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## The Biology of Belief

By JEFFREY KLUGER

Most folks probably couldn't locate their parietal lobe with a map and a compass. For the record, it's at the top of your head — aft of the frontal lobe, fore of the occipital lobe, north of the temporal lobe. What makes the parietal lobe special is not where it lives but what it does — particularly concerning matters of faith.

If you've ever prayed so hard that you've lost all sense of a larger world outside yourself, that's your parietal lobe at work. If you've ever meditated so deeply that you'd swear the very boundaries of your body had dissolved, that's your parietal too. There are other regions responsible for making your brain the spiritual amusement park it can be: your thalamus plays a role, as do your frontal lobes. But it's your parietal lobe — a central mass of tissue that processes sensory input — that may have the most transporting effect. ([Read "Top 10 Medical Breakthroughs"](#).)

Needy creatures that we are, we put the brain's spiritual centers to use all the time. We pray for peace; we meditate for serenity; we chant for wealth. We travel to Lourdes in search of a miracle; we go to Mecca to show our devotion; we eat hallucinogenic mushrooms to attain transcendent vision and gather in church basements to achieve its sober opposite. But there is nothing we pray — or chant or meditate — for more than health.

Health, by definition, is the sine qua non of everything else. If you're dead, serenity is academic. So we convince ourselves that while our medicine is strong and our doctors are wise, our prayers may heal us too.

Here's what's surprising: a growing body of scientific evidence suggests that faith may indeed bring us health. People who attend religious services do have a lower risk of dying in any one year than people who don't attend. People who believe in a loving God fare better after a diagnosis of illness than people who believe in a punitive God. No less a killer than AIDS will back off at least a bit when it's hit with a double-barreled blast of belief. "Even accounting for medications," says Dr. Gail Ironson, a professor of psychiatry and psychology at the University of Miami who studies HIV and religious belief, "spirituality predicts for better disease control." ([Read "Finding God on YouTube."](#))

It's hard not to be impressed by findings like that, but a skeptic will say there's nothing remarkable — much less spiritual — about them. You live longer if you go to church because you're there for the cholesterol-screening drive and the visiting-nurse service. Your viral load goes down when you include spirituality in your fight against HIV because your levels of cortisol — a stress hormone — go down first.

"Science doesn't deal in supernatural explanations," says Richard Sloan, professor of behavioral medicine at Columbia University Medical Center and author of *Blind Faith: The Unholy Alliance of Religion and Medicine*. "Religion and science address different concerns."

That's undeniably true — up to a point. But it's also true that our brains and bodies contain an awful lot of spiritual wiring. Even if there's a scientific explanation for every strand of it, that doesn't mean we can't put it to powerful use. And if one of those uses can make us well, shouldn't we take advantage of it? "A large body of science shows a positive impact of religion on health," says Dr. Andrew Newberg, a professor of radiology, psychology and religious studies at the University of Pennsylvania and co-founder of Penn's Center for Spirituality and the Mind. "The way the brain works is so compatible with religion and spirituality that we're going to be enmeshed in both for a long time."

### **It's All in Your Head**

"enmeshed in the brain" is as good a way as any to describe Newberg's work of the past 15 years. The author of four books, including the soon-to-be-released *How God Changes Your Brain*, he has looked more closely than most at how our spiritual data-processing center works, conducting various types of brain scans on more than 100 people, all of them in different kinds of worshipful or contemplative states. Over time, Newberg and his team have come to recognize just which parts of the brain light up during just which experiences.

When people engage in prayer, it's the frontal lobes that take the lead, since they govern focus and concentration. During very deep prayer, the parietal lobe powers down, which is what allows us to experience that sense of having loosed our earthly moorings. The frontal lobes go quieter when worshippers are involved in the singular activity of speaking in tongues — which jibes nicely with the speakers' subjective experience that they are not in control of what they're saying.

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Pray and meditate enough and some changes in the brain become permanent. Long-term meditators — those with 15 years of practice or more — appear to have thicker frontal lobes than nonmeditators. People who describe themselves as highly spiritual tend to exhibit an asymmetry in the thalamus — a feature that other people can develop after just eight weeks of training in meditation skills. "It may be that some people have fundamental asymmetry [in the thalamus] to begin with," Newberg says, "and that leads them down this path, which changes the brain further."

