

NIH News in Health

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Stamp Out Smoking Tobacco-Free Living

Most of us know that smoking is unhealthy. So why do so many people still do it? The answers are complex. Researchers have found effective ways to help people quit smoking—or prevent them from starting in the first place. The tricky part is putting these tools to use. We can all take steps to help stamp out smoking.

Fifty years ago, the first Surgeon General's Report on Smoking and Health revealed that smoking cigarettes raises your risk of developing several diseases. Since then, smoking rates have declined, saving millions of lives. But at the same time, more than 20 million Americans have died too soon because of smoking. And more than 3,200 children under age 18 smoke their first cigarette every day as a result of tobacco industry marketing and other influences.

We know a lot more than we used to about the dangers of tobacco smoke. "When you smoke, you inhale thousands of hazardous chemicals," explains Dr. Michele Bloch, a tobacco control expert at NIH. "They travel all around inside your body and cause damage to numerous parts."

Cigarette smoke can quickly damage delicate lung tissue. It doesn't have a chance to heal when it's exposed to smoke day after day. The result can be a wide range of deadly lung conditions, such as emphysema and chronic bronchitis.



Definitions

Cardiovascular

The system of heart and vessels that circulates blood through the body.

The chemicals from tobacco smoke travel from the lungs into the bloodstream. They damage your heart and blood vessels to cause **cardiovascular** problems, such as heart disease and stroke. Cardiovascular disease kills over 800,000 people a year nationwide.

The compounds in tobacco smoke can enter cells throughout your body and damage the DNA inside. DNA is the long threadlike molecule found in nearly all your cells. It's an essential "blueprint" that controls how your cells grow, where they go, and what they do.

When DNA gets damaged, cells can begin to grow abnormally. The body usually attacks and kills such cells. But the toxic chemicals in cigarette smoke weaken this process, making it easier for the cells to multiply out of control. The result is cancer.

Smokers dramatically increase their risk of developing many types of cancer. Nearly all lung cancer—the number-one cancer killer—is caused by smoking. Smoking can lead to cancer in many parts of the body, including the throat, mouth, nasal cavity, stomach, pancreas, liver, kidney, bladder, colon, rectum, and cervix. It can also cause leukemia, a cancer of the blood.

Smoking can cause all sorts of other health issues, too. When the DNA in sperm becomes damaged, it can lead to infertility. Smoking while you're pregnant can cause a host of



problems, including low birth weight and preterm delivery. Smokers are 30% to 40% more likely to develop type 2 diabetes than nonsmokers. And smoking can make it harder for the body to fight disease.

"People who are exposed to secondhand smoke from other people's cigarettes have many of these same problems," Bloch says. Secondhand smoke contains a mixture of hazardous compounds similar to that inhaled by smokers. Researchers estimate that 2.5 million nonsmokers have died from secondhand smoke since 1964.

The best way to prevent tobacco-related health problems is to keep kids from smoking in the first place.

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"The vast majority of new smokers begin when they are too young to appreciate the risk," Bloch says.

"Usually people start smoking when they are adolescents," explains Dr. Ivan Montoya, an NIH expert on treating substance abuse. "Adolescents who start smoking regularly can very quickly become addicted to nicotine and tobacco. It is then very difficult to quit."

Nicotine is the primary drug in tobacco that causes addiction.



Wise Choices Tackle Tobacco Use

Communities and government at all levels can come together to help break the cycle of sickness and death caused by smoking:

- Work in your community to protect youth from advertising that makes smoking seem appealing.
- Make smoking less accessible, less affordable, less acceptable.
- Make stop-smoking resources readily available.
- Be persistent. Most people need to try quitting several times before they succeed, but more than half of smokers have successfully quit.
- If you're a smoker, free help is available at 1-800-QUIT-NOW (1-800-784-8669) and online at <http://smokefree.gov>.

"Nicotine is a very addictive substance," Montoya says. "It takes only a few contacts with the substance to become addicted."

It takes just 10 seconds for the nicotine from one puff of smoke to reach the brain. Once it gets there, it causes cells in the brain to release a chemical called dopamine. The dopamine can make you feel calm and satisfied, or alert and focused. Over time, the brain cells of smokers change to expect regular bursts of extra dopamine. When smokers try to quit, their brains crave more nicotine.

"Some people are more susceptible than others to get addicted to tobacco," Montoya says. Scientists have found some genes that seem to be involved in nicotine dependence, but the work is still ongoing.

Researchers do know that the health of even long-time smokers can improve quickly after quitting. Within a year of quitting, heart attack risk drops dramatically. Within 5 years, the risk of stroke can fall to nearly that of a nonsmoker. Quitting also lowers the risk of cancer and other diseases.

"If you are a smoker, the single most important thing you can do to protect your health and the health of your family is to quit," Bloch says. "And help is available."

