

# Complementary Therapies in CHRONIC CARE™

Practical Applications of Alternative Medicine for CHF, Diabetes, and Chronic Disease

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## Add these alternative weapons to your pain-relief arsenal for kids

*Acupuncture, controlled breathing, visualization all have place*

“**T**his won't hurt a bit,” you tell your young patient as you are about to administer an injection that delivers a stinging, burning medication.

Think of it from the viewpoint of a 4-year-old: The needle looks like it is 3 feet long, and the medication you inject feels like fire in her vein. The patient could develop a little mistrust. After all, you promised it wouldn't hurt — didn't you?

Children feel pain, perhaps even more keenly than adults, says **Brenda McClain, MD, DADPM**, associate professor of anesthesiology at Yale School of Medicine in New Haven, CT. McClain is the director of Yale's Pediatric Pain Management Services.

### *No reason for children to suffer*

“There is no reason for any child to suffer through a medical procedure, however minor it may be,” says McClain.

From minor methods, such as using distraction techniques for a vaccination, to major ones, such as acupuncture and guided imagery to relieve pain of advanced cancers, McClain's mission is to keep her small patients as comfortable as possible.

### KEY POINTS

- Complementary therapies can help children find relief from painful chronic disease conditions.
- Therapies used in conjunction with traditional pharmacologic methods of pain relief can offer additional analgesia and possibly reduce or eliminate the need for medications.
- Acupuncture can offer immediate relief from some types of pain, including chronic migraine, and sometimes provides long-term relief as well.
- Controlled breathing, guided imagery, and distraction methods all are effective in temporarily relieving pain.

In the past, she says, some physicians and parents were hesitant to use common pain medications in children for fear they were too strong. Others contended that the infant nervous system was too immature to feel pain. But current research shows that even premature infants feel pain, and young infants may even be more vulnerable to pain than adults.

Of the millions of children who undergo surgery every year, many receive inadequate pain relief,

which prolongs the recovery period and can delay wound healing, McClain adds.

This can result in heightened sensitivity to pain, a change in temperament, and distrust of adults, physicians, and other caregivers. “When proper pain management is used, physicians have observed a faster return to normal activities, a lower risk of complications, and shorter hospital stays,” she says.

McClain has used complementary pain therapies for children with cancer, sickle cell anemia, migraines, reflex sympathetic dystrophy, and postoperative pain from a variety of types of surgery.

The first step to providing complementary forms of pain relief in conjunction with mainstream pharmacology is to simply explain alternatives and adjuncts to routine pain medications to the child’s family, she says.

“Some families will request complementary therapies like acupuncture, but most don’t even know they exist,” she explains.

And another important tenet to remember, says McClain, is never lie to the patient. “Don’t tell

*“Sometimes, the effect is immediate when the needles are inserted at the proper meridians. The first treatment is usually the most dramatic, and I like to see [patients] three times or more if it is necessary.”*

them it won’t hurt if it will. You don’t have to tell them, ‘This is going to hurt,’ instead you can say it will feel like a bee sting or it may burn a little,” she advises.

From there, the jump to complementary therapies such as acupuncture, controlled breathing, distraction, and a variety of meditation techniques is a relatively short one.

### **Acupuncture: Fast and effective**

Acupuncture is by far the most effective and fastest form of pain relief say McClain and her colleague **Shu-Ming Wang**, MD, an anesthesiologist who practices acupuncture, among other techniques, in Yale’s Pediatric Pain Management Service.

“Sometimes, the effect is immediate when the needles are inserted at the proper meridians,” says Wang. “The first treatment is usually the most dramatic, and I like to see [patients] three times or more if it is necessary.”

Textbooks say such patients should have three treatments a day, but that simply is not practicable, says Wang, so she devised a way of giving them almost continuous treatment until they get relief.

For some patients who may need multiple treatments, such as teen-agers with migraines, Wang developed a self-stimulation technique that involves placing a needle in the ear lobes, anchoring it with tape, and sending patients home to move the needles three times a day.

### **Hold the phone**

The patients can sleep, shower, and conduct their normal activities without any problems, although Wang notes that sometimes needles are dislodged or can become painful when patients use the telephone. Wang recommends placing needles in the ear the patients least often use when on the phone.

