

Brain Check

BY HERBERT BENSON, M.D.,
JULIE CORLISS AND GEOFFREY COWLEY

IMAGINE YOU'RE ALLERGIC TO THE OIL OF the Japanese lacquer tree—so allergic that the brush of a leaf against your skin provokes an angry rash. Strapping a blindfold over your eyes, a scientist tells you she's going to rub your right arm with lacquer leaf and your left arm with the innocuous leaf of a chestnut tree. The rubbing commences, and before long your right arm is covered with burning, itchy welts. Your left side feels

Scientists are mapping the pathways that link emotion to health. The challenge for the rest of us is to put the discoveries to work.

fine. No surprise, until you learn that your left arm—not the right—is the one that got lacquered. Or imagine that Parkinson's disease has reduced your walk to a shuffle and left your hands too shaky to grasp a pencil. You enroll in a study and receive an experimental surgical treatment, which dramatically improves both your gait and your grip. You're ready to declare it a miracle of modern medicine, when you discover that the operation was a sham. The surgeons merely

drilled a small hole in your skull and then patched it.

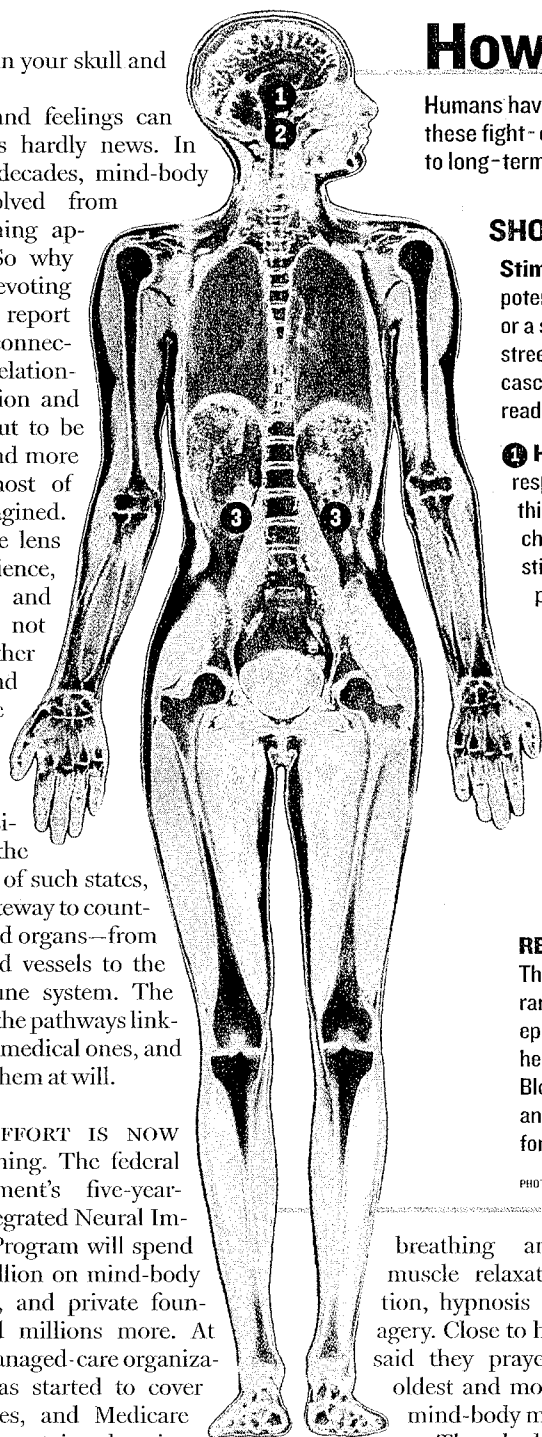
That thoughts and feelings can affect our health is hardly news. In the span of a few decades, mind-body medicine has evolved from heresy into something approaching cliché. So why is NEWSWEEK devoting this Health for Life report to the mind-body connection? Because the relationship between emotion and health is turning out to be more interesting, and more important, than most of us could have imagined. Viewed through the lens of 21st-century science, anxiety, alienation and hopelessness are not just feelings. Neither are love, serenity and optimism. All are physiological states that affect our health just as clearly as obesity or physical fitness. And the brain, as the source of such states, offers a potential gateway to countless other tissues and organs—from the heart and blood vessels to the gut and the immune system. The challenge is to map the pathways linking mental states to medical ones, and learn how to travel them at will.