No matter what explains the shape of the brain, it can pay dividends. Better-functioning frontal lobes help boost memory. In one study, Newberg scanned the brains of people who complained of poor recall before they underwent meditation training, then scanned them again after. As the lobes bulked up,

memory improved.

Faith and health overlap in other ways too. Take fasting. One of the staples of both traditional wellness protocols and traditional religious rituals is the cleansing fast, which is said to purge toxins in the first case and purge sins or serve other pious ends in the second. There are secular water fasts, tea fasts and grapefruit fasts, to say nothing of the lemon, maple-syrup and cayenne-pepper fast. Jews fast on Yom Kippur; Muslims observe Ramadan; Catholics have Lent; Hindus give up food on 18 major holidays. Done right, these fasts may lead to a state of clarity and even euphoria. This, in turn, can give practitioners the blissful sense that whether the goal of the food restriction is health or spiritual insight, it's being achieved. Maybe it is, but there's also chemical legerdemain at work. ([See pictures of Pope Benedict XVI visiting America.](#))

The brain is a very energy-intensive organ, one that requires a lot of calories to keep running. When food intake is cut, the liver steps into the breach, producing glucose and sending it throughout the body — always making sure the brain gets a particularly generous helping. The liver's reserve lasts only about 24 hours, after which, cells begin breaking down the body's fats and proteins — essentially living off the land. As this happens, the composition of the blood — including hormones, neurotransmitters and metabolic by-products — changes. Throw this much loopy chemistry at a sensitive machine like the brain and it's likely to go on the blink. "There are very real changes that occur in the body very rapidly that might explain the clarity during fasting," says Dr. Catherine Gordon, an endocrinologist at Children's Hospital in Boston. "The brain is in a different state even during a short-term fast." Biologically, that's not good, but the light-headed sense of peace, albeit brief, that comes with it reinforces the fast and rewards you for engaging in it all the same. ([See pictures of the end of Ramadan.](#))

### **How Powerful Is Prayer?**

For most believers, the element of religious life that intersects most naturally with health is prayer. Very serious theologians believe in the power of so-called intercessory prayer to heal the sick, and some very serious scientists have looked at it too, with more than 6,000 published studies on the topic just since 2000. Some of them have been funded by groups like the John Templeton Foundation — part of whose mission is to search for overlaps of religion and science — but others have come from more dispassionate investigators.

As long ago as 1872, Francis Galton, the man behind eugenics and fingerprinting, reckoned that monarchs should live longer than the rest of us, since millions of people pray for the health of their King or Queen every day. His research showed just the opposite — no surprise, perhaps, given the rich diet and extensive leisure that royal families enjoy. An oft discussed 1988 study by cardiologist Randolph Byrd of San Francisco General Hospital found that heart patients who were prayed for fared better than those who were not. But a larger study in 2005 by cardiologist Herbert Benson at Harvard University challenged that finding, reporting that complications occurred in 52% of heart-bypass patients who received intercessory prayer and 51% of those who didn't. Sloan says even attempting to find a scientific

basis for a link between prayer and healing is a "fool's errand" — and for the most basic methodological reason. "It's impossible to know how much prayer is received," he says, "and since you don't know that, you can't determine dose."

Such exactitude does not dissuade believers — not surprising, given the centrality of prayer to faith. But there is one thing on which both camps agree: when you're setting up your study, it matters a great deal whether subjects know they're being prayed for. Give them even a hint as to whether they're in the prayer group or a control group and the famed placebo effect can blow your data to bits.

First described in the medical literature in the 1780s, the placebo effect can work all manner of curative magic against all manner of ills. Give a patient a sugar pill but call it an analgesic, and pain may actually go away. Parkinson's disease patients who underwent a sham surgery that they were told would boost the low dopamine levels responsible for their symptoms actually experienced a dopamine bump. Newberg describes a cancer patient whose tumors shrank when he was given an experimental drug, grew back when he learned that the drug was ineffective in other patients and shrank again when his doctor administered sterile water but said it was a more powerful version of the medication. The U.S. Food and Drug Administration ultimately declared the drug ineffective, and the patient died. All that may be necessary for the placebo effect to kick in is for one part of the brain to take in data from the world and hand that information off to another part that controls a particular bodily function. "The brain appears to be able to target the placebo effect in a variety of ways," says Newberg. There's no science proving that the intercessions of others will make you well. But it surely does no harm — and probably helps — to know that people are praying for you.

