The following excerpt has been taken from the Christopher & Dana Reeve Foundation Paralysis Resource Center website. 

**Stroke**

A stroke occurs when the blood supply to part of the brain is suddenly blocked or when a blood vessel in the brain bursts, spilling blood into the spaces surrounding brain cells. In the same way that a person suffering a loss of blood flow to the heart is said to be having a heart attack, a person with a loss of blood flow to the brain or sudden bleeding in the brain can be said to be having a "brain attack."

Paralysis is a common feature of stroke, often on one side of the body (hemiplegia). The paralysis or weakness may affect only the face, an arm, or a leg or may affect one entire side of the body and face.

A person who suffers a stroke in the left hemisphere of the brain will show right-sided paralysis or paresis. Conversely, a person with a stroke in the right hemisphere of the brain will show deficits on the left side of the body.

Ischemia is the term used to describe the loss of oxygen and nutrients for brain cells when there is inadequate blood flow. Ischemia ultimately leads to infarction, the death of brain cells, which are eventually replaced by a fluid-filled cavity (or infarct) in the injured brain.

When blood flow to the brain is interrupted, some brain cells die immediately; others remain at risk for death. The damaged cells can be saved by early intervention with drugs. Researchers have learned that restoring blood flow to these cells can be achieved by administering the clot-dissolving agent tissue plasminogen activator (t-PA) within 3 hours of the start of the stroke. Many neuroprotective drugs are being tested to prevent the wave of damage after the initial attack.

Stroke has always been viewed as unpreventable and untreatable. Added to this fatalism was the wrong belief that stroke happens only to the elderly and is therefore not of concern.
As a result of these misconceptions, the average stroke patient waits more than 12 hours before arriving at the emergency room. Health care providers take an attitude of "watchful waiting" instead of treating stroke as a medical emergency.

With the use of the term "brain attack," stroke has a definitive, descriptive name. The appropriate response to a brain attack is emergency action, both by the person it strikes and the medical community. Educating the public to treat stroke as a brain attack and to seek emergency treatment is crucial because every minute lost, from the onset of symptoms to the time of emergency contact, cuts into the limited window of opportunity for intervention.

**Symptoms**

The symptoms of a stroke are easy to spot: sudden numbness or weakness, especially on one side of the body; sudden confusion or trouble speaking or understanding speech; sudden trouble seeing in one or both eyes; sudden trouble walking, dizziness, or loss of balance or coordination; or sudden severe headache with no known cause. Stroke can usually be distinguished from other causes of dizziness or headache. These symptoms may indicate that a stroke has occurred and that medical attention is needed immediately.

**Risk Factors**

The most important risk factors for stroke are hypertension, heart disease, diabetes, and cigarette smoking. Others include heavy alcohol consumption, high blood cholesterol levels, illicit drug use, and genetic or congenital conditions, particularly vascular abnormalities.

**Early Recovery**

In ways not clearly understood, the brain compensates for the damage caused by stroke or brain attack. Some brain cells may be only temporarily damaged, not killed, and may resume functioning. In some cases, the brain can reorganize its own functioning. Sometimes, a region of the brain takes over for a region damaged by the stroke. Stroke survivors sometimes experience remarkable and unanticipated recoveries that can't be explained.

General recovery guidelines show:

- 10 percent of stroke survivors recover almost completely
- 25 percent recover with minor impairments
- 40 percent experience moderate to severe impairments requiring special care
- 10 percent require care in a nursing home or other long-term care facility
- 15 percent die shortly after the stroke
Rehabilitation

Rehabilitation starts in the hospital as soon as possible after the stroke. In patients who are stable, rehabilitation may begin within two days after the stroke has occurred, and should be continued as necessary after release from the hospital. Rehabilitation options may include the rehab unit of a hospital, a subacute care unit, a rehab hospital, home therapy, outpatient care, or long term care in a nursing facility.

The goal in rehabilitation is to improve function so that the stroke survivor can become as independent as possible. This must be accomplished in a way that preserves dignity while motivating the survivor to relearn basic skills the stroke may have taken away – such as eating, dressing and walking.

Although stroke is a disease of the brain, it can affect the entire body. Some of the disabilities that can result from a stroke include paralysis, cognitive deficits, speech problems, emotional difficulties, daily living problems, and pain.

Stroke may cause problems with thinking, awareness, attention, learning, judgment, and memory. A stroke patient may be unaware of his or her surroundings, or may be unaware of the mental deficits that resulted from the stroke.

Stroke victims often have problems understanding or forming speech. Language problems usually result from damage to the left temporal and parietal lobes of the brain.

