

NIH News in Health

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Caring for Concussions More Than a Bump on the Head

Accidents happen. A fender bender. A collision while playing sports. Or a fall at home. Many types of accidents can cause a bang to the brain. Each year, more than 2 million people in the U.S. visit an emergency room for a traumatic brain injury. Many others experience a blow to the head but never see a doctor.

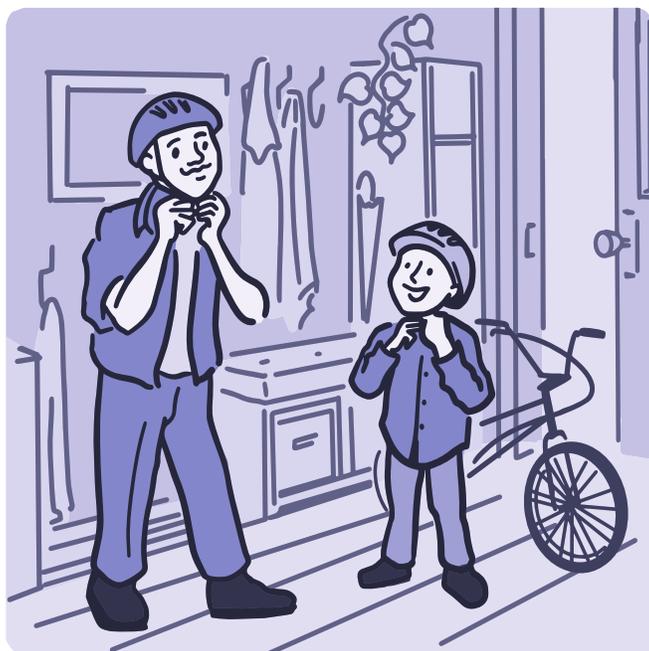
Brain injuries can range from mild to severe. The most common type of mild brain injury is a concussion. Concussions can be caused by an impact to your head or whiplash motion to your body that makes your brain bounce or twist inside your skull. That can stretch your brain cells and cause harmful chemical changes that interfere with brain activity.

Even though they're called "mild," concussions should be taken seriously, explains Dr. Geoffrey Manley, an NIH-funded traumatic brain injury researcher at the University of California, San Francisco.

Most people heal from a concussion relatively quickly. But some will experience long-term effects on their thinking, mood, balance, and more. "If you're still feeling effects a year after your injury, there's nothing mild about it," he says.

Concussions are particularly common among children and young adults. Older adults—age 75 and up—also have a higher than average risk of concussion because they're at higher risk for falls.

Being able to recognize the causes and symptoms of a concussion is



important so you can reduce the risk of getting one and seek immediate treatment if you have one.

Seek Treatment • Some people may briefly lose consciousness right after a jolt to the head. Later symptoms can include headache, nausea, confusion, dizziness, or memory problems. Some people may also have sensitivity to light or noise, feel groggy or slow, or have changes to their sleep patterns.

"No two brain injuries are exactly the same," says Dr. Dorian McGavern, a brain-injury researcher at NIH. Every person's brain is a little different, and each impact can affect your brain differently, he explains.

Doctors have become much better at diagnosing concussions over the last decade, says Dr. Christina Master, an NIH-funded researcher studying children with traumatic

brain injury at the Children's Hospital of Philadelphia.

To diagnose a concussion, your doctor will ask how the injury happened and about your symptoms. They may also evaluate your balance, vision, and eye movements.

Most people with a suspected concussion don't need additional tests. But those with more serious concussions may have bleeding or other damage in the brain. They may need an imaging test, like a CT scan, to detect these issues. A recently approved blood test can help doctors identify adults who need an imaging test.

Manley and other researchers are studying whether blood tests can better, and more quickly, diagnose concussions. "If we can identify who has a brain injury, we can treat them better, and make sure they don't fall through the cracks," he explains.

People with a concussion also need follow-up care. But Manley and others found in a recent study that fewer than half of people diagnosed with concussion in the ER receive such care. This lack of follow-up can prevent people from getting treatment that could improve their

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quality of life, Manley explains.

Drugs don't yet exist to treat concussion itself. "But we have plenty of drugs and interventions for the side effects of traumatic brain injury," he says. These include medications to help with chronic headache, depression, and sleep problems.

Avoid a Second Blow • The brain is more vulnerable to a second blow after a concussion. That's because a concussion can damage nerve cells in the brain. It can also cause the blood vessels that feed the brain to become leaky.

The body usually repairs these blood vessels over a period of several weeks. But in some people, they don't heal that quickly—or at all.

"Some vessels will still have cracks in the seals. This lets material from the blood enter into the brain," McGavern says. "These leaks



Definitions

Inflammation

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

NIH News in Health

ISSN 2375-6993 (Print) ISSN 1556-3898 (Online)

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can continue for sometimes months or more after the initial injury."

