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Inside News: 3 Surviving Sepsis... 4 Sickle Cell Treatment... Fibromyalgia... Diabetes Health Sense

Can You Recognize a Heart Attack or Stroke?

What To Do When Every Moment Counts

How would you react to a medical emergency? When it comes to life-threatening conditions like heart attack or stroke, every minute counts. Get to know the signs and symptoms of these health threats. If you think you or someone else might be having a heart attack or stroke, get medical help right away. Acting fast could save your life or someone else's.

Heart disease and stroke are 2 of the top killers among both women and men in the U.S. Nationwide, someone dies from a heart attack about every 90 seconds, and stroke kills someone about every 4 minutes, according to the U.S. Centers for Disease Control and Prevention. Quick medical help could prevent many of these deaths. Fast action can also limit permanent damage to the body.

Heart attack and stroke are caused by interruptions to the normal flow of blood to the heart or brain—2 organs that are essential to life. Without access to oxygen-rich blood and nutrients, heart or brain cells begin to malfunction and die. This cell death can set off a series of harmful effects throughout the body. The changes ultimately lead to the familiar symptoms of a heart or brain emergency.

You might know the most common symptoms of heart attack: sustained, crushing chest pain and difficulty breathing. A heart attack might also cause cold sweats, a racing heart, pain down the left arm, jaw stiffness, or shoulder pain.

Many don't know that women often have different heart attack symptoms than men. For instance, instead of having chest pain during a heart attack, women may feel extremely exhausted and fatigued or have indigestion and nausea.

"Many women have a vague sense of gloom and doom, a sense of 'I just don't feel quite right and don't know why,'" says Dr. Patrice Desvigne-Nickens, an NIH expert in heart health.

The symptoms of stroke include sudden difficulty seeing, speaking, or walking, and feelings of weakness, numbness, dizziness, and confusion. "Some people get a severe headache that's immediate and strong, different from any kind you've ever had," says Dr. Salina Waddy, an NIH stroke expert.

At the first sign of any of these symptoms, fast action by you, someone you know, or a passerby can make a huge difference. NIH-funded research has helped ensure that more people survive heart attacks and strokes every year. We now have medicines, procedures, and devices that can help limit heart and brain damage following an attack, as long as medical help arrives quickly.

If the heart is starved for blood for too long—generally more than 20 minutes—heart muscle can be irreversibly damaged, Desvigne-Nickens says. "You need to be in the hospital because there's a risk of cardiac arrest [your heart stopping]," which could be deadly. At the hospital, doctors can administer clot-busting drugs and other emergency procedures.

With stroke, Waddy says, "The longer you wait, the more brain cells are dying," and the greater the chance for permanent damage or disability.

Emergency treatment for stroke depends on the kind of stroke. The most common type, ischemic stroke, is caused by a clot that clogs a blood vessel in the brain. The clot-

continued on page 2

continued from page 1

dissolving drug tPA works best when given soon after symptoms begin. NIH research shows that patients who received tPA within 3 hours of stroke onset were more likely to recover fully.

Other strokes are caused by a hemorrhage—when a blood vessel breaks and bleeds into the brain. "The patient can have a larger hemorrhage within the first 3 hours," Waddy says. A hospital medical team can help contain the bleeding, so every moment counts.

Wise Choices
Know the Symptoms

Don't hesitate to call 9-1-1 if you see these symptoms of heart attack or stroke. Every minute counts.

Heart attack:

- Chest pain or discomfort
- Pain, stiffness, or numbness in the neck, back, or one or both arms or shoulders
- Shortness of breath
- Cold sweat, nausea, dizziness

Stroke:

- Sudden numbness or weakness of the face, arm, or leg, especially on one side of the body
- Sudden severe headache, dizziness, confusion
- Sudden difficulty with vision, balance, speech

Even if you're unsure, don't feel embarrassed or hesitate to call 9-1-1 if you suspect a heart attack or stroke. "You should not go get your car keys. Your spouse shouldn't be driving you to the hospital," advises Desvigne-Nickens. "The emergency crew is trained to treat these symptoms, and it could mean the difference between life and death."

Heart attack or stroke can happen to anyone, but your risk increases with age. A family or personal history of heart attack or stroke also raises your risk. But some risk factors for heart attack and stroke are within your control. Treating them can dramatically reduce your risk.

"If you have high blood pressure, high cholesterol, or diabetes, work with your doctor to get these conditions under control," Waddy says. "Know your numbers [blood pressure, blood sugar, and cholesterol] and what they mean."

