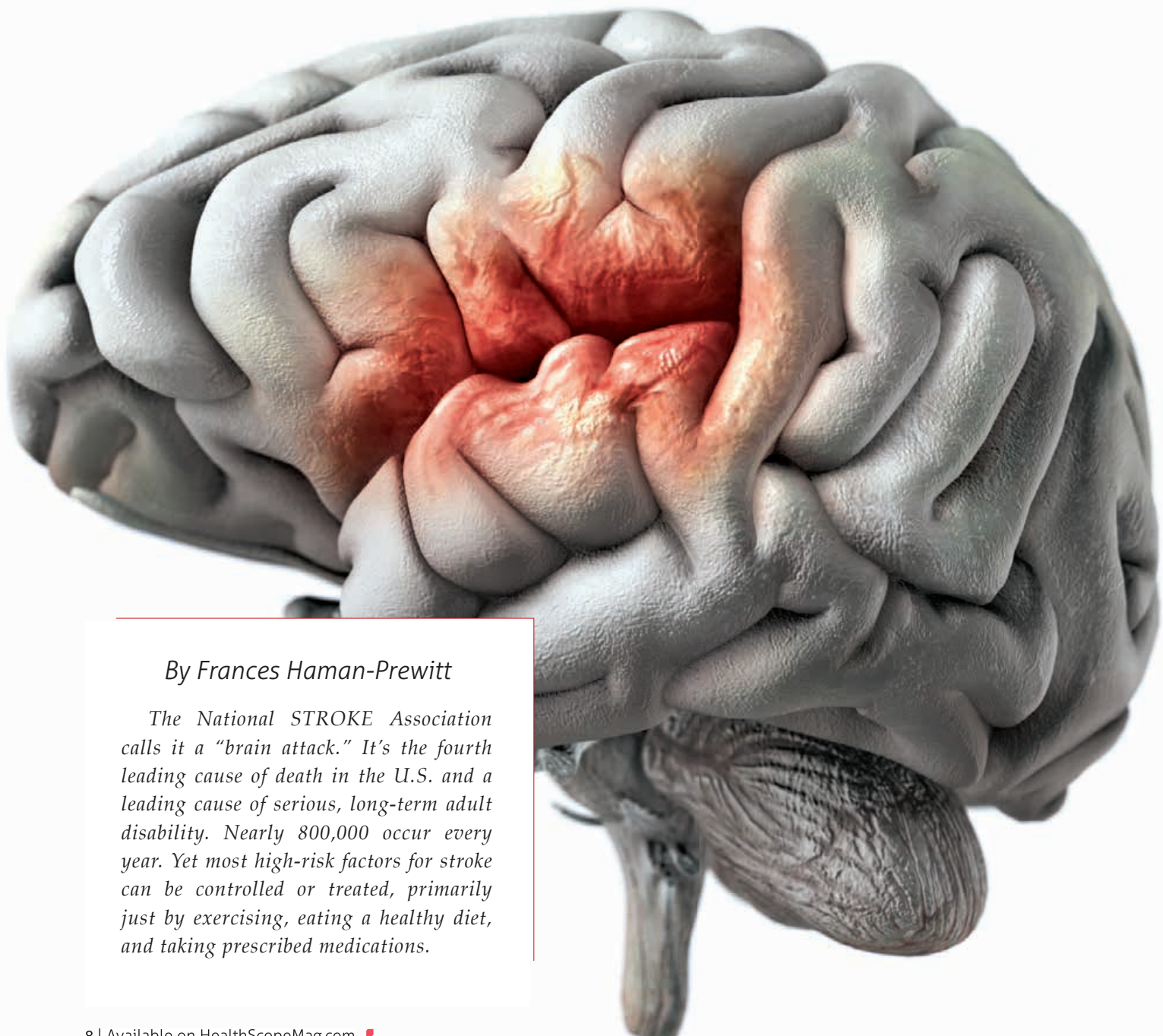


Understanding **STROKE**

And New Treatment Breakthroughs



By Frances Haman-Prewitt

The National STROKE Association calls it a “brain attack.” It’s the fourth leading cause of death in the U.S. and a leading cause of serious, long-term adult disability. Nearly 800,000 occur every year. Yet most high-risk factors for stroke can be controlled or treated, primarily just by exercising, eating a healthy diet, and taking prescribed medications.

