



STACEY CRAMP

For Depression and Anxiety, Running Is a Unique Therapy

Running puts everyone in a better mood. But for some of us, our miles are key to managing depression and anxiety.

By **SCOTT DOUGLAS** AUG 9, 2017

Most Tuesdays, I run early in the morning with a woman named Meredith. For such close friends,

we're quite different. Meredith is a voluble social worker who draws energy from crowds. I'm an introverted editor who works from home.

Meredith runs her best in large races and loves training with big groups. I've set PRs in solo time trials and tend to bail when a run's head count gets above five. Meredith is a worrier, beset by regrets and anticipated outcomes, who has sought treatment for anxiety. I have dysthymia, or chronic low-grade depression. We like to joke that Meredith stays up late as a way of avoiding the next day, whereas I go to bed early to speed the arrival of a better tomorrow.

We do have one key thing in common: Meredith and I run primarily to bolster our mental health. Like all runners, we relish the short-term experience of finishing our run feeling like we've hit reset and can better handle the rest of the day. What's not universal is our recognition that, without regular running, the underlying fabric of our lives—our friendships, our marriages, our careers, our odds of being something other than miserable most of the time—will fray. For those of us with depression or anxiety, we need running like a diabetic needs insulin.



Running Is My Therapy: Relieve Stress and Anxiety, Fight Depression, Ditch Bad Habits, and Live Happier. \$16.50, amazon.com

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Meredith and I discovered this decades ago, and now researchers and practitioners are starting to catch up. Studies show that aerobic exercise can be as effective as anti-depressants in treating mild to moderate depression (and with side effects like improved health and weight management rather than bloating and sexual

dysfunction). In countries such as Australia, United Kingdom, and the Netherlands, official guidelines include exercise as a first-line treatment for depression. Although U.S. guidelines have yet to change, at least one psychotherapist, Sepideh Saremi in Los Angeles, California, conducts on-the-run sessions with willing patients.

How does moving the body change the mind? A growing body of work—both in the lab and with patients—shows that there's more to it than endorphins, the well-known opioid the body

produces during certain activities, including exercise. The emerging, more sophisticated view of running to improve mental health also takes into account long-term structural changes in the brain as well as subjective states like mood and cognition. Science continues working to explain the theory behind what we runners already know from practice.

Think Different

Unlike many with the condition, I've never been majorly incapacitated by depression. Most people would consider me productive, accomplished, perhaps even energetic, given that my lifetime running odometer is past 110,000 miles. My dysthymia has two main components: *weltschmerz*, a German word meaning sadness about how reality doesn't live up to one's hopes, and anhedonia, a diminished ability to experience pleasure. Life often feels like waiting out a series of not-horrible, not-fun obligations. Things sometimes seem so pointless that I watch myself not caring that I don't care. For example, I once received a group email that a book I'd coauthored had made *The New York Times* best seller list. That's

a big deal in publishing. As if from outside, I observed myself writing an exclamation-point-filled reply-all response thanking and congratulating those of us who worked on the book. As I typed I thought, “Yeah, fine, whatever. Is this really going to lift life above 2 p.m. on a gray Tuesday in March?”

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That it’s possible to be outwardly active but internally askew can mask just how common depression and anxiety are. In any one year, about 10 percent of the U.S. population would meet the diagnostic criteria for depression, and about 20 percent for anxiety. (The two often coexist.) The incidence of those conditions in the running population is probably similar; [a 2017 review of research published in the *British Journal of Sports Medicine*](#) found no difference in depressive symptoms between what the researchers called “high-performance athletes” and nonathletes. All levels of runners are affected, with elites such as Olympian Adam Goucher and Western States 100-mile champions Rob Krar and Nikki Kimball having spoken publicly about their depression.

Of course, everybody gets sad and worried at times. What distinguishes those feelings from clinical depression and anxiety? In the short term, therapists often look for significant changes in emotions, behavior, and psychological functioning. They also focus on how symptoms such as feeling agitated, threatened, and uncomfortable (for anxiety) or joyless, lethargic, and apathetic (for depression) interfere with people's everyday functioning. "I look at how these things affect activities of daily living, like sleeping, going to work, interpersonal relationships," says Franklin Brooks, Ph.D., a clinical social worker in Portland, Maine.

