



Better Safe!



WELCOA'S ONLINE BULLETIN FOR YOUR FAMILY'S SAFETY

A Bang to the Brain

What We Know About Concussions

Your brain is your body's command center. Its soft, sensitive tissues float in a cushioning fluid within the hard and sturdy skull. But a swift blow to the head or violent shaking can override these protections and lead to a mild type of brain injury known as a concussion.

More than 1 million mild traumatic brain injuries occur nationwide each year. These injuries can be caused by falls, car crashes or recreational activities like bike riding, skateboarding, skiing or even playing at the playground. More than half of concussions occur in children—often when playing organized sports such as football and soccer.

Although concussions are considered to be a mild brain injury, they need to be taken seriously. They should not be treated as minor injuries that quickly resolve. With proper care, most people recover fully from a concussion. But in some cases, a concussion can have a lasting effect on thinking, attention, learning and memory.

A single concussion is also known to raise your risk for having another concussion—and a second concussion may be more severe. It's important to learn to recognize the causes and symptoms of concussion so you can take steps to prevent or treat these head injuries.

More serious brain injuries that involve skull fracture, bleeding in the brain or swelling of the brain can be detected with X-rays or other imaging methods. But concussions can be more difficult to identify.

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A Bang to the Brain (Continued from previous page)

“A concussion isn’t visible from the outside, and you can’t see it with standard imaging tools like MRI and CAT scans,” says Dr. Christopher Giza, a pediatric brain specialist at the University of California, Los Angeles. “Instead we look for the signs and symptoms of abnormal brain function to make a diagnosis.”

Common symptoms include nausea, headache, confusion, dizziness and memory problems. Loss of consciousness occurs in about 1 in 10 concussions. A person with a concussion might have trouble answering basic questions and move in an awkward, clumsy way.

For about 9 in 10 people with concussions, symptoms disappear within 7 to 10 days. Scientists have been working to learn more about those who take longer to recover. In one NIH-funded study, Dr. Keith Yeates of Ohio State University looked at 8- to 15-year-olds treated in an emergency room for mild traumatic brain injury.

“We found that the majority of these kids recovered quite quickly or showed no increase in symptoms at all,” Yeates says. “But a subgroup of kids, about 10% or 20%, showed a dramatic onset of symptoms after their injury and persistent symptoms that in some cases remained even 12 months after the injury.”

Body-related symptoms, such as headache and dizziness, tended to fade fairly quickly, the researchers found. But thinking-related

symptoms, including problems with memory and paying attention, tended to linger in some kids throughout the year-long study. Children who had lost consciousness or had some additional abnormality that showed up on MRI scans after the injury had an increased risk for lasting problems.

Researchers know that immediately after a concussion, the brain is especially vulnerable to having a second, more serious injury. But it’s not clear why—or how long that vulnerable period lasts. Giza and his colleagues have found that a single mild injury reduces the brain’s use of the sugar glucose as a fuel, at least in rats. A second mild injury 24 hours later leads to an even steeper drop in glucose use and memory problems that last longer. But when the brain has several days to recover, and the use of glucose returns to normal, a second mild brain injury seems to be no worse than the first.

Take steps to avoid concussions. Athletes can decrease their risk of concussion by wearing proper headgear and following the rules of good sportsmanship. Make living areas safer for seniors by removing tripping hazards such as throw rugs and clutter in walkways, and install handrails on both sides of stairways.

While this research continues, do what you can to prevent concussions. Learn to recognize the symptoms. And make sure that people with signs of concussion stop their activities and seek medical attention.

SYMPTOMS OF CONCUSSION

Stop activity if you have these symptoms. Athletes should not return to play until evaluated by a health care provider.

- ✘ Headache or “pressure” in head
- ✘ Nausea or vomiting
- ✘ Balance problems or dizziness
- ✘ Double or blurry vision
- ✘ Sensitivity to light or noise
- ✘ Feeling sluggish or groggy
- ✘ Concentration or memory problems
- ✘ Confusion
- ✘ Feeling “down” or “not right”
- ✘ Changes to sleep patterns

Adapted from the U.S. Centers for Disease Control and Prevention



Sleep ON IT

How Snoozing Strengthens Memories

When you learn something new, the best way to remember it is to sleep on it. That's because sleeping helps strengthen memories you've formed throughout the day. It also helps to link new memories to earlier ones. You might even come up with creative new ideas while you slumber.

What happens to memories in your brain while you sleep? And how does lack of sleep affect your ability to learn and remember? NIH-funded scientists have been gathering clues about the complex relationship between sleep and memory. Their findings might eventually lead to new approaches to help students learn or help older people hold onto memories as they age.

"We've learned that sleep before learning helps prepare your brain for initial formation of memories," says Dr. Matthew Walker, a sleep scientist at the University of California, Berkeley. "And then, sleep after learning is essential to help save and cement that new information into the architecture

of the brain, meaning that you're less likely to forget it."

While you snooze, your brain cycles through different phases of sleep, including light sleep, deep sleep, and rapid eye movement (REM) sleep, when dreaming often occurs. The cycles repeat about every 90 minutes.