What is a stroke?

Most of the time, strokes are “ischemic,” meaning they involve a clot that lodges in a narrow blood vessel, blocking the flow of blood to an area of the brain. However, about 13% of strokes are “hemorrhagic,” the result of a broken blood vessel caused by an aneurysm, or weak area of the vessel that bulges under pressure. In either case, damage occurs because brain cells die when they are deprived of oxygen and nutrients.

Effects can be large or small, permanent or temporary, and can include paralysis of arms, legs, and facial muscles; difficulty talking or swallowing; vision problems; memory loss or thinking difficulties; and even changes in mood, outlook, and behavior.

It all depends on which area of the brain is damaged and how extensive that damage is – and on how quickly treatment is received. Since brain cells die during a stroke at the rate of 2 million per minute, quick action is imperative.

How can I know if I’m having one? What do I do if I suspect someone else is having one?

Unfortunately, since the brain is affected, a person having a stroke may not recognize a problem. However, if you or someone near you experiences sudden symptoms such as: numbness of the face, arm or leg, especially on one side of the body; confusion, trouble speaking or understanding speech; trouble seeing; trouble walking, dizziness, or loss of balance or coordination; or a severe headache, you should immediately seek medical attention.

The National Stroke Association offers the FAST test if you have doubts:

Face – Ask the person to smile. Does one side of the face droop?

Arms – Ask the person to raise both arms. Does one arm drift downward?

Speech – Ask the person to repeat a simple sentence. Does the speech sound slurred or strange?

Time – If you observe any of these signs, call 911 immediately.

How is stroke normally treated?

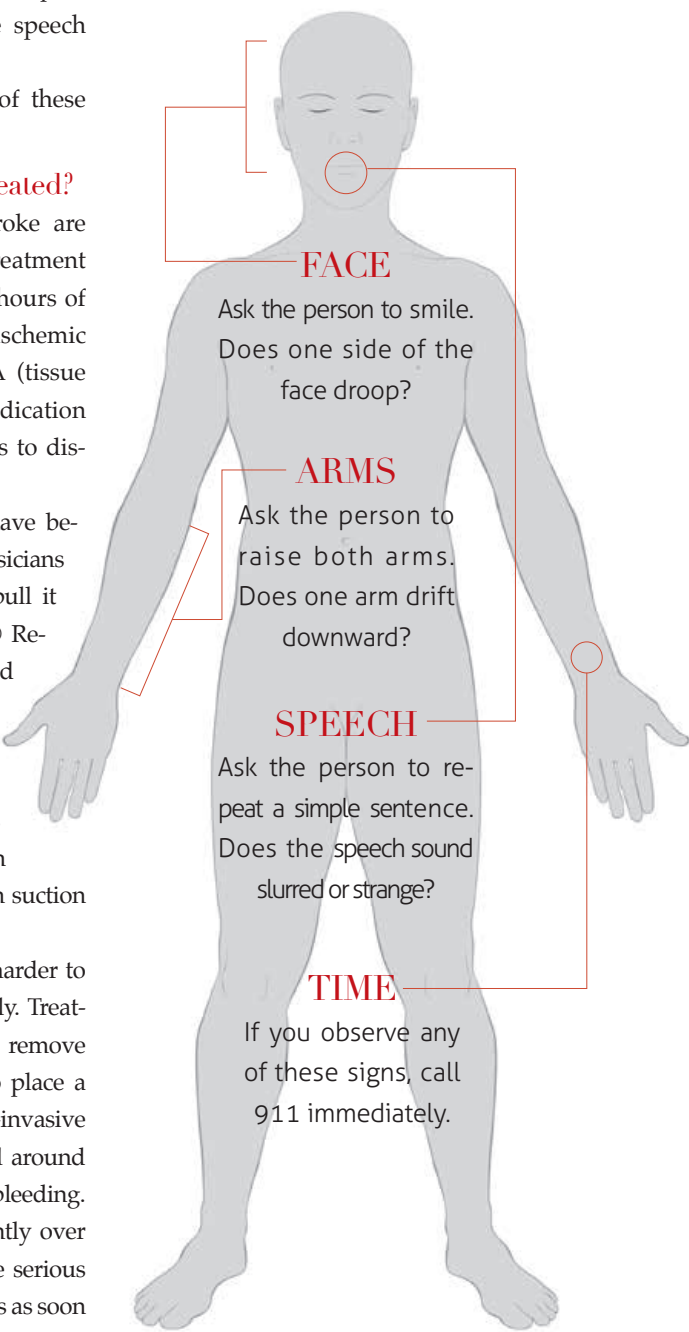
Currently, treatments for stroke are limited. In the rare case that treatment can begin within three or four hours of the onset of symptoms, many ischemic patients can be helped by tPA (tissue plasminogen activator), a medication given through an IV that works to dissolve blood clots.