"There's a profound difference between 'I'm having a bad day at work' and 'I'm having a bad day at work and I'm not going to get out of bed tomorrow because of it.'"

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That classic depiction of depression sounds like what Amelia Gapin, 34, a software engineer and marathoner from Jersey City, New Jersey, has experienced. "I've had episodes where, for six weeks, two months, I couldn't even get myself out of bed," she says. "During the weekends it

was wake up and take a couple hours to move myself to the couch.”

Ian Kellogg, 22, a 14:43 PR 5K college runner at Otterbein University in Westerville, Ohio, says, “When I fall into depression, I more often than not don’t run. I can’t find the energy or willpower to get out the door, even though I know my training is suffering and that just half an hour will make me feel better.”

Pati Haaz, 42, also knows this form of depression but was able to use running to overcome it. In June 2015, the finance professional from Kendall Park, New Jersey, had a miscarriage while two months pregnant. She became severely depressed and started missing work. “I didn’t want to get out of bed, I didn’t want to go out of my house,” she says. “It was that feeling that there’s no point in continuing. I had no motivation to do anything other than take care of my kids, which was more an automatic duty.” Guilt over being depressed — “feeling like I’m the worst mother in the world” — compounded the situation.

Haaz started seeing a therapist who asked about Haaz's pre-depression hobbies. Haaz said that she was a runner who, before becoming pregnant, had planned to run her first marathon that fall in New York City. The therapist encouraged her to resume running. Haaz decided she needed the goal of finishing a marathon to overcome the inertia that depression had introduced to her life.

She found that marathon training helped in two key ways. "If I was running for the sake of running, I would have stopped with my normal six-mile run," Haaz says. "But I was doing 16, 18, 20 miles, things I'd never done before. I was able to carry this sense of accomplishment into other areas."

Even her shortest runs helped Haaz think differently. "If I was driving or working or waking up in the middle of the night and thinking about the things that were making me sad, it would just make things worse—it would become like a spiral, and there was no end to it. But when I was running, I would think about those same things, and somehow I was able to process them differently. I would start my run with all

these negative thoughts, and after a mile or two, they were gone.” Five months after her miscarriage, Haaz finished New York City in 6:38.

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Reframing ruminations—thinking differently about hashed-over topics—is one of the main appeals of running for those of us with mental health issues. Cecilia Bidwell, 42, an attorney from Tampa, Florida, who has anxiety, puts it this way: “When I’m running, the thoughts come in and out, and I’m not worried,” she says. “I can think about things objectively. I realize that things that I’m thinking are a huge deal aren’t a big deal in the scheme of things.” The effect carries through Bidwell’s stressful work days. “When I’ve gone for a good run in the morning, if things are going haywire at 2 p.m. I’m handling them a lot better. I’m not creating crises and wondering, ‘Why am I here?’”

The more-immediate cognitive focus of a typical run also contributes to its efficacy. “When we’re overwhelmed with anxiety and depression, shifting from the big picture—all the frustrations,

worst-case scenario thinking—to the small, in-the-moment task of doing something that approaches a goal, like running a four-mile loop with two hills, will kick off a positive feedback loop that continues throughout the run and takes our thinking and emotions out of the trench of negativity,” says Laura Fredendall, Psy.D.

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These changes in mood and thinking are more accessible for runners. In a 2008 study published in the *Archives of Physical Medicine and Rehabilitation*, ultramarathoners, moderate regular exercisers, and non-exercisers walked or ran for 30 minutes at a self-selected pace that felt somewhat hard. After the workout, everyone’s mood had improved, but that of the ultramarathoners and moderate exercisers did so about twice as much as that of the sedentary people. Also, the ultrarunners and regular exercisers reported greater vigor and less fatigue after the workout than before, while the non-exercisers felt the same.

