What is tPA?

In 1996, the Food and Drug Administration (FDA) approved a new medication to treat stroke when it first occurs. This is called tissue plasminogen activator (tPA). It is a clot-busting drug; i.e., it helps to dissolve blood clots. It is the same drug that cardiologists (heart specialists) use to treat patients with a heart attack (caused by a blood clot which blocks blood flow to the heart muscle) or pulmonary embolism (a clot in the lungs).

The vast majority of strokes are caused by a blood clot blocking a major brain artery. Therefore it makes sense that a medicine, which can break up a blood clot, can prevent or reduce the amount of permanent brain injury. Blood clots are normally made up of several proteins found in blood. If you cut yourself, these proteins stick together to form a blood clot. tPA breaks up blood clots by breaking down some of the proteins that cause a clot (tPA is therefore referred to as a "clot buster").

Are you/your family member a candidate for tPA?

Brain damage occurs very quickly when a stroke takes place. Therefore, to be effective, tPA must be used very soon after the stroke starts. In a study conducted by the National Institutes of Health in the early 1990s, tPA treatment was initiated within 3 hours of stroke onset. Further studies are ongoing to see if the 3-hour time "window" can be increased. Your doctor will tell you if you can be enrolled in one of these studies.

Since tPA breaks up clots, it can increase the risk of bleeding problems. There are some conditions that may make tPA dangerous. These include any type of bleeding in your body, such as an active bleeding ulcer, a brain tumor, a history of recent stroke, uncontrolled high blood pressure, a bleeding disorder (hemophilia), recent surgery or injury, or taking a blood thinner such as coumadin. Obviously, tPA cannot be used in patients who have a brain hemorrhage. A brain scan is required before tPA treatment to make sure the stroke is not caused by a hemorrhage. A brain scan takes time to complete and all of this, including blood tests and a thorough assessment by a doctor, needs to be done to determine if tPA can be used.

In most cases, pregnant women and women who are breast-feeding cannot take tPA, since the risks it poses to the health of the fetus or baby are not known. However, tPA might be considered in extreme cases. Your doctor will discuss with you the risks and potential benefit.

Benefit vs. risk of tPA?

Approximately 26% of patients who suffer a stroke have an excellent recovery, free of any disability, without any active treatment. The remaining 74% have some remaining degree of disability, including 21% of patients who die within 3 months of their stroke. In the tPA study, an additional 13% (that's 39% total!) had no disability after they received tPA compared to patients who did not get tPA. That's a very significant difference! In addition, less people who received tPA were severely disabled, less died, and more had minor rather than severe residual disability. It is important to know that the improvement seen after treatment with tPA may not occur immediately, and may only be apparent after weeks-to-months. Treatment with tPA is associated with a 6% risk of brain hemorrhage, which can be fatal. However, in the tPA study 13 out of each 100 patients did much better than expected with tPA, even after accounting for the 6 out of 100 who suffered a brain hemorrhage following tPA. New studies performed since the release of tPA suggest that careful scrutiny before and during treatment probably reduces the risk of hemorrhage.

Other potential complications from tPA may include an allergic reaction, which on rare occasions can lead to difficulty breathing and swelling of tongue/throat, and bleeding complications from other sites, such as blood in urine/stools, bruises or internal bleeding.

The drug is put directly into the body through a vein. It usually takes one hour to receive the whole dose. During this time, you/your family member will be watched closely to make sure that the medication is not causing unwanted side effects.

For More Information: Call the BIDMC Comprehensive Stroke Center at 617-632-8913 or 8917 or 8911.