“I had a 16-year-old boy with chronic

## **COMING IN FUTURE MONTHS**

■ Confusion: Patients don’t know which diet advice to take these days, so they are taking none

■ This Bud’s good for you: Studies show powerful cardioprotective effects of moderate beer consumption

■ Health care insurance and complementary therapies: Pressure is on to cover more modalities, including spiritual interventions

■ CAM in practice? How well are you integrating it?

migraines whose pain disappeared after the first treatment. I saw him two more times and then he did not return because he had no more pain,” says Wang.

There are many theories about how acupuncture works, and some of them are a stretch for the Western mind because they are based on Eastern medical precepts that seem at odds with Western mainstream medicine.

However, Wang notes there is scientific evidence that acupuncture stimulates the nerve endings and sends signals to the central nervous system to modify neurotransmitters, which then modify the perception of pain.

“Some colleagues accuse me of practicing voodoo — or the kinder ones say acupuncture simply provides a psychological placebo effect,” she says. “I say if it’s a placebo, so be it.”

Eastern and Western medicine do not have to be at odds, says Wang, who grew up in a Chinese culture and received her medical education in the United States. “If we can combine the best of Eastern and Western medicine and relieve our patients’ pain while using fewer drugs, why not?”

She says she has recently been encouraged by the depth of interest in acupuncture and other complementary therapies among interns and residents. “It seems to me the new generation of physicians in training are more open-minded to different medical approaches and, as they begin to practice, they will facilitate this combination of approaches to medicine.”

### ***Take a deep breath***

Physicians treating young patients with sickle cell anemia at Grady Health System in Atlanta have discovered they can add complementary therapies to their arsenal against the pain of this debilitating disease.

Deep breathing and visualization seem to have a beneficial physiological effect as well as psychological benefits, says **Beatrice Gee**, MD, assistant professor of pediatrics at Morehouse School of Medicine, also in Atlanta, and co-director of Grady’s Pediatric Sickle Cell Clinic.

Ideally, patients are taught deep abdominal breathing and visualization techniques before getting in a sickle cell crisis, because the technique works best with practice, says Gee.

“We teach the parents to work with their children and to practice the techniques at home,” says Gee. Some families do their homework

better than others, so the results during a crisis are mixed and usually temporary, says Gee, who thinks the techniques should be used in conjunction with pharmacological remedies.

Working with the child at home also gives the family members a feeling of comfort in knowing they can do something should a crisis occur.

Teaching a child to visualize lying on a beach

*“Controlled breathing improves the flow of oxygen, and it’s particularly helpful for sickle cell patients because it helps relieve the abnormal shape of the indented sickle cell, which has become that way because of a lack of oxygen.”*

with a warm breeze blowing or sitting in a field of daisies on a mountain-top helps divert the patient’s attention from the pain at hand and causes some physiological responses such as muscle and blood vessel relaxation and increased oxygenation of the

blood — all key issues for sickle cell patients, notes Gee.

A very young child might be diverted with a favorite toy or older ones by listening to some favorite music, says Gee. The techniques vary depending on the child’s age.

Controlled breathing is fairly simple to teach and can have fast and powerful effects. Respiratory therapists work with patients to teach them controlled breathing techniques, often incorporating spirometers in the teaching process.

“Controlled breathing improves the flow of oxygen, and it’s particularly helpful for sickle cell patients because it helps relieve the abnormal shape of the indented sickle cell, which has become that way because of a lack of oxygen,” says Gee.

Deep breathing also helps muscles relax and blood vessels to loosen, offering even more relief, she adds.

“Kids will almost always say they feel better — even a little bit better — when they are doing deep breathing,” Gee says.

Pediatric pain can be difficult to treat because many physicians are slow in recognizing children’s pain. “They may say, ‘She doesn’t look like she’s in pain.’ That isn’t helpful. We need to believe our patients when they say they are in pain,” says Gee.

Health care professionals then can take the next logical step toward complementary therapies that may reduce the quantity of medications needed to control pain.

“Many people think the only thing that can touch the pain of sickle cell is morphine,” says Gee. “We can let our patients know we want to approach their pain from all different angles.” ■

## Mindfulness meditation can help your patients

### *Prestigious medical centers offer meditation*

Visualize a classroom full of eager students learning a simple, yet astonishingly complex form of meditation that primarily involves giving one’s attention to breathing.

Visualize now that many, if not most of those students, have cancer, heart disease, or diabetes.

