



Age Is Just a Number

Young adult stroke is on the rise.

Here's what you should know.

BY STEPHANIE STEPHENS

With another energetic daily workout behind her, Dana Hokin came back to her home in Scarsdale, NY, at 9:45 a.m., showered, and then bent down to retrieve her dropped towel. Suddenly, the vision in her right eye became “squiggly,” then blurry, then totally black. Age 44 at the time, Hokin didn’t know exactly what was happening, but she knew it wasn’t good.

“I had always been diligent about doctor visits, and I was in great shape,” Hokin remembers of Sept. 22, 2011. She called her husband, Michael, then her mother, Ellen—who suggested it was a detached retina—and then a nearby retinal specialist, Howard Charles, M.D., at the Mt. Kisco Medical Group in Rye, NY. However, acute symptoms such as Hokin’s are best treated in an emergency department.

Precious time was passing as Hokin arrived at Dr. Charles’ office around 11 a.m. After an examination, he determined Hokin had a blockage in one of the small arteries carrying blood to her retina. The condition—central retinal artery occlusion (CRAO)—is relatively rare, occurring in less than 3.5 per 100,000 people. Sometimes referred to as ocular stroke, CRAO can result in severe or permanent vision loss and increases a person’s risk for an ischemic stroke of the brain, which is also caused by a blocked artery.

Dr. Charles knew that the sooner a person with stroke gets treatment, the better the outcome. (See box, “Stroke: The Basics.”) So he arranged for Hokin to be taken to the nearest stroke center, at St. Luke’s Hospital in New York, NY.

Once there, Hokin’s team included Johanna T. Fifi, M.D., a neuroendovascular surgeon (who specializes in minimally invasive procedures of the brain and spine), and assistant professor at the Albert Einstein College of Medicine in Bronx, NY; and Carolyn Brockington, M.D., director

Catalyst for Change

In 2008, Ronald Stewart, M. D., was one of several people advocating for designated stroke centers in San Antonio, TX, where he lives and works. A designated stroke center is a hospital that specializes in stroke care. Dr. Stewart chaired both the surgery department at the University of Texas Health Science Center at San Antonio and the Southwest Texas Regional Advisory Council, which oversees care for patients with traumatic injuries, heart attacks, and strokes across 22 south Texas counties. He still holds both positions.

Back in 2008, at yet another meeting held on the topic of designated stroke centers, Dr. Stewart once quipped, “You know what? I have atrial fibrillation [the most common cause of irregular heart beat and a risk factor for stroke]. I could have a stroke and need you guys someday.”

He did.

And he did.

He was 53 years old and sitting at his home computer on December 21, 2011, when he experienced a type of ischemic stroke caused by multiple clots in the brain—in his case, on the left side of his brain. His arm involuntarily shot straight up as he struggled to make sense to his daughter Elizabeth. Fortunately, within a matter of minutes, he was able to tell her he’d had a stroke, needed an aspirin, and needed to go to the university hospital. She called 911.

By then, thanks in part to his efforts, that facility had implemented a designated stroke center, as had nine other San Antonio hospitals. He was treated by the team of his colleague and friend, Robin L. Brey, M. D., chair of the department of neurology at the University of Texas Health Science Center, Fellow of the AAN, and editor-in-chief of *Neurology Now*. She quickly diagnosed his stroke and administered tissue plasminogen activator (tPA), which dissolves blood clots, improving blood flow to prevent further organ or tissue damage when administered intravenously within a 3 to 4.5-hour window of time. Having recovered fully, Dr. Stewart is now eager to share his wisdom.

“Patients who have atrial fibrillation should take an anticoagulant or blood thinner. I should have been on something more than aspirin, as my doctors had recommended,” he says somewhat sheepishly.

“And if you think you’re having a stroke, don’t say, ‘This will get better,’ because it won’t. Call 911 and go to the hospital, not to a doctor’s office or a clinic. Take an ambulance so you don’t waste time in the waiting room—the quicker you get stroke treatment, the better your chances,” Dr. Stewart says.

“If symptoms include sudden alterations in consciousness and neurologic function, don’t hesitate to think stroke,” says Dr. Stewart. “Lots of younger people who have periodic atrial fibrillation may or may not be diagnosed. It’s more common than most people believe.”

Dr. Stewart is back to full speed in his career and his life—and happy to talk, walk, and work again. “As best I can tell, I’ve made a complete recovery. I am very blessed and very grateful,” he says.



of the Stroke Center at St. Luke’s Roosevelt Hospital Center and Beth Israel Medical Center, both in New York, NY. At 3 p.m., their patient underwent a three-hour procedure to dissolve her clot with the drug tissue plasminogen activator (tPA), which is the most promising treatment approved by the U.S. Food & Drug Administration (FDA) for an ischemic stroke. It dissolves blood clots, improving blood flow to prevent further organ or tissue damage when administered intravenously within a 3- to 4.5-hour window of time (if given directly into an artery, as in Hokin’s case, the window is 8 hours). Although tPA is not FDA-approved for CRAO, Hokin’s doctors felt it was the best treatment in her case.