A stroke can lead to emotional problems. Stroke patients may have difficulty controlling their emotions or may express inappropriate emotions in certain situations. One common disability that occurs with many stroke patients is depression -- more than a general sadness resulting from the stroke incident.

Stroke patients may experience pain, uncomfortable numbness, or strange sensations after a stroke. These sensations may be due to many factors including damage to the sensory regions of the brain, stiff joints, or a disabled limb.

According to the National Stroke Association, the total cost of stroke to the United States is about $43 billion a year, with direct costs for medical care and therapy estimated at about $28 billion a year.

Sources: National Stroke Association, National Institute of Neurological Disorders and Stroke.

Web Sites
http://www.strokeassociation.org
American Stroke Association
7272 Greenville Avenue
Dallas, TX 75231
Phone: 888-4-STROKE (888-478-7653), 888-474-VIVE (888-474-8483)
Deep, authoritative site affiliated with the American Heart Association covering medical
issues, rehabilitation, recovery, caregiving, prevention and research.

http://www.stroke.org
National Stroke Association
9707 East Easter Lane, Suite B
Centennial, CO 80112
Phone: 800-STROKES (800-787-6537)
E-mail: info@stroke.org
Rich information site for resources, connections, and local chapter network.
Please see their Guide to Choosing Stroke Rehabilitation Services document at:

http://careliving.stroke.org/
Careliving
Careliving is a social network for caregivers and family members of people who
have had a stroke.

http://www.heart.org/HEARTORG/General/Heart-and-Stroke-Association-
Statistics_UCM_319064_SubHomePage.jsp
American Heart Association: Heart Disease and Stroke Statistics
Statistics on heart disease, stroke and other vascular diseases in the United States
including data on disease morbidity, mortality and risks; quality of care; medical
procedures and operations; and costs associated with the management of these diseases.

http://www.bafound.org
Brain Aneurysm Foundation
269 Hanover Street, Building 3
Hanover, MA 02339
Phone: 781-826-5556, 888-272-4602
E-mail: office@bafound.org
The Brain Aneurysm Foundation is dedicated to providing critical awareness, education,
support and research funding to reduce the incidence of brain aneurysm ruptures. The
website provides information on symptoms, diagnosis and treatment for stroke and has a
patient resource directory and links to support groups.

http://www.inspire.com/groups/stroke/
Inspire: Stroke Support Group
Online support group for patients, families, friends and caregivers.

http://www.strokecenter.org
The Internet Stroke Center
UT Southwestern Medical Center
Department of Neurology and Neurotherapeutics
5323 Harry Hines Boulevard
Dallas, TX 75390
Phone: 214-648-3111
E-mail: info@strokecenter.org
This site has information for patients and health professionals on diagnosis and treatment of stroke. There are also extensive resources for caregivers.

http://www.strokecenter.org/trials/
The Internet Stroke Center: Stroke Trials Registry
This registry lists clinical trials in stroke and cerebrovascular disease throughout the United States and the world. The registry database can be searched using keywords, locations and other advanced criteria.

http://www.strokecenter.org/patients/caregiver-and-patient-resources/when-grandpa-comes-home/
The Internet Stroke Center: When Grandpa Comes Home – A Story About Stroke
Interactive story about a young girl’s journey when Grandpa comes to live with her family after his stroke.

http://www.jointcommission.org/facts_about_primary_stroke_center_certification/
Joint Commission: Facts About Primary Stroke Center Certification
The Joint Commission (formerly the Joint Commission on Accreditation of Healthcare Organizations) has certified more than 800 primary stroke centers in 49 states through a program developed in collaboration with the American Stroke Association. Certification signifies a center provides quality care that is effectively managed to meet the unique and specialized needs of stroke patients.

http://www.stroke.nih.gov/
National Institute of Neurological Disorders and Stroke (NINDS)
NIH Neurological Institute
PO Box 5801
Bethesda, MD 20824
Phone: 301-496-5751, 800-352-9424
This site offers information on the medical aspects of stroke, risk factors, biomedical research, therapies, and rehabilitation.

http://stroke.nih.gov/
NINDS: Know Stroke
This site offers a wide range of materials about stroke prevention, treatment, and rehabilitation.

National Institute of Neurological Disorders and Stroke (NINDS):
Post-Stroke Rehabilitation booklet

http://www.strokenetwork.org
The Stroke Network
The Stroke Network is an online stroke support organization created by stroke survivors that provides information and support to stroke survivors and caregivers through multiple web sites. Support services include daily chat sessions, instant messages, blogs and a message board. Information resources include a monthly newsletter, book shop, articles, links, webcasts and a Stroke Caregiver Handbook.

http://www.world-stroke.org/
World Stroke Organization
c/o Kenes International
7, rue Francois-Veronnex
P.O. Box 6053, CH-1211 Geneva 6
Switzerland
Tel: + 41 22 906 9166
E-mail: admin@world-stroke.org
The World Stroke Organization promotes stroke prevention, education, and clinical research, as well as care of persons with stroke and vascular dementia.