THAT EFFORT IS NOW burgeoning. The federal government's five-year-old Integrated Neural Immune Program will spend \$16 million on mind-body research next year, and private foundations will spend millions more. At least one leading managed-care organization, HIP USA, has started to cover mind-body practices, and Medicare now reimburses for certain relaxation techniques administered by psychologists. Hospitals, for their part, are opening mind-body clinics—and yoga classes are spreading from health clubs into shopping malls. According to a recent government survey, nearly half of all Americans used mind-body interventions in 2002. The respondents embraced practices ranging from deep



Tune in to the Discovery Health Channel's "Daily

Rounds" program Sept. 20 to Sept. 24, at 7:55 p.m., ET, for more on the mind-body connection



How the Body Harms Itself

Humans have evolved a complex system for responding to danger. While these fight-or-flight responses served our ancestors well, they can lead to long-term health problems in modern-day environments.

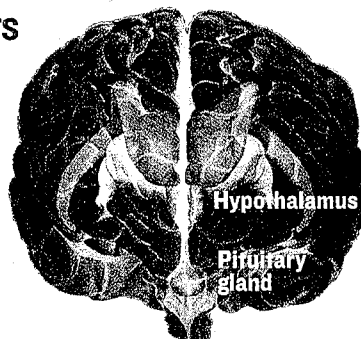
SHORT-TERM EFFECTS

Stimulus: When it senses a potential threat, a loud noise or a shadowy figure on a dark street, the brain initiates a cascade of events that readies the body for action.

1 Hypothalamus: In response to warning signals, this structure secretes a chemical called CRH that stimulates the nearby pituitary gland.

2 Pituitary: The gland makes a molecule called ACTH, which travels to the adrenal glands.

3 Adrenal glands: The glands release cortisol. This hormone helps keep up blood sugar, giving the body extra energy to act.



LONG-TERM EFFECTS

New conflicts: While well adapted to passing threats that require immediate action, our stress responses are less effective against constant, low-level annoyances, such as a pushy boss or a hectic daily commute.

Health problems: After years of chronic activation, stress responses can wear the body down. Some of the common symptoms include:

- impaired memory
- a weakened immune system
- high blood pressure
- stomach ulcers
- skin problems
- digestive difficulties

RELATED RESPONSES:

The body has other ways to ramp up. The adrenals produce epinephrine, which increases heart and breathing rates. Blood pressure rises; the legs and arms receive extra blood for energy.

breathing and progressive muscle relaxation to meditation, hypnosis and guided imagery. Close to half of them also said they prayed—perhaps the oldest and most basic form of mind-body medicine.

They had plenty to pray for. Modern life is rife with potential stressors, and there is now little question that uncontrolled stress can kill. Harvard physiologist Walter Cannon recognized 90 years ago that when confronted by a threat—physical or emotional, real or imagined—the body responds with a rise in blood pressure, heart rate, muscle tension and breathing rate. We now know that this physiological “stress response” (chart) involves hormones and inflammatory chemicals that, while valuable in measured bursts, can foster everything from headaches to heart attacks in over-

dose. Cannon verified that people who believed they'd been hexed by voodoo witch doctors could drop dead from a sudden and massive stress response. We now know that chronic stress, though not always fatal, can disrupt the digestive system, worsen symptoms of menopause and interfere with fertility. Indeed, experts now believe that 60 to 90 percent of all doctor visits involve stress-related complaints.

As researchers chart the health effects of hostility and hopelessness, they're also gaining unprecedented insights into the mind's power to heal. The “placebo response” has been widely recognized since the 1950s, when Harvard's Dr. Henry Beecher described the phenomenon. Until recently, most experts dismissed it as a feat of self-deception, in which people who remain sick (or never were) convince themselves they're better. But we're now discov-

PHOTOGRAPHS BY SIMON FRASER—PHOTO RESEARCHERS; ZEPHYR—PHOTO RESEARCHERS, INC

—JOSH ULICK

ering that expectations can directly alter a disease process. Consider those Parkinson's sufferers who improved with sham surgery. Using PET scans, researchers compared their brains with those of patients who received an active treatment. As expected, the active intervention caused a significant rise in dopamine, the neurotransmitter that people with Parkinson's lack. But the patients who improved on placebo experienced a similar dopamine surge. A related study found that fake analgesics could boost the brain's own pain-fighting mechanisms. In both cases, the placebo response was not an imaginary lessening of symptoms but an objective, measurable change in brain chemistry.

