

NIH News in Health

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Positive Emotions and Your Health

Developing a Brighter Outlook

Do you tend to look on the sunny side, or do you see a future filled with dark, stormy skies? A growing body of research suggests that having a positive outlook can benefit your physical health. NIH-funded scientists are working to better understand the links between your attitude and your body. They're finding some evidence that emotional wellness can be improved by developing certain skills.

Having a positive outlook doesn't mean you never feel negative emotions, such as sadness or anger, says Dr. Barbara L. Fredrickson, a psychologist and expert on emotional wellness at the University of North Carolina, Chapel Hill. "All emotions—whether positive or negative—are adaptive in the right circumstances. The key seems to be finding a balance between the two," she says.

"Positive emotions expand our awareness and open us up to new ideas, so we can grow and add to our toolkit for survival," Fredrickson explains. "But people need negative emotions to move through difficult situations and respond to them appropriately in the short term. Negative emotions can get us into trouble, though, if they're based on too much rumination about the past or excessive worry about the future, and they're not really related to what's happening in the here and now."

People who are emotionally well, experts say, have fewer negative emotions and are able to bounce back from difficulties faster. This quality is called resilience. Another sign of



emotional wellness is being able to hold onto positive emotions longer and appreciate the good times. Developing a sense of meaning and purpose in life—and focusing on what's important to you—also contributes to emotional wellness.

Research has found a link between an upbeat mental state and improved health, including lower blood pressure, reduced risk for heart disease, healthier weight, better blood sugar levels, and longer life. But many studies can't determine whether positive emotions lead to better health, if being healthy causes positive emotions, or if other factors are involved.

"While earlier research suggests an association between positive emotions and health, it doesn't reveal the underlying mechanisms," says Dr. Richard J. Davidson, a neuroscientist at the University of Wisconsin-Madison. "To understand the mechanisms,

I think it will be crucial to understand the underlying brain circuits."

By using brain imaging, Davidson and others have found that positive emotions can trigger "reward" pathways located deep within the brain, including in an area known as the ventral striatum.

"Individuals who are able to savor positive emotions have lasting activation in the ventral striatum," Davidson says. "The longer the activation lasts, the greater his or her feelings of well-being." Continued activation of this part of the

brain has been linked to healthful changes in the body, including lower levels of a stress hormone.

Negative emotions, in contrast, can activate a brain region known as the amygdala, which plays a role in fear and anxiety. "We've shown that there are big differences among people in how rapidly or slowly the amygdala recovers following a threat," Davidson says. "Those who recover more slowly may be more at risk for a variety of health conditions compared to those who recover more quickly."

Among those who appear more resilient and better able to hold on

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to positive emotions are people who've practiced various forms of **meditation**. In fact, growing evidence suggests that several techniques—including meditation, cognitive therapy (a type of psychotherapy), and self-reflection (thinking about the things you find important)—can help people develop the skills needed to make positive, healthful changes.

"Research points to the importance of certain kinds of training that can

alter brain circuits in a way that will promote positive responses," Davidson says. "It's led us to conclude that well-being can be considered as a life skill. If you practice, you can actually get better at it."

In one study, Davidson and his colleagues found changes in reward-related brain circuits after people had 2 weeks of training in a simple form of meditation that focuses on compassion and kindness. These changes, in turn, were linked to an increase in positive social behaviors, such as increased generosity.

Fredrickson and her colleagues are also studying meditation. They found that after 6 weeks of training in compassion and kindness meditation, people reported increased positive emotions and social connectedness compared to an untrained group. The meditation group also had improved functioning in a nerve that helps to control heart rate. "The results suggest that taking time to learn the skills to self-generate positive emotions can help us become healthier, more social, more resilient versions of ourselves," Fredrickson says.

Dr. Emily Falk, a neuroscientist at the University of Pennsylvania, is taking a different approach. Falk is exploring how self-affirmation—



Web Links

For more about emotional wellness and health, click the "Links" tab at: <http://newsinhealth.nih.gov/issue/Aug2015/Feature1>

that is, thinking about what's most important to you—can affect your brain and lead to positive, healthful behaviors. Her team found that when people are asked to think about things that they find meaningful, a brain region that recognizes personally relevant information becomes activated. This brain activity can change how people respond to health advice.

"In general, if you tell people that they sit too much and they need to change their behavior, they can become defensive. They'll come up with reasons why the message doesn't apply to them," Falk says. But if people reflect on the things they value before the health message, the brain's reward pathways are activated.