Material from the blood is not supposed to get into the brain. Its presence can trigger **inflammation** and other types of damage. This damage may help explain the long-term symptoms some people experience after a concussion, McGavern says.

It may also explain why another blow to the head soon after the first can be so dangerous. McGavern's team found that blood vessels in mice that had a second brain injury within a day had difficulty healing. In contrast, blood vessels in mice that experienced a second injury later repaired themselves normally.

Take Time to Heal • After a concussion, the brain needs some rest. Research has shown that both children and adults benefit from reducing their mental and physical activity for a short time and should return to those activities gradually.

"Visual and balance problems can make it hard to do things like read, write, use an electronic device, or navigate a busy hallway," Master explains. "Early recognition and accommodations for those problems can make a huge difference in the quality of life for people as they slowly return to work or school."

People who have experienced a head injury shouldn't feel frustrated if it takes up to a month to feel normal, she adds. "Rest" for someone with a concussion doesn't mean doing nothing at all, Master says. Doing light physical activity and using your brain in ways that don't make concussion symptoms worse can help you heal faster.

Physical rehabilitation programs can also help those with longer-lasting symptoms, explains Master. Talk with your doctor about how to return to your normal activity after a concussion. If symptoms persist, ask about physical therapy.



Wise Choices Lower Your Risk of Concussion

Many head injuries can be avoided. Tips to stay safe include:

- Wear a seatbelt when you drive or ride in a car.
- Wear the correct helmet and make sure it fits properly when riding a bicycle, skateboarding, skiing or snowboarding, and playing sports like hockey and football.
- Install window guards and stair safety gates at home for young children.
- Improve lighting and remove area rugs, clutter, and other trip hazards in the hallway.
- Use nonslip mats and install grab bars next to the toilet and in the tub or shower for older adults.
- Install handrails on stairways.
- Improve balance and strength with regular physical activity.

As scientists have come to understand the importance of protecting the brain after a concussion, new safety rules have followed, Master says. "In the last decade, every state in the nation has passed 'return to play' legislation," she explains.

These rules, designed to protect youth athletes playing school sports, mandate a period of recovery for young athletes after a brain injury. It also requires a doctor-supervised period of gradual physical activity before returning to sports.

"These rules make sure that we don't return athletes back to play before they are recovered, where another injury could cause more significant problems," Master says.

Everyone can take steps to decrease their risk of concussion. See the Wise Choices box for tips. ■



Web Links

For more about concussions, see "Links" in the online article: newsinhealth.nih.gov/2020/05/caring-concussions

The Risks of Vaping

A Look at Safety

You've probably heard a lot about vaping lately. You might also know about the recent outbreak of lung injuries and deaths linked to vaping in the U.S. But those aren't the only risks that come with vaping. Here's what you need to know.

Vaping devices, also known as e-cigarettes, vape pens, and e-hookahs among other terms, come in many shapes and sizes. Some look like traditional cigarettes, cigars, or pipes. Others are shaped like everyday objects, such as pens or USB memory sticks.

While they may look different, most vaping devices work in a similar way. Puffing activates a battery-powered heating device. This heats the liquid in a cartridge, turning it into vapors that are inhaled.

Vaping exposes the lungs to a variety of chemicals. These may include the main active chemicals in tobacco (nicotine) or marijuana (THC), fla-

vorants, and other ingredients that are added to vaping liquids. Plus, other chemicals can be produced during the vaporizing process.

"If the liquid has nicotine in it, then the user is inhaling nicotine along with the other ingredients in the liquid," explains Dr. Thomas Eissenberg, an expert on tobacco research at Virginia Commonwealth University.

While vaping devices work similarly, some are more powerful than others. They create more vapor and deliver more chemicals.

So how safe is vaping? Studies suggest nicotine vaping may be less harmful than traditional cigarettes when people who regularly smoke switch to them as a complete replacement. But nicotine vaping could still damage your health.

"Your lungs aren't meant to deal with the constant challenge of non-air that people are putting into them—sometimes as many as 200 puffs a day—day after day, week after week, year after year," Eissenberg says.

"You're inhaling propylene glycol, vegetable glycerin, flavorants that were meant to be eaten but not inhaled, and nicotine," he explains. "And all of those are heated up in this little reactor, which is an e-cigarette. When they get heated up, those components can turn into other potentially dangerous chemicals."

One harmful chemical may be a thickening agent called Vitamin E acetate, which is sometimes used



as an additive in THC-containing vape products. The CDC identified it as a "chemical of concern" among people with vaping-associated lung injuries. They recommend avoiding any vaping product containing Vitamin E acetate or THC, particularly those from informal sources like friends, family, or in-person or online dealers.