You can also prepare for a medical emergency, to some degree. A hospital may not have access to your medical records when you arrive. Keep important health information handy, such as the medicines you're taking, allergies, and emergency contacts. It would be important for the medical team to know, for example, if you've been taking anti-coagulants to help prevent blood clots; these blood thinners put you at increased risk of bleeding. You might consider carrying a wallet card (see www.nhlbi.nih.gov/health/resources/heart/heart-attack-wallet-card.htm).

Definitions

CPR
Cardiopulmonary resuscitation—a lifesaving procedure that's performed when a person's breathing or heartbeat has stopped.

Web Links

For more about heart attack and stroke, click the "Links" tab at:
http://newsinhealth.nih.gov/issue/Aug2014/Feature1

NIH researchers are studying new drugs and procedures to help the heart and brain repair themselves and improve organ function. "But there is absolutely nothing that will save both your time and health as well as prevention," says Dr. Jeremy Brown, director of NIH's Office of Emergency Care Research. Studies show that making healthy lifestyle choices can help prevent these medical emergencies from happening in the first place. Eat a healthy diet rich in protein, whole grains, and fruits and vegetables, and low in saturated fat. Get regular physical activity and don't smoke.

"I think one of the most important things we can do is to take a basic **CPR** and first aid course," recommends Brown. "We know the majority of cardiac arrests happen outside of hospitals and of that many, many can be saved if we get people with basic training on the scene quickly. An ambulance can never get there as quickly as a citizen passing by."

Whether or not you're trained to offer help, if you see someone having symptoms of a heart attack or stroke, call for help immediately.

"If you're even thinking about calling 9-1-1, you should call," Desvigne-Nickens says. "Yes other conditions can mimic the signs and symptoms of a heart attack or stroke, but let the emergency physician figure that out in the emergency room." ■

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Surviving Sepsis

Taming a Deadly Immune Response

Many people have never heard of sepsis, or they don't know what it is. But sepsis is one of the top 10 causes of disease-related death in the United States. The condition can arise suddenly and progress quickly, and it's often hard to recognize.

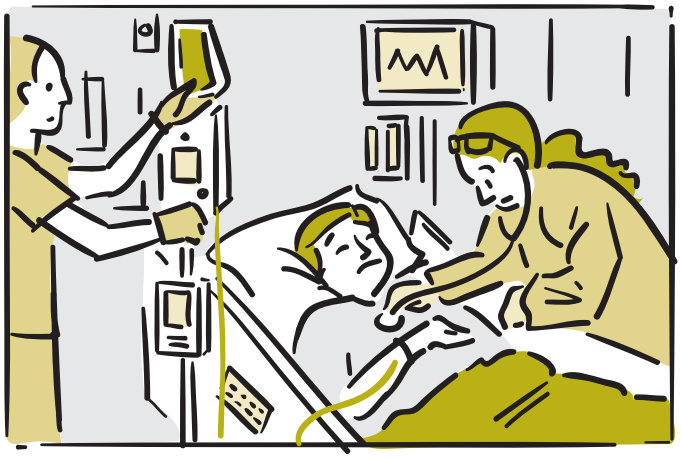
Sepsis was once commonly known as "blood poisoning." It was almost always deadly. Today, even with early treatment, sepsis kills about 1 in 5 affected people. It causes symptoms such as fever, chills, rapid breathing, and confusion.

Anyone can get sepsis, but the elderly, children, and infants are most vulnerable. People with weakened **immune systems**, severe burns, physical trauma, or long-term illnesses (such as diabetes, cancer, or liver disease) are also at increased risk.

At one time, sepsis was thought to arise from an overgrowth of bacteria or other germs in the bloodstream. We now know that sepsis actually springs from 2 factors: first an infection (such as **pneumonia** or a urinary tract infection) and then a powerful and harmful response by your body's own immune system.

"With sepsis, the fight between the infection and the body's immune response makes the body like a battleground," says Dr. Derek Angus, a critical care physician at the University of Pittsburgh School of Medicine. "In the case of severe sepsis, that fight results in vital organ dysfunction, which puts one's life in peril."

Severe sepsis can damage essential organs like the liver and kidneys. An even more extreme disorder occurs when blood pressure plummets—a condition known as septic shock. "With septic shock, the immune response that's trying to fight infection can actually lead to a dangerous drop in blood pressure," Angus says. As blood pressure falls, tissues become starved for oxygen-rich blood. Organs can fail, which could lead to death.



By some estimates, severe sepsis or septic shock strikes nearly 1 million Americans each year. At least 200,000 of them die in the hospital shortly afterward. Many who survive recover completely. But others have lasting problems, including permanent organ damage and thinking difficulties (such as problems with planning, organizing, and multitasking).

