

# Mythbusters: Complementary and Alternative Treatments in Cancer

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September 02, 2014

Over the past decade, complementary and alternative medicine (CAM) has grown into a multi-billion-dollar industry in the United States, with the use of CAM interventions becoming increasingly popular among cancer patients.

Studies estimate that at least half of cancer patients use some type of complementary intervention,<sup>[1]</sup> though the reported range varies from less than 10% to more than 60%.<sup>[2]</sup> The number of patients who seek out alternative therapies is quite low, with experts estimating that the percentage falls in the single digits.

Although the term "CAM" combines complementary and alternative medicine, distinguishing the two is important. Complementary interventions are only intended to supplement mainstream care and are used primarily to control symptoms and bolster physical and emotional well-being throughout treatment.

"Although we can't rely on complementary therapies to shrink a tumor, if given together with chemotherapy or radiation therapy, such interventions may improve quality of life and possibly survival as well," said Gary Deng, MD, PhD, interim Chief of Integrative Medicine at Memorial Sloan Kettering Cancer Center in New York City. "It's a common misconception that cancer treatment is all about shrinking the tumor. Reducing anxiety or pain can make an enormous impact on a patient's day-to-day quality of life."

Alternative therapies, however, are meant as a substitute for mainstream care. Both supporters and skeptics of complementary treatments agree that alternative modalities are not viable substitutes for mainstream care and that using any in lieu of conventional medicine is dangerous.

"We discourage our patients from using alternative interventions instead of mainstream therapies because they will miss the opportunity for proper care," said Dr. Deng. "Even the best chemotherapy does not cure cancer. Surgery is the only cure."

David Rosenthal, MD, Medical Director of Integrative Therapies at Dana-Farber Cancer Institute and a professor in the Department of Medicine at Harvard Medical School, agrees about the harms of alternative medicine. "A major problem is there are still quacks claiming alternative cures," he said.

That is why a growing number of oncologists and policy makers want to abandon the term "CAM" in favor of "integrative oncology," which focuses solely on combining mainstream and complementary care.

These integrative services facilitate communication between oncologists and patients, providing an environment where patients can share their concerns and disclose any complementary interventions they already use or would like to try.

Disclosing this information is particularly important because some complementary modalities can interact with chemotherapy drugs. "Many patients don't realize that herbs and supplements -- one of

the most common complementary interventions -- are drugs, and that some have been shown to interact with chemotherapy and can be harmful to patients," said Steven Novella, MD, a neurologist and assistant professor at Yale University School of Medicine who is executive editor of the blog [Science-Based Medicine](#).

Still, many patients don't inform their doctors about their CAM use. One study found that only 58% of men with prostate cancer had told their physician about using CAM interventions, and even fewer asked their family physician (15%) or oncologist (7%) for guidance regarding CAM use.<sup>[3]</sup>

When it comes to treating cancer, "there are no magic bullets," Dr. Rosenthal said. Patients need proper, evidence-based guidance to get the best possible care and to avoid risky treatments.

In this column, Medscape will delve into the scientific validity of popular complementary interventions, from acupuncture to Reiki, exploring common myths about these modalities and examining what the scientific literature and experts in the field say about their safety and effectiveness.

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## Exercise

**Proposition:** *Engaging in physical activity, such as walking, running or recreational sports, can improve cancer survival.*

**What the science says:** The benefits of exercise for both mental and physical health cannot be denied. Since 1996, the Centers for Disease Control and Prevention has recommended that adults engage in moderate-intensity activities, such as a brisk walk or jog, for at least 30 minutes 5 days a week.<sup>[4]</sup> In 2008, the American Cancer Society (ACS) reiterated these recommendations, providing a wealth of new evidence to support the role of exercise in cancer prevention and for promoting overall health.<sup>[5]</sup>