More recently, new devices have become available that allow physicians to actually capture a clot and pull it out. These include the MERCI® Retriever, a tiny corkscrew-shaped device that wraps around a clot; the Penumbra system, which uses suction; and self-expanding stent-retriever devices like Solitaire® and Trevo® which compress and trap clots and then suction them out.

Hemorrhagic stroke is much harder to treat and more likely to be deadly. Treatments include surgery, either to remove the damaged blood vessel or to place a metal clip at its base, or a less-invasive catheter used to place a tiny coil around the aneurysm to prevent further bleeding.

In spite of these efforts, currently over 50% of stroke victims experience serious impairment. Rehabilitation begins as soon as possible after the stroke. Neurologists

The *FAST* test



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EXPERT ADVICE On Stroke Centers and New Protocols

“The symptoms of a stroke are immediate. So the longer you wait with no blood flow to that portion of the brain, the more irreversible damage done. The biggest and best thing immediately is the establishment of stroke centers and protocols, so that when paramedics say, “Hey, we’ve got a stroke,” the ER immediately pages the entire hospital. This has certainly revolutionized the way we evaluate and treat stroke patients. They get evaluated much more quickly, and they get treated much more quickly.”



Michael Hartley,
M.D., Vascular
Surgeon,
Hamilton Health
Care System

usually lead acute-care stroke teams and direct patient care during hospital stays. Psychiatrists specializing in rehabilitation medicine usually coordinate the rehabilitation stage of care, which often includes other subspecialists like physical therapists, occupational therapists, and speech-language pathologists.

Therapies are likely to include exercises and stretching, re-learning or adaptation of skills needed to perform everyday



activities, counseling, medication, and electrical stimulation of affected muscles and/or the brain cortex. They may also include modified constraint-induced therapy (mCIT), in which the less affected part of the body is restrained so that the weakened part of the body is forced to work, and motor imagery, in which the patient helps to re-wire the brain by visualizing the muscles working.

Advancements in Stroke Treatment and Research

Breakthroughs are on the horizon in a wide variety of ways, including drugs, devices and procedures.

Ischemic Stroke System (ISS). As one of the five busiest stroke centers in the nation, Erlanger Health System is participating in a number of clinical trials including administration of the Ischemic Stroke System (ISS) created

DID YOU KNOW?

May is National Stroke Awareness Month! The National Stroke Association honors this month in its efforts to conquer stroke through education and prevention, and to raise funding for research. During May, donations will be matched up to \$30,000. Learn more at stroke.org.



by the Israeli Brainsgate company. ISS increases the crucial window for treatment to 24 hours using an easily implantable electrode to stimulate a nerve center in the brain. This gently increases blood flow and reduces the destruction of brain cells.

