Nearly everyone has a family member or friend who has had a stroke. Strokes are one of the most common causes of death and disability in the United States. According to the National Stroke Association, it is the third leading cause of death and primary cause of disability in adults.

What do you need to know to avoid having a stroke?

First of all, know the risk factors—some are controllable, lifestyle choices, while others are uncontrollable (see inset box).

Up to 80 percent of strokes are preventable. Other risk factors—age, gender, race, family history, stroke/TIA history, and some medical conditions—are not controllable.

The controllable risk factors include:

- High blood pressure
- Atrial fibrillation
- High cholesterol
- Diabetes
- Tobacco use and smoking
- Alcohol use
- Physical inactivity
- Obesity

Other risk factors—age, gender, race, family history, stroke/TIA history, and some medical conditions—are not controllable.

For more information on strokes and stroke prevention, go to the National Stroke Association’s Web site at stroke.org.

Know your risks

You can make lifestyle changes that will significantly reduce your risks of stroke. The controllable risk factors include:

- High blood pressure
- Atrial fibrillation
- High cholesterol
- Diabetes
- Tobacco use and smoking
- Alcohol use
- Physical inactivity
- Obesity

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The EPA Human Studies Facility Is located on the UNC-Chapel Hill campus
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medication based on the type of seizure, the person’s age, and any other medical conditions the patient may have. These drugs are used to prevent the symptoms, such as convulsion, associated with seizures but usually do not target the underlying cause.

Parkinson’s Disease—Parkinson’s disease is caused by an impairment or deterioration of neurons in the part of the brain known as the substantia nigra. This degeneration results in a lack of the neurotransmitter dopamine, leading to impairment of motor skills, speech, and other body movements.

There are several medicines that can ease the symptoms of Parkinson’s disease. Most work by replacing or mimicking dopamine, which improves the tremor, imbalance, rigidity and slowness associated with the disease.

The progression of the disease differs from person to person. But with the appropriate treatment, most people with Parkinson’s disease can lead productive lives for many years after their diagnosis.

Dementia—Though there are several different diseases associated with dementia (such as Alzheimer’s disease and Huntington’s disease), all involve a loss of brain function. This deterioration can affect memory, thinking, language, judgment and behavior.

Some treatments may help slow or minimize the development of dementia symptoms. Several medications attempt to boost or regulate chemical messengers in the brain that are associated with memory, judgment, or learning. While none of the currently available medications stop or reverse the progression of dementia, various ongoing drug trials may offer ways to halt degenerative changes in the brain.

Dr. William Ferrell has practiced with Raleigh Neurology Associates since 1991. He frequently treats patients at WakeMed. Home to the only nationally certified Primary Stroke Center in Wake County, WakeMed partners with board-certified neurosurgeons, orthopedic surgeons, neurologists, critical care intensivists, neuroradiologists and rehabilitation experts to create a coordinated multidisciplinary team.

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not explain why,” said Dr. Christopher Goetz, eminent Parkinson’s disease specialist at Rush Medical Center. The disease gradually destroys brain cells in the basal ganglia that produce dopamine, a neurotransmitter that tells the body how to move. Dopamine loss causes tremors, rigidity, slow movement and problems with gait and balance, but symptoms vary.

Human studies Dr. Jeff Bronstein, director of UCLA’s movement disorders program, said exercise is strong medicine. “Short of taking the drug levodopa exercise is probably the most effective therapy we have; it’s holistic, its natural with no side effects, and we know it helps,” Bronstein said.

Dr. Margaret Schenkman, former Duke physical therapist who is Associate Dean of Physical Therapy Education at the University of Colorado, supports the benefits of exercise and is cautiously enthusiastic. “Quite honestly, if I had Parkinson’s, I’d be exercising,” she said.

Like many neuroscientists, Schenkman considers the possibility that exercise, in the right dose, can protect brain cells but indicates it will not be an easy fix. “Exercise may be neuroprotective or may slow disease progression—but only if done 4-5 times per week.”