A growing body of research now suggests that exercise may not only help protect people from developing cancer but also may increase survival in those already diagnosed.<sup>[6]</sup> A 2005 prospective, observational study, which followed almost 3000 women diagnosed with nonmetastatic breast cancer, found that those who engaged in moderate physical activity -- equivalent to walking 3-5 hours each week at a modest pace -- significantly lowered their risk of dying from breast cancer compared with their more sedentary peers.<sup>[7]</sup>

Exercise may also enhance survival for those diagnosed with nonmetastatic colorectal cancer.<sup>[8]</sup> In one observational study which followed 573 women diagnosed with stage I, II, or III colorectal cancer, those who were physically active after their diagnosis, regardless of their prediagnosis exercise regimen, were less likely to die from cancer or in general. And the more exercise they did, the better their odds became: Those who engaged in 6 or more hours of moderate exercise each week, including walking, bicycling, swimming, and running, reduced their risk of dying from cancer by about half compared with their peers who exercised less than 1 hour per week.

For men with prostate cancer, the data also look promising. In a prospective study, which followed 47,620 men in the United States over 14 years, researchers from Harvard School of Public Health analyzed the relationship between cancer incidence and reported physical activity levels.<sup>[9]</sup> Although the researchers did not find an association between exercise and survival in younger men, in men 65 years and older, regular vigorous activity did appear to slow the progression of both advanced and

fatal prostate cancer. The authors concluded that "regular vigorous activity could slow the progression of prostate cancer and might be recommended to reduce mortality from prostate cancer."

Encouraging results from a 2014 prospective cohort study showed an association between exercise and survival in men diagnosed with a range of cancers.<sup>[10]</sup> The study followed 1021 men diagnosed with cancer for 2 decades, in which time the men completed questionnaires about their level of physical activity. Those who engaged in more frequent and vigorous exercise, measured by their estimated weekly calorie burn, had the lowest risk of dying from cancer. The best survival advantage occurred in men who burned over 3000 calories per week, which is equivalent to about 45 minutes to an hour of hiking or jogging 5 days a week for a typical 150- to 200-lb man.

**What the expert says:** According to Dr. Deng, "Physical activity is the only integrative oncology therapy with a survival advantage."

Cheryl L. Rock, PhD, RD, a professor in the Department of Family and Preventive Medicine at the University of California, San Diego, added, "Exercising not only lowers a person's risk of developing cancer and makes it less likely they will have a recurrence, but it also increases the odds of cancer survival. For patients diagnosed with cancer, exercise enhances quality of life and can change how the body metabolizes food, which may promote important healing processes."

As an oncologist who practices integrative oncology, Dr. Rosenthal tries to get patients to increase their activity levels to at least 30 minutes a day, 5 days a week. "Although the specific type of exercise may vary, patients do need to get their heart rate up, so the exercise should be higher-impact, such as jogging, as opposed to stretching or yoga. Even on a bad day, doing just 5-10 minutes could have preventative and rehabilitative effects," he said. In fact, Dr. Rosenthal noted, "at the Dana-Farber Cancer Center, we give chemotherapy to some patients while they walk on a treadmill."

The evidence supporting exercise in cancer care is so compelling that most experts consider physical activity to be part of mainstream, not complementary, treatment. "At this point, exercise and diet regimens can easily be considered conventional medicine," said David Gorski, MD, PhD, a surgical oncologist at the Barbara Ann Karmanos Cancer Institute in Detroit who specializes in breast cancer surgery.

Despite the clear benefits of physical activity, Dr. Deng cautioned, "We can't give patients generic advice about exercising after they are diagnosed with cancer. There are many nuances to developing an appropriate exercise program that is tailored to patients' individual condition and needs -- one that takes into account their personal preferences, whether they are overweight or underweight, their current diet, their type and severity of cancer."

**Verdict:** Confirmed. The evidence showing that regular moderate-to-vigorous exercise improves survival for men and women diagnosed with a range of cancers is compelling.

