

NIH News in Health

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Feeling Stressed? Stress Relief Might Help Your Health

Winter holidays—do they fill you with joy or with worries about gift-giving and family gatherings? Do summer vacations leave you relaxed or fretful over travel and money? If you're feeling stressed out over supposedly fun things, it might be time to reassess. Take a few moments to learn how stress affects your health and what you can do about it.

Everyone feels stressed from time to time. Stress can give you a rush of energy when it's needed most—for instance, competing in sports, working on an important project, or facing a dangerous situation. The **hormones** and other chemicals released when under stress prepare you for action. You breathe faster, your heartbeat quickens, blood sugar rises to give you energy, and your brain uses more oxygen as it shifts into high alert.

But if stress lasts a long time—a condition known as chronic stress—those “high-alert” changes become harmful rather than helpful. “Stress



clearly promotes higher levels of **inflammation**, which is thought to contribute to many diseases of aging. Inflammation has been linked to cardiovascular disease, diabetes, arthritis, frailty, and functional decline,” says Dr. Janice Kiecolt-Glaser, a leading stress researcher at Ohio State University. She and other researchers have found that stress affects the body's **immune system**, which then weakens your response to vaccines and impairs wound healing.

Research has linked chronic stress to digestive disorders, urinary problems, headaches, sleep difficulties, depression, and anxiety.

“Some studies have found the physical, emotional, and social effects of a disease like cancer to be stressful for patients, caregivers, and long-term cancer survivors,” says NIH's Dr. Paige Green McDonald, an expert

on stress and cancer biology. “However, there's no definitive evidence that stress causes cancer or is associated with how long one survives after a cancer diagnosis.”

The top causes of stress in the U.S. are money and work-related pressures, according to a 2013 survey from the American Psychological Association. Stress can also arise from major life changes, such as the death of a loved one, divorce, illness, or losing a job. Traumatic stress is brought on by an extreme event such as a major accident, exposure to

violence, or a natural disaster such as a hurricane or flood.

Caring for a person with severe illness—such as dementia or cancer—can also be a significant source of stress. More than a decade ago, studies by Kiecolt-Glaser and others showed that the stressful demands placed on caregivers can lead to poorer health, lower responses to vaccines, increased inflammation, and a more than 60% higher death rate compared to non-caregivers.

It's not clear why some people can sidestep or recover more quickly

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Definitions

Hormones

Substances produced in one part of the body to signal another part to react a certain way.

Inflammation

Heat, swelling, and redness caused by the body's protective response to injury or infection.

Immune System

The system that protects your body from microscopic threats.

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from stress than others. These resilient people seem to “bounce back” more easily after stressful situations. Recent studies of animals suggest that resiliency may depend at least in part on our genes. But learning healthy ways to cope with stress can also boost your resilience.

“There are many different ways to cope with stress. We know from a lot of different studies that having close personal relationships—people with



Wise Choices To Reduce Stress

- **Get enough sleep.**
- **Exercise regularly.** Just 30 minutes a day of walking can boost mood and reduce stress.
- **Build a social support network.**
- **Set priorities.** Decide what must get done and what can wait. Say no to new tasks if they are putting you into overload.
- **Think positive.** Note what you’ve accomplished at the end of the day, not what you’ve failed to do.
- **Try relaxation methods.** Mindfulness, meditation, yoga, or tai chi may help.
- **Seek help.** Talk to a mental health professional if you feel unable to cope, have suicidal thoughts, or use drugs or alcohol to cope.

If you or someone you know is in crisis, call the toll-free, 24-hour National Suicide Prevention Lifeline at 1-800-273-TALK (1-800-273-8255).

whom you can talk, with whom you can share your feelings—can be helpful,” says Kiecolt-Glaser. “So spending time with family and friends in order to maintain those relationships is perhaps one of the most crucial things you can do as a stress reducer.”

Unfortunately, Kiecolt-Glaser adds, “when we’re stressed, we tend to do the worst things that are not at all helpful to our health.”

For instance, stressed out people may tend to isolate themselves and not seek social support. “Exercise is a great stress reducer. But when people are stressed, exercise becomes less common and less appealing,” Kiecolt-Glaser says. “Instead of maintaining a healthy diet—also important to reducing stress—some people who are stressed tend to eat more donuts than vegetables.”

You may think that the agitation brought on by stress might help to burn calories. But evidence hints that the opposite is more likely. Kiecolt-Glaser and colleagues found that, compared to nonstressed people, those who were stressed burned fewer calories after high-fat meals and they produced more of the hormone insulin, which enhances fat storage. “So stress may contribute to weight gain and obesity through these biological routes,” Kiecolt-Glaser adds.

