

# get the facts

## Meditation: What You Need To Know



© Goodshoot

### What's the Bottom Line?

#### How much do we know about meditation?

Many studies have been conducted to look at how meditation may be helpful for a variety of conditions, such as high blood pressure, certain psychological disorders, and pain. A number of studies also have helped researchers learn how meditation might work and how it affects the brain.

#### What do we know about the effectiveness of meditation?

Research suggests that practicing meditation may reduce blood pressure, symptoms of irritable bowel syndrome, anxiety and depression, insomnia, and the incidence, duration, and severity of acute respiratory illnesses (such as influenza). Evidence about its effectiveness for pain and as a smoking-cessation treatment is uncertain.

#### What do we know about the safety of meditation?

Meditation is generally considered to be safe for healthy people. However, people with physical limitations may not be able to participate in certain meditative practices involving movement.

### What Is Meditation?

Meditation is a mind and body practice that has a long history of use for increasing calmness and physical relaxation, improving psychological balance, coping with illness, and enhancing overall health and well-being. Mind and body practices focus on the interactions among the brain, mind, body, and behavior.

There are many types of meditation, but most have four elements in common: a quiet location with as few distractions as possible; a specific, comfortable posture (sitting, lying down, walking, or in other positions); a focus of attention (a specially chosen word or set of words, an object, or the sensations of the breath); and an open attitude (letting distractions come and go naturally without judging them).

U.S. DEPARTMENT OF HEALTH  
AND HUMAN SERVICES

National Institutes of Health  
National Center for Complementary  
and Alternative Medicine



**NIH** National Center for  
Complementary and  
Alternative Medicine

## **What the Science Says About the Effectiveness of Meditation**

Many studies have investigated meditation for different conditions, and there's evidence that it may reduce blood pressure as well as symptoms of irritable bowel syndrome and flare-ups in people who have had ulcerative colitis. It may ease symptoms of anxiety and depression, and may help people with insomnia. Meditation also may lower the incidence, duration, and severity of acute respiratory illnesses (such as influenza).

Meditation has been studied for many conditions including the following:

### **High Blood Pressure**

- Results of a 2009 NCCAM-funded trial involving 298 university students suggest that practicing Transcendental Meditation may lower the blood pressure of people at increased risk of developing high blood pressure.
- The findings also suggested that practicing meditation can help with psychological distress, anxiety, depression, anger/hostility, and coping ability.
- A literature review and scientific statement from the American Heart Association suggest that evidence supports the use of Transcendental Meditation (TM) to lower blood pressure. However, the review indicates that it's uncertain whether TM is truly superior to other meditation techniques in terms of blood-pressure lowering because there are few head-to-head studies.

### **Irritable Bowel Syndrome**

- Results of a 2011 NCCAM-funded clinical trial that enrolled 75 women suggest that practicing mindfulness meditation for 8 weeks reduces the severity of irritable bowel syndrome (IBS) symptoms.
- A 2013 review concluded that mindfulness training improved IBS patients' pain and quality of life but not their depression or anxiety. The amount of improvement was small.

### **Ulcerative Colitis**

- In a 2014 pilot study, 55 adults with ulcerative colitis in remission were divided into two groups. For 8 weeks, one group learned and practiced mindfulness-based stress reduction (MBSR) while the other group practiced a placebo procedure. Six and 12 months later, there were no significant differences between the 2 groups in the course of the disease, markers of inflammation, or any psychological measure except perceived stress during flare-ups. The researchers concluded that MBSR might help people in remission from moderate to moderately severe disease—and maybe reduce rates of flare-up from stress.

## **Anxiety, Depression, and Insomnia**

- A 2014 literature review of 47 trials in 3,515 participants suggests that mindfulness meditation programs show moderate evidence of improving anxiety and depression. But the researchers found no evidence that meditation changed health-related behaviors affected by stress, such as substance abuse and sleep.
- A 2012 systematic review and meta-analysis of 36 randomized controlled trials found that 25 of them reported statistically superior outcomes for symptoms of anxiety in the meditation groups compared to control groups.
- In a small, NCCAM-funded study, 54 adults with chronic insomnia learned mindfulness-based stress reduction (MBSR), a form of MBSR specially adapted to deal with insomnia (mindfulness-based therapy for insomnia, or MBTI), or a self-monitoring program. Both meditation-based programs aided sleep, with MBTI providing a significantly greater reduction in insomnia severity compared with MBSR.

