

# NIH News in Health

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## Breaking Bad Habits Why It's So Hard to Change

If you know something's bad for you, why can't you just stop? About 70% of smokers say they would like to quit. Drug and alcohol abusers struggle to give up addictions that hurt their bodies and tear apart families and friendships. And many of us have unhealthy excess weight that we could lose if only we would eat right and exercise more. So why don't we do it?

NIH-funded scientists have been searching for answers. They've studied what happens in our brains as habits form. They've found clues to why bad habits, once established, are so difficult to kick. And they're developing strategies to help us make the changes we'd like to make.

"Habits play an important role in our health," says Dr. Nora Volkow, director of NIH's National Institute on Drug Abuse. "Understanding the biology of how we develop routines that may be harmful to us, and how to break those routines and embrace new ones, could help us change our lifestyles and adopt healthier behaviors."

Habits can arise through repetition. They are a normal part of life, and are often helpful. "We wake up every morning, shower, comb our hair or brush our teeth without being aware of it," Volkow says. We can drive along familiar routes

on mental auto-pilot without really thinking about the directions. "When behaviors become automatic, it gives us an advantage, because the brain does not have to use conscious thought to perform the activity," Volkow says. This frees up our brains to focus on different things.

Habits can also develop when good or enjoyable events trigger the brain's "reward" centers. This can set up potentially harmful routines, such as overeating, smoking, drug or alcohol abuse, gambling and even compulsive use of computers and social media.

"The general machinery by which we build both kinds of habits are the same, whether it's a habit for overeating or a habit for getting to work without really thinking about the details," says Dr. Russell Poldrack, a neurobiologist at the University of Texas at Austin. Both types of habits are based on the same types of brain mechanisms.

"But there's one important difference," Poldrack says. And this difference makes the pleasure-based habits so much harder to break. Enjoyable behaviors can prompt your brain to release a chemical called **dopamine**. "If you do something over and over, and dopamine



is there when you're doing it, that strengthens the habit even more. When you're not doing those things, dopamine creates the craving to do it again," Poldrack says. "This explains why some people crave drugs, even if the drug no longer makes them feel particularly good once they take it."

In a sense, then, parts of our brains are working against us when we try to overcome bad habits. "These routines can become hardwired in our brains," Volkow says. And the brain's reward centers keep us craving the

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### Definitions

#### Dopamine

A brain chemical that regulates movement, emotion, motivation and pleasure.

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things we're trying so hard to resist.

The good news is, humans are not simply creatures of habit. We have many more brain regions to help us do what's best for our health.

"Humans are much better than any other animal at changing and orienting our behavior toward long-term goals, or long-term benefits," says Dr. Roy Baumeister, a psychologist at Florida State University. His studies on decision-making and willpower have led him to conclude that



### Wise Choices Break Bad Habits

- **Avoid tempting situations.** If you always stop for a donut on your way to work, try a different route. Keep fatty foods, cigarettes, alcohol and other tempting items out of your home.
- **Replace unhealthy behaviors with healthy ones.** Try exercise, a favorite hobby or spending time with family.
- **Prepare mentally.** If you can't avoid a tempting situation, prepare yourself in advance. Think about how you want to handle it and mentally practice what you plan.
- **Enlist support.** Ask friends, family and co-workers to support your efforts to change.
- **Reward yourself for small steps.** Give yourself a healthy treat when you've achieved a small goal or milestone.

"self-control is like a muscle. Once you've exerted some self-control, like a muscle it gets tired."

After successfully resisting a temptation, Baumeister's research shows, willpower can be temporarily drained, which can make it harder to stand firm the next time around. In recent years, though, he's found evidence that regularly practicing different types of self-control—such as sitting up straight or keeping a food diary—can strengthen your resolve.

"We've found that you can improve your self-control by doing exercises over time," Baumeister says. "Any regular act of self-control will gradually exercise your 'muscle' and make you stronger."

Volkow notes that there's no single effective way to break bad habits. "It's not one size fits all," she says.