Pediatric Stroke

http://www.strokeassociation.org/STROKEORG/AboutStroke/StrokeInChildren/Stroke-In-Children_UCM_308543_SubHomePage.jsp
American Stroke Association: Stroke in Children
This site has information on strokes in infants and children, as well as links to support groups and other resources for parents and caregivers.

http://www.chasa.org
Children’s Hemiplegia and Stroke Association (CHASA)
4101 West Green Oaks
Suite 305, #149
Arlington, TX 76016
CHASA provides assistance, information and counseling to families of children who have hemiplegia, hemiparesis, or hemiplegic cerebral palsy. The site covers medical conditions, rehabilitation, daily living, finances and more.
http://www.hemikids.org/

Hemi-Kids
E-mail discussion group operated by CHASA for families of children who have hemiplegia due to pediatric stroke or other causes.

http://www.chasa.org/you-can-help/pediatric-stroke-awareness/

Pediatric Stroke Awareness
Informational site operated by CHASA.

http://www.cshconnections.org

Childhood Stroke & Hemiplegia Connections of Illinois
CSHC is dedicated to improving the quality of life for children who survived a stroke and/or who have symptoms of hemiplegia or hemiparesis from any cause. The organization works to increase awareness about pediatric stroke and hemiplegic cerebral palsy and to provide education, resources, recreation, and access to research for families affected by these disorders.

http://www.pediatricstrokenetwork.com

Pediatric Stroke Network
The Pediatric Stroke Network aims to bring together friends and families of infant or childhood stroke survivors from around the world. The website has information on childhood stroke, rehabilitation, and after effects. The network maintains a listserv for members.

Stroke in Young Adults

American Heart Association: Early Strokes Leave Many Young Adults with Long-Lasting Disability

American Heart Association’s Heart Insight: Risk of Stroke on the Rise in the Young

Evidence-Based Review of Stroke Rehabilitation (EBRSR): The Rehabilitation of Younger Stroke Patients

http://well.blogs.nytimes.com/2012/09/03/too-young-to-have-a-stroke-think-again/
New York Times: Too Young to Have a Stroke? Think Again
**Constraint-Induced Movement Therapy**

[http://www.uab.edu/citherapy/](http://www.uab.edu/citherapy/)

**University of Alabama at Birmingham: CI Therapy Research Group**
CI Therapy Research Group  
University of Alabama at Birmingham  
1720 2nd Ave South  
CPM 712  
Birmingham, AL 35294  
Phone: 205-934-9768  
E-mail: citherapy@uab.edu

This page has information on constraint-induced movement therapy, which was developed by Edward Taub, Ph.D. and other researchers at the University of Alabama at Birmingham. The site includes information on active research projects and a pediatric CI therapy clinic.

[http://www.strokeassociation.org/STROKEORG/LifeAfterStroke/RegainingIndependence/PhysicalChallenges/Constraint-Induced-Movement-Therapy_UCM_309798_Article.jsp#.TupA8nrQiuI](http://www.strokeassociation.org/STROKEORG/LifeAfterStroke/RegainingIndependence/PhysicalChallenges/Constraint-Induced-Movement-Therapy_UCM_309798_Article.jsp#.TupA8nrQiuI)

**American Stroke Association: Constraint-Induced Movement Therapy**

This page on constraint-induced movement therapy was excerpted from the article "A Rehab Revolution," *Stroke Connection Magazine*, September/October 2004. Includes 2006 update.
http://www.uab.edu/civitansparks/pediatric-neuromotor

University of Alabama at Birmingham Pediatric Neuromotor Research Clinic:

ACQUIREc Therapy
UAB Civitan-Sparks
1720 2nd Avenue South
CH19 307
Birmingham, AL 35294-2041
Phone: 205-975-0466, 205-306-4479
Email: ksl@uab.edu

This page has information on ACQUIREc therapy (formerly called pediatric CI therapy).