## **Smoking Cessation**

- Findings from a 2013 systematic review suggest that meditation-based therapies may help people quit smoking; however, the small number of available studies is insufficient to determine rigorously if meditation is effective for this.
- A 2011 randomized controlled trial comparing mindfulness training with a standard behavioral smoking cessation treatment found that individuals who received mindfulness training showed a greater rate of reduction in cigarette use immediately after treatment and at 17-week followup.
- Results of a 2013 brain imaging study suggest that mindful attention reduced the craving to smoke, and also that it reduced activity in a craving-related region of the brain.
- However, in a second 2013 brain imaging study, researchers observed that a 2-week course of meditation (5 hours total) significantly reduced smoking, compared with relaxation training, and that it increased activity in brain areas associated with craving.

## **Other Conditions**

- Results from a 2011 NCCAM-funded study of 279 adults who participated in an 8-week Mindfulness-Based Stress Reduction (MBSR) program found that changes in spirituality were associated with better mental health and quality of life.
- Data from a 2013 literature review concluded that practicing mindfulness meditation may enhance immune function, particularly among patients with cancer or HIV/AIDS.
- Guidelines from the American College of Chest Physicians published in 2013 suggest that MBSR and meditation may help to reduce stress, anxiety, pain, and depression while enhancing mood and self-esteem in people with lung cancer.

- Clinical practice guidelines issued in 2014 by the Society for Integrative Oncology (SIO) recommend meditation as supportive care to reduce stress, anxiety, depression, and fatigue in patients treated for breast cancer. The SIO also recommends its use to improve quality of life in these people.
- Meditation-based programs may be helpful in reducing common menopausal symptoms, including the frequency and intensity of hot flashes, sleep and mood disturbances, stress, and muscle and joint pain. However, differences in study designs mean that no firm conclusions can be drawn.
- Because only a few studies have been conducted on the effects of meditation for attention deficit hyperactivity disorder (ADHD), there isn't sufficient evidence to support its use for this condition.
- A 2014 literature review and meta-analysis suggested that mind and body practices, including meditation, reduce chemical identifiers of inflammation and show promise in helping to regulate the immune system.
- Results from a 2013 NCCAM-supported study involving 49 adults suggest that 8 weeks of mindfulness training may reduce stress-induced inflammation better than a health program that includes physical activity, education about diet, and music therapy.
- There's some evidence that forms of meditation may help with chronic pain, but research has shown mixed results.

## **Meditation and the Brain**

Some research suggests that meditation may physically change the brain and body and could potentially help to improve many health problems and promote healthy behaviors.

- In a 2012 study, researchers compared brain images from 50 adult meditators and 50 adult non-meditators. Results suggested that people who practiced meditation for many years have more folds in the outer layer of the brain. This process (called gyrification) may increase the brain's ability to process information.
- A 2013 review of three clinical studies suggests that meditation may slow, stall, or even reverse changes that take place in the brain due to normal aging.
- Results from a 2012 NCCAM-funded study suggest that meditation can affect activity in the amygdala (a part of the brain involved in processing emotions), and that different types of meditation can affect the amygdala differently even when the person is not meditating.
- Research about meditation's ability to reduce pain has produced mixed results. However, in some studies scientists suggest that meditation activates certain areas of the brain in response to pain.

## **What the Science Says About Safety and Side Effects of Meditation**

- Meditation is generally considered to be safe for healthy people.
- People with physical limitations may not be able to participate in certain meditative practices involving movement. People with physical health conditions should speak with their health care providers before starting a meditative practice, and make their meditation instructor aware of their condition.
- There have been rare reports that meditation could cause or worsen symptoms in people with certain psychiatric problems like anxiety and depression. People with existing mental health conditions should speak with their health care providers before starting a meditative practice, and make their meditation instructor aware of their condition.

## **NCCAM-Funded Research**

NCCAM-supported studies are investigating meditation for:

- Relieving psychological distress and improving physical health in people with type 2 diabetes
- Regulating emotions
- Relieving stress and enhancing weight management
- Reducing stress and improving sleep and psychological well-being to reduce the risk of heart disease.