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## Acupuncture

**Proposition:** *Acupuncture reduces nausea, vomiting, and pain from cancer.*

**What the science says:** Acupuncture is an ancient Chinese technique in which practitioners insert needles into specific points on the body, called acupoints, to stimulate nerves and release the body's natural energy flow, called Qi. Cancer patients use acupuncture primarily to help relieve pain and

reduce nausea and vomiting, with one study estimating its prevalence among cancer patients to be about 5%.<sup>[11]</sup>

Despite hundreds of studies evaluating acupuncture, its benefits to cancer patients remain unclear. The majority of studies cannot distinguish between the genuine pain-relieving effects of acupuncture and its robust placebo effect.

In a 2012 systematic review, researchers identified 15 randomized controlled trials (RCTs) evaluating the efficacy of acupuncture for reducing cancer pain alone or in combination with analgesics.<sup>[12]</sup> Although acupuncture was no more effective at relieving pain than drug therapy, patients who received acupuncture alongside a pain medication reported significantly less discomfort compared with those who only received analgesics. Still, the authors could not draw firm conclusions about the pain-relieving benefits of acupuncture, given that most of the trials were poorly designed.

A 2006 review, which included 11 RCTs, evaluated whether a variety of acupuncture methods could reduce chemotherapy-induced nausea and vomiting compared with sham acupuncture. The analysis revealed that, overall, acupuncture reduced the incidence of vomiting but not nausea severity, except in patients who underwent acupressure.<sup>[13]</sup>

Preliminary data also suggest that acupuncture may help relieve a slew of other symptoms, including hot flashes, fatigue, and depression and anxiety.<sup>[14-16]</sup> Additionally, acupuncture may reduce the quantity of opioids patients need to control their pain after surgery. One systematic review found that individuals required fewer pain medications post-surgery when they underwent real acupuncture compared with sham acupuncture.<sup>[17]</sup>

**What the experts say:** According to Dr. Rosenthal, "acupuncture is evidence-based for reducing chemotherapy-induced nausea, vomiting, and fatigue, and almost 70% of users are acupuncture responders. Although not yet proven, acupuncture may also be helpful for relieving neuropathy, hot flashes, insomnia, and decreasing anxiety and stress. Overall, acupuncture appears to be a safe technique that can help treat some side effects of cancer and improve quality of life."

Harriet Hall, MD, a retired family physician and Air Force flight surgeon who writes the SkepDoc column in *Skeptical* magazine, is much more cautious about the benefits of acupuncture. "The published evidence on acupuncture indicates that it might be helpful for pain and possibly for postoperative nausea and vomiting, but not for any other indications. There are studies showing that acupuncture may help with subjective symptoms like fatigue and chemotherapy-related nausea in cancer patients, but it is difficult to design studies that control adequately for nonspecific effects and bias, and the entire body of research is consistent with just what would be expected from a treatment that has no specific effects but acts only as a theatrical placebo. Some acupuncture proponents argue that the technique causes endorphin release in the brain, but so does taking a sugar pill. Endorphin release is merely an indication that a placebo effect is at work." Dr. Hall also stressed, "There is no evidence that acupuncture prolongs survival or slows the course of the disease in any way. Any claims that acupuncture can cure cancer must be disregarded."

Dr. Gorski agreed, noting that "if you have an intervention that claims to treat everything from infertility, headaches, back pain, and dry mouth from radiation, it is more likely a treatment that is good for nothing and simply relies on placebo effects. In my opinion, the evidence for acupuncture is weak, at best."

In regard to prevalence of the placebo effect, Dr. Rosenthal's response is, "So what? If an intervention is making you feel better and it's safe, then what is the harm? The main disadvantage to acupuncture is making it more widely available and getting insurance companies to cover it."

**Verdict:** Plausible for pain, nausea, and vomiting. Although the evidence conflicts, it appears that acupuncture does reduce pain, nausea, and vomiting for some cancer patients. With a low-risk intervention such as acupuncture, some experts believe that the importance of a perceived benefit may trump clinical benefit.