**Apps**

www.ConstantTherapy.com

**Constant Therapy**
Constant Therapy is a customizable iPad application to support the rehabilitation efforts of stroke survivors. It offers 60+ tasks with up to 10 challenge levels, allowing for personalized activity programs for each individual. As performance scores change, tasks can change in the level of difficulty and new tasks can be introduced. Constant Therapy provides tools for stroke survivors who want to get back to everyday activities like speaking, reading, writing, counting money, solving problems, reading maps and calendars, and more. Constant Therapy provides a science-based mobile solution for highly personalized, continuous therapy tools to patients with traumatic brain injury, stroke, aphasia, and learning disabilities.

**Magazines**

http://www.strokeassociation.org/STROKEORG/StrokeConnectionMagazine/InStroke-Connection-Magazine_UCM_308575_SubHomePage.jsp

**Stroke Connection Magazine**
Published 6 times a year by the American Stroke Association. Written for the consumer or patient. Free to individuals. 888-4-STROKE (888-478-7653)

http://www.stroke.org/stroke-resources/strokesmart-magazine

**Stroke Smart**
Published 4 times a year by the National Stroke Association. Written for the consumer or patient. Free to qualified individuals. 800-STROKES (800-787-6537).

www.strokesmart.org/resource_directory

**Stroke Smart's Resource Directory**
The following books and videos are available for free loan from the PRC library. For more information, please visit the online catalog at: https://www.ChristopherReeve.org/Library

Books

- Ackerman, Diane. **One Hundred Names for Love: A Stroke, A Marriage, and the Language of Healing.** New York: W.W. Norton, 2011. Ackerman’s husband Paul West suffered a stroke following kidney surgery. West is an author which made his aphasia particularly poignant.


  Autobiography of man with locked-in syndrome (a type of stroke).

  Autobiography

  The stories and challenges of survivors and caregivers.


  A collection of memoirs from various stroke survivors.

  A daughter’s story of dealing with her mother’s stroke and searching for answers.

  Bradley’s mother sang Elvis songs to him when he had his stroke at 18.


  Biography


Children’s book about a grandfather having a stroke and the grandson helping him relearn to walk.


Choreographer de Mille had a massive stroke in 1975. Large type print.

• Derk, Tim. **Hi Mom, Send Sheep! My Life As the Coyote and After.** San Antonio, TX: Trinity University Press, 2006.  
Former San Antonio Spurs mascot.


Occupational therapist.

• Edlow, Jonathan A. **Stroke (Biographies of Disease).** Westport, CT: Greenwood Press, 2008.


Edsall’s father was a pilot who suffered a massive stroke. She and her sister devised their own rehab strategy to get their father fit enough to fly again.


• Good, Gilbert. **Short Circuit: Biography of a Stoke As Told to My Husband.** Victoria, BC, Canada: Trafford, 2005.


• Geared toward health professionals.


• Geared toward health professionals.


• Autobiography of a 100% recovery after two major strokes.


• Levin, Betty. Away to Me, Moss. New York; Greenwillow Books, 1994. Fiction for children about a girl working with a sheep dog that belongs to a stroke patient her mother is helping to rehabilitate.


A memoir from Maples who had a paralyzing stroke at age 20. Thirteen years later she received a Texas Secondary School Teacher of the Year award.


- McClosky, Gerald and Pauline. *Growing Old is Not for Sissies: A Senior’s Story of Love and Devotion, of Trauma and Courage, of Rehab and Recovery, a Story Told with Tears and Laughter from a Dual Perspective*. Charleston, SC: BookSurge, 2005. Gerald’s stroke is told from his and his wife’s perspectives.


- Paperback (published in hardcover under the title *Change in the Weather*)


Biography


• Senelick, Richard C. and Karla Dougherty. **La Vida despues de un accidente cerebrovascular.** Birmingham, AL: HealthSouth Press, 2003


• Triewth, Corrie L. () *Through A Stroke of Luck: Seeing Simple Mysteries of the Universe*. Plus Publications, 2003. Shortly before her 60th birthday, Triewth’s vision was permanently impaired by facial shingles and weeks later she had a stroke that paralyzed her right side. The author used the pen name Genia Pauli Haddon for other writings.


**Videos**

• **Amour.** Culver City, Calif.: Sony Pictures, 2013. DVD (127 minutes) in French. Drama awarded the Academy Award for 2012 Best Foreign Language film. The female lead portrays a stroke survivor.

• **Brain Attack: Importance of Immediate Treatment from Stroke.** Sherborn, MA: Aquarius Healthcare Videos, 2000. (28 minutes)

• **A Change of Character.** Boston, MA: Fanlight Productions, 2004. (31 minutes) A man suffers a series of strokes which damaged his frontal lobes and changed his personality.