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NUMBERS ON THE RISE

The clot, which remained for more than five hours, destroyed 80 percent of Hokin’s vision, leaving 20 percent blurred.

“You’re so young to have had a stroke,” Hokin remembers one doctor telling her. In fact, many well-known people have had strokes at a relatively young age: actor Kevin Sorbo (see our article on him at <http://bit.ly/osbf1E>); actress Sharon Stone; Sen. Mark Kirk (R-Ill.); Beau Biden, son of U. S. Vice President Joseph Biden; Tedy Bruschi, former linebacker for the New England Patriots (see our story on Bruschi at <http://bit.ly/136pE7P>); and singer/songwriter Bret Michaels; to name a few.

Stroke symptoms such as dizziness or headache can be confusing—mimicking signs of other conditions, including brain tumor, multiple sclerosis, spinal cord injury, or serious infection. Stroke can also masquerade as vertigo, alcohol intoxication, inner ear disorder, or migraine headache. (See box, “Warning Signs of Stroke.”)

One out of seven patients with stroke between the ages of 16 and 50 was misdiagnosed according to a 2011 study conducted by the department of neurology and stroke program at Wayne State University/Detroit Medical Center, according to program director and study co-author Seemant Chaturvedi, M.D., professor of neurology and Fellow of both the American Academy of Neurology (AAN) and the American Heart Association.

“One out of seven is not a trivial number when you consider that more than 50,000 young people have a stroke each year,”

“The good news is that some of the possible **contributing factors** to these strokes can be modified with lifestyle changes, such as diet and exercise.”

—BRETT M. KISSELA, M.D., M.S.

Dr. Chaturvedi says.

Early use of magnetic resonance imaging (MRI) can improve diagnostic accuracy in young adults with stroke, as can having a neurologist see the patient in the emergency department.

HOW YOUNG IS YOUNG?

So just who is a “young adult”? Experts agree it can be a controversial issue.

Dr. Chaturvedi defines the term as between the ages of 18 and 50. “That number has been commonly used in previous studies,” he says.

Others define the upper limit as between ages 45 or 50 years, according to Aneesh B. Singhal, M.D., of Massachusetts General Hospital’s department of neurology and stroke service. “The vast majority say age 45, a few say 49, one or two say 55, but 45 is the standard,” says Dr. Singhal. “It is a ‘moving target,’ an arbitrary definition that depends upon the research you’re doing. We really should emphasize that stroke can affect people of all ages including newborns, children, adolescents, young adults, and middle-aged individuals—not just the old and very old.”

True, nearly three-quarters of all strokes do occur in people over the age of 65, and stroke risk more than doubles each decade after the age of 55. But evidence continues to mount that strokes really don’t just occur in the elderly, in spite of what many people think.

“It’s possible that the increases in stroke among the young result from better detection, due to advances in brain imaging such as MRI,” says Dr. Singhal. But he also refers to studies such as the 2012 study from the University of Cincinnati College of Medicine in Ohio led by Brett M. Kissela, M.D., M.S., and Fellow of the AAN: According to the study, rates of modifiable stroke risk factors such as hypertension, diabetes, obesity, and cigarette smoking increased significantly between 1993 and 2005, as did rates of first stroke, among patients age 20 to 54.

“The data are particularly relevant given the U.S. and global epidemics of obesity and diabetes,” says Dr. Singhal.

STROKE CAUSE AND EFFECT

For stroke in general, doctors determine a cause in about two-thirds of cases. “The cause of stroke in young adults is much more ‘wide spectrum,’ with a high frequency of causes that, overall, are considered uncommon,” says Dr. Singhal.

Dr. Singhal co-authored an October 2012 study that found newer diagnostic tests—such as CT angiography, genetic studies, and newer blood tests—can detect the cause in the vast majority of young adult stroke patients. It also found that vascular risk factors are common and that early treatment with

clot-busting agents can be safe.

The most common collective cause among patients younger than age 45 is disease of the arteries in the brain, according to Dr. Singhal. Atherosclerosis is prevalent in approximately 10 percent of young patients with stroke and can result from high blood pressure, high cholesterol, smoking, or physical inactivity, he notes.

Younger patients who have diabetes, HIV/AIDS, tuberculosis, the autoimmune disease lupus, or migraines are also at increased risk for stroke. Migraine with aura—visual sensory disturbances that precede or accompany the migraine—increases a woman’s risk of stroke two-fold to three-fold, Dr. Singhal says. The risk is 12-fold to 16-fold higher for women with migraine with aura who also smoke and take oral contraceptive pills.

Birth control pills have been the subject of much discussion and research; they remain generally ill-advised for women who smoke. They can also raise stroke risk for women over 35 and those with high blood pressure, diabetes, or high cholesterol. Pregnancy also raises stroke risk for women.