Getting enough sleep is also key to resilience and stress relief—although stress itself can interfere with sleep. To improve your sleep habits, go to bed the same time each night and get up the same time each morning, and limit the use of light-emitting electronics like computers and smart-



Web Links

For more about stress and health, click the “Links” tab at:
<http://newsinhealth.nih.gov/issue/Dec2014/Feature1>

phones before bed. The light can reduce production of a natural sleep hormone called melatonin, which then makes it hard to fall asleep.

Beyond recommendations for exercise, healthy diet, social contacts, and getting enough sleep, Green McDonald says, “studies have also shown that mindfulness (focused attention on one’s own emotions) and other meditative practices can effectively relieve stress.”

“Mindfulness means staying aware and conscious of your experiences. No matter what we’re doing, we can always make time to bring our attention to our breath and body and stay there for a short period of time,” says NIH psychologist Dr. Rezvan Ameli, who specializes in mindfulness practice. “Recent studies show that even short periods of mindful attention can have a positive impact on health and well-being.”

Other NIH-funded studies have shown that mindfulness meditation can reduce stress, alter brain structure and function, and have a positive effect on the immune system.

“Mindfulness is a simple and effective tool that anybody can use to reduce stress,” Ameli says. Although the concept is simple, becoming more mindful requires commitment and practice. You can learn more about mindfulness meditation from local resources like yoga or meditation classes, mindfulness-based stress-reduction programs, or books.

If you feel overwhelmed by stress, talk with a health care provider or mental health professional. Medications or other therapies might help you cope. In the long run, reducing stress may help you to slow down and enjoy your time with the people and activities you really care about. ■

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When Your Back Hurts

Don't Let Back Pain Knock You Flat

Is your back hurting? You're in good company. In any 3-month period, about 1 in 4 adults in the U.S. has at least one day of back pain, mostly in the lower back.

The back is a complicated structure. Its center is the spine, which is made up of 33 bones called vertebrae, stacked in a column. The nerves of the spinal cord run in a tunnel through the middle of those bones. Spongy discs between the vertebrae act as cushions. Ligaments and tendons hold everything together.

A lot of things can go wrong with your back. A strained muscle or a problem with a disc or a bone can cause pain. Back pain might also arise from a fracture or tumor. Much of the time, though, it's impossible to tell what's making your back hurt.

"We rarely find out exactly what it is," says Dr. Gunnar Andersson, an **orthopedic** surgeon at Rush University Medical Center in Chicago. "As long as it stays as back pain, we are typically not that concerned."

Your back naturally changes as you get older. Discs degenerate and arthritis may develop in the small joints of the back. Those changes may show up on an MRI or other types of imaging scans. But such changes to the back are also seen in a lot of people who don't have back pain. So it's hard to know if the changes are actually what's causing the pain.

People with obesity are more likely to have low back pain, as are people who smoke. Back pain is also more common in people who don't exercise much, or in people who are mostly inactive but have occasional bursts of exercise.

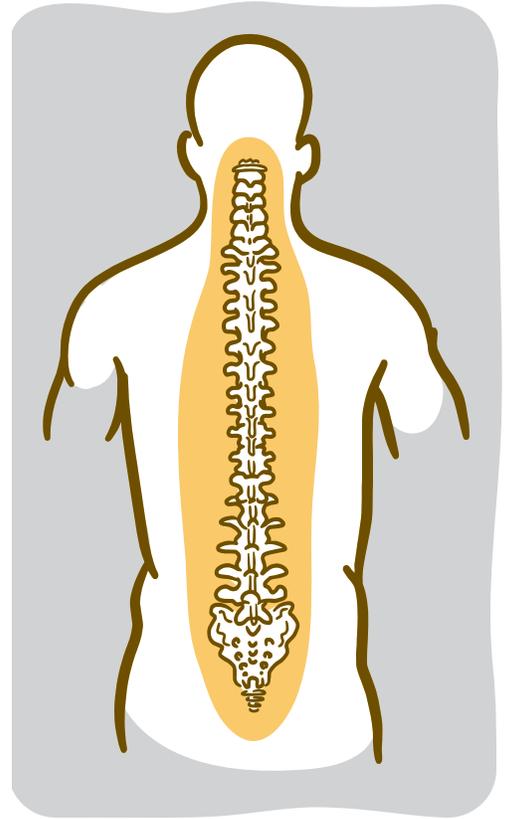
The good news is most back pain goes away by itself. For a new pain in

the back, Andersson says he usually advises taking over-the-counter medications for the pain and staying away from activity that is hard on the back—lifting, carrying, bending, and twisting. "Then, wait for the problem to disappear, which it will in the great majority of people over a few weeks," he says.

But for some people, the pain continues. If your back hurts most of the time for more than 3 months, you have chronic back pain.