One approach is to focus on becoming more aware of your unhealthy habits. Then develop strategies to counteract them. For example, habits can be linked in our minds to certain places and activities. You could develop a plan, say, to avoid walking down the hall where there's a candy machine. Resolve to avoid going places where you've usually smoked. Stay away from friends and situations linked to problem drinking or drug use.

Another helpful technique is to visualize yourself in a tempting situation. "Mentally practice the good behavior over the bad," Poldrack says. "If you'll be at a party and want to eat vegetables instead of fattening foods, then mentally visualize yourself do-



### Web Links

For more information about breaking bad habits, see our links online:

<http://newsinhealth.nih.gov/issue/Jan2012/Feature1>

ing that. It's not guaranteed to work, but it certainly can help."

One way to kick bad habits is to actively replace unhealthy routines with new, healthy ones. Some people find they can replace a bad habit, even drug addiction, with another behavior, like exercising. "It doesn't work for everyone," Volkow says. "But certain groups of patients who have a history of serious addictions can engage in certain behaviors that are ritualistic and in a way compulsive—such as marathon running—and it helps them stay away from drugs. These alternative behaviors can counteract the urges to repeat a behavior to take a drug."

Another thing that makes habits especially hard to break is that replacing a first-learned habit with a new one doesn't erase the original behavior. Rather, both remain in your brain. But you can take steps to strengthen the new one and suppress the original one. In ongoing research, Poldrack and his colleagues are using brain imaging to study the differences between first-learned and later-learned behaviors. "We'd like to find a way to train people to improve their ability to maintain these behavioral changes," Poldrack says.

Some NIH-funded research is exploring whether certain medications can help to disrupt hard-wired automatic behaviors in the brain and make it easier to form new memories and behaviors. Other scientific teams are searching for genes that might allow some people to easily form and others to readily suppress habits.

Bad habits may be hard to change, but it can be done. Enlist the help of friends, co-workers and family for some extra support. ■

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# Mindfulness Matters

## Can Living in the Moment Improve Your Health?

At some point in your life, someone probably told you: "Enjoy every moment. Life is short." Maybe you've smiled and rolled your eyes at this well-intentioned relative or co-worker. But the fact is, there's something to it. Trying to enjoy each moment may actually be good for your health.

The idea is called mindfulness. This ancient practice is about being completely aware of what's happening in the present—of all that's going on inside and all that's happening around you. It means not living your life on "autopilot." Instead, you experience life as it

unfolds moment to moment, good and bad, and without judgment or preconceived notions.

"Many of us go through our lives without really being present in the moment," says Dr. Margaret Chesney of the University of California, San Francisco. She's studying how mindfulness affects health. "What is valuable about mindfulness is that it is accessible and can be helpful to so many people."

Studies suggest that mindfulness practices may help people manage stress, cope better with serious illness and reduce anxiety and depression. Many people who practice mindfulness report an increased ability to relax, a greater enthusiasm for life and improved self-esteem.

One NIH-supported study found a link between mindfulness meditation and measurable changes in the brain regions involved in memory, learning and emotion. Another NIH-funded researcher reported that mindfulness practices may reduce anxiety and hostility among urban youth and lead to reduced stress, fewer fights and better relationships.

A major benefit of mindfulness is that it encourages you to pay attention to your thoughts, your actions and your body. For example, studies have shown that mindfulness can help people achieve and maintain a healthy weight. "It is so common for people to watch TV and eat snack food out of the box without really attending to how much they are eating," says Chesney. "With mindful eating, you eat when you're hungry, focus on each bite, enjoy your food more and stop when you're full."



Finding time for mindfulness in our culture, however, can be a challenge. We tend to place great value on how much we can do at once and how fast. Still, being more mindful is within anyone's reach.

You can practice mindfulness throughout the day, even while answering e-mails, sitting in traffic or waiting in line. All you have to do is become more aware—of your breath, of your feet on the ground, of your fingers typing, of the people and voices around you.

Chesney notes that as people start to learn how to be more mindful, it's common and normal to realize how much your mind races and focuses on the past and future. You can just notice those thoughts and then return to the present moment. It is these little, regular steps that add up and start to create a more mindful, healthy life.