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## Massage

**Proposition:** *Massage therapy reduces cancer patients' pain and anxiety.*

**What the science says:** Massage, defined as the systematic manipulation of soft tissues, is increasingly being incorporated into integrative oncology programs as a way to reduce cancer-related stress and pain. More than 20% of patients with cancer use massage alongside their mainstream care.<sup>[18]</sup>

The evidence in support of this practice, however, is mixed. Many studies report that massage alleviates a range of symptoms, including pain, nausea, anxiety, depression, and stress, but often the study methodology is flawed, making it difficult to provide definitive recommendations.

In one meta-analysis, Edzard Ernst, MD, Emeritus Professor of Complementary Medicine at the University of Exeter, evaluated evidence from 14 RCTs examining the extent to which classic massage (also known as Swedish massage) therapy improved cancer patients' quality of life.<sup>[19]</sup> The most robust study, which compared classic massage to light touch in 380 advanced cancer patients with moderate to severe pain, found that both groups reported reductions in pain, but those in the classic massage group reported significantly greater relief.<sup>[20]</sup> Still, Dr. Ernst noted, two of the studies did not show a significant benefit to massage in relation to pain, anxiety, depression, and sleep quality, while the remaining 11 were fraught with weaknesses, including small sample sizes and lack of a control group. Despite these flaws, Dr. Ernst concluded that overall the data suggest that massage can help reduce cancer-related pain, nausea, and anxiety.

Another systematic review assessing the potential benefits of massage in cancer patients came to a similar conclusion.<sup>[21]</sup> Among the 10 RCTs evaluated, the authors reported that massage or aromatherapy massage may reduce cancer patients' anxiety, pain, and nausea in the short term, but "the lack of rigorous research evidence precludes drawing definitive conclusions."

Part of the difficulty is separating out the benefits of massage therapy and simple touch.<sup>[20]</sup> Additionally, some experts have raised concerns over potential adverse effects of massage. In a 2005 review, Lisa Corbin, MD, from the Center for Integrative Medicine at the University of Colorado Hospital, found potential harmful effects of massage, ranging from bruising to internal hemorrhaging, fracture, and increased pain or infection.<sup>[18]</sup> Although rare, these types of adverse events become more likely when a person is inadequately trained or is using a more forceful technique, such as shiatsu or Rolfing.<sup>[22]</sup>

Generally, the evidence points to massage being an effective tactic to control symptoms and improve quality of life, but in order to minimize risk for injury, massage must be shaped to the needs of each patient.

**What the expert says:** According to Dr. Gorski, "Massage is perfectly fine for patients who enjoy it, and if massage makes cancer patients feel better and improves their quality of life, then it is worthwhile." But, he noted, "I take issue when massage is co-opted and turns into massage therapy. Medicalizing the things we do normally to feel good can lead to exaggerated or false claims about their benefits."

**Verdict:** Plausible.

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## Sugar-Free Diet

**Proposition:** *Cutting sugar out of one's diet will stop a tumor from growing.*

**What the science says:** After a cancer diagnosis, patients frequently ask their oncologist about the foods they should and shouldn't eat. A particularly common query is whether eliminating sugar will help starve tumor growth.

At a glance, the evidence appears quite compelling. Consuming copious amounts of sugar is associated with a slew of poor health outcomes, including diabetes, obesity, and cardiovascular disease. And studies have consistently shown a link between excess consumption of refined sugars and greater cancer risk as well as a rather robust relationship between being overweight or obese and an increased likelihood of developing cancer.<sup>[5,23]</sup>

One comprehensive review published in 2011 looked at whether reducing glucose consumption could help prevent or treat cancer.<sup>[24]</sup> Studies showed that when starved of glucose, tumor cells commit cell suicide in vitro, and that high glucose concentrations may alter gene expression in ways that promote cell growth in tumor cells studied in vitro. Still, there are no RCTs in humans that have evaluated whether sugar fuels cancer growth.