She said that from a clinical and scientific perspective, exercise is beneficial, “but exercise studies aren’t big enough yet to make definitive statements.”

A 2008 Washington University study of 19 adults with PD compared tango with strength/flexibility exercise. Both groups improved in mobility, but tango dancing, a challenging dance that requires balance and learning, generated better scores on PD assessments.

A small 2009 Cleveland Clinic study generated national attention because it showed reduced symptoms and a change in brain activity.

While bicycling across Iowa two people with PD underwent surprising transformations. A woman’s micrographia, tiny writing related to PD, returned to normal. A man’s tremors vanished.

Dr. Jay Alberts, avid cyclist, trip leader and Cleveland Clinic researcher, initially credited a local elixir: Iowa ice cream. But the next time PD symptoms disappeared on an Iowa trip, he got serious—and designed a study. Alberts suspected that effort and speed were important. He compared people with PD who biked at a slow speed with those who were “forced” to push themselves 30% beyond their norm and reach 80–90 rpms. He found that forced exercise, but not normal exercise, improved motor function (gait, finger dexterity, coordination) by 35% and changed brain activity.

Combination of human and animal research offers hope The combination of the animal, epidemiological and clinical studies provide “a fairly strong rationale for exercise being neuroprotective,” said Dr. Michael Zigmond, Director of the University of Pittsburgh’s Center of Excellence in Parkinson’s disease Research.

Large epidemiological studies that look at disease trends in large populations show that people who get regular exercise are less likely to develop PD than those who are inactive. Animal studies offer strong evidence that exercise protects the animal brain from destructive neurotoxins by stimulating growth factors like GDNF, a protein that helps dopamine-producing neurons survive.

Zigmond’s recent study, published in the December 2009 edition of Parkinsonism and Related Disorders, showed this process at work. Rats ran on a wheel, and the exercise triggered GDNF, which protected the rats’ brain cells from a neurotoxin. Rats ran before and after they were given the neurotoxin to offset the ill effects.

Future research may uncover efficient ways to trigger GDNF as exercise-induced brain protection produced cheaply and safely within the human body. Science may some day make designer drugs based on GDNF to protect vulnerable brain cells.

At this point, experts advise that people commit to a life-long exercise routine that they enjoy: the joy of movement should not be overlooked. “Exercise may change the neuropathways, but even if it does not, people who exercise feel healthier, they’re carrying themselves with positive energy—strolling like Joseph and clogging like Joan.”

Carol Winkelman is a writer, former dance student and coordinator/program developer for PEP Wellness. She has experience as a health advocate and with people living with Parkinson’s disease.

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brain, the use of these blood thinners will only increase bleeding, and result in more damage than the stroke itself. That is why it is essential for a patient to undergo a CT to assess for bleeding. CT shows acute hemorrhage very well. CT is also needed to assess the size of an acute stroke. Even if there is no bleeding in the brain at the time of the CT, if the stroke is very large, there may be increased risk of bleeding if blood thinners are introduced.”

Dr. Saha says that designated stroke centers are the best choice for patients experiencing stroke symptoms. “These certified centers have the necessary components in place for the patients to be treated with the most advanced technology and methods by an experienced team of physicians, nurses, and technologists.”

“In some cases, patients are not having a stroke, but what is known as Transient Ischemic Attack (TIA). Unless a patient undergoes a CT scan, there is no way to tell the difference between the temporary attack and stroke. The symptoms—very similar to a stroke—appear briefly and then resolve spontaneously. While some people ignore them, it is important to seek medical attention by calling 911. TIAs typically are a strong warning of an impending stroke.”

“The problem is that one doesn’t have the luxury of waiting to see if the symptoms will resolve as a means of distinguishing TIA from stroke,” explains Dr. Saha. “While one is waiting to see if the symptoms will resolve, the window of opportunity for stroke intervention gets smaller and eventually closes.”