## **More to Consider**

- Don't use meditation to replace conventional care or as a reason to postpone seeing a health care provider about a medical problem.
- Ask about the training and experience of the meditation instructor you are considering.
- Help your health care providers give you better coordinated and safe care by telling them about all the health approaches you use. Give them a full picture of what you do to manage your health. For tips about talking with your health care providers about complementary health approaches, see NCCAM's Time to Talk campaign at [nccam.nih.gov/timetotalk](http://nccam.nih.gov/timetotalk).

## **For More Information**

### **NCCAM Clearinghouse**

The NCCAM Clearinghouse provides information on NCCAM and complementary health approaches, including publications and searches of Federal databases of scientific and medical literature. The Clearinghouse does not provide medical advice, treatment recommendations, or referrals to practitioners.

Toll-free in the U.S.: 1-888-644-6226

TTY (for deaf and hard-of-hearing callers): 1-866-464-3615

Web site: [nccam.nih.gov](http://nccam.nih.gov)

E-mail: [info@nccam.nih.gov](mailto:info@nccam.nih.gov)

## **PubMed®**

A service of the National Library of Medicine, PubMed contains publication information and (in most cases) brief summaries of articles from scientific and medical journals.

Web site: <http://www.ncbi.nlm.nih.gov/pubmed>

## **NIH Clinical Research Trials and You**

The National Institutes of Health (NIH) has created a Web site, NIH Clinical Research Trials and You, to help people learn about clinical trials, why they matter, and how to participate. The site includes questions and answers about clinical trials, guidance on how to find clinical trials through ClinicalTrials.gov and other resources, and stories about the personal experiences of clinical trial participants. Clinical trials are necessary to find better ways to prevent, diagnose, and treat diseases.

Web site: [www.nih.gov/health/clinicaltrials/](http://www.nih.gov/health/clinicaltrials/)

## **Research Portfolio Online Reporting Tools Expenditures & Results (RePORTER)**

RePORTER is a database of information on federally funded scientific and medical research projects being conducted at research institutions.

Web site: [projectreporter.nih.gov/reporter.cfm](http://projectreporter.nih.gov/reporter.cfm)

## **Key References**

Barrett B, Hayney MS, Muller D, et al. Meditation or exercise for preventing acute respiratory infection: a randomized controlled trial. *Annals of Family Medicine*. 2012;10:337-346.

Brewer JA, Mallik S, Babuscio TA, et al. Mindfulness training for smoking cessation: results from a randomized controlled trial. *Drug and Alcohol Dependence*. 2011;119(1-2):72-80.

Brook RD, Appel RJ, Rubenfire M, et al. Beyond medications and diet: alternative approaches to lowering blood pressure: a scientific statement from the American Heart Association. *Hypertension*. 2013;61(6):1360-1383.

Carim-Todd L, Mitchell SH, Oken BS. Mind-body practices: an alternative, drug-free treatment for smoking cessation? A systematic review of the literature. *Drug and Alcohol Dependence*. 2013;132(3):399-410.

Chen KW, Berger CC, Manheimer E, et al. Meditative therapies for reducing anxiety: a systematic review and meta-analysis of randomized controlled trials. *Depression and Anxiety*. 2012;29(7):545-562.

Cramer H, Haller H, Lauche R, et al. Mindfulness-based stress reduction for low back pain. A systematic review. *BMC Complementary and Alternative Medicine*. 2012;12(162):1-8.

Dakwar E and Levin FR. The emerging role of meditation in addressing psychiatric illness, with a focus on substance use disorders. *Harvard Review of Psychiatry*. 2009;17(4):254-267.

Desbordes G, Negi LT, Pace TW, et al. Effects of mindful-attention and compassion meditation training on amygdala response to emotional stimuli in an ordinary, non-meditative state. *Frontiers in Human Neuroscience*. 2012;6:1-15.

