research shows today, in plain language, with free links so you can read further.

1. Less Cortisol, the Stress Hormone

Cortisol helps you rise to a challenge. When it stays high for weeks, though, it can raise blood pressure and blood sugar, weaken immunity, disturb sleep and add weight around the belly. Reviews of many studies find that meditation and mindfulness practices lower cortisol, with the clearest effects in people under strain. They also show lower blood pressure and resting heart rate, and less C-reactive protein, a marker of inflammation.

Read more: Pascoe and colleagues, “Mindfulness mediates the physiological markers of stress: Systematic review and meta-analysis,” Journal of Psychiatric Research (2017). https://pubmed.ncbi.nlm.nih.gov/28863392/

2. More GABA, the Brain’s Calming Messenger

GABA is the main chemical messenger that tells nerve cells to slow down, and low GABA is linked with anxiety, insomnia and depression. In a 12-week study, people who practiced yoga, which pairs movement with breath and meditative attention, showed larger rises in brain GABA, better mood and less anxiety than people who walked for the same amount of time.

Read more: Streeter and colleagues, “Effects of yoga versus walking on mood, anxiety, and brain GABA levels,” Journal of Alternative and Complementary Medicine (2010). https://pmc.ncbi.nlm.nih.gov/articles/PMC3111147/

3. Natural Pain Relief

Meditation can ease pain, and the body’s own painkillers, the endorphins, are only part of the story. In a 2016 study, mindfulness eased pain even when the body’s opioid system was blocked with medication. Meditation seems to bring relief through its own pathways, which means it may pair well with other kinds of pain care.

Read more: National Center for Complementary and Integrative Health (NCCIH), “Mindfulness Meditation Relieves Pain, But Works Differently Than Opioids in the Body.” https://www.nccih.nih.gov/research/research-results/mindfulness-meditation-relieves-pain-but-works-differently-than-opioids-in-the-body

4. Melatonin and Deeper Sleep

Melatonin, made by the pineal gland deep in the brain, tells your body it is time to sleep, and stress can lower it. Small studies have found higher nighttime melatonin in people who meditated in the evening. Larger reviews show that mindfulness meditation improves sleep quality about as well as other proven approaches.

Read more: NCCIH, “Meditation and Mindfulness: Effectiveness and Safety.” https://www.nccih.nih.gov/health/meditation-and-mindfulness-effectiveness-and-safety

5. Serotonin, DHEA and Mood

Serotonin helps steady mood, sleep and appetite. DHEA is a hormone that tends to fall with age and long-term stress. A handful of older studies found higher levels of both in longtime meditators, but that evidence is thin and hard to separate from other parts of their lives. The mood benefits themselves are much better established: a major review of 47 trials found that meditation programs eased anxiety, depression and pain.

Read more: Goyal and colleagues, “Meditation programs for psychological stress and well-being: a systematic review and meta-analysis,” JAMA Internal Medicine (2014). https://pubmed.ncbi.nlm.nih.gov/24395196/

6. A Calmer Immune System

Ongoing stress keeps the immune system on high alert, and that low, steady inflammation wears on the body over time. A review of randomized trials found that mindfulness meditation reduced signs of inflammation and was linked with stronger immune defenses in some groups.

Read more: Black and Slavich, “Mindfulness meditation and the immune system: a systematic review of randomized controlled trials,” Annals of the New York Academy of Sciences (2016). https://pmc.ncbi.nlm.nih.gov/articles/PMC4940234/

7. Caring for Your Cells as You Age

Telomeres are protective caps on the ends of your chromosomes, a bit like the plastic tips on shoelaces, and they wear down with age and stress. A review of several trials found mindfulness meditation linked with higher activity of telomerase, the enzyme that helps maintain them.

Read more: Schutte and Malouff, “A meta-analytic review of the effects of mindfulness meditation on telomerase activity,” Psychoneuroendocrinology (2014). https://rune.une.edu.au/web/handle/1959.11/14859

Bringing Meditation Into Your Life

- **Start small.** Five or ten minutes most days does more for your body than an hour once in a while.
- **Find a form that fits you.** Sitting with the breath, walking slowly, gentle yoga, chanting and body scans are all doorways into the same house.

- **Choose a regular time.** Linking practice to something you already do, like morning tea or the drive home, helps it take root. Even micro-mindfulness moments can help slow down the internal rumble. Breathe deeply for the 30 seconds you're in the bathroom, the few minutes it takes the coffee to brew or the 20 seconds at a stoplight. These natural pauses in the cadence of life are good opportunities for a mindfulness moment.
- **Bring your parts along.** If a restless or doubtful part of you shows up, welcome it. It can sit with you too.
- **Go gently with hard memories.** If closing your eyes stirs up distress, open them, move your body or shorten the practice, and reach out for support.

Calling on Support

Meditation has always been a way of keeping company with something larger than yourself, and the living world is a patient teacher. Sit at the edge of the tide and let your breath follow its rhythm. Rest your gaze on the embers of a fire, or listen as crickets tune up the dusk and rain drums on the roof. A mountain can show you how to stay rooted through every kind of weather, and a heron waiting at the water's edge can show you patience. You might invite an ancestor who prayed, chanted or sat in contemplation to keep you company, or the future self who has made practice a home. And let each sitting rest in the Great Mystery, or whatever name you give the sacred, so that every breath becomes a small offering.

A Final Word

Each time you sit, you give your body a chance to remember how to rest and repair. The chemistry follows the practice, one breath at a time.

Free Resources

- NCCIH's plain-language guide to meditation research: nccih.nih.gov/health/meditation-and-mindfulness-effectiveness-and-safety
- Every study above is free to read at the link given with it.
- Related handouts: Visualization Research, Binaural Beats and Sleep Hygiene.

Influences and Credits

These summaries are written fresh from the research linked above, and all credit for the studies belongs to their authors.

- Welcoming restless and doubtful parts comes from Internal Family Systems, developed by Dr. Richard Schwartz.
- Calling on the support of the living world and the unseen comes from Neoshamanic IFS (NIFS), the approach I practice and teach.