This type of self-affirmation, Falk's research shows, can help physically inactive "couch potatoes" get more active. In a recent study, inactive adults received typical health advice about the importance of moving more and sitting less. But before the advice, about half of the participants were asked to think about things that they value most.

The "self-affirmation" group became more physically active during the month-long study period that followed compared to the group that hadn't engaged in self-affirmation. "The study shows one way that we can open the brain to positive change and help people achieve their goals," Falk says.

Being open to positive change is a key to emotional wellness. "Sometimes people think that emotions just happen, kind of like the weather," Fredrickson says. "But research suggests that we can have some control over which emotions we experience." As mounting research suggests, having a positive mindset might help to improve your physical health as well. ■



Wise Choices Enhance Your Emotional Wellness

To develop a more positive mindset:

- **Remember your good deeds.** Give yourself credit for the good things you do for others each day.
- **Forgive yourself.** Everyone makes mistakes. Learn from what went wrong, but don't dwell on it.
- **Spend more time with your friends.** Surround yourself with positive, healthy people.
- **Explore your beliefs about the meaning and purpose of life.** Think about how to guide your life by the principles that are important to you.
- **Develop healthy physical habits.** Healthy eating, physical activity, and regular sleep can improve your physical and mental health.

Adapted from U.S. Health Resources and Services Administration.



Definitions

Meditation

A mind and body practice designed to increase calmness and relaxation.

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All About ALS

Understanding a Devastating Disorder

In the summer of 2014, social media was taken by storm with videos of people pouring ice water on themselves for the Ice Bucket Challenge. The worldwide phenomenon raised awareness—and millions of research dollars—for a fatal disease called ALS.

ALS stands for amyotrophic lateral sclerosis. It's also called Lou Gehrig's disease. ALS attacks motor neurons, the nerve cells responsible for regulating "voluntary" muscles that we're aware of controlling, such as those in our arms, legs, and face. As these motor neurons degenerate or die, they stop sending signals to muscles. Unable to function, the muscles gradually weaken and waste away.

"At first only a single limb may be affected, such as some weakness in a hand or a leg, or a person may have problems speaking or swallowing," explains Dr. Amelie Gubitza, who oversees much of NIH's ALS research.

Other symptoms may include stiff muscles, cramps, or stumbling. It may become hard to turn a key, lift a coffee pot, or button a shirt.

Eventually, all muscles under

voluntary control are affected, and people lose the ability to move different parts of their body. When breathing-related muscles fail, ventilation support can help people breathe. Most people with ALS die from respiratory failure, usually within 3 to 5 years after symptoms first appeared. However, about 10% of people with ALS survive for 10 or more years.

Nationwide, more than 12,000 people have ALS. It affects people of all races and ethnicities. ALS most commonly strikes between the ages of 40 and 60, but younger and older people also can develop the disorder. Men are more likely than women to be affected.

In most ALS cases, the underlying causes are unknown. "The reasons why you get it are not really understood," Gubitza says. "Even a healthy young person can get this disease out of the blue."

A small percentage of cases, about 10%, are inherited. In 1993, scientists discovered that mutations, or alterations, in a certain **gene** were associated with some cases of ALS. Since then, mutations in over a dozen genes have been found to cause familial ALS. These discoveries provide new information about the disease that will help guide future research.

Although ALS has no cure, it can be managed to some extent with medication and therapy. In 1995, the U.S. Food and Drug Administration approved a medication called riluzole (Rilutek) as the first drug treatment for ALS. The drug prolongs life by several months, and it can extend the time before someone needs ventilation support. Riluzole doesn't re-



verse the damage already done, and patients must be closely watched for possible side effects.

Other treatments for ALS aim to ease symptoms and improve quality of life. For example, an FDA-approved drug combination of dextromethorphan and quinidine (Nuedexta) helps manage intense emotional changes, such as uncontrollable laughing or crying, that are often seen with ALS.

Because the mind remains relatively intact, people with ALS may be keenly aware of their continued loss of function. They may become anxious and depressed. Health care professionals can tailor plans for therapy and equipment to keep people as mobile and comfortable as possible.

While much is still unknown, scientists are working to gain new insights into ALS. "I believe potentially promising approaches for treatment are in the pipeline," Gubitza says. "Researchers are trying to attack the disease from many different angles, which brings much hope for progress." ■



Wise Choices

How Can I Help ALS Research?