• **Clot Busters: Case Studies of Stroke Treatment.** Princeton, NJ: Films for the Humanities & Sciences, 2007. DVD. (46 minutes)

• **Communication: Aphasia.** Healing Arts Communications, 2000. DVD (24 minutes)

• **Core & Stability Exercises for Stroke Survivors and People with Multiple Sclerosis.** Chicago, Ill.: National Center on Physical Activity and Disability, 2006. DVD

• **Exercise Program for Stroke Survivors.** Chicago, IL: National Center on Physical Activity and Disability, 2007. DVD

• **Flawless.** MGM, 1999. Drama. Stars Robert DeNiro as a police officer partially paralyzed by a stroke. He takes singing lessons from a drag queen as speech therapy. VHS and DVD. (111 minutes)

• **Harbor: Helping Patients & the Family Cope After a Loved One Had a Stroke.** Sherborn, MA: Aquarius Healthcare Videos, 1999. (16 minutes)

• **Jeremy and David’s Story: Striking Back at Stroke.** Princeton, NJ: Films for the Humanities & Sciences, 2001. (23 minutes)

• **One Strong Arm.** Boston, MA: Fanlight Productions, 2004. (19 minutes)
• **Pins and Noodles.** New York: Filmakers Library, 1997. DVD (60 minutes)
  Film co-director Paul Kwan takes us on a journey back to his Asian roots in San Francisco’s Chinatown to get help for his food allergies. Midway through filming, Kwan had a debilitating stroke.

• **Post Stroke Spasticity.** Information Television Network, 2010. (30 min.) DVD.

• **Preventing a Stroke.** Information Television Network, 2006. DVD


• **Sit and Be Fit.** Spokane, WA: Sit and be Fit, Inc., 1993. (30 minutes)
  Specialty exercise video for stroke.

  (23 minutes)

• **Stroke Awareness.** Stanford Health Video Library, 2004. DVD. (155 minutes)

• **Stroke Help: Bed Positioning & Mobility for Families & Caregivers.**

• **Stroke Help: Improving Function & Awareness for Families & Caregivers.**
  Champion Productions, 2001. (26 minutes)

• **Stroke Help: Preventing Shoulder Pain for Families & Caregivers.** Champion Productions, 2001. (26 minutes)

• **Stroke Help: Standing Safely for Families & Caregivers.** Champion Productions, 2001. (27 minutes)

• **Stroke Help: Self Care for Families & Caregivers.** Champion Productions, 2001. (27 minutes)

  Set of 4 DVDs with book. A training tool for healthcare workers.

• **Stroke Help: Wheelchair Transfers for Families & Caregivers.** Champion Productions, 2001. (30 minutes)
- **Stroke Patient: A Comprehensive Guide.** Naples, Fla.: NEVCO, 2011. DVD (50 min.)
  Part 1 goes over what a stroke is, what causes it, how it affect the body and mind and Part 2 offers info on how to prevent another stroke.


  The video is broken down into 19 segments covering topics like the challenge of rehabilitation; the importance of a positive attitude in aiding recovery and beating depression; various types of family and professional support networks; the relevance of spirituality; and regaining an intimate relationship with your sexual partner.


- **Stroke: Touching the Soul of Your Family.** National Stroke Association. (15 minutes)
  Reducing stroke in African Americans.

- **Surviving a Stroke.** California: Nostalgia Network, 2005. American Family series volume 35. DVD

- **Take a Bow: The Ingrid Clarfield Story.** Seattle, Wash.: Majestic Creative Ventures, 2011. (78 minutes)
  Documentary of a piano professor who had a severe stroke at age 60 that paralyzed the left side of her body.


- **Understanding Stroke.** Information Television Network, 2006. DVD.
  Healthy Body Healthy Mind TV series.

- **Very Annie Mary.** Port Washington, NY: Koch Vision, 2004. DVD (100 minutes)
  The main character’s father has a stroke and is a wheelchair user as a result. Comedy starring Rachel Griffiths.
• **Women, Stroke and the Red Dress: Cerebrovascular Disease in Women.**
  Stanford, CA: Stanford Hospital and Clinics, 2007. DVD. (50 minutes.)

**Audiobooks**

• **How to Conquer the World with One Hand…And An Attitude.** By Paul E. Berger and Stephanie Mensh. 2nd ed. Merrifield, Va.: Positive Power Publishing, 2007. 8 Audio CDs.
  This publication shares the true story of Paul Berger’s 15 years of living with stroke.

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This project was supported, in part by grant number 90PR3002, from the U.S. Administration for Community Living, Department of Health and Human Services, Washington, D.C. 20201. Grantees undertaking projects under government sponsorships are encouraged to express freely their findings and conclusions. Points of view or opinions do not, therefore, necessarily represent official Administration for Community Living policy.