Now take the final leap of faith — visualize that those students are learning this profoundly life-changing form of meditation at a major medical center.

It’s happening now. In 200 medical centers throughout the United States, mindfulness meditation, often known as insight meditation or by the Buddhist term, vipassana, is rapidly gaining popularity as an adjunct therapy for many patients with chronic disease, including cancer, diabetes, and heart disease.

Some experts suggest that the effects of meditation of various types may go far beyond the

documented beneficial effects of stress relief into creating physiological changes that combat disease, including reduced prostate-specific antigen (PSA) levels in prostate cancer patients and elevated melatonin levels in patients with prostate and breast cancer.

Mindfulness meditation, considered by some to be the heart of Buddhist meditation practice, is widely taught in the United States by **Jon Kabat-Zinn**, PhD, professor of medicine at the University of Massachusetts Medical Center in Worcester.

“The key of mindfulness is not so much what you choose to focus on, but the quality of the awareness you bring to each moment,” he says.

In the practice of mindfulness, says Kabat-Zinn, the student focuses one-pointed attention to cultivate calmness and stability, ability to live in the present, and ability to keep in contact with whatever is happening in body and mind at the precise moment it is happening. The student later moves to a wider scope of observing as a non-judgmental witness and finally to an element of spiritual inquiry.

Kabat-Zinn is director of UMass’s Center for Mindfulness in Medicine, Health Care, and Society. The center’s goal, he says, is “helping our patients mobilize their own inner resources of mind and body, heart and soul, for learning, growing, for healing, for moving to greater levels of well-being and health, and for taking charge in a new way in their lives, inwardly and outwardly.”

Many of the patients at the Stress Reduction Clinic are heart and cancer patients who are not responding completely to medical treatment or where “something is needed for a higher quality of life in order to better manage stress and the pain of chronic diseases,” says Kabat-Zinn.

He and colleague Saki Santorelli guide the center (founded in 1995) and its affiliated Stress Reduction Clinic (founded in 1979) and have supervised the treatment of thousands of patients and the training of hundreds of professionals to teach mindfulness meditation.

Patients with cancer respond particularly well to mindfulness meditation, says **Barrie Cassileth**, PhD, a psychologist and chief of the integrative medicine service at Memorial Sloan-Kettering Cancer Center in New York City.

Memorial offers meditation classes that have proven to be “very effective for the many unique challenges of cancer patients, particularly for relieving anxiety, depression, and fatigue,” says Cassileth.

### KEY POINTS

- Meditation now is offered as a complementary therapy in more than 200 medical centers across the United States to help patients come to terms with heart disease, cancer, diabetes, and other chronic diseases.
- Mindfulness meditation, a Buddhist practice, focuses the practitioner’s attention on the present moment, usually on breathing, inducing relaxation quickly.
- Beneficial physiological effects include the possibility that meditation helps increase tumor-inhibiting melatonin and lower prostate-specific antigen levels.

In fact, says Cassileth, some patients enjoy the classes so much they return over and over again. "People do better when they feel they are doing something to help themselves, and it's something they enjoy."

"I see mindfulness meditation as a way of not only coping with illness but as a way of moving through it," says Atlanta-based psychotherapist **Kaye Coker**, MSW, who wrote a paper on meditation-induced melatonin production when she worked at the Emory University Clinic in Atlanta.

Coker says research suggests that increased melatonin production inhibits the growth of cancer cells.

Unpublished laboratory studies have shown that meditators produce more melatonin than nonmeditators. "The inference here is that you can have an effect on the growth of cancer cells if you can somehow get the pineal gland to manufacture more melatonin," says Coker.<sup>1</sup>

Coker uses mindfulness techniques in her daily psychotherapy practice and receives frequent referrals from primary care physicians. She says even a beginner's practice of the meditation brings about a sense of relaxation and the associated effects of reducing cortisol, thereby reducing stress, whether it is related to a disease condition or other factors.

She says this form of meditation also is extremely valuable in changing the presence of classically recognized stress indicators: neck pain, chronic bowel irritability, high blood pressure, anxiety, depression, insomnia, and lack of mental focus.

The practice takes dedication and effort on the part of the practitioner, says Coker.