What doctors do about chronic pain depends on the source of the pain. Some chronic back pain requires prolonged medical attention. If the pain comes from a fracture or tumor, those problems can be treated. Surgery can help if the pain is caused by a ruptured (herniated) disc or certain other conditions like spinal stenosis (narrowing of the spinal column, which can put pressure on the nerves) or degenerative spondylolisthesis (when one vertebra slips over another). But surgery isn't the right choice for everyone.

There are many treatment options for back pain, so be sure to talk to your health care provider about which approach is right for you. For most people, even chronic pain eventually clears up without surgery. The most important thing, Andersson says, is not to let the pain take over. Research has shown that patients who stay active are better off. Just be sure to avoid activities that might strain the back. "It's important not to succumb to the pain and become afraid of moving," Andersson says. "It doesn't seem to make much difference what you do, as long as you stay active." ■



Definitions

Orthopedic

Related to bones, joints, and the body's movement.

Web Links

For more information about back pain, click the "Links" tab at: <http://newsinhealth.nih.gov/issue/Dec2014/Feature2>



Wise Choices For a Healthier Back

- Stay active and maintain a healthy weight.
- Stretch before exercise or other strenuous physical activity.
- Don't slouch when standing or sitting.
- Make sure your work surface is at a comfortable height for you.
- Wear comfortable, low-heeled shoes.
- If you must lift something heavy, don't bend over the item; instead, keep your back straight, bend at the knees, and lift by putting the stress on your legs and hips.
- Talk with a health care provider to make sure you're getting enough calcium and vitamin D.
- Don't smoke.



Health Capsules

For links to more information, see these stories online:
<http://newsinhealth.nih.gov/issue/Dec2014/Capsule1>

Detecting Rare Disease-Causing Glitches

For people with suspected rare genetic conditions, getting an accurate diagnosis can be difficult and frustrating. A new study suggests that a fast, powerful technique called whole-exome sequencing can help doctors pinpoint the causes of many hard-to-diagnose genetic conditions.

Understanding the cause is crucial for developing a treatment plan. It can also help the family understand the risk to other members.

Instead of sequencing the entire human **genome**, which has 6 billion DNA base pairs, whole-exome sequencing focuses on just 1%. The exome only includes regions that

code for proteins—where many disease-causing glitches are found.

In 2 NIH-supported studies, research teams analyzed the exomes of a total of nearly 3,000 people who were thought to have a genetic disorder. Most were under age 18. In many cases, their parents' genetic sequences were also assessed. Some of the patients had gone through years



Definitions

Genome

The entire set of genetic instructions in your body.

of consultation and testing, but none had yet received a definite diagnosis.

Both studies found that whole-exome sequencing led to a potential molecular diagnosis for about 1 in 4 participants.

More studies will be needed to confirm these findings. Further work will also be needed to assess how whole-exome sequencing can best be applied in the clinic.

"I expect that in a few years, we'll learn of the importance of whole-exome sequencing in adult medicine and in pediatric fields outside of development," says Dr. Sharon Plon of Baylor College of Medicine, a coauthor of one study. ■

A Priceless Gift: Your Family Health History

Conditions such as cancer, heart disease, and diabetes often run in families. Tracing the illnesses of your parents, grandparents, and other blood relatives can help your health care practitioner predict your risk for specific disorders. It could suggest vital screening tests and treatments before any disease is evident. That's why it's so important to discuss your family's health history.

The U.S. Surgeon General has an online tool, *My Family Health Portrait* (<https://familyhistory.hhs.gov>), that can help you gather and record your family health history. The tool lets you save family information to your own computer and share health histories with other family members. The tool is available in English, Spanish, Italian, and Portuguese.

Before you start using this tool, talk with family members to gather details about their health histories. The Surgeon General offers tips on starting the conversations at www.hhs.gov/familyhistory/start/startenglish.pdf.

In the future, tests may make it possible to identify and possibly fix the gene glitches that raise a person's risk for diseases. NIH is now working on technology that will help doctors quickly create a health plan based on a person's unique genetic blueprint. In the meantime, family health history is a no-cost way to help doctors personalize your health care.

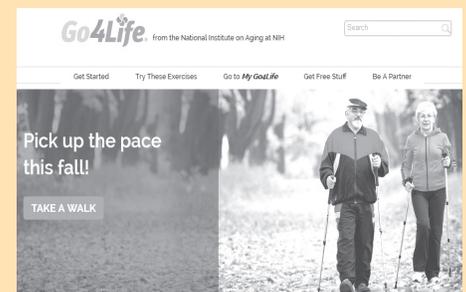
As the holiday season continues, start a new tradition and create a family health portrait. This will truly be a priceless gift to you, your family, and future generations. ■



Featured Website Go4Life

<http://go4life.nia.nih.gov>

This interactive site helps adults, ages 50 and older, to fit more physical activity into their days. A science-based exercise guide, videos, success stories, motivational tips, and free materials can help you get ready, start exercising, and keep moving.



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