Stem cell therapy. Other clinical trials, including one at Erlanger, are experimenting with stem cell therapy to

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**EXPERT
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**On New
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for Stroke**

“I’m very optimistic that in the next five to ten years, we’re going to see many new therapies approved and – working synergistically – driving good outcomes so that perhaps more than 50% of patients who present with acute stroke can survive with minimal or no disability. Here at Erlanger, we offer world-class stroke care around the clock. Not only are we defining new standards for other hospitals, we are partnering with scientists from around the world to discover the therapies of the future.”



Thomas Devlin, M.D., Ph.D., Director, Southeast Regional Stroke Center at Erlanger

regenerate brain tissue damaged by stroke. After a promising study of rats in which brain cells regenerated after being injected with the rats’ own stem cells, researchers at the University of Glasgow injected 2 million neural stem cells into the brains of each of 12 stroke victims. After two years, results show “reductions in neurological impairment and spasticity,” according to pharmaceutical sponsor ReNeuron.

Drug therapy. In the realm of drug therapy, researchers at the University of Georgia have shown that a common blood pressure medication called candesartan can help regenerate blood vessels in the brain. While the drug has been shown to protect the brain after a stroke, it’s generally avoided because it lowers blood pressure, decreasing the flow of much-needed oxygen to the brain. However, the medication also stimulates the brain receptor AT2, which secretes brain derived neurotrophic factor (BDNF) that stimulates brain repair through the growth of new blood vessels. The task will be to develop a drug that stimulates the AT2 receptor without lowering blood pressure. Such drugs are being de-

veloped, but researchers estimate it will take another five to 10 years before they are widely available for use.

Genes-specific treatment plans. Another window for prevention and treatment has been opened by an international study led by King’s College London that discovered a genetic variant associated with certain types of strokes. In particular, some people have a genetic tendency to more aggressive blood coagulation – leading to clots, which lead to stroke. This suggests that strokes have different origins and a “one-size-fits-all” treatment plan will fall short. Instead, treatment and prevention should be tailored to individual needs.



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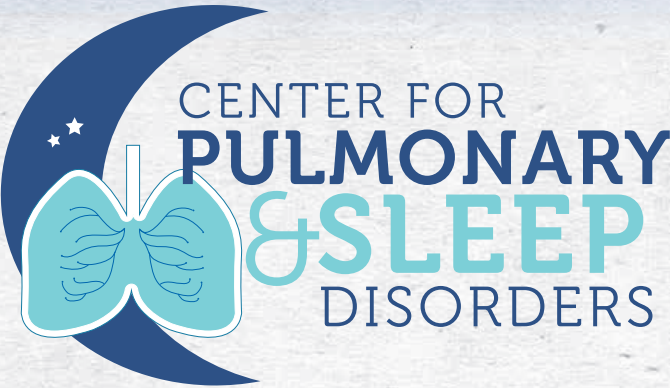
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Exercise therapy. As much as we hate to admit it, we all know that exercise is an important requirement for good health. Now compelling research from the Canadian Stroke Congress has demonstrated that a consistent exercise regime of strength and aerobics can trigger healing in the brain, leading to dramatic increase in the recovery of both cognitive and physical function after a stroke. Stroke patients who took part in a five-day-a-week program (including walking, lifting weights and doing squats) that was adapted to their physical limitations had an almost 50% improvement in memory, language, thinking and judgment. In addition, muscle strength and walking ability “improved dramatically.”

How can I prevent it?

Although stroke can happen to anyone at any age in any physical condition, most are preventable. Certainly, some risk factors like genes or age can’t be changed. However, most high-risk factors can be controlled or treated, primarily just by exercising, eating a healthy diet and taking prescribed medications. These risk factors include high blood pressure, atrial fibrillation, high cholesterol, smoking, physical inactivity, obesity, diabetes, atherosclerosis, circulation problems, and alcohol or drug use.

So take a walk, swim or ride a bike for 30 minutes per day, put away the chips, and eat your fruits and vegetables. Follow any treatment plans laid out by your doctor. And remember: if you or someone around you exhibits symptoms of a stroke, speed is of the utmost importance. Call 911 immediately and give your medical caregivers a fighting chance of saving you or your loved one from a lifetime of disability. 



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