Placebos are just the beginning. Mounting evidence suggests that any number of soothing emotional experiences can improve our physical health. At Duke University, researchers have found that religious observance is associated with lower rates of illness and hospitalization. In studies of HIV-positive men, researchers at UCLA

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have found that optimism is associated with stronger immune-cell function. And research at Harvard suggests that the "relaxation response"—the deep sense of calm we can achieve through yoga, prayer or simple deep-breathing exercises—can help counter the effects of chronic stress. We now believe that the body produces more nitric oxide when deeply relaxed, and that this molecule acts as an antidote to cortisol and other potentially toxic stress hormones.

Can we teach ourselves to be healthier? That is the central question of mind-body medicine, and the answer is not an unqualified yes. Stressful life circumstances are sometimes inescapable (no one chooses

poverty or discrimination). Heredity and temperament leave some of us more stress-prone than others. And prayer is clearly no substitute for penicillin or a decent diet. Yet mind-body techniques can improve almost anyone's quality of life. Meditation may not cure cancer, but by alleviating fear and softening the side effects of treatment, it leaves many patients feeling less victimized. Stress-related illness often defies conventional remedies, and when we persist with high-tech pills and procedures, the costs of treatment can easily outweigh the benefits. Mind-body medicine offers a saner starting place. If it fulfills half its promise, it could reduce medical costs while improving our health and our lives. And whatever its limitations, it has the advantage of doing no harm.

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Relaxation

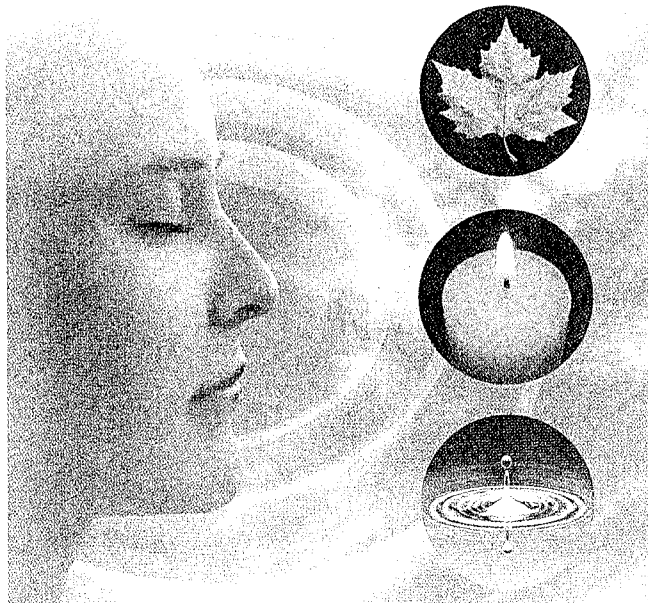
Ways to Calm Your Mind

BY HERBERT BENSON, M.D., AND JULIE CORLISS

Over the past three decades, scores of studies have confirmed the benefits of what we call the "relaxation response," a state of mental calm during which your blood pressure drops, your heart and breathing rate slow, and your muscles become less tense. Practicing the relaxation response on your own is simple. Once you're comfortable with it, you can use it to cope better with stresses from road rage to performance anxiety. Kids can benefit, too. Studies of inner-city middle-school students have documented better grades, work habits and cooperation among those who learned the relaxation response.

Here are three simple ways to elicit the relaxation response:

1 Meditation: Our original approach to evoking the full relaxation response is a form of this ancient practice. Choose a short phrase or prayer that is rooted in your belief system, such as



"peace" or "the Lord is my shepherd." Sit quietly in a comfortable position and close your eyes. Relax your muscles, progressing from your feet to your calves, thighs, abdomen, shoulders, neck and head. Breathe slowly

and naturally, and as you exhale, say your word or phrase silently to yourself. Don't be concerned when other thoughts come to mind. Just acknowledge them and return calmly to your phrase.

Ideally, you'll continue the ex-

ercise for 10 to 20 minutes, but even five minutes of deep relaxation can leave you calm and refreshed. Place a clock nearby if you need to keep track of time—don't set an alarm. And when you're finished, sit quietly for a minute before resuming the day.

2 Paced respiration: Start by inhaling slowly. As you exhale, say the number "five" silently to yourself. Breaths should be deep enough to cause the belly to expand fully (no points for holding your stomach in here). After pausing briefly, take another slow breath, and think "four" as you exhale. Continue at your own pace, counting down to one. Practice this for 10 to 15 minutes in the morning and again in the evening.

3 Repetitive activities: You don't always have to sit quietly to evoke the relaxation response. You can do it while walking, jogging, playing a musical instrument or carrying out simple repetitive tasks such as knitting. Yoga, tai chi, meditation and repetitive prayer are other ways to put yourself in this healthful frame of mind.

For more information go to health.harvard.edu/newsweek.