Vaping is now more popular among teens than smoking traditional cigarettes. One in four high school seniors say they vaped nicotine in the past month. And studies have found that teens who vape nicotine may be more likely to go on to smoke traditional cigarettes.

Marijuana vaping has also increased dramatically among teens. About 20% of high school seniors vaped marijuana in the past year. The rates have more than doubled in the past two years.

New laws are aimed at curbing vaping among teens. People must now be 21 to buy any tobacco product, including vaping products. And companies can no longer produce and sell flavors that appeal to children like fruit and mint.

If you've already started vaping or smoking cigarettes, it's never too late to quit. See the Wise Choices box for tips on stopping. ■



Wise Choices

Ready to Quit?

Here are some tips to help you stop using nicotine:

- **Know why you're quitting.** Ask yourself if nicotine is getting in the way of what matters to you.
- **Quit completely.** If you use different tobacco products, now is a good time to quit those too.
- **Set your quit date.**
- **Understand your triggers,** so you can avoid them.
- **Imagine your life without nicotine.** Picture the positives of quitting.
- **Build a team of people who will support you** while you quit.
- **Get free help** online at smokefree.gov, at 1-800-QUIT-NOW (1-800-784-8669), or by texting QUIT to 47848.



Web Links

For more about vaping, see "Links" in the online article: newsinhealth.nih.gov/2020/05/risks-vaping



Health Capsules

For links to more information, please visit our website and see these stories online.

New Blood Test May Predict Alzheimer's Disease

A new blood testing technique could help researchers detect Alzheimer's disease before symptoms start or in its early stages.

Alzheimer's disease is an age-related brain disorder that develops over many years. Toxic changes in the brain slowly destroy memory and thinking skills.

The disease involves two proteins called beta-amyloid and tau. Beta-amyloid clumps into plaques, which slowly build up between brain cells. Abnormal tau collects inside brain

cells and forms tangles.

Researchers investigated whether a new blood testing technique could help predict development of Alzheimer's disease. They tested for a modified version of tau called ptau181 in blood plasma (the liquid part of blood). Levels of this protein have been linked with Alzheimer's disease.

The team collected blood samples from more than 400 people. The analysis showed that ptau181 levels differed between healthy

participants and those with Alzheimer's disease.

The new approach could be less invasive and costly than current tests for Alzheimer's disease. These rely on brain scans and lab tests of spinal fluid.

"The development of a blood test would enable us to rapidly screen a much larger and more diverse group of volunteers who wish to enroll in studies," says Dr. Richard J. Hodes, director of NIH's National Institute on Aging. ■

Staying Connected to Fight Loneliness

Positive relationships with friends and family help us thrive. Without social connections, it's easy to feel lonely or isolated. Many of us have been spending more time alone in our homes lately. While anyone can feel lonely, certain factors increase your risk. Major life changes or losses can increase feelings of loneliness.

Older adults are at greater risk because they're more likely to live alone. Mobility issues can make it harder to leave the house. And sensory issues like vision and hearing loss can contribute to feeling isolated.

No matter what your age, it's important for your health to stay socially connected. Loneliness can take a toll. It's linked to higher rates of depression and heart disease, and can weaken your immune system. Here are some strategies to help stay connected if you're feeling lonely.

Get your heart going. Exercise has been shown to reduce stress and boost your mood. Whether it's sweating to a workout video or taking a walk around your neighborhood, exercise can help.

You might also consider getting

a pet. Animals can be a source of comfort and companionship.

Many people are using technology to connect with friends and family virtually. Take time to reach out to others by phone or online. A call or video chat can remind you that you're not alone. Providing social support or helping others in need can give meaning to our lives and help combat feelings of isolation or disconnection.

To learn more, visit: www.nia.nih.gov/health/infographics/stay-connected-combat-loneliness-and-social-isolation. ■



Featured Website

Coronavirus: What People with Cancer Should Know

www.cancer.gov/coronavirus

Are you being treated for cancer? You may be at increased risk of developing serious complications from COVID-19.

Learn how to protect yourself from coronavirus and what to do before your next cancer treatment.

The screenshot shows the NIH National Cancer Institute website. The main content area features the article title "Coronavirus: What People with Cancer Should Know" under the heading "ON THIS PAGE". Below the title is a list of bullet points:

- What is coronavirus, or COVID-19?
- If I have cancer, am I at higher risk of getting or dying from COVID-19?
- If I have cancer, how can I protect myself?
- I receive cancer treatment at a medical facility. What should I do about getting treatment?
- I participate in a clinical trial at a medical facility. What should I do?
- What should I do if I have symptoms of an infection?
- What if I have additional questions?

 Below the list is a section titled "What is coronavirus, or COVID-19?" with a small image of a virus particle.

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