



# Pre-Hospital Assessment and Approach to Stroke

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# **Statistics and information provided by the National Stroke Association**

See [www.stroke.org](http://www.stroke.org) for more  
information



# Learning Goals for EMS Provider

- Understand the different types of stroke
- Be able to identify the risk factors for stroke
- Understand the time frame for stroke intervention
- Identify interventions EMS providers can make to improve stroke outcome

# Stroke Statistics

- In the United States, stroke is the fourth leading cause of death, killing over 133,000 people each year, and a leading cause of serious, long-term adult disability.
- There are an estimated 7,000,000 stroke survivors in the U.S. over age 20.
- Approximately 795,000 strokes will occur this year, one occurring every 40 seconds, and taking a life approximately every four minutes.
- Stroke can happen to anyone at any time, regardless of race, sex or age.

# Stroke Statistics

- From 1998 to 2008, the annual stroke death rate fell approximately 35 percent, and the actual number of deaths fell by 19 percent.
- Approximately 55,000 more women than men have a stroke each year.
- African Americans have almost twice the risk of first-ever stroke compared with whites.
- Women are twice as likely to die from stroke than breast cancer annually.
- The estimated direct and indirect cost of stroke in the United States in 2010 is \$73.7 billion.

# Types of Stroke

- Ischemic stroke occurs when arteries are blocked by blood clots or by the gradual build-up of plaque and other fatty deposits. About 87 percent of all strokes are ischemic.



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# Types of Stroke

- Hemorrhagic stroke occurs when a blood vessel in the brain breaks leaking blood into the brain. Hemorrhagic strokes account for thirteen percent of all strokes, yet are responsible for more than thirty percent of all stroke deaths.





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# Risk Factors for Stroke

- Controllable medical risk factors
  - High blood pressure
  - Atrial fibrillation
  - High Cholesterol
  - Diabetes
  - Atherosclerosis
  - Circulation Problems

# Risk Factors for Stroke

- Controllable lifestyle risk factors
  - Tobacco use
  - Alcohol use
  - Physical Inactivity
  - Obesity

# Risk Factors for Stroke

- Uncontrollable risk factors
  - Age
  - Gender
  - Race
  - Family History
  - Previous stroke or TIA
  - Fibromuscular dysplasia
  - Patent Foramen Ovale

# Time Is Brain

- Two million brain cells die every minute during stroke, increasing risk of permanent brain damage, disability or death. Recognizing symptoms and acting FAST to get medical attention can save a life and limit disabilities
- EMS providers have the ability and the opportunity to facilitate rapid response for stroke victims and improve outcomes by acting quickly and understanding stroke management

# EMS Provider at the scene

- Obtain vital signs and fingerstick blood glucose at the scene
- Administer a pre-hospital stroke assessment
  - Multiple available assessment scales including Cincinnati Stroke Scale, Los Angeles Prehospital Stroke Scale, ABCD (Age, BP, Clinical features, Duration), FAST (Face, Arm, Speech, Time)
  - If abnormal, alert stroke center that a potential stroke is in route

# EMS Provider at the scene

- Facilitate transfer to a primary stroke center as quickly and safely as possible
- If available, encourage family member familiar with patient's medical history to accompany patient to the hospital
- Obtain a current list of patient's medications or bring medications in a bag with patient

# EMS Provider at the scene

- Determine time of onset
  - This time is critical in the stroke center's ability to appropriately manage the stroke patient
  - Time of onset is considered the last time seen normal
  - Example Scenarios
  - Remember "TIME IS BRAIN"



# EMS Provider at the scene

- DO respond quickly
- DO NOT delay patient transfer to primary stroke center
- DO NOT attempt to manage hypertension in the field. This is usually the brain's attempt to maintain perfusion

# ***Inclusion Criteria for TPA***

- Clinical diagnosis of ischemic stroke causing a measurable neurological deficit
- Neurological signs should not be clearing spontaneously
- Neurological signs should not be minor and isolated
- Onset of symptoms <180 minutes before beginning treatment

# ***Exclusion criteria for TPA***

- Head trauma or prior stroke in previous 3 months
- Intracranial neoplasm
- Myocardial infarction in previous 3 months
- GI or urinary tract hemorrhage in previous 21 days
- Major surgery in the previous 14 days
- Arterial puncture at noncompressible site in the previous 7 days

# Exclusion criteria for TPA

- History of previous intracranial hemorrhage
- Elevated BP  $>185$  sys  $>110$  dia
- Evidence of active bleeding or acute trauma
- Oral anticoagulation, or if on anticoagulant INR must be less than 1.7
- If Heparin in previous 48 hours, aPTT must be normal
- Platelet count  $<100,000$

# Exclusion criteria for TPA

- Blood Glucose  $<50$
- Seizure with postictal residual neurological impairment
- CT showing hypodensity  $>1/3$  cerebral hemisphere

# Extended time

- Patients may be treated with IV TPA between 3-4.5 hours with the additional exclusion criteria:
  - Patients older than 80 years
  - Patients on anticoagulation
  - Baseline NIHSS score >25
  - Patients with history of both stroke and diabetes
- Intra-arterial TPA may be administered up to 6 hours from time of onset
- Mechanical thrombectomy may be performed up to 8 hours from time of onset

# Stroke Mimics

- Hypoglycemia
- Bell's Palsy (affecting only the face)
- Todd's Paresis (following a seizure)
- Complex Migraine
- Psychogenic
- Metabolic disorders
- Hypertensive crisis

# Summary

- TIME IS BRAIN
- You can make a difference in patient care and outcome
- Get patients to a primary stroke center