- If you have ALS, join the National ALS Registry at www.cdc.gov/als. The registry collects and analyzes data from people with ALS. All information is kept confidential.
- To participate in a clinical trial, visit www.clinicaltrials.gov. Use the search terms "amyotrophic lateral sclerosis" or "ALS" and [your state] to find trials in your area.
- Tissue donated by people with ALS can help scientists study the disorder. To learn more, contact the Human Brain and Spinal Fluid Resource Center (part of the NIH NeuroBioBank) at www.brainbank.ucla.edu, or call 310-268-3536.



Definitions

Gene

A stretch of DNA, a substance you inherit from your parents, that affects characteristics such as how likely you are to get certain diseases.



Web Links

For more information about ALS, click the "Links" tab at: <http://newsinhealth.nih.gov/issue/Aug2015/Feature2>



Health Capsules

For links to more information, see these stories online:
<http://newsinhealth.nih.gov/issue/Aug2015/Capsule1>

Increases in Problem Drinking

Alcohol use disorder is becoming more common, a new study found, but few people seek treatment. The findings highlight the need to better educate people about problem drinking and its treatment.

Alcohol use disorder, or AUD, is the clinical term for problem drinking that causes mild to severe harm or distress. Excessive drinking can interfere with work, school, and relationships. It also raises the risk of many ailments, including heart disease, high blood pressure, liver disease, depression, and some cancers.

Doctors diagnose AUD using guidelines that were updated in

2013. The new guidelines combined 2 different disorders—alcohol abuse and alcohol dependence—into the single disorder of AUD.

A team led by NIH's Dr. Bridget F. Grant wanted to find out how many Americans would be diagnosed with AUD based on the new guidelines. They conducted face-to-face interviews with over 36,000 U.S. adults.

They found that about 14% of the adults met the criteria for having AUD within the previous year. Almost 1 in 3 people they interviewed had AUD at some time in their lives. Of these, only about 20% sought treatment or help for their AUD.

Problem drinking was more common in men than in women. It was also more common in young adults than in older adults.

"These findings underscore that alcohol problems are deeply entrenched and significantly under-treated in our society," says NIAAA Director Dr. George F. Koob. "The new data should provide further impetus for scientists, clinicians, and policymakers to bring AUD treatment into the mainstream of medical practice." ■

Join the Fight Against Superbugs

Can you imagine a world where antibiotics didn't work anymore? You shouldn't have to. But over the past few decades, they've been losing their punch. Bacterial strains that are resistant to many types of antibiotics are called superbugs. Sadly, our excessive use of antibiotics is partly to blame. A new video from NIH, *Fighting Superbugs*, can help you learn more about what you can do to help win this battle.

Superbugs infect over 2 million people across the U.S. each year and kill more than 23,000. Common forms of superbugs include types of tuberculosis, staph infections like MRSA, and gonorrhea.

You can help in the fight against superbugs. First, there's prevention. Try not to spread infectious bac-

teria. Wash your hands often. Promote healthy bacteria in your body through exercise and healthy eating.

Your second line of defense is using antibiotics properly. Don't ask for antibiotics if your doctor doesn't recommend them—they should only be taken when necessary. Be sure to take them exactly as directed and finish all your medication, even if you feel better.

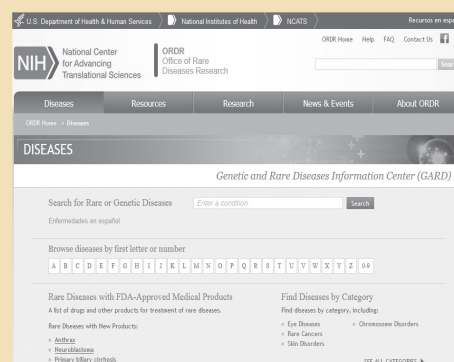
We can win this fight with prevention, proper antibiotic use, and research. NIH is doing its part by supporting studies of new antibiotics. To learn more about what you can do, watch the video at <http://newsinhealth.nih.gov/issue/aug2015/capsule2>. And read our "Stop the Spread of Superbugs" article at <http://newsinhealth.nih.gov/issue/feb2014/feature1>. ■



Featured Website Genetic and Rare Diseases Information Center

<https://rarediseases.info.nih.gov/GARD>

This website provides accurate, up-to-date information about thousands of rare and genetic diseases. Learn about symptoms, treatment options, and current research. Information specialists are available to discuss questions online, by mail, or by phone (888-205-2311) in English or Spanish.



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