Research has revealed effective strategies to help people quit smoking. That's partly why quit rates for smokers are on the rise. More than half of all people who've smoked have already quit.

Studies show that people who talk to their doctors about quitting or call quit lines for advice are more suc-



Web Links

For more about smoking and health, click the "Links" tab at:

<http://newsinhealth.nih.gov/issue/Apr2014/Feature1>

cessful than those who go it alone. Quitters can double or triple their chances of success by using medications approved by the U.S. Food and drug Administration (FDA) and nicotine patches, gum, or lozenges, along with coaching support.

"Different things work for different people," explains Dr. David Theodore Levy, a tobacco control expert at Georgetown University Medical Center. "Most people make many quit attempts before they're successful." Check to see if stop-smoking therapy is covered under your health plan.

You've probably seen electronic cigarettes, or e-cigarettes, promoted as an alternative to traditional cigarettes. These battery-powered devices deliver nicotine to the lungs without burning tobacco. However, they still release hazardous chemicals into the air. Unlike traditional cigarettes, e-cigarettes can be advertised on TV and radio, and many people worry that they'll be attractive to kids.

E-cigarettes aren't regulated by FDA. Scientists still don't know their health effects, including how they could affect attempts to quit smoking. "The evidence is only beginning to come in," Levy says, and research is ongoing.

NIH-funded scientists continue to look for more effective therapies and approaches to help people quit. Researchers are also developing vaccines against nicotine, Montoya says. The vaccine would prompt your body to identify nicotine as a foreign substance and fight to block it from reaching the brain, which might help extinguish the addiction.

"Quitting is lifesaving, and early quitting is especially good," Bloch says. Let's all work to end the use of cigarettes and other tobacco products. ■

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The Sting of Shingles

Vaccine, Treatments Reduce Risks

If you've ever had chickenpox, you may be at risk for a painful disease called shingles as you grow older. Shingles is a sometimes-agonizing skin rash and nerve disease that's caused by a virus. Fortunately, you can take steps to prevent shingles or ease its serious effects.

Shingles usually affects adults after age 50, although it can strike at any age. "In the U.S., the incidence of shingles is actually increasing," says Dr. Jeffrey Cohen, an infectious disease researcher at NIH. "If you live to be 85 years old, you have a 50% chance of getting shingles."

Shingles is caused by the varicella-zoster virus—the same virus that causes chickenpox. Once you've had chickenpox, the virus stays with you for life, hidden and inactive in your nerve cells. Your **immune system** helps keep chickenpox from returning. But later in life, the virus can re-emerge and cause shingles (also known as herpes zoster).



Wise Choices When To Get a Shingles Vaccine

For most people 50 and older, the vaccine can help prevent shingles. If vaccinated people do get shingles, it's likely to be less severe.

- **At ages 50 to 59**, the Zostavax vaccine is FDA-approved for preventing shingles, but experts often advise waiting until age 60. Talk with your doctor if you have questions about the shingles vaccine.
- **At ages 60 and older**, the U.S. Centers for Disease Control and Prevention advises that most people get the vaccine, even if they've already had shingles. The vaccine can protect against post-herpetic neuralgia, one of the most serious complications of shingles.

You can't "catch" shingles from someone else. But it is possible for a person with a blistery shingles rash to pass on the varicella-zoster virus to someone who's never had chickenpox or a chickenpox vaccine. If that happens, the other person would get chickenpox, not shingles.

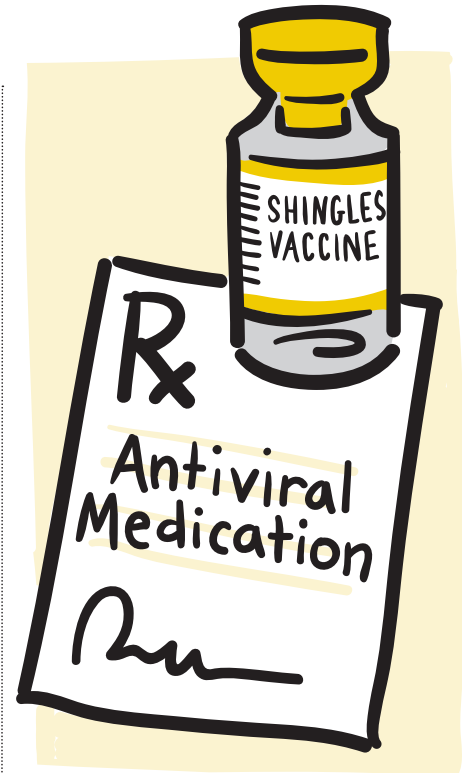
Shingles may cause skin sensitivity ranging from mild itching to severe pain along with burning, tingling, or numbness. A rash with fluid-filled blisters nearly always appears on just one side of the body or face. The rash usually lasts for 7 to 10 days. Other symptoms may include chills, fever, upset stomach, and headache.