"It is true that when a cell becomes a cancer cell, it changes its cellular metabolism, and in a cell culture dish, a cancer cell prefers sugar," said Dr. Rock. "But in the context of the human body, cancer cells don't behave the same way, so we can't extrapolate from the cell culture to humans."

According to the 2012 ACS guidelines on nutrition and physical activity for cancer prevention, the best diet advice is to consume mostly fruits, vegetables, lean meats, low-fat dairy products, and whole grains and to limit the consumption of red and processed meats and alcohol as well as high-fat, high-calorie foods that may promote weight gain.<sup>[5]</sup> One study found that adhering to the ACS dietary guidelines was associated with lower mortality from cancer, cardiovascular diseases, and any cause.<sup>[25]</sup> This prospective study evaluated the effects of dietary patterns on the risk for cardiovascular, cancer, and all-cause mortality among 72,113 healthy women. After following these women for 18 years, the researchers determined that those who consumed a diet high in red and processed meats, refined grains, and desserts had a 16% greater risk of dying from cancer and a 21% greater risk of dying from any cause compared with those who followed a healthful diet of mostly vegetables, fruit, fish, poultry, and whole grains. Although the study did not separate out the effects of different foods on cancer mortality, it contributes to a growing body of literature that demonstrates that maintaining a generally healthy diet can decrease the risk of developing and dying from cancer.

**What the experts say:** "The sugar in your diet won't promote cancer growth, and there are no studies to date that show that avoiding sugar will shrink a tumor," said Dr. Rock. "Still, no oncologist or

nutritionist would recommend a high-sugar diet because patients would be missing out on the beneficial nutrients."

But, Dr. Rock added, "When patients go through chemo- or radiation therapy, their tastes often change and they may lose weight. If putting sugar in food helps some patients get the vitamins and minerals they need, then eating sugar is not such a bad thing. Overall, though, it's best not to consume foods with added sugar or fat."

According to Dr. Deng, eating too much sugar is bad for us -- not just from a cancer standpoint but for many other health reasons. "Although we don't have evidence that eliminating refined sugar will shrink tumor and prolong survival, doing so is a low-risk lifestyle change and will certainly not harm patients. We are not talking about giving people a toxic drug, so there is very little downside." Still, Dr. Deng cautioned, "None of the radical anticancer diets that employ restrictive regimens have been shown to improve survival. The downside to such restrictive diets is that patients run the risk of depriving themselves of essential nutrients."

**Verdict:** Unconfirmed for a potential anticancer effect of eliminating sugar, but it's important to minimize excess sugar intake as part of maintaining a generally healthy diet.

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## Antioxidants

### Dietary Supplements

**Proposition:** *Consuming antioxidant-rich supplements may protect against cancer and prevent tumor growth.*

**What the science says:** Dietary supplement use has become particularly prevalent among cancer patients. One review found that 64% to 81% of cancer survivors take vitamin and mineral supplements and 14% to 32% of patients begin using supplements after they're diagnosed.<sup>[26]</sup>

Antioxidants in particular have garnered notoriety for their potential to heal. Hype over the therapeutic properties of antioxidants began to emerge after research revealed that consuming fruits and vegetables, which are rich in antioxidants, may lower the incidence of cancer and heart disease and prolong life.<sup>[27]</sup>

Antioxidants do participate in an essential biological balancing act: The human body naturally produces antioxidants to neutralize the effects of oxidation. During oxidation, the body generates free radicals -- unstable molecules that can damage cells by tearing away their electrons -- and an overabundance of free radicals has been linked to an increased risk for cancer.

But when researchers began examining the role that antioxidant supplementation might play in cancer prevention, the evidence was largely disappointing. The bulk of studies found that antioxidant supplements do not reduce the risk for cancer or prevent tumor growth, and that antioxidant supplementation may actually increase people's likelihood of dying from cancer.

