



The Biology of Stress

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The last in a series on the physical impact of stress. Here's a recap of what we've learned, plus some ways to reduce damage.

The first three parts of this series outlined the physical elements of the body's stress response and described various ways acute and chronic stress impact physical health. In this final installment, we bring it all together and examine ways to assess and manage the stressors you encounter.

We launched this series on the biology of stress by pointing out that scientists are increasingly exploring stress as a key factor in the origin of illness. Research has linked the long-range physical effects of stress to the development of heart conditions, high blood pressure, weight problems, diabetes, early cognitive decline and other conditions. Recent studies have also shown a higher prevalence of CFS in people with increased measures of cumulative wear and tear on the body from stress.

In fact, the body experiences stress as a cascade of physical reactions that call multiple systems and chemical messengers into play—from brain impulses and hormone release to heart rate and circulation changes all the way down to a flurry of cellular activity that affects energy conversion and immune function. While we often view stress as an external force, we ultimately experience it within all the major systems of the body.

What do we know about stress and the body?

Already in this series we've explored how acute stress—the famed “fight or flight” response—taxes the body by sending multiple systems into battle mode. We also know that chronic stress affects can impede the body's ability to regain balance (homeostasis or allostasis). Over time the body can accumulate what's called allostatic load—the physical wear from a chronically activated stress response. Think of it like a clothes dryer where the lint trap never gets fully emptied. As the residual lint

appears to be through increased production of chemical messengers called cytokines, particularly the ones that create inflammation.

Normally “proinflammatory” cytokines aid in the healing process by calling other immune cells to the site of infection or injury to repair damage or “fight off” a biologic invader—often producing fatigue, achiness, fever and slowed cognition as a by-product of the battle. But research shows that people under stress can produce too many of these cytokines, actually making them feel worse and prolonging the healing

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builds up, the machine has to work harder, and ultimately this can damage the unit.

We've also looked at how stress affects the immune system by disrupting the tightly orchestrated process of specialized organs and cells that protect us. Research shows that stress makes it harder to fend off illness, makes symptoms worse when we *do* get sick and even slows our ability to heal wounds. One way this occurs

process. This may be particularly significant to people with CFS, some of whom exhibit higher than normal levels of cytokines as well as lower production of cortisol, a hormone that can help contain proinflammatory activity.

So it's not hard to see how stress plays itself out in our bodies and how, through science, we're realizing that the phrase “can't handle the pressure” is more accurately applied to our bodies than our minds.

What can we do to minimize stress?

The notion of stress management has spawned a multibillion-dollar industry, but that doesn't necessarily mean meaningful help is readily available. Commercial products may aid some people in reducing their stress levels, but more success is likely to come from looking inward.

Different things stress different people, and we each develop unique ways of addressing the stress we encounter. Sometimes these learned reactions can influence the degree and duration of our body's stress response. So there's a practical benefit to understanding what your unique stressors are and recognizing the ways you currently respond to them.

Make a list. There are a number of stress diary and journaling techniques touted on websites and in self-help books, but they basically boil down to making a list of what stresses you (for example, "too many chores to complete in a day"), to what degree (on a scale where 10 is totally stressed) and how it affects your health or lifestyle ("kept me awake thinking about what was left to do"). Some sources suggest creating this list in real time or once a day for several weeks. Others propose reflecting on recent events and creating the list in one or two sittings. But the goal is always the same: to objectively identify your specific sources of stress and how they currently affect you.

Assert control. Gaining a sense of control can be a powerful stress mitigator, and often people have more control than they think, especially at the incremental level.

Find things on your list that you can do something about. Perhaps you can minimize the amount of chores

you generally plan for one day. Or maybe you'll recognize a need to sign up for community services to help you care for an aged parent. Even small but well-targeted adjustments can change the landscape considerably.

Pay attention, as well, to events on your list that you *can't* control and examine how you react to them. Increasing your awareness and gradually modifying how you respond to these events can be the most empowering factor of all.