- Fang CY, Reibel DK, Longacre ML, et al. Enhanced psychosocial well-being following participation in a mindfulness-based stress reduction program is associated with increased natural killer cell activity. *Journal of Complementary and Alternative Medicine*. 2010;16(5):531-538.
- Gaylord SA, Palsson OS, Garland EL, et al. Mindfulness training reduces the severity of irritable bowel syndrome in women: results of a randomized controlled trial. *American Journal of Gastroenterology*. 2011;106(9):1678-1688.
- Goldstein CM, Josephson R, Xie S, et al. Current perspectives on the use of meditation to reduce blood pressure. *International Journal of Hypertension*. 2012;2012:578397.
- Goyal M, Singh S, Sibinga EM, et al. Meditation programs for psychological stress and well-being: a systematic review and meta-analysis. *JAMA Internal Medicine*. 2014;174(3):357-368.
- Greeson JM, Webber DM, Smoski MJ, et al. Changes in spirituality partly explain health-related quality of life outcomes after Mindfulness-Based Stress Reduction. *Journal of Behavioral Medicine*. 2011;34(6):508-518.
- Jedel S, Hoffman A, Merriman P, et al. A randomized controlled trial of mindfulness-based stress reduction to prevent flare-up in patients with inactive ulcerative colitis. *Digestion*. 2014;89:142-155.
- Lakhan SE, Schofield KL. Mindfulness-based therapies in the treatment of somatization disorders: a systematic review and meta-analysis. *PLoS One*. 2013;26;8(8):e71834.
- Lerner R, Kibler JL, Zeichner SB. Relationship between mindfulness-based stress reduction and immune function in cancer and HIV/AIDS. *Cancer and Clinical Oncology*. 2013;2(1):62-72.
- Luders E. Exploring age-related brain degeneration in meditation practitioners. *Annals of the New York Academy of Sciences*. 2013;1307:82-88.
- Luders E, Kurth F, Mayer EA, et al. The unique brain anatomy of meditation practitioners: alterations in cortical gyrification. *Frontiers in Human Neuroscience*. 2012;6:1-9.
- Nidich SI, Rainforth MV, Haaga DAF, et al. A randomized controlled trial on effects of the transcendental meditation program on blood pressure, psychological distress, and coping in young adults. *American Journal of Hypertension*. 2009;22(12):1326-1331.
- Morgan N, Irwin MR, Chung M, et al. The effects of mind-body therapies on the immune system: meta-analysis. *PLOS One*. 2014;9(7):1-14.
- Ong JC, Manber R, Segal Z, et al. A randomized controlled trial of mindfulness meditation for chronic insomnia. *Sleep*. 2014;37(9):1553-1563.
- Reiner K, Tibi L, Lipsitz JD. Do mindfulness-based interventions reduce pain intensity? A critical review of the literature. *Pain Medicine*. 2013;14:230-242.
- Rosenkranz M, Davidson RJ, MacCoon D, et al. A comparison of mindfulness-based stress reduction and an active control in modulation of neurogenic inflammation. *Brain, Behavior, and Immunity*. 2013;27(1):174-184.
- Rubia K. The neurobiology of meditation and its clinical effectiveness in psychiatric disorders. *Biological Psychology*. 2009;82(1):1-11.
- Tang Y-Y, Tang R, Posner MI. Brief meditation training induces smoking reduction. *Proceedings of the National Academy of Sciences*. 2013;110(34):13971-13975.

Westbrook C, Creswell JD, Tabibnia G, et al. Mindful attention reduces neural and self-reported cue-induced craving in smokers. *Social Cognitive and Affective Neuroscience*. 2013;8(1):73-84.

Zeidan F, Grant JA, Brown CA, et al. Mindfulness mediation-related pain relief: evidence for unique brain mechanisms in the regulation of pain. *Neuroscience Letters*. 2012;520(2):165-173.

## **Acknowledgments**

NCCAM thanks the following individuals for their technical expertise and review of this publication: Richard J. Davidson, Ph.D., Vilas Professor, Psychology and Psychiatry, University of Wisconsin-Madison; Jeffrey M. Greeson, Ph.D., M.S., Assistant Professor, Psychiatry and Behavioral Sciences, Duke University Medical Center; Helané Wahbe, N.D., Assistant Professor, Neurology, Oregon Health & Science University; and John Glowa, Ph.D., and John (Jack) Killen, Jr., M.D., NCCAM.

*This publication is not copyrighted and is in the public domain.  
Duplication is encouraged.*

NCCAM has provided this material for your information. It is not intended to substitute for the medical expertise and advice of your primary health care provider. We encourage you to discuss any decisions about treatment or care with your health care provider. The mention of any product, service, or therapy is not an endorsement by NCCAM.

National Institutes of Health



U.S. Department of Health and Human Services