[See pictures of spiritual healing around the world.](#)

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### **Faith and Longevity**

If belief in a pill can be so powerful, belief in God and the teachings of religion — which touch devout people at a far more profound level than mere pharmacology — ought to be even more so. One way to test this is simply to study the health of regular churchgoers. Social demographer Robert Hummer of the University of Texas has been following a population of subjects since 1992, and his results are hard to argue with. Those who never attend religious services have twice the risk of dying over the next eight years as people who attend once a week. People who fall somewhere between no churchgoing and weekly churchgoing also fall somewhere between in terms of mortality.

A similar analysis by Daniel Hall, an Episcopal priest and a surgeon at the University of Pittsburgh Medical Center, found that church attendance accounts for two to three additional years of life. To be sure, he also found that exercise accounts for three to five extra years and statin therapy for 2.5 to 3.5. Still, joining a flock and living longer do appear to be linked. ([Read "The Year in Medicine 2008: From A to Z."](#))

Investigators haven't teased out all the variables at work in this phenomenon, but Hummer, for one, says some of the factors are no surprise: "People embedded in religious communities are more likely to rely on one another for friendship, support, rides to doctor's appointments."

But even hard scientists concede that those things aren't the whole story and that there's a constellation of other variables that are far harder to measure. "Religious belief is not just a mind question but involves the commitment of one's body as well," says Ted Kaptchuk, a professor of medicine at Harvard Medical School. "The sensory organs, tastes, smells, sounds, music, the architecture of religious buildings [are involved]." Just as the very act of coming into a hospital exposes a patient to sights and smells that are thought to prime the brain and body for healing, so may the act of walking into a house of worship.

Neal Krause, a sociologist and public-health expert at the University of Michigan, has tried to quantify some of those more amorphous variables in a longitudinal study of 1,500 people that he has been conducting since 1997. He has focused particularly on how regular churchgoers weather economic downturns as well as the stresses and health woes that go along with them. Not surprisingly, he has found that parishioners benefit when they receive social support from their church. But he has also found that those people who give help fare even better than those who receive it — a pillar of religious belief if ever there was one. He has also found that people who maintain a sense of gratitude for what's going right in their lives have a reduced incidence of depression, which is itself a predictor of health. And in another study he conducted that was just accepted for publication, he found that people who believe their lives have meaning live longer than people who don't. "That's one of the purported reasons for religion," Krause says. "The sign on the door says, 'Come in here and you'll find meaning.'"

African-American churches have been especially good at maximizing the connection between faith and health. Earlier in American history, churches were the only institutions American blacks had the freedom to establish and run themselves, and they thus became deeply embedded in the culture. "The black church is a different institution than the synagogue or mosque or even the white church," says Ken Resnicow, a professor of health and behavior education at the University of Michigan School of Public Health. "It is the center of spiritual, community and political life." ([See pictures of the Civil Rights movement from Emmett Till to Barack Obama.](#))

Given the generally higher incidence of obesity, hypertension and other lifestyle ills among African Americans, the church is in a powerful position to do a lot of good. In the 1990s, Marci Campbell, a professor of nutrition at the University of North Carolina, helped launch a four-year trial called North Carolina Black Churches United for Better Health. The project signed up 50 churches with a goal of helping the 2,500 parishioners eat better, exercise more and generally improve their fitness. The measures taken included having pastors preach health in their sermons and getting churches to serve healthier foods at community events.

The program was so successful that it has been renamed the Body and Soul project and rolled out nationally — complete with literature, DVDs and cookbooks — in collaboration with the National Cancer Institute and the American Cancer Society. To skeptics who conclude that the churches have played a secondary role in the success of the programs — as a mere venue for secular health counseling — Campbell points out that in her studies, the most effective pitches came not from the nutritionists but from the pulpit. "The body is a temple, and the connection was made between the physical body and religious and spiritual well-being," she says.

