

Stroke

Quick Test:



Definition of Stroke

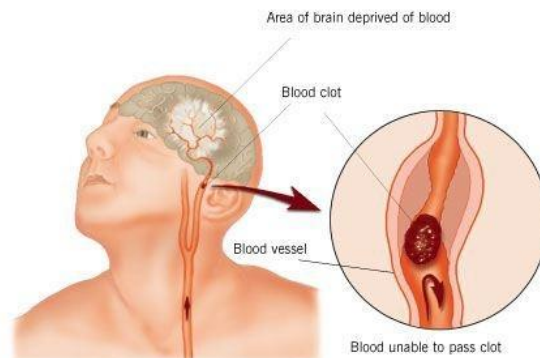
A stroke is a non-convulsive episode of neurologic dysfunction that last longer than 24 hours. The symptoms of a stroke can be a sudden weakness or paralysis due to disturbance of the blood flow to the brain.

Average outcomes of Strokes:

It is estimated that only 10% of the stroke survivors return to work without disability, 40% have mild disability, 40% are severely disabled and 10% are institutionalized.

Stroke May Include:

A - An ischemic event (low oxygen) due to a blockage or reduction of blood flow occurring at the brain inflow or outflow of blood supply.



B - An ischemic event due to an arterial spasm resulting from hypertension or a migraine.

C - A hemorrhagic episode (leaky or ruptured vessels) due to a rupture of an aneurysm (ballooning vessel) at an inflow or outflow of blood supply to the brain.

Oxygen Requirements of Brain

One liter of blood circulates to the brain each minute, representing 25% of the body's total oxygen consumption. With complete blood flow loss to the brain:

- Neural function is affected within 6 seconds
- Brain activity ceases after 2 minutes
- Brain damage begins after 5 minutes

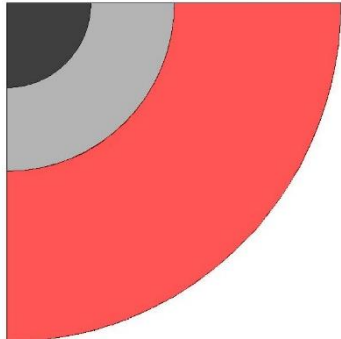
The Recoverable Brain

A portion of stroke-associated function loss is due to cellular death referred to as the 'Umbra'. A portion of function loss also relates to a living but non-functional zone around the Umbra, referred to as the 'Penumbra'. The 'Penumbra', to varying degrees, is recoverable.

Affected Site of Stroke

Umbra (dark core)

- Receiving less than 20% of normal blood flow.
- Results in primarily dead, non-salvageable brain tissue.



Penumbra (light gray area)

- Receiving only 30% of normal blood flow.
- Results in some dead, but mostly living brain cells in a 'stunned' or nonfunctional state.
- Much of the 'penumbra' is salvageable through the oxygenation process of hyperbaric oxygen.
- Has potential to become functional and retrained to take over a portion of function lost in the Umbra.
- This area may remain alive in a stunned condition for many years.

Marginal Function Area (outer colored area)

- Receiving only 50% of normal blood flow.
- Marginal oxygen levels of living, marginally active cells.

Healing with Hyperbaric Oxygen



Hyperbaric Chamber

Provides Increased Pressure and 100% Oxygen

Increased pressure causes the 100% oxygen to dissolve into all of the body fluids providing an efficient means of delivering up to 20 times the normal levels of oxygen into all tissue, including areas of poor circulation.

Swelling Reduced

Swelling is associated to injury. The presence of high levels of oxygen has a constricting effect on vessels, giving relief to excessive cranial pressure by temporarily reducing the amount of fluid able to enter the skull area.

Vessel Repair

The oxygen induced vessel constriction gives the torn, leaky vessel walls temporary relief while oxygen rich plasma continues to flow through them, stimulating healing. As the capillaries heal, plasma leakage into the surrounding tissue stops.

New Blood Supply

Daily Hyperbaric Oxygen stimulate new blood vessel growth where needed, sufficient to maintain brain function and ongoing healing in the injured area.

Retraining the Brain

The oxygen-revived brain cells reestablish communication pathways, a form of retraining. The brain must be challenged to regain lost functions during the course of HBOT. This should include appropriate therapies such as physical, speech and occupational.

Hyperbaric Oxygen Benefits:

- Increased energy production.
- Improved alertness.
- Less need for sleep during the day.
- Emotional stability.
- Functional progress beginning where there has been little or none.
- Notable improvements in motor function, clarity of speech and thought process.
- Notable improvements of independence.

Hyperbaric Oxygen Stroke Protocols

Hyperbaric oxygen for neurological injury, is typically required once daily, five days per week for eight weeks. Eight weeks of Hyperbaric Oxygen provides time for the brain to reestablish sufficient new blood flow to maintain brain function and ongoing healing processes.

In some cases, subtle improvement in function becomes more noticeable within the first week or two of treatment. For others changes become apparent near the end of the course of forty treatments as well as in the following four weeks after cessation of the treatments. Depending on the original degree of injury, it may be appropriate to repeat a second course of 40 hyperbaric treatments, four to eight weeks after the first course has been completed.

References:

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