In a 2004 meta-analysis from the *Lancet*, researchers evaluated 14 RCTs that compared the effects of antioxidant supplementation with a placebo on the incidence of esophageal, gastric, colorectal, pancreatic, and liver cancers.<sup>[27]</sup> They found that consuming vitamins A, C, and E and beta-carotene and selenium supplements actually increased overall mortality. A 2009 RCT in *JAMA*, which explored the effects of selenium and vitamin E supplementation on prostate cancer risk in 35,533 healthy men,

failed to find evidence that selenium, vitamin E, or both supplements reduced participants' risk for prostate cancer.<sup>[28]</sup> In fact, the study uncovered an increased risk for prostate cancer in participants who consumed vitamin E. A follow-up to this trial, also published in *JAMA*, revealed that vitamin E supplements increased the risk for prostate cancer in healthy men.<sup>[29]</sup>

For cancer patients receiving radiation therapy, antioxidant supplements may be harmful. A 2006 RCT of 540 patients with head and neck cancer who were undergoing radiation treatment found that patients who consumed vitamin E and beta-carotene supplements each day had a significantly increased likelihood of dying compared with those who took a placebo.<sup>[30]</sup>

**What the experts say:** According to Dr. Rock, "Consuming antioxidants through fruits and vegetables is the best option for cancer patients. When we get our antioxidants from food, our body can regulate how much cells are actually exposed to, whereas supplements may shock the body with high doses of a substance. In fact, antioxidants derived from supplements may interact with chemotherapy and radiation therapy and thus be potentially dangerous. Chemotherapy creates oxidative stress that kills cancer cells, so taking antioxidants may interfere with that process, making it more likely that the therapy won't work."

Yale's Dr. Novella also stressed that although vitamins and herbs may seem harmless, "they can have potent pharmacologic activity, which may counteract chemotherapy. Another problem with supplements is that they are poorly regulated, so users don't really know what they're getting in terms of dose or purity."

**Verdict:** "Busted" for supplements, though it is plausible that antioxidants from food may be beneficial.

## Curcumin

**Proposition:** *Curcumin supplements can help shrink tumors.*

**What the science says:** Curcumin, a main ingredient in the Indian spice turmeric, has been shown to exhibit anticancer activity against colorectal cancer in cell cultures.<sup>[31]</sup> Several studies have also revealed potential anticancer activity in cancer patients receiving curcumin alongside chemotherapy. In one study, general surgeons from China reported that patients with colorectal cancer who received curcumin supplements prior to surgery appeared to exhibit enhanced anticancer activity as well as improved general health.<sup>[32]</sup> In a phase 2 trial, researchers at MD Anderson Cancer Center studied the effects of 8 g of curcumin daily on 21 patients with advanced pancreatic cancer, and found no curcumin-related toxic effects.<sup>[33]</sup> Two patients even showed improvements in disease progression.

Still, no RCTs have examined the anticancer effects of curcumin, and some studies have found that curcumin may interact with certain chemotherapy agents.<sup>[34]</sup> Other limitations to curcumin supplementation are that the body excretes most of the compound, and that it's unclear whether curcumin in isolation or turmeric consumed in combination with other spices provides the greatest benefit.<sup>[35]</sup>

**What the experts say:** According to Dr. Rock, "Curcumin does have biological activity, but we don't know how the body reacts to curcumin supplements, which provide very high concentrations of the compound. When we eat foods like curry, we don't absorb very much of the curcumin, which is how your body protects itself."

Dr. Rosenthal cautioned that "in pharmacologic doses, curcumin may interfere with some chemotherapy agents. I think we put too much onus on herbs, botanicals, and supplements before we know their true safety and effectiveness. I believe we should focus on getting the bulk of our nutrients from food."

**Verdict:** Unconfirmed.

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## Reiki

**Proposition:** *Reiki can diminish cancer pain and stress.*

**What the science says:** The ACS, Cancer Research UK, and the National Center for Complementary and Alternative Medicine agree that there is no clinical or scientific evidence to suggest that Reiki can effectively treat any condition, including cancer.