Typically, students of mindfulness meditation are enrolled in an eight-week course in which classical sitting meditation is taught. They are encouraged to practice every day for approximately 45 minutes, with the clear message that the more they meditate, the more profoundly they will experience results. Standing, walking,

*"You don't have to sit in the lotus posture to meditate. Any activity in which you become totally focused and totally absorbed can become a meditation. You can meditate while washing dishes or reading a book. . . ."*

and body scan meditations also are integrated into the mindfulness practice.

Almost any form of meditation will produce relaxation and stress relief, says Coker, but mindfulness meditation has the added dimension of bringing the practitioner to a new level of awareness of body and mind.

And while mindfulness traditionally is taught as a quiet sitting meditation, the technique can be translated to any activity and make it uniquely suitable to the busy Western lifestyle, says **Shachi Shantinath**, PhD, a psychologist in private practice and an editor for the Novartis Foundation Web site in Bern, Switzerland. Shantinath works on weight control with numerous patients with Type 2 diabetes.

"Meditation is a tool kit that offers new ways of thinking about life and health and how we respond to the stressors around us," she says.

"You don't have to sit in the lotus posture to meditate," she says. "Any activity in which you become totally focused and totally absorbed can become a meditation. You can meditate while washing dishes or reading a book. It's the one-pointed nature of meditation that makes it so valuable as a life-change tool."

Shantinath teaches patients to bring their newfound moment-to-moment self-awareness to an understanding of their relationship with food. "Many people with weight problems have a guilty relationship with food," she explains. "Eating is not sinful. Eating is meant to be an act of pleasure as well as simply nourishing the body."

Continuous dieting and failed diets lead a patient into a negative spiral that prophesies inevitable failure. The first time the patient falls off the healthy eating plan, the good intentions are usually abandoned in a storm of self-recrimination. Shantinath uses mindfulness meditation, and a particular "spin" of her own invention, to show patients that the enjoyment of eating is not related to the amount they consume, but to the degree of consciousness with which the food is eaten.

Shantinath applies mindfulness to the act of eating a small square of chocolate as an example to show how much pleasure can be derived from a tiny amount of a much-loved food.

She makes the consumption of this tiny piece of chocolate a sensual act. Using sight, smell, touch, and finally taste, she directs students to take a full five minutes to eat the chocolate.

"I tell them to let it melt completely in their

## A Taste of Mindfulness Meditation

- ☞ *Feel your breath as it flows into your body, then watch it flow out.*
- ☞ *Feel your body as it lets go of each outbreath.*
- ☞ *As you pay attention to your body in this way, you may feel it relax by itself as any tension in your body or mind flows out and dissolves along with the breath.*
- ☞ *Whether you feel less tense or not, allow yourself to be in touch with this very moment of your life as it comes into better focus along with your breathing.*
- ☞ *Sense that you may become more aware and more accepting of how things are right now, in this moment, no matter how they are, just by feeling your breath flowing in and out.*
- ☞ *Perhaps notice, too, that it is possible to relax some just by holding any discomfort and distress you may be feeling in awareness for a moment without struggling with them. After all, if they are already here anyway, like it or not, maybe it's how you see them and how you deal with them that will be most important in the long run and in the short run.*
- ☞ *You may also notice that you can flow from one moment to the next in awareness as your breath flows in and out of your body. Try reminding yourself that you are actually alive now, right here, in this moment.*
- ☞ *Notice that as you stay in touch in this way from one moment to the next, this tiny shift in awareness in you may lead to your seeing things somewhat differently, perhaps to feeling less stuck, or to a sense of having more options, more strength, and more confidence in your possibilities, in your own wisdom.*

Source: University of Massachusetts Medical Center Stress Reduction Clinic, Worcester.

mouths, to savor every bit of the flavor," she says. "I tell them to think of nothing else but how wonderful this chocolate is. I tell them to ignore any distracting thoughts or negative self-talk and simply revel in eating the chocolate."

What happens without fail, says Shantinath, is that patients "get it" that they don't have to eat huge quantities of food to get the pleasure they are seeking.

"For people with diabetes, food is such a conflicted theme. They are required to think about it all the time, and yet when they get too wrapped up in food, they begin to fantasize and overeat or eat things that in quantity are harmful to them. Mindfulness helps them to balance out and find the center — both spiritually and physically."