The reason is that runners can hold a good pace for a long time without going anaerobic, and that allows the physiological processes that lead to improved mood, according to Panteleimon Ekkekakis, Ph.D., a professor at Iowa State University who is a leading figure in the field of exercise psychology. “In sedentary folks, their ventilatory threshold—the point where exercise is no longer purely aerobic—is very low,” he says. “So they get up off the couch, they take a few steps, they’re already above their ventilatory threshold. If you’re a regular runner, you have the cardiorespiratory fitness to sustain an exercise intensity that’s associated with a feel-better effect.”

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Pati Haaz overcame post-miscarriage depression by training for the New York City Marathon. Amelia Gapin's daily runs provide reprieve from depressive rumination.

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My Chemical Romance

What causes that feel-better effect? Although the quick answer is usually endorphins, they're not the only relevant aspect of brain chemistry. What's more, focusing on the nebulous "runner's high" ignores crucial changes in brain structure and thinking patterns that running can induce.

Endorphins entered the runner's lexicon in the 1970s. That's when it became known that these chemicals, which bind to neuron receptors in the brain, are released at higher levels during a run. Several studies found that higher blood levels of postrun endorphins correlated to improved mood. In terms of the brain, however, a strong correlation between endorphin levels and improved mood wasn't demonstrated until 2008. German researchers used PET scans, an imaging study often used to check for cancer,

on triathletes' brains while the athletes ran for two hours. They found high levels of endorphins in the prefrontal cortex and other parts of the brain associated with mood, and that these levels aligned with the athletes' reports of euphoria.

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But endorphins aren't everything. As part of his research into human evolution, David Raichlen, Ph.D., a professor of anthropology at the University of Arizona, has measured pre- and postrun endocannabinoid levels in runners, dogs, and ferrets. Endocannabinoids are substances that bind to the same receptors in the brain as THC, the primary substance responsible for a marijuana high.

Raichlen says there are two leading theories on why running causes increased levels of endorphins and endocannabinoids. First, when humans became hunter/gatherers close to 2 million years ago, they became more active; the release of these chemicals, which act as pain relievers, may have evolved to allow longer,

faster movement. In this scenario, the feel-good aspect is a byproduct. Second, higher levels of these chemicals while active could have motivated continued movement, which would lead to getting more food and ultimately higher survival rates. Raichlen says the two mechanisms might have worked in tandem.

Whatever the original mechanism for these evolutionary adaptations, they're especially helpful for modern runners with mental-health issues. It's nice to run for an hour and go from being in a good-enough mood to a better one. It's a fundamental shift to go from being miserable to content, thanks to an infusion of feel-good substances. "I'll finish a run and be like, 'Wow, this is how most people feel all the time,'" Bidwell says.

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A short-term mood boost thanks to endorphins and endocannabinoids is one thing. (Granted, one much-appreciated thing.) But where running really helps with mental health is over time, thanks to a change in brain structure. [A review](#)

of research published in *Clinical Psychology Review* concluded “exercise training recruits a process which confers enduring resilience to stress.” This appears to occur because regular running produces the same two changes that are thought to be responsible for the effectiveness of anti-depressants: increased levels of the neurotransmitters serotonin and norepinephrine, and neurogenesis, or the creation of new neurons.

Neurogenesis occurs primarily due to a protein called brain-derived neurotrophic factor, which has been called the Miracle-Gro of the brain. “It helps neurons fire and wire together,” Fredendall says. Much of this happens in the hippocampus, an area of the brain that’s often shrunken in people with depression. “MRI scans have shown that even after a six-month exercise intervention, there’s a visible increase in the size of the hippocampus,” Ekkekakis says.

As Ekkekakis notes, you have to be fit to really get the daily benefits that can lead to structural changes. Of course, you also have to get yourself out the door, which can be especially

difficult if you're depressed. But success in running on an especially tough day makes it easier to get out the next time. And it can spur another key mental health benefit of running.

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I Think I Can, I Think I Can

Levels of chemicals in the brain are only part of your mental state. There's also cognition, or mental processes. Cognition includes not just straightforward thinking ("I should run long today because a blizzard is coming tomorrow") but also more involved phenomena, such as how you think about your thoughts.

