

# MANAGING ACUTE ISCHEMIC STROKE: IV TPA

This information sheet is provided to help you understand the role of intravenous (IV) injection of tissue plasminogen activator (tPA) for managing acute ischemic stroke.

This sheet summarizes information from an American College of Emergency Physicians (ACEP) clinical policy. The policy is the result of a joint project of the American Academy of Neurology (AAN) and the ACEP. Read the full clinical policy at [www.acep.org/clinicalpolicies](http://www.acep.org/clinicalpolicies).

Neurologists from the AAN are doctors who identify and treat diseases of the brain and nervous system. Emergency physicians from the ACEP are doctors who practice emergency medicine. The following evidence-based information is provided by experts who carefully reviewed all available scientific studies on the effectiveness of IV tPA in managing acute ischemic stroke.

For people with acute ischemic stroke symptoms, early intervention may improve the chances of recovery. It is important to understand the benefits and risks of treating acute ischemic stroke with IV tPA.

## WHAT IS STROKE? HOW CAN I KNOW IF I AM AT RISK?

Stroke is a disease of the arteries that affect the brain. Arteries are blood vessels that carry blood from the heart to other parts of the body, including to the brain. Arteries can become blocked by blood clots, or can burst or tear. When this happens to the arteries feeding the brain, a stroke occurs. A stroke is sometimes called a brain attack. This is because the brain suddenly loses access to the blood that feeds it. When this happens, brain cells die, and the brain can be damaged.

Stroke is a major cause of death and disability worldwide. In the United States alone, there are about 795,000 new stroke cases each year. In addition, stroke in the United States:

- Is the leading cause of disability
- Is the third leading cause of death

Stroke causes damage to the brain. The damage can affect many functions of the body. The following may result from a stroke:

- Paralysis on one or both sides of the body
- Speech or language problems
- Memory loss
- Vision problems
- Changes in behavior

## Risk Factors

A person's risk of stroke depends on many factors. Some risk factors are beyond a person's control. These include:

- Age – risk increases after age 55
- Race/ethnicity – risk is higher for African Americans than for whites
- History of stroke, transient ischemic attack (temporary symptoms less severe than stroke symptoms), heart attack – risk for stroke is higher if the person has experienced one of these
- Family history – risk increases if parent, grandparent, or sibling has had a stroke
- Sex/gender – risk is higher for men than women

Other risk factors can be managed. These include:

- High blood pressure
- Heart disease
- Lack of physical activity
- Cigarette smoking
- Sickle cell disease
- Obesity (health condition caused by being overweight, defined as having a body mass index of 30 or higher)
- Diabetes mellitus (sugar diabetes)
- High blood cholesterol
- Artery disease
- Poor diet

## Warning Signs and Symptoms: Call 911

There are specific signs and symptoms that can warn of a stroke. The Joint Commission, a health care evaluation organization, developed a campaign to educate the public about these. The campaign, called Speak Up for Stroke, identifies the following warning signs and symptoms:

- Numbness or weakness of the face, arm, or leg, especially on one side of the body
- Confusion or trouble speaking or understanding
- Trouble seeing in one or both eyes
- Trouble walking, dizziness, or loss of balance or coordination
- Severe headache

If a person experiences any of these signs, he or she should call 911 for help immediately. For more information, visit [www.aan.com/view/stroke](http://www.aan.com/view/stroke).

## WHAT IS ACUTE ISCHEMIC STROKE?

There are two main types of stroke: hemorrhagic and ischemic. Hemorrhagic strokes result from torn or burst arteries. The second type of stroke—**ischemic**—is the focus of this information sheet. Most strokes are ischemic strokes. They account for about 80 percent of all strokes. Ischemic strokes happen when clots form in the arteries that feed the brain. Clots can lead to stroke in three ways:

- A clot develops where there is hardening of an artery
- A clot forms in the heart, upper chest, or neck and then travels to the brain
- An irregular (uneven) heartbeat causes a clot to form in the heart and travel to the brain

## WHAT IS IV TPA? CAN IT HELP TO TREAT ISCHEMIC STROKE?

The drug tPA comes from a protein found in the walls of blood vessels. Because it dissolves blood clots, it can be used to treat ischemic stroke. tPA can be given by injection into a vein or artery.

### Effectiveness

Health professionals may use IV tPA as emergency treatment for people with stroke symptoms. Earlier treatment is more effective than later treatment. For people with symptoms of acute ischemic stroke:

- There is a stronger level of evidence that IV tPA use may help improve recovery if given within three hours after first symptoms appear to those patients who meet inclusion/exclusion criteria for treatment
- There is a moderate level of evidence that IV tPA may be helpful if given within three to four-and-a-half hours after first symptoms to those patients who meet inclusion/exclusion criteria for treatment
- Within either time window, earlier treatment is more effective than later treatment
- The effectiveness of tPA has been less well established in institutions without the systems in place to safely administer the drug

However, even if time has passed since the first stroke signs or symptoms, it is important to seek treatment. Call 911 as soon as possible and get a doctor evaluation. Emergency services will guide you to the appropriate care center in your area. Treatment can still be helpful even if hours have passed.

## CAN ANYONE WITH STROKE SYMPTOMS RECEIVE IV TPA? WHAT ARE THE RISKS OF THIS DRUG?

IV tPA is not for everyone with stroke symptoms. Because it breaks up clots, IV tPA can be given only in cases of possible acute ischemic stroke; it cannot be given in hemorrhagic stroke. Therefore, doctors must do a brain scan to make certain there is no bleeding before giving tPA. The drug is useful only when given within the time frame described above. In addition, IV tPA cannot be used to prevent stroke.

Not everyone with symptoms of ischemic stroke is a candidate for IV tPA. The biggest risk of this drug is uncontrolled bleeding. Thus, anyone with bleeding risk should not receive IV tPA. This includes anyone with symptoms or history of brain hemorrhage (bleeding in the brain).

## ACEP

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