Sepsis can be triggered by many types of infections. "But the most common cause of sepsis is community–acquired pneumonia," Angus says. Scientists are still working to understand why some people with infections develop severe sepsis or septic shock while others don't.

Researchers are exploring new ways to diagnose, reverse, or prevent this serious and costly condition. Treatment for sepsis is most successful if the condition is spotted early and then treated quickly with antibiotics to fight the infection and fluids to maintain blood pressure.

In a large NIH-funded clinical trial of sepsis care, Angus and his colleagues found that a relatively simple strategy worked as well at preventing deaths as did more complex and costly approaches. "The study helped to clarify that a lot of the treatment steps we'd been using are essential, but the extra steps with sophisticated and invasive procedures aren't always necessary to improve survival," Angus says.

Sepsis is a health emergency that requires swift medical care. See a doctor or get emergency assistance if you feel unwell and have a combination of the symptoms listed in the "Wise Choices" box. ■

Definitions

Immune System
The system that protects your body from invading bacteria, viruses, and other microscopic threats.

Pneumonia
An infection of the lungs.

Web Links

For more information about sepsis, click the "Links" tab at:
http://newsinhealth.nih.gov/issue/Aug2014/Feature2

Wise Choices
Signs of Sepsis

Sepsis can be hard to spot, because its early symptoms are similar to many other conditions. Medical personnel look for these signs:

- Fever or low body temperature (hypothermia)
- Chills
- Rapid heart rate
- Difficulty breathing
- Skin rash
- Confusion and disorientation
- Light-headedness caused by a sudden drop in blood pressure

Health Capsules

For links to more information, see these stories online:
http://newsinhealth.nih.gov/issue/Aug2014/Capsule1

Transplant Reverses Sickle Cell Disease

A specialized **bone marrow** transplant successfully reversed severe sickle cell disease in adults, in some cases without the need for extensive immune-suppressing drugs. Follow-up testing will be needed to further assess this experimental therapy.

Sickle cell disease affects more than 90,000 Americans, mostly of African descent. It causes red blood cells to become stiff, sticky, and sickle-shaped. The deformed cells can block blood flow, leading to pain, organ damage, and stroke.

Definitions

Bone Marrow
A spongy tissue that contains blood-producing stem cells, which give rise to many types of blood cells.

Some affected children have been successfully treated with bone marrow transplants—an approach thought to be too toxic for adults. With this method, high doses of chemotherapy destroy all of a child's bone marrow, which is then replaced with healthy marrow from a donor. Transplant recipients often require harsh immunosuppressants for years.

In the new study, a research team at the NIH Clinical Center tested a modified transplant procedure in 30 adults with severe sickle cell disease. A less toxic regimen destroyed only some of their marrow cells. They then received blood-forming stem cells donated by a healthy sibling.

The transplanted cells reversed the disease in 26 of 30 adults. They had fewer hospitalizations and needed less narcotics for pain. A year after the procedure, 15 patients no longer needed immune-suppressing drugs.

"Side effects caused by immunosuppressants can endanger patients already weakened by years of organ damage from sickle cell disease," says NIH's Dr. John Tisdale, the study's senior author.

People with sickle cell disease interested in joining NIH blood stem cell transplant studies may call 1-800-411-1222 or visit www.clinicaltrials.gov for more information. ■

Mind and Body Therapy for Fibromyalgia

Fibromyalgia is a long-lasting disorder marked by widespread pain, tenderness, fatigue, and other symptoms that can interfere with daily life. An estimated 5 million American adults have the condition. It most often affects women, although men and children also can have the disorder. Unfortunately, despite ongoing research, its causes remain unknown.

Fibromyalgia can be difficult to diagnose and treat. Individualized therapy may include conventional medications as well as mind and body approaches, such as exercise, strength training, massage, and acupuncture. But what does the science say about mind and body practices for fibromyalgia? To help you learn more, NIH developed an easy-to-read list that outlines the current evidence.

The research is still preliminary, but encouraging results suggest that tai chi, qi gong, yoga, massage therapy, acupuncture, and balneotherapy (hydrotherapy) may help relieve some fibromyalgia symptoms. You can get additional details at http://nccam.nih.gov/health/tips/fibromyalgia.

Be sure to speak with your health care provider before starting to use any mind and body practice. ■

Featured Website
Diabetes Health Sense

http://ndep.nih.gov/resources/diabetes-healthsense/

About 29 million Americans have diabetes, and many more are at risk because of excess weight, family history, or age. This site offers easy access to resources that can help you eat well, stay active, and meet your health-related goals, whether you have diabetes or are at risk for the condition.

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