The non-REM stages of sleep seem to prime the brain for good learning the next day. If you haven't slept, your ability to learn new things could drop by up to 40%. "You can't pull an all-nighter and still learn effectively," Walker says. Lack of sleep affects a part of the brain called the hippocampus, which is key for making new memories.

You accumulate many memories, moment by moment, while you're

awake. Most will be forgotten during the day. "When we first form memories, they're in a very raw and fragile form," says sleep expert Dr. Robert Stickgold of Harvard Medical School.

But when you doze off, "sleep seems to be a privileged time when the brain goes back through recent memories and decides both what to keep and what not to keep," Stickgold explains. "During a night of sleep, some memories are strengthened." Research has shown that memories of certain procedures, like playing a melody on a piano, can actually improve while you sleep.



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Sleep ON IT

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The Connection between Deep Sleep & Memory

Memories seem to become more stable in the brain during the deep stages of sleep. After that, REM—the most active stage of sleep—seems to play a role in linking together related memories, sometimes in unexpected ways. That's why a full night of sleep may help with problem-solving. REM sleep also helps you process emotional memories, which can reduce the intensity of emotions.

It's well known that sleep patterns tend to change as we age. Unfortunately, the deep memory-strengthening stages of sleep start to decline in our late 30s. A study by Walker and colleagues found that adults older than 60 had a 70% loss of deep sleep compared to young adults ages 18 to 25. Older adults had a harder

time remembering things the next day, and memory impairment was linked to reductions in deep sleep. The researchers are now exploring options for enhancing deep stages of sleep in this older age group.

“While we have limited medical treatments for memory impairment in aging, sleep actually is a potentially treatable target,” Walker says. “By restoring sleep, it might be possible to improve memory in older people.”

For younger people, especially students, Stickgold offers additional advice. “Realize that the sleep you get the night after you study is at least as important as the sleep you get the night before you study.” When it comes to sleep and memory, he says, “you get very little benefit from cutting corners.”



Sleeping to Learn

Research suggests these tips may aid students and other learners:

- ▶ Get a good night's sleep before learning. Lack of sleep can cut learning ability by up to 40%.
- ▶ Get a full night of sleep within 24 hours after learning to strengthen new memories and build connections between different pieces of information.
- ▶ Get enough sleep each night—7 to 8 hours for most adults. Memories won't be strengthened with 4 hours or less of nighttime sleep.
- ▶ Naps might help or hinder. A 90-minute nap can strengthen memories, but naps late in the day may make it harder to get to sleep at night.

Many things can influence a child, including friends, teachers and the things they see when they sit in front of the TV or computer. If you're a parent, know that your everyday behavior plays a big part in shaping your child's behavior, too. With your help, kids can learn to develop healthy eating and physical activity habits that last throughout their lives.

Healthy eating and physical activity are essential for children of any age. "Good nutrition and physical activity are important for building strong bones and muscles and feeling good about yourself," says Dr. Lynne Haverkos, a child development specialist at NIH. "Some research suggests that physical activity might even help improve children's thinking and mental functions."

Getting active and eating right may also prevent excess weight and childhood obesity, a growing concern in this country. Today, nearly one in three children in the United States is overweight or obese. "Being overweight puts a lot of stress on joints, muscles, bones and the heart, and it increases your risk for certain diseases," Haverkos says. "We're also finding that overweight toddlers are more likely to become overweight middle schoolers, high schoolers and then adults. That's why it's important to take action early."

Although most of us know that it's a good idea to eat healthy food and move more, it isn't always easy to do. Children

SHAPE

Your Family's Habits

HELPING KIDS MAKE HEALTHY CHOICES



aren't likely to change their diet and activity habits on their own. It's up to you to make it easier for your family to make healthy choices.

"Parents are very important in terms of arranging an environment and setting a model for healthy or unhealthy behavior," says Dr. Leonard H. Epstein, an expert on childhood obesity at the University of Buffalo. "Parents bring foods into the house. They control how much time a child can watch TV. They control what kinds of social activities are paired with foods. And kids learn a huge amount

about eating and physical activity from watching and imitating their parents."

Epstein's research shows how important parents can be. In NIH-funded work, his team assigned obese children, ages 8 to 12, to different types of weight loss programs. All the groups were taught about healthy diet, behaviors and exercise. For some groups, positive feedback and encouragement for weight loss and behavior changes were given only to the child. Other groups focused on both the child and an obese parent. Comparison groups received little feedback.

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DAY IN DAY OUT

WELCOA'S ONLINE BULLETIN FOR YOUR LIFESTYLE

SHAPE

Your Family's Habits

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Stay Positive, Stay Healthy

If your child doesn't like a new food right away, stay positive and keep trying over time. Encouraging kids to take just one bite of a new food can help. But avoid creating conflicts and stress over it. Several studies show that kids are more likely to try a new food if they're eating in a setting that's relaxing and pleasant.

Children under the age of three tend to stop eating on their own when they're full. But after age three, the more you put on their plate, the more they'll eat. So make sure to give your kids child-size portions.