*(For more information, contact:  
University of Massachusetts Center for*

*Mindfulness in Medicine, Health Care and Society  
Web site: [www.umassmed.edu/cfm](http://www.umassmed.edu/cfm).*

*Mindfulness-Based Stress Reduction Web site:  
[www.mbsr.com](http://www.mbsr.com) — includes listing of trained mindfulness meditation instructors.)*

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# Tai chi relieves arthritis pain

*Slow movements have deep mind-body effects*

It's dawn. The mists rise from the wet grass. The park is silent. Near the lake, ghostly figures bend and sway, their bodies flowing in a slow-motion dance. On closer examination, most of the dancers are elderly. The expressions of serenity on their faces and the fluidity of their movements belie their age.

They are practitioners of tai chi, an ancient Chinese art of classical conditioning used for centuries to promote long life and self-defense. We're seeing them more often in parks across the country. It's an art still widely used today for its broad health benefits for all ages, especially for elderly people with one of the most common complaints of aging found among Americans: osteoarthritis.

The joint instability, stiffness, muscle atrophy, decreased range of motion, and secondary inflammation attributed to osteoarthritis adds up to considerable pain and decreased quality of life for sufferers.

## *No-impact exercise showing results*

While treatment usually includes anti-inflammatory medications and exercise as tolerated, Massachusetts researchers have found that tai chi offers arthritis sufferers a no-impact weight-bearing exercise that gives relief from pain and may even reverse the functional disability usually associated with advancing cases of the disease.

A group of 33 arthritis patients ages 49 to 81 were given two one-hour tai chi classes a week for 12 weeks. A control group was given physician advice to exercise but was offered no special intervention other than a telephone call every two weeks.

The Springfield (MA) College research team found "older adults with osteoarthritis can realize meaningful improvements in their mental and physical health through regular tai chi practice," says lead author **Catherine Hartman**, MS, CHFI, who conducted the study as part of her masters' work and now is a health project director at Dana-Farber Cancer Institute in Boston.<sup>1</sup>

Further, Hartman says, "Tai chi may be especially suitable for the geriatric population because it improves the health-related fitness outcomes

## KEY POINTS

- Tai chi, a Chinese form of classical conditioning, has been shown to have positive effects on elderly patients with osteoarthritis.
- A recent study from Springfield College in Massachusetts and other studies show that elderly practitioners of tai chi have improved fitness outcomes, including VO<sub>2</sub> max, muscular strength, flexibility, reduced blood pressure, and reduced risk of falls.

necessary for functional mobility and independent living."

Although tai chi is performed as slow, fluid movements, Hartman says the physical act of performing tai chi is equivalent to walking at a speed of 6 km (3.6 miles) per hour, while the cognitive aspect equates to quiet meditation. "Tai chi involves cognitive, cardiovascular, and musculoskeletal responses that evoke physiological and psychological changes," says Hartman.

Among the benefits other studies have shown for elderly practitioners of tai chi are improved fitness outcomes, including VO<sub>2</sub> max, muscular strength, flexibility, reduced percentage of body fat, and reduced risk of falls. Plus, tai chi requires no large amount of space or particular equipment, and "anybody can do it," says Hartman.

Subjects in Hartman's study had widely varying disabilities — some caused severe limitations in mobility including obesity, use of a walker, and the use of an oxygen tank. At the outset, the tai chi group had osteoarthritis for significantly more years and reported less participation in physical activity and more pain than the control group.

After just 12 weeks, Hartman's team found that tai chi practitioners benefited significantly from the following:

- decreased pain;
- improvement in one-leg balance;
- improvement in 50-foot walking speed;
- improvement in time to rise from a chair;
- decreased levels of tension;
- increased feelings of well-being and calm;
- increased satisfaction with overall health, including controlling fatigue and regulating pain during physical activities.

Hartman's study did not show increased mobility in lower extremities, although she says she is confident such a benefit would present itself with longer practice.

Other studies have attributed a host of benefits to elderly tai chi practitioners, says **Janelle White**, MD, geriatric staff physician at the Canyon Ranch Health Resort in Tucson, AZ.

A Chinese study of 38 people ages 58 to 70 who practiced tai chi for 11 months with 4.6 practice sessions per week found the following:<sup>2</sup>

- **Men practicing tai chi:**

- increased their VO<sub>2</sub> max by 16.1%;
- increased thoracic/lumbar flexibility by 11%;
- increased muscle strength in knee extensor by 18.1%;
- increased muscle strength in knee flexor by 15.4%.