So, before you roll your eyes again, take a moment and consider mindfulness. ■



### Wise Choices Being Mindful

The concept of mindfulness is simple, but becoming a more mindful person requires commitment and practice. Here are some tips to help you get started:

- **Take some deep breaths.** Breathe in through your nose to a count of 4, hold for 1 second and then exhale through the mouth to a count of 5. Repeat often.
- **Enjoy a stroll.** As you walk, notice your breath and the sights and sounds around you. As thoughts and worries enter your mind, note them but then return to the present.
- **Practice mindful eating.** Be aware of taste, textures and flavors in each bite, and listen to your body when you are hungry and full.
- **Find mindfulness resources in your local community,** including yoga and meditation classes, mindfulness-based stress reduction programs and books.



### Web Links

For more about being mindful, see our links online:

<http://newsinhealth.nih.gov/issue/Jan2012/Feature2>

# Health Capsules

For links to more information, see these stories online:  
<http://newsinhealth.nih.gov/issue/Jan2012/Capsule1>

## Delaying Treatment for Prostate Cancer

An independent panel convened by NIH recently studied strategies for managing low-risk prostate cancer that hasn't spread. It found that close monitoring and delayed treatment may be a better option than immediate surgery or radiation therapy for many patients.

Prostate cancer is the buildup of abnormal cells in the prostate, a male gland below the bladder and in front of the rectum. It usually occurs in older men, affecting about 30% to 40% of men over age 50.

More than half of prostate cancers are confined to the prostate and unlikely to become life-threatening. But about 90% of patients receive immediate treatment, such as surgery or radiation therapy. These treatments can have serious short- and long-term side effects for many patients—including problems with sexual function and loss of urinary

control—without improving survival.

"It's clear that many men would benefit from delaying treatment," says panel chairperson Dr. Patricia A. Ganz of the University of California, Los Angeles. "I think the real challenge that we have is that the word 'cancer' immediately elicits the equation with death."

There are 2 alternatives to immediate treatment. "Watchful waiting" involves avoiding treatment unless symptoms develop. "Active surveillance" also involves delaying treatment, but includes periodic testing to detect cancer progression. More work needs to be done to know who would benefit from which approach.

Ganz added that after a review of the research, "we feel confident that in the very low-risk patients [active surveillance] is a reasonable thing to offer men when they are being told that they have this diagnosis." ■



### Featured Website NIH Clinical Research Trials and You

<http://clinicalresearchtrials.nih.gov>

Clinical trials help scientists find better ways to prevent, diagnose and treat disease. Read about the experiences of clinical trial volunteers and researchers, and learn more about how you might participate in these life-saving studies.



## Rats Show Empathy, Too

A new study shows that empathy may drive rats to help each other. The finding gives insight into the roots of our urge to assist others in need.

Empathy motivates us to take action when we see someone suffering. Apes and other primates also help each other when they perceive distress. Rats share the distress of other rats, too, but whether they would take the next step to help a fellow rat was unknown.

A team of NIH-funded researchers at the University of Chicago put pairs of rats together in cages. One

rat roamed freely while the other was restrained in a clear tube. Each tube had a door that could be nudged open only from the outside by the free rat.

Most rats learned how to quickly release the door to set their companion free. But the rats paid little attention to tubes that were empty or contained only a toy rat. Even when the free rats couldn't get to the liberated rats to play with them, they still released the trapped rats.

The scientists then tried giving rats 2 tubes—one with a rat inside and

another with 5 chocolate chips, a favorite rat snack. The free rats opened both tubes in no consistent order and allowed their liberated cagemates an average of 1.5 chips.

"That was very compelling," says researcher Dr. Peggy Mason. "It said to us that essentially helping their cagemate is on a par with chocolate. He could hog the entire chocolate stash if he wanted to, and he does not. We were shocked."

The researchers say their experiments suggest we have a biological need to act on our empathic feelings. "It's in our brain," Mason says. ■

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