Some studies do suggest that this ancient Japanese form of spiritual healing, which purportedly works through the transfer of spiritual energy, or Qi, from the practitioner to the patient, may help relieve stress and reduce pain, but most of these studies are poorly designed.

One systematic review analyzed data from 9 RCTs exploring the effects of Reiki on a range of conditions, including depression, pain, anxiety, and stress, and found mixed results.<sup>[36]</sup> Several RCTs reported greater pain relief and lower anxiety in the true Reiki group compared with the sham control, but others found no differences in anxiety or pain. A 2014 literature review, which looked at 7 RCTs, 4 of which studied cancer patients, found some evidence to suggest that Reiki therapy may help relieve pain and anxiety, but it concluded that further study was required to reach a definitive conclusion.<sup>[37]</sup>

One recent RCT, which looked at whether Reiki therapy could improve patients' well-being, came to a rather compelling conclusion.<sup>[38]</sup> In the study, 189 patients undergoing chemotherapy in an outpatient center were randomly assigned to receive Reiki therapy, sham Reiki placebo therapy, and standard care. Patients in both the Reiki therapy and sham groups reported significant improvements in their comfort and well-being after a therapy session. The authors found that it was the one-on-one support during chemotherapy that was the key to their enhanced quality of life, regardless of whether Reiki was used.

**What the expert says:** According to Dr. Gorski, "The evidence for the efficacy of Reiki, and energy-based medicine in general, is weak to nonexistent. Training yourself to relax, on the other hand, can be evidence-based, but a lot of other modalities get thrown into the mind-body wastebasket. The claim that Reiki practitioners can manipulate patient's energy field is nonsense."

**Verdict:** Plausible for reducing anxiety and improving relaxation, though the effects are not necessarily better than any other relaxation technique. "Busted" for the claim that Reiki reduces pain and anxiety by channeling a person's energy field.

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## Meditation

**Proposition:** *Meditation diminishes anxiety, stress, and depression in cancer patients.*

**What the science says:** Meditation as a complement to cancer treatment does appear to improve patients' quality of life and reduce anxiety and pain. Studies consistently show that high levels of stress can boost inflammation, which may increase the risk of developing cancer, having a recurrence, or

dying from the disease.<sup>[39]</sup> Alternatively, meditation or other relaxation techniques have been shown to alleviate anxiety, depression, and stress and even enhance immune function.<sup>[40]</sup>

One recent meta-analysis that included 9 studies, 2 of which were RCTs, found that various mindfulness-based stress-reduction techniques decreased stress, depression, and anxiety in breast cancer patients.<sup>[41]</sup> Another meta-analysis, which evaluated 3 RCTs, found that mindfulness-based stress reduction, which included meditation and yoga, reduced depression and anxiety in breast cancer patients receiving mainstream treatments significantly more than those who just received conventional care.<sup>[42]</sup>

**What the experts say:** "Although there is no evidence that meditation reduces cancer recurrence or increases survival in cancer patients, it may enhance relaxation and overall quality of life," said Dr. Rock.

According to Dr. Deng, when it comes to integrating mind-body interventions, such as meditation, into mainstream care, the burden of proof doesn't need to be high. "With chemotherapy, we have to be very certain that it will help patients because it is a high-risk treatment that needs to be tailored to a patient's particular pathology and genome. Meditation, however, won't hurt patients so the requirement for trying it is quite low. Research shows that mindfulness meditation, yoga, and other relaxation techniques reduce stress and improve quality of life. Whether a patient chooses to do meditation, yoga, or tai chi to relax is a choice that depends on a person's belief system, personality, cultural background, and general likes and dislikes. Mind-body techniques are essentially different tools that serve the same purpose, so it is a moot point to compare their effectiveness. It's more about what works for each person."

**Verdict:** Confirmed for diminishing stress, depression, and anxiety.

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Cite this article: Mythbusters: Complementary and Alternative Treatments in Cancer. *Medscape*. Sep 02, 2014