- **Women practicing tai chi:**

- increased VO<sub>2</sub> max by 21.3%;
- increased thoracic/lumbar flexibility by 8.8%;
- increased muscle strength in knee extensor by 20.3%;
- increased muscle strength in knee flexor by 15.9%.

The control group showed no changes in those parameters.

A large multicenter study called *Frailty and Injuries: Cooperative Studies of Intervention Techniques* included a tai chi component that showed a 47.5% reduction in multiple falls.<sup>3</sup>

Furthermore, a large study of most myocardial infarction patients in England, which randomized patients to a nonexercise support group, an aerobic exercise group, and a tai chi exercise group showed improvements in systolic and diastolic blood pressure only in the tai chi group.<sup>4</sup>

Among the benefits White noticed in patients with arthritis who visit the Canyon Ranch clinics and study tai chi with the ranch's octogenarian instructor are:

- improved balance and fewer falls;
- increased strength;
- improved circulation;
- lower blood pressure;
- lower cholesterol;
- improved flexibility;
- reduced anxiety and depression;
- improved mental functioning;
- improved bone mass;
- improved breathing patterns.

"We have concentrated programs for people with different chronic disease conditions, including two one-week programs every year for patients with arthritis," says White. "Tai chi is a very popular option for them, although they obviously can't learn the entire form in that short period of time, yet we still see good results."

Even in the one-week programs, patients get a good idea of how to perform the movements. The results patients see in a short time may motivate them to continue with classes and practice after they leave the ranch, says White.

Tai chi is characterized by stillness and lightness and slowness with a focus on relaxation of muscles of the whole body and the use of mind — not force. The physiological responses are raised from passivity, inside the body, according to Canyon Ranch's patient literature.

That is exactly the opposite of dynamic exercise, which involves strenuous activity of the muscles, causing increased oxygen demand and resulting in temporary increases in heart rate and blood pressure.

### ***Taking it slow***

White says the exact mechanism at work in tai chi is not known to Western medicine, but she notes that more energy is needed to move slowly and that slow movement is essential for brain control and endurance.

"The stillness that comes from this slow practice aids in developing awareness, relaxing nerves and abolishing anxiety and tension. Tai chi promotes flexibility of the nervous system and harmony of the mind and body," she says.

White also notes that tai chi instructors vary widely. Practitioners considering referring patients to tai chi should look for instructors willing to be flexible in their teaching to accommodate disabilities.

"Look for instructors willing to teach modified and simplified forms (some classical forms may take a year or more to learn correctly) and instructors who are not perfectionists, insisting on every movement being done in an absolutely precise manner," she says.

White explains that her experience shows that it's the movement and the breathing associated with the movement that help, although Chinese medicine attributes many of the benefits of tai chi to precise stimulation of meridians that increase energy flows to the areas affected by arthritis.

"That may be true, but we see benefits even when people perform the movements in the most imprecise ways," she says.

Clinicians know that very few arthritis patients participate in exercise programs, despite their potential benefit. Hartman suggests that they may find tai chi appealing as an enjoyable alternative to traditional exercise programs.

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# A laugh a day may keep the cardiologist away

*Study shows heart patients are short on humor*

A good heart-y laugh can do wonders for heart health, say University of Maryland researchers. And conversely, people with heart disease are 40% less likely to laugh in humorous situations than those with healthy hearts, according to a paper presented at the American Heart Association's annual meeting in New Orleans last November.

"The old saying that laughter is the best medicine definitely appears to be true when it comes to protecting your heart," says **Michael Miller, MD**, director of the Center for Preventive Cardiology at the University of Maryland Medical Center in Baltimore.

The study of 300 people — half of whom had histories of heart problems — used the Situational Humor Response Questionnaire to gauge how

### KEY POINTS

- Patients with heart disease are 40% less likely to laugh in humorous situations than healthy patients, according to a University of Maryland study.
- Laughter increases cardiac output in healthy patients, say exercise physiologists at St. Scholastica College.
- Two studies strongly suggest that laughter alters both mental and physical states for the benefit of the patient.

healthy people and those with heart disease differed in their responses to situations where humor was expected, says **Adam Clark, MD**, a cardiologist who worked with Miller on the unpublished study.

Clark says the team based its research in part on findings that people with Type A personalities are more prone to heart disease than those with a more placid nature. Particularly, says Clark, study participants were screened for the anger and hostility components of Type A.