Set limits. The key to setting limits is first to set priorities. Make a list of "must haves" too—if only to give yourself a chance to focus on what things add meaning and enjoyment to your life. Decide what's most important for your sense of well-being and put those things at the forefront of your mind and your decisions. For everything that falls outside your priority list, ask yourself, "What's the worst thing that would happen if I didn't do this?" If you can live with the answer, then let it go at least until

GADGETS AND TOOLS

Americans spend about \$11 billion a year on products to reduce their stress. Here's a rundown of a few items on the market:

Stress balls: If your stress manifests itself by making you restless, a stress ball may help use up extra energy. Otherwise, it's of little benefit.

Aromatherapy: This has been shown to help with relaxation and mild stress headaches. One of the benefits comes simply from the ritual of it and by taking time out to employ the process.

Meditation recordings: Studies show that meditation can alleviate stress and boost your immune system, but many people don't have time or focus to devote to authentic meditative practices. Recordings aren't a substitute for true meditation, but they can help you slow down, breathe deeply and separate yourself from the stress at hand. This, in turn, can help initiate your body's relaxation response.

Biofeedback machines: This device monitors body signals and notifies you when you reach a relaxed state. Over time this can help you condition yourself to initiate this state more effectively.

Massage: Studies show that massage can alleviate tension. It can also bolster your immune system by helping toxins work their way through the lymphatic system. Therapeutic and relaxation massage is often worth the time and cost involved, particularly when more than one session is employed. Even the simple act of making time for yourself to enjoy a massage can improve your overall well-being.

Acupuncture: Several studies have shown that acupuncture can relieve stress. For instance, patients given acupuncture before cataract surgery experience less anxiety related to the experience. But treatment can be expensive and can require repeated sessions. Ear acupuncture is emerging as a less expensive and effective way to reduce tension.

you reach a point to add more activities without increasing your stress level.

Know when to seek help. At times it pays to seek outside help to address and manage the stressors you face. For some people, confiding in a spouse or friend helps alleviate anxiety and inject a fresh perspective.

Other people seek compassion and guidance from ministers, rabbis or spiritual leaders. Peer support groups can also help.

But if you find you're not making progress minimizing the effects of stress in your life, it may be worth seeking help from a trained profes-

sional like a family counselor, social worker, therapist, psychologist or psychiatrist. These practitioners are schooled in techniques for coping with stress and can assist you for a limited time or in an ongoing capacity based on what you feel you need.

What can we do to reduce the physical toll?

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GETTING DOWN TO BUSINESS ABOUT STRESS

The business world uses what's called SWOT Analysis to assess a company's strategic position. The website Mindtools.com suggests that the same process can help people assess their stressors and better meet the challenges they identify.

A SWOT Analysis is a systematic method for understanding your *Strengths* and *Weaknesses*, and for looking at the *Opportunities* and *Threats* you face.

Strengths

Start by listing the things you're good at and the positive situations in your life. Then list your support network of family or friends you can usually count on, professional or social networks, government or community services, powerful contacts and spiritual allies. Also list the resources you feel you can draw on like money, assets, power and/or spirituality.

Look back to the past and think about times you managed a stressful situation successfully. Write down the practical skills you used to do this.

Weaknesses

Think back and identify times when you didn't handle stress well. Write down why you think this was the case. List things for which people fairly criticize you or traits with which you struggle. Also list resources you lack that impact your ability to manage stress (like a poor living or work environment).

This allows you to identify possible areas of change and to spot where you need to develop new skills.

Opportunities

Brainstorm about the opportunities you have available to you. Work your way through the strengths you've identified, asking yourself how you can draw on them to help you manage stress. Are there people whose job it is to help you? Are there people whose support you could call on? Are you fully using the resources you have? Could you pay to have certain tasks handled, or are there community services to assist with your needs? Could you use your skills in one area to help yourself in another?