Dr. Singhal offers this advice. “Clinical guidelines recommend against using oral contraceptives in women who have

Warning Signs of Stroke

Stroke strikes fast. You should, too. Call 9-1-1 if you experience any of these signs:

- ▶ Sudden numbness or weakness of the face, arm or leg, especially on one side of the body
- ▶ Sudden confusion, trouble speaking or understanding
- ▶ Sudden trouble seeing in one or both eyes
- ▶ Sudden trouble walking, dizziness, loss of balance or coordination
- ▶ Sudden, severe headache with no known cause

Call 911 immediately if you or someone you are with shows signs of having a stroke. Do not try to drive yourself to the hospital.

Stroke can happen with just one of these symptoms, and the symptoms can vary. In addition, the symptoms can either start slowly or come on quickly.

(Go to jointcommission.org/speak_up_what_you_should_know_about_stroke for more information.)

Stroke: The Basics

There are two types of stroke: ischemic and hemorrhagic. Ischemic stroke is caused by blockage of a blood vessel supplying the brain. Hemorrhagic stroke is caused by bleeding into or around the brain.

How common is stroke?

- ▶ About 795,000 Americans each year experience a new or recurrent stroke. On average, a stroke occurs every 40 seconds in the United States.
- ▶ Stroke kills more than 137,000 people a year—approximately 1 of every 18 deaths. It's the fourth-highest cause of death in the United States.
- ▶ About 40 percent of stroke deaths occur in men, and 60 percent in women.

What are the risk factors for stroke?

Risk factors that can be treated, changed, or controlled include high blood pressure, cigarette smoking, diabetes, carotid or other artery disease, peripheral artery disease, atrial fibrillation (irregular heartbeat), heart failure, sickle cell anemia, high cholesterol, poor diet, physical inactivity, and obesity.

- ▶ **Prior stroke, transient ischemic attack (TIA), or heart attack:** The risk of stroke for someone who has already had one is many times that of a person who has not. A TIA produces stroke-like symptoms but no lasting damage; it is also a predictor of stroke. And if you have had a heart attack, you are at higher risk of having a stroke.
- ▶ **Age:** The chance of having a stroke approximately doubles for each decade of life after age 55.
- ▶ **Sex:** Stroke is more common in men than in women. In most age groups, more men than women will have a stroke in a given year. However, more than half of total stroke deaths occur in women. At all ages, more women than men die of stroke. Use of birth control pills and pregnancy pose special stroke risks for women.

- ▶ **Race:** African-Americans have a much higher risk of death from a stroke than whites do, partly because African-Americans have higher risks of high blood pressure, diabetes, and obesity.
- ▶ **Family history:** Stroke risk is greater if a parent, grandparent, sister, or brother has had a stroke. Rarely, strokes may be symptoms of genetic disorders like cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL).

What treatments are available?

- ▶ **Prevention:** The best treatment for stroke is prevention. Therapies to prevent a first or recurrent stroke are based on treating an individual's underlying risk factors for stroke, such as high blood pressure, atrial fibrillation, and diabetes.
- ▶ **Acute stroke therapies immediately after a stroke:** These try to stop a stroke while it is happening by quickly dissolving the blood clot causing an ischemic stroke or by stopping the bleeding of a hemorrhagic stroke. Medication or drug therapy is the most common treatment for stroke. The most popular classes of drugs used to prevent or treat stroke are antithrombotics and thrombolytics.
- ▶ **Post-stroke rehabilitation:** This helps a patient prevent or overcome disabilities that can result from stroke damage.

What research is being done?

The National Institute of Neurological Disorders and Stroke (ninds.nih.gov) conducts stroke research and clinical trials at its laboratories and clinics at the National Institutes of Health (NIH) and through grants to major medical institutions. Some of the topics of current stroke research include: how stroke risk factors contribute to stroke; how stroke damages the brain; the genetics of stroke; and ways to help the brain repair itself after stroke to restore important cognitive functions. New advances in imaging and rehabilitation have shown that the brain can compensate for some function lost as a result of stroke.

had a stroke—which is all about secondary prevention. Most experts agree that women with migraine should take progesterone-only contraceptives.”

LOOKING FORWARD

Dana Hokin has relearned necessary daily life skills and is grateful for the little things. “You don't know how much you can't handle,” she says, recalling how she felt somewhat “helpless” immediately after her stroke. The road back to normalcy presents a few bumps along with new insights, like learning to drive a car again—and smashing the rear-view window along the way.

“I deal with my vision loss every day,” she says. “But I have a lifeline to an amazing husband and two wonderful kids and my

friends. ‘Stuff happens’ to everyone, and this is my thing. I'm grateful it wasn't worse, and I am moving on and not dwelling on my stroke,” Hokin says.

“Not everybody has a devastating stroke,” says Dr. Chaturvedi. “A lot of young people have made a good recovery. We are continually optimistic about the increasing number of excellent diagnostic tools for stroke.”

“The good news is that some of the possible contributing factors to these strokes can be modified with lifestyle changes, such as diet and exercise,” said Dr. Kissela in a prepared statement. “However, given the increase in stroke among those younger than 55, younger adults should see a doctor regularly to monitor their overall health and risk for stroke and heart disease.” NN