Clark and Miller used the Minnesota Multiphasic Personality Scale to determine Type A personalities and the Cook-Medley hostility scale.

"There are probably 100 different types of humor, so it is difficult to measure sense of humor," says Clark. He says he decided to use as a control for each subject a closely affiliated person without heart disease — typically a spouse or family member — and first administered the questionnaire designed to measure sense of humor.

Here is a sample question: You are shopping alone in a city distant from your home when you unexpectedly encounter an acquaintance you haven't seen for a long time. Rate how amusing you would find this situation on a scale of one to five, with one (not at all amusing) to five (you laugh heartily).

"People without heart disease had a higher score on the humor scale, and that correlated with less coronary artery disease," says Clark.

Clark and Miller theorize that a higher tendency toward laughter relieves anxiety and indicates lower hostility.

"We know that many things happen physiologically with laughter," says Clark. "The heart rate increases, and there has even been evidence that platelet aggregation is decreased, lowering the risk of thrombosis."

Perhaps the psychological effects, and the physiological spillover, are more important, says Clark. During laughter, a tremendous amount of stress and anxiety are released.

"Some of the ways we handle anxiety and use laughter are ingrained, and they may play a critical role in whether or not we develop heart disease. That may be the most important mechanism at work here," he says.

Clark also says the study suggests that people use laughter to modulate their behavior to help them through anxiety-provoking experiences.

He also points out that humans are social animals and since laughter is a social activity,

it “helps us feel that we aren’t alone.”

“We don’t know whether people lacking a sense of humor are prone to developing heart disease or whether having heart disease tends to sour a person’s sense of humor, but I’d like to believe the former,” Clark concludes.

What’s most important about the study, he says, is that this is another confirmation of the mind-body connection about which many health care professionals remain skeptical.

Researchers at the College of St. Scholastica agree that laughter may be a powerful mechanism in coping with stress and concluded that laughter may have certain health benefits.<sup>1</sup>

Using eight college-age volunteers, **Tommy Boone**, PhD, lead researcher and chair of the exercise physiology department at the college in Duluth, MN, measured cardiac output after subjects watched a humorous five-minute video featuring comedian Robin Williams.

They found that laughter significantly increased cardiac stroke volume and cardiac outputs. “There was a significant increase in the amount of blood ejected, and the effect was highly centralized in the thoracic area,” says Boone. Blood pressure was unaffected, although other studies have indicated an increase in blood pressure during a period of laughter.

The effects of laughter continued for at least five minutes after the laughter period with the same beneficial effects.

Boone’s study also defined something laughter does not do: mimic the effects of aerobic exercise. He found that heart rates were elevated only slightly during the laughter period — to about 75 beats per minutes, as opposed to the 120 beats per minute necessary to constitute aerobic exercise.

“One thing we were able to determine immediately is that the physiological response to laughter is not the same as produced by aerobic exercise,” he says.

Boone says his research is a starting place for more studies on the health benefits of laughter. “While there are several anecdotal accounts of healing through laughter, the prevention of health problems using laughter is a relatively new area of research and merits deeper examination.”

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# It’s high time for tea

## Study shows black tea may fight heart disease

Even though the United States seems caught in a coffee craze, tea drinkers are having their day. What’s more, they’re getting some potent health benefits in addition to the simple pleasure of sipping away at a steaming hot cup of tea or savoring a frosted glass of iced tea on a summer’s day.

Tea consumption in the United States has doubled in the past decade, keeping pace with scientific literature that suggests cardioprotective and anticarcinogenic benefits of tea drinking, including evidence from an unpublished Boston University study that suggests tea drinking has a powerful effect on blood vessels.

## Results within two hours

In results presented at the American Heart Association annual meeting in New Orleans last November, Boston University researchers reported that drinking two cups of black tea dilates the arteries and improves blood flow in heart patients within two hours.

Lead researcher **Joseph Vita**, MD, professor of medicine at Boston University, gave four cups of ordinary black tea, similar to what one would buy in the supermarket, per day for four weeks to 50 subjects with known heart disease. The study was controlled for the effects of caffeine and there was a washout period of water drinking for an equal period of time.