A hallmark of depression is self-defeating, absolutist thinking—"everything is harder than it should be," "there's no pleasure in my life," "it's always going to be like this." I've learned that lacing up and hitting the roads is my best way to break free from such thoughts. On a daily basis, running reminds me that I can overcome apathy and torpor. Seeing that small victory, I can convince myself that progress is possible

on meeting professional goals, or not feeling lonely so often, or figuring out how to afford retirement. “The subjective experience of seeing yourself do something can make you feel better,” Fredendall says.

Ekkekakis says cognition is key to understanding another aspect of running’s effectiveness. “If you take anti-depressants and they make you feel better, the psychological attribution is external—the patients believe that the reason they get better is because of the drug they take,” he says. “With exercise, the attribution is internal—the reason I get better is that I’m doing this thing, I’m putting in the effort. That’s where perhaps the additional benefit of exercise compared to anti-depressants lies—that sense of empowerment, that sense that I’m taking control of my situation.”

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Even elite runners like two-time Western States 100-mile winner Rob Krar use running to manage their mental health.

ALEX ARISTEI

You Don't Hear About the Golfer's High

Is there something uniquely effective about running for managing mental health? Or can any form of exercise provide similar relief?

The short answer is nobody knows for sure, and definitive research comparing the mood-boosting properties of various ways of working out is unlikely. “Such a study would have multiple arms—optimal intensity, duration, or frequency of different forms of exercise—so you go from a study costing \$1 million to \$3 million,” Ekkekakis says. “The pharmaceutical companies fund their own studies, but who is going to fund the exercise studies? The amount of government funding available is simply not at

that level.” (According to the World Health Organization, depression is the leading cause of disability and poor health worldwide, but on average only 3 percent of government health budgets is spent on mental-health issues.)

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It is safe to say that purposeful exercise is better than incidental physical activity. A study published in *Medicine & Science in Sports & Exercise* found improved mood in people after they worked out, but not after daily-living activities such as climbing stairs. Aerobic exercise seems more effective than something like lifting weights. In fact, a review of research published in *Preventive Medicine* found that people with low levels of cardiovascular fitness were at greater risk of developing depression.

When I asked Raichlen about running compared to other activities, he began by citing more studies on endocannabinoids and talking about “mechanical pain” and “analgesic triggers.” Then the practical runner in him took over.

“It’s much easier to get yourself into a reasonable intensity compared to a lot of other sports,” he says. “It’s not too difficult to get in the right zone and stay there. You have a lot more control over your speed than even in something like cycling, where your effort level is more dictated by the topography or even stop lights.”

“I’ve dabbled with triathlons a little,” says Rich Harfst, 54, a federal government employee and marathoner from Annandale, Virginia, who was diagnosed with depression as a teenager. “I’ve done yoga, I’ve done cycling. Nothing is the same as running.” Ultrarunner Krar, who also mountain bikes and competes in ski mountaineering, says, “Running is that perfect balance where you can push yourself as hard as you like and more easily get in that flow state.” Bidwell says that when she doesn’t run, her anxiety puts her basic state at a 4 out of 10. “Running normally gets me to an 8,” she says. “When I’m hurt and swim instead, I’m at 6.”

That's been my experience over the last nearly four decades. When I've been injured and switch to cycling or pool running, the workouts themselves are like proverbial castor oil—I do them because I know I need them, not because they're enjoyable in themselves. The net that keeps me from plummeting starts to fray and sag.

But when running is going well, the net is taut and strong. A few times a month, usually while cruising along a wooded trail speckled with morning light, I'm overcome with a sensation best articulated as simply “yes.” Yes to the moment, yes to whatever is in store the rest of the day, yes to life itself. If I could bottle that feeling, I'd eventually forget what it's like to be depressed.

—

Contributing editor Scott Douglas's book *Running Is My Therapy*, which will be published in April, is [available now](#).

Scott is a veteran running, fitness, and health journalist who has held senior editorial positions at Runner's World and Running Times.

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