Stroke or cerebrovascular accident (CVA) refers to the loss of functioning brain tissue caused by blood circulation problems within the brain. This reduced blood flow limits the brain's supply of oxygen.

Without oxygen, neurons will die. The disabilities that result depend upon what area of the brain has been affected. These impairments include a persistent paralysis and spasticity or rigid muscles. The damage to the brain can reduce mobility, speech and swallowing abilities and can result in mental difficulties including memory loss and personality changes.

A cut-off of blood circulation to the brain can occur from many causes. The three most common reasons are:

Ischemia

- reduced blood flow from a blockage or the narrowing of an artery.

Emboli

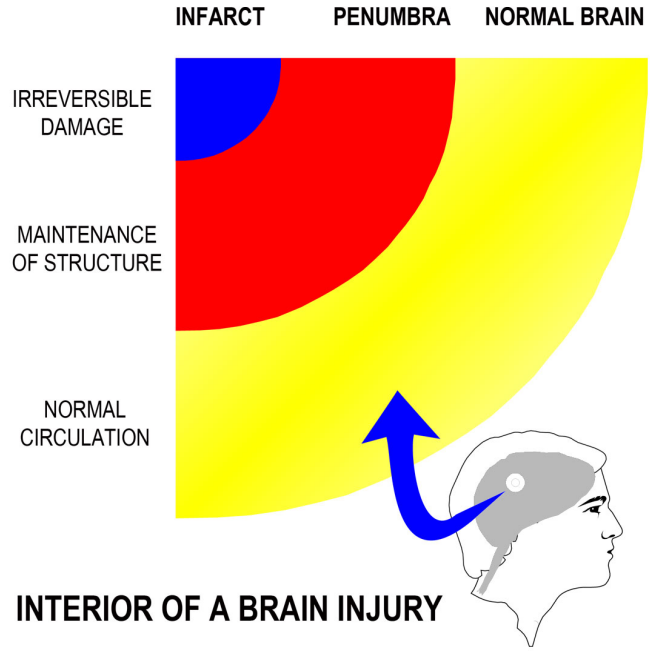
- blood clots that block an artery and cut off blood flow.

Cerebral hemorrhage

-this is uncontrolled bleeding inside the brain which will destroy brain tissue and impair brain cell function.

No matter what causes a stroke, the result is a localized area of decay in the brain called an infarct. The infarction is irreparably damaged tissue. Between this damaged tissue and the unaffected, normal brain is a zone referred to as the ischemic penumbra.

The penumbra is an area known to be hypoxic, it is an area lacking adequate oxygen delivery.



INTERIOR OF A BRAIN INJURY

Between the irreparable tissue (infarct) and normal tissue is the penumbra... structurally intact brain cells but non-functioning due to inadequate oxygen.

The most important factors in a stroke recovery are the extent of the infarct and of the penumbra, the region that surrounds the damaged, non-recoverable tissue.

A key attribute of Hyperbaric Oxygen (HBO) is that it decreases swelling and reawakens the idling neurons within the penumbra. Activation of these neurons explains why, by providing oxygen, there can be improvement when Hyperbaric Oxygen is administered - even years after a stroke occurs.

The revival of nonfunctional neurons in the brain is the most notable effect of Hyperbaric Oxygen on cases of stroke.

Hyperbaric Oxygen (HBO) works well in conjunction with physical therapy, in which exercise and other forms of movement are used to help regain control of lost function. Physical therapy reorganizes the neurons awakened by the oxygen, allowing these neurons to regain their plasticity.

Hyperbaric Oxygen Therapy provides a stroke patient with a number of other benefits.

Relief of oxygen starvation

Oxygen starvation, also know as hypoxia, occurs during ischemia - when the flow of blood is reduced. HBO increases the amount of oxygen carried to the tissues by forcing oxygen into the plasma (the liquid portion of the blood), the lymph and the cerebrospinal fluid (the fluid that bathes the brain and spinal cord). The oxygen enriched cerebrospinal fluid will help to nurture the tissues.

Improvement of microcirculation

The flow of blood through the tiny blood vessels that connect arteries to veins is microcirculation. This is where nutrients leave the blood and enter the tissues. Adequately oxygenated tissue is capable of repairing or healing itself by producing new capillaries.

Relief of spasticity

A stroke patient's muscles often become spastic or rigid. Hyperbaric Oxygen has been shown to be effective in treating spasticity.