Several studies show that parents can effectively influence healthy behaviors by

talking in a positive way or avoiding certain situations altogether. When you bring unhealthy food and sugary drinks into the house, "parents essentially become the food police," adds Epstein. "It's easier to create an environment in the home where there's limited access to unhealthy foods and lots of access to healthy foods."

Experts recommend that most kids get at least an hour of moderate to vigorous physical activity each day. Parents can help by limiting TV and computer time to no more than 1 or 2 hours per day. When it comes to food and physical activity, what you say and do around your children can have a lasting effect. Work together as a family to make healthy habits easy and fun.



Help Kids Form Healthy Habits

- Be a role model. Eat healthy family meals together. Walk or ride bikes instead of watching TV or surfing the Web.
- Make healthy choices easy. Put nutritious food where it's easy to see. Keep balls and other sports gear handy.
- Focus on fun. Play in the park, or walk through the zoo or on a nature trail. Cook a healthy meal together.
- Limit screen time. Don't put a TV in your child's bedroom. Avoid snacks and meals in front of the TV.
- Check with caregivers or schools. Make sure they offer healthy foods, active playtime and limited TV or video games.
- Change a little at a time. If you drink whole milk, switch to 2% milk for a while, then try even lower fat milks. If you drive everywhere, try walking to a nearby friend's house, then later try walking a little farther.



Keep Your Kidneys Healthy

Catch Kidney Disease Early

Your kidneys aren't very big—each is about the size of your fist—but they do important work. They keep you healthy by maintaining just the right balance of water and other substances inside your body.

Unfortunately, if your kidneys start to malfunction, you might not realize it for a long while. Kidney disease usually doesn't make you feel sick until the problem becomes serious and irreversible.

Your kidneys are two reddish, bean-shaped organs located on either side of your spine in the middle of your back. Their main job is to filter your blood. Each kidney contains about a million tiny filters that can process around 40 gallons of fluid every day—about enough to fill a house's hot water heater. When blood passes through the kidney, the filters sift and hold onto the substances your body might need, such as certain nutrients and much of the water. Harmful wastes and extra water and nutrients are routed to the nearby bladder and flushed away as urine.

Your kidneys also produce several hormones. These hormones help to control your blood pressure, make red blood cells and activate vitamin D, which keeps your bones strong.

We all lose a little of our kidney function as we get older. People can even survive with just one kidney if they donate the other to a friend or family member.

But when kidney function drops because of an underlying kidney disease, it's something to be concerned about. Toxins and extra water can build up in your blood. Falling hormone production can cause other problems. About 1 in 10 adults nationwide, or about 20 million people, have at least some signs of kidney damage.



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You & Your Kidneys

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There are different types of kidney disease. Most strike both kidneys at the same time, harming the tiny filters—called nephrons—and reducing their filtering ability. When damage to nephrons happens quickly, often because of injury or poisoning, it's known as acute kidney injury. It's more common, though, for nephrons to worsen slowly and silently for years or even decades. This is known as chronic kidney disease.

"Most people have few or no symptoms until chronic kidney disease is very advanced," says Dr. Andrew Narva, a kidney specialist at NIH. "You can lose up to three-fourths of your kidney function and essentially have no symptoms."

Chronic kidney disease can strike people of any race, but African Americans are especially at risk. African Americans also tend to have high rates of diabetes and high blood pressure, the 2 leading causes

of kidney disease. Other risk factors for kidney disease include heart disease and a family history of kidney failure—a severe form of kidney disease.

Tests & Treatment

"If you have these risk factors, it's important to be screened for kidney disease," says Narva. "That usually involves simple laboratory tests: a urine test to look for kidney damage, and a blood test to measure how well the kidneys are working."

The urine test checks for a protein called albumin, which isn't routinely detected when your kidneys are healthy. The blood test checks your GFR—

glomerular filtration rate. GFR is an estimate of your kidney's filtering ability. A GFR below 60 is a sign of chronic kidney disease. A GFR below 15 is described as kidney failure.

Dialysis is a treatment that filters wastes and water from the blood, allowing patients with kidney failure to feel better and continue with everyday activities. You can take many steps to avoid or delay reaching the point of kidney failure. The best thing you can do is control your blood pressure. A healthy lifestyle, including physical activity and a heart-healthy diet, can help to normalize blood pressure and also slow kidney disease.

Don't wait to take the first step to keep your kidneys healthy. Talk to your health care provider about your kidneys, and ask if you should be tested for kidney disease.

PROTECT YOUR KIDNEYS

If you're at risk for kidney disease—especially if you have diabetes, high blood pressure, or a family history of kidney failure—talk to your health care provider to choose the best steps for you.

- ✓ Get your blood and urine checked for kidney disease.
- ✓ Learn to manage your diabetes, high blood pressure or heart disease.
- ✓ Take medicines the way your provider advises.
- ✓ Cut back on salt. Aim for less than 1,500 mg of sodium daily.
- ✓ Choose foods that are healthy for your heart.
- ✓ Be physically active.
- ✓ Lose weight if you're overweight.
- ✓ Limit alcohol.
- ✓ If you smoke, take steps to quit.