Shingles can lead to some serious problems. If it appears on your face, it can affect your hearing and vision. It may cause lasting eye damage or blindness. After the rash fades, the pain may linger for months or years, especially in older people. This lasting pain, called post-herpetic neuralgia, affects nearly 1 out of every 3 older people with shingles. The pain can be so severe that even the gentlest touch or breeze can feel excruciating.

To help prevent these problems, see your doctor at the first sign of shingles. Early treatment can shorten the length of infection and reduce the risk of serious complications.

To treat shingles, your doctor may prescribe antiviral drugs to help fight the varicella-zoster virus. Steroids can lessen pain and shorten the time you're sick. Other types of medicines can also relieve pain.

Fortunately, a vaccine called Zostavax can help prevent shingles or decrease its severity. It's been approved by the U.S. Food and Drug



Administration (FDA) for people ages 50 and older. "The vaccine can prevent shingles and reduce the risk of post-herpetic neuralgia, which can be very debilitating," Cohen says.

The shingles vaccine is available by prescription. Unfortunately, the vaccine is expensive, and the costs aren't always covered by health insurance. If you're considering the shingles vaccine, be sure to discuss the pros and cons of the vaccine with your doctor, and check with your insurance provider about coverage.

Now that people have been receiving the shingles vaccine for several years, researchers are evaluating whether booster shots might be appropriate. Scientists are also studying post-herpetic neuralgia to find better ways to treat this complication from shingles. ■



Definitions

Immune System

The system that protects your body from viruses and other microscopic threats.



Web Links

For more information about shingles, click the "Links" tab at:

<http://newsinhealth.nih.gov/issue/Apr2014/Feature2>

Health Capsules

For links to more information, see these stories online:
<http://newsinhealth.nih.gov/issue/Apr2014/Capsule1>

Nurse Staffing Affects Patient Safety

Having well-educated nurses with fewer patients to care for can help reduce hospital deaths, a new study suggests. The findings can help hospitals make informed decisions about staff schedules and hiring.

Earlier research found that nurse education and other factors can affect patient health. In response, the Institute of Medicine recommended that most nurses in the U.S. have a bachelor's degree by 2020. Many hospitals now aim to hire more bachelor's degree-trained nurses, and nearly 25 U.S. states have proposed or enacted legislation to improve hospital nurse staffing.

To learn more about the link between nurses and health, scientists examined data on more than 420,000

patients who underwent common surgeries in 9 European countries. The researchers also surveyed more than 26,500 nurses in the study hospitals to measure nurse staffing and education. The team analyzed how these nursing factors affected the likelihood of patients dying within 30 days of hospital admission.

The researchers estimated that each additional patient in a hospital nurse's workload increased the chances of a patient dying within 30 days of admission by 7%. Nurse education also affected outcomes. For every 10% increase in nurses with bachelor's degrees, the likelihood of patient death dropped by 7%.

In hospitals where 60% of nurses had bachelor's degrees and cared

for an average of 6 patients, the researchers calculated, the likelihood of patients dying after surgery was nearly one-third lower than in hospitals where only 30% of nurses had bachelor-level education and cared for an average of 8 patients.

"This study emphasizes the role that nurses play in ensuring successful patient outcomes and underscores the need for a well-educated nursing workforce," says Dr. Patricia A. Grady, director of NIH's National Institute of Nursing Research. ■

Updated Report on Heroin

NIH recently updated its *Heroin Research Report*, which provides an overview of heroin use and its consequences. The online report also describes treatment options for those struggling with addiction.

Heroin is an illegal street drug that's highly addictive. Its use is linked to many serious health conditions, including fatal overdose and infectious diseases like hepatitis and HIV. Unfortunately, the number of people using heroin in the United States has been rising since 2007, especially among young adults from 18 to 25 years old.

Repeated heroin use changes the structure and function of the brain. It creates long-term imbalances in the

body's chemistry and nervous system that aren't easily reversed.

Research suggests that abuse of prescription pain relievers known as opioids may open the door to heroin use. Some people report switching to heroin because it's cheaper and easier to obtain than prescription opioids.

Like many long-term diseases, heroin addiction can be treated. Medications can help reduce drug cravings and withdrawal symptoms to improve the chances of quitting. Medication combined with behavioral therapy is especially effective.

The *Heroin Research Report* is available at www.drugabuse.gov/publications/research-reports/heroin. ■



Featured Website Understanding Health News

<http://nccam.nih.gov/health/understanding-health-news>

News stories about complementary approaches to health can sometimes be misleading. They might lack key details, or they may be confusing or conflicting. This site can help you assess news stories about complementary health approaches, so you can make informed decisions about your health.



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