Using ultrasound to measure blood flow in the

## KEY POINTS

- New research shows black tea can have short- and long-term effects in dilating blood vessels, leading to a possible application in prevention of heart disease.
- A Boston University study shows four cups of tea a day for four weeks returned blood vessel dilation to near normal in heart patients.
- Other research shows tea’s effectiveness in preventing the oxidation of LDL cholesterol, preventing the formation of plaque.
- Antioxidants in cancer also are probably causes of cancer protection properties of tea found in numerous studies.

forearm, investigators found that the tea helped blood vessels function more effectively. Blood vessels in people without heart disease normally dilate 11%, but patients with heart disease only dilate 6%, Vita says. Tea drinking restored blood vessel response to near-normal levels after the tea was consumed.

"The effects were visible as soon as two hours after drinking the first cup, and those effects persisted after the four weeks," Vita says.

The effects are not due to the caffeine in tea, Vita says. Some of the participants were given caffeine tablets equal to two cups of tea and then repeated the artery response test with no effect on blood vessel function.

Clearly, the various antioxidant effects in tea are responsible for the response in blood vessels, says Vita, but it will take further research to determine which of the multitude of flavonoids, polyphenols, and catechins are to be credited. In both green and black tea, potent antioxidant polyphenols account for 36% of the dry weight.

### ***Neutralizing oxygen-free radicals***

Antioxidants neutralize the effect of oxygen-free radicals, which are known to be a major factor in aging in chronic diseases, including cancer, cardiovascular disease, and diabetes. Free radicals can cause DNA injuries, resulting in DNA mutations and possible cell proclivity toward malignancy.

Free radicals are a by-product of normal metabolism and exposure to cigarette smoke, sun, and environmental pollutants.

The antioxidants in just one cup of tea, according to a Chinese study, can provide the same potential for improving antioxidant status as 150 mg of pure vitamin C.<sup>1</sup>

Research has shown that antioxidants prevent the oxidation of LDL cholesterol, thereby preventing the formation of atherosclerotic plaque in blood vessels.<sup>2</sup>

Vita's research takes this theory a step further.

"We know that abnormalities in the endothelium or cell lining are associated with heart disease, and it has been shown these endothelial abnormalities can be reversed by the use of antioxidants," he says.

By aiding the blood vessels to dilate, increased blood flow also improves the ability of the blood vessels to release vasodilating nitric oxide.

"That may explain why tea drinkers do better," Vita adds.

Vita cautions against a blanket recommendation that tea will protect against heart disease. "It's way too early to say that yet, but there is no known harm from drinking tea in the amounts we used," he says.

While there is little literature on cardiovascular effects of tea drinking, there is substantial evidence of the cancer protection effects of tea drinking.

Animal and other preclinical laboratory studies suggest that both green and black tea decrease the risk of several cancers. Studies regarding tea's

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effect on lung cancer in humans are inconclusive, but animal studies suggest tea may inhibit tobacco-induced cancers.<sup>3</sup>

The Iowa Women's Health Study, which looked at 35,369 postmenopausal women, showed those who drank two or more cups of black tea per day had a decreased risk of digestive and urinary tract cancers. However, other cancers were not affected, including melanoma and cancers of the pancreas, lung, breast, uterus, and ovary.<sup>4</sup>

Another study indicated that men who drank one to six cups of tea daily had a decreased risk of developing all types of cancer. However, heavy tea drinkers (more than six cups per day) increased their overall risk of getting cancer.<sup>5</sup>

And a recent report from Japan found that green tea also might enhance the effectiveness of chemotherapy.<sup>6</sup>

The increase in tea sales in the United States is a sign of increasing awareness of the health benefits of tea drinking, says **Susan Kundrat, MS, RD**, outreach director of the University of Illinois Functional Foods for Health Program in Urbana.

"We recommend drinking three to four cups of tea a day and that people look at ways they can fit functional foods like tea into their daily lives on a consistent basis," Kundrat says.

Many of the antioxidants found in tea also are found in fruits and vegetables, and Vita and Kundrat both note that tea comes from leaves, so it could nominally be considered a vegetable.

The cogent point they make is that the antioxidants in tea make it an important nutrient and "it may be easier to ingest that some other foods," says Kundrat.

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## CE objectives

After reading *Complementary Therapies in Chronic Care*, the health care professional will be able to:

1. Identify management, clinical, educational, and financial advantages of complementary therapies for chronic care.
2. Describe how those therapies affect chronic patients and the providers who care for them.
3. Describe practical ways to incorporate complementary therapies into chronic disease management based on independent recommendations from clinicians at individual institutions. ■