Work through the weaknesses you've identified and reframe them as opportunities for positive change.

Consider and list the practical opportunities that would be open to you if you improved the ways you manage stress.

Threats

Consider the consequences of not addressing your weaknesses—including the damage to relationships, career, peace of mind and health that would come from failing to manage your stress. But don't get trapped in this phase. Think of these things as incentives to take stress management seriously.

If a stress SWOT Analysis is anything like the business-generated version, you're likely to end up with an interesting map of where you stand in the stress landscape and some paths you could take to better navigate the terrain.

Eat smart. Diet can be key to minimizing the effects of your stress load. Many people turn to sweets or starchy “comfort foods” when feeling anxious. But stress-induced hormone secretion and the activity of the autonomic nervous system also produce elevated levels of sugar in the blood. Eating sweets and starches ultimately makes a bad situation worse, boosting the negative chemical effects of stress. But increasing your fiber intake and decreasing your sugar can have a balancing effect on stress hormones and insulin levels.

Foods can also play a role in how much inflammation you have (from stress or otherwise) because certain foods are less easily converted into the chemical components that aid inflammation. For example, eating foods higher in omega-3 fatty acids—like fish, walnuts and soybeans—can help prevent inflammation. On the other hand, omega-6 fatty acids from meat and dairy can bolster inflammatory responses.

Increasing the amounts of antioxidants in your diet can also help fight inflammation and keep your cells fit and prepared to handle stress. Green and black teas, garlic and fresh fruits are all high in antioxidants.

Get rest. When it comes to stress and sleep, it can be hard to tell if stress is making you sleep less or a lack of sleep is making you more stressed. But one thing is certain: adequate sleep increases the body’s ability to weather the physical challenges it faces, including those from stress.

Medical experts recommend at least eight hours of sleep per night to give the body a chance to reset itself and prepare for the next day.

Since sleep disturbances are common among people with CFS, you may need to see your doctor

about specific sleep treatments. But with or without medical intervention, it’s important to be mindful of sleep hygiene habits like not eating, drinking caffeine, smoking or exercising within three hours of bedtime. Studies also show that going to bed and waking up at the same times each day can gradually improve your body’s ability to fall asleep and stay asleep.

Exercise as able. Exercise can be difficult for people with CFS, many of whom experience a “crash” following rigorous activity. But mild, regular exercise helps regulate stress hormones and blood pressure. Gentle stretching and movement interspersed with longer rest periods can have a positive effect if done consistently.

Stay connected. Research shows that people with more social ties often have lower allostatic load scores, suggesting that social interaction is an important factor in reducing the physical effects of stress. But this doesn’t have to mean attending more social gatherings. One bedbound woman with CFS socializes without overextending herself by having a friend over once a week to sit quietly reading or listening to music together.

Another woman maintains her sense of connection to the larger community by stuffing envelopes for a local charity. Other people with chronic illness connect online or find low-key ways to maintain communication with friends and family. In the end, it’s the quality of the connections, not a busy social calendar, that matters.

Adequate hydration, deep breathing and body/mind care like massage and meditation can also target the systems most affected by stress.

What does it all mean?

It’s clear that, although stress can affect our emotions, its real impact occurs within the body and can influence our health. Being aware of this reframes the discussion of stress in physical terms. It also opens the door to exploring ways to better arm the body for dealing with stress, even as we learn to manage the specific stressors in our lives. ■

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WHEN TO SEEK PROFESSIONAL ASSISTANCE

The American Psychological Association recommends you seek professional help for stress if:

- You feel trapped by the stressors you face.
- You worry all the time to the point of not being able to concentrate.
- The way you feel from stress affects your sleep, eating habits, job and/or relationships on a daily or near-daily basis.

Your primary care doctor or insurance provider may be able to recommend an appropriate mental health professional. Some employers also offer private counseling through Employee Assistance Programs (EAPs). It’s also a good idea to “interview” prospective mental health professionals about their therapy strategies and views on CFS.