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### **Joining Hands**

Many scientists and theologians who study these matters advocate a system in which both pastoral and medical care are offered as parts of a whole. If a woman given a diagnosis of breast cancer is already offered the services of an oncologist, a psychologist and a reconstructive surgeon, why shouldn't her doctor discuss her religious needs with her and include a pastor in the mix if that would help?

While churches are growing increasingly willing to accept the assistance of health-care experts, doctors and hospitals have been slower to seek out the help of spiritual counselors. The fear has long been that patients aren't interested in asking such spiritually intimate questions of their doctors, and the doctors, for their part, would be uncomfortable answering them. But this turns out not to be true. When psychologist Jean Kristeller of Indiana State University conducted a survey of oncologists, she found that a large proportion of them did feel it was appropriate to talk about spiritual issues with patients and to offer a referral if they weren't equipped to address the questions themselves. They didn't do so simply because they didn't know how to raise the topic and feared that their patients would take offense, in any event. When patients were asked, they insisted that they'd welcome such a conversation but that their doctors had never initiated one. What both groups needed was someone to break the ice. ([See pictures of Billy Graham, America's Pastor.](#))

Kristeller, who had participated in earlier work exploring how physicians could help their patients quit smoking, recalled a short — five- to seven-minute — conversation that the leader of a study had devised to help doctors address the problem. The recommended dialogue conformed to what's known as patient-centered care — a clinical way of saying doctors should ask questions then clam up and listen to the answers. In the case of smoking, they were advised merely to make their concern known to patients, then ask them if they'd ever tried to quit before. Depending on how that first question was received, they could ask when those earlier attempts had been made, whether the patients would be interested in trying again and, most important, if it was all right to follow up on the conversation in the future. "The more patient-centered the conversations were, the more impact they had," Kristeller says.

The success of that approach led her to develop a similar guide for doctors who want to discuss religious questions with cancer patients. The approach has not yet been tested in any large-scale studies, but in the smaller surveys Kristeller has conducted, it has been a roaring success: up to 90% of the patients whose doctors approached them in this way were not offended by the overture, and 75% said it was very helpful. Within as little as three weeks, the people in that group reported reduced feelings of depression, an improved quality of life and a greater sense that their doctors cared about them.

Even doctors who aren't familiar with Kristeller's script are finding it easier to combine spiritual care and medical care. HealthCare Chaplaincy is an organization of Christian, Jewish, Muslim and Zen Buddhist board-certified chaplains affiliated with more than a dozen hospitals and clinics in the New York City area. The group routinely provides pastoral care to patients as part of the total package of treatment. The chaplains, like doctors, have a caseload of patients they visit on their rounds, taking what amounts to a spiritual history and either offering counseling on their own or referring patients to others. The Rev. Walter Smith, president and CEO of the chaplaincy and an end-of-life specialist, sees what his group offers as a health-care product — one that is not limited to believers.

What patients need, he says, is a "person who can make a competent assessment and engage a patient's spiritual person in the service of health. When people say, 'I'm not sure you can help because I'm not very religious,' the chaplains say, 'That's not a problem. Can I sit down and engage you in conversation?'"

Patients who say yes often find themselves exploring what they consider secular questions that touch on such primal matters of life and death, they might as well be spiritual ones. The chaplains can also refer patients to other care providers, such as social workers, psychologists and guided-imagery specialists. The point of all this isn't so much what the modality is; it's that the patient has a chance to find one that works. "People say you tell the truth to your doctor, your priest and your funeral director," says Smith, "because these people matter at the end." It's that truth — or at least a path to it — that chaplains seek to provide.

Smith's group is slowly going national, and even the most literal-minded scientists welcome the development. Says Sloan, the author of *Blind Faith*: "I think that a chaplain's job is to explore the patient's values and help the patient come to some decision. I think that's absolutely right."

Sloan's view is catching on. Few people think of religion as an alternative to medicine. The frontline tools of an emergency room will always be splints and sutures, not prayers — and well-applied medicine along with smart prevention will always be the best ways to stay well. Still, if the U.S.'s expanding health-care emergency has taught us anything, it's that we can't afford to be choosy about where we look for answers. Doctors, patients and pastors battling disease already know that help comes in a whole lot of forms. It's the result, not the source, that counts the most.

*With reporting by Alice Park and Bryan Walsh / New York*

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