A. A sudden loss of neurological function (movement, speech, vision, comprehension, etc.) is a sign of a stroke or transient ischemic attack (TIA). It is caused by an interruption of blood flow to, or hemorrhage within, a specific part of the brain; which deprived of oxygen and vital nutrients, ceases to properly function unless blood flow can be restored quickly.

B. Time is brain tissue. Failure to restore blood flow results in permanent deficits.

C. When the interruption of flow is transient and resolves before causing tissue damage, this is called a TIA. These patient’s symptoms typically last less than one hour. Most patients with symptoms lasting more than one hour have already experienced a stroke.

D. 30% of patients with TIAs will have a major stroke within 30 days, and half of them within the next 24 hours of symptoms. Therefore, TIAs are in need of urgent evaluation.

E. The time of onset needs to be determined as best as possible. There are new treatments that extend the window of time in which blood flow can be restored.

F. For patients who were able to live independently and walk unassisted prior to symptom-onset (i.e. “walky-talky” and fully functional), a STROKE TEAM shall be activated for these patients if their last known normal was WITHIN 24 HOURS of calling EMS. Patients who do not function independently do not qualify for this extended treatment window and shall only have a STROKE TEAM activated if their last known normal was within 6 hours of calling EMS.

G. Certain tests and special intra-arterial interventions are not available at all hospitals. Patients who fall within the extended 6-24 hour window should be transported directly to a thrombectomy-capable stroke center if possible.

H. Hypertension is a normal physiologic response in stroke patients and is the body's way to attempt to improve blood flow to the stroke area. Blood pressures are not to be treated in the prehospital environment.

Basic EMT

A. Assess and maintain airway. Apply pulse oximeter and treat per procedure.

B. Determine blood sugar and treat per Altered LOC Protocol. Patient MUST have a gag reflex in order to administer oral glucose. Give nothing else to the patient by mouth – keep NPO.

C. Perform the **FAST-ED Stroke Scale** on scene and document findings and the time on chart.

   - Facial Droop – have patient show teeth or smile
     - Normal – both sides of face move equally
     - Abnormal – one side of the face does not move as well as the other

   - Arm Drift – patient closes eyes and holds both arms out straight for 10 seconds
     - Normal – both arms move the same or do not move at all
     - Abnormal – one arm pronates or moves downward compared to the other
• Speech – have patient say “you can’t teach an old dog new tricks”
  • Normal – patient uses correct words with no slurring
  • Abnormal – patient slurs words, uses wrong words, or is unable to speak or understand your instructions

• Gaze Deviation – Determine if patient has full range of motion of both eyes
  • Normal – Both eyes have full range of motion and move in unison
  • Abnormal – Both eyes are either partially or completely (“hard over”) deviated to one side, and the patient can only look to that side, regardless of any stimuli from the other direction.
  
  **Gaze deviation is the single most reliable predictor of large vessel occlusion stroke!**

• Neglect – Does patient recognize and act on stimuli coming from both sides of their environment?
  • Normal – Patient can recognize incoming stimuli from both sides and follow commands to use both sides of their body.
  • Abnormal – Patient has no understanding or concept of one side of their world, makes no effort to move one side’s arm or leg (not out of weakness alone, but out of lack of understanding/perception that it exists), doesn’t process stimuli coming from that side either

D. Evaluate patient’s general appearance, relevant history of condition and determine OPQRSTI and SAMPLE.

  • When was the patient last seen without symptoms?
  • Was there any head trauma associated with onset?
  • Where there any seizures (shaking or staring) at onset?
  • Is patient on blood thinners (Coumadin, Plavix, ASA, Eliquis, Xarelto, or Aggrenox)?
  • Does the patient have history of bleeding problems?
  • Is there a possibility of brain hemorrhage (severe headache, stiff, decreased LOC)?
  • Has the patient ever had a prior stroke or intracerebral hemorrhage?

E. Transport IMMEDIATELY unless an ALS unit is en route and has an ETA of less than 5 minutes.

F. Give supplemental oxygen as necessary to maintain SaO2 > 94%

G. Elevate head of bed 0-20 degrees to decrease intracranial pressure

H. If time permits, acquire and transmit 12-lead ECG if properly trained and available.

A. Apply cardiac monitor and check rhythm

B. Start IV normal saline while en route to the hospital. Administer 250 ml bolus unless the patient has a history of CHF or end-stage renal disease on dialysis. Additional fluids may be required afterward; goal is to keep BPsys > 120 mmHg. Do NOT use pressors (i.e. IV Epinephrine) to accomplish this!

C. Determine blood sugar and treat as follows:

  1. Blood sugar less than 70
Adult dose – 250 ml of D10 IV is the solution of choice. If unavailable, administer 50 ml of D50 IVP. May be repeated in 10 minutes if blood sugar remains less than 70 or altered mental status persists. If unable to obtain IV access, administer 1 mg of Glucagon IM or IN. Recheck glucose 15 minutes after administration of Glucagon; may repeat Glucagon 1 mg IM or IN if blood sugar remains less than 70 or altered mental status persists.

A. If patient does not have a secure, protected airway, intubate per Advanced Airway Procedure. Ventilate at normal rates – one breath every 5-6 seconds. DO NOT HYPERVENTILATE UNLESS PATIENT SHOWS SIGNS OF HERNIATION. Monitor CO₂ levels if available.
STROKE

- Assess and manage airway
- Maintain O2 SATS =>94%
- Perform fast-ed stroke scale
  - Facial droop
  - Arm drift
  - Speech
  - Gaze deviation
  - Neglect
- Determine blood sugar and treat accordingly if low
- Evaluate patient condition
- Obtain medical history
- Monitor vital signs
- Reassure patient
- Acquire and transmit 12 lead ECG if time permits
- Transport in supine position – head of cot should not exceed 20 degrees.

- Monitor ECG
- Administer normal saline 250 mL IV
  - Fluid bolus – unless history of CHF or on dialysis.
- Determine blood sugar level
- Administer dextrose 10% (D10) if blood sugar less than 70: 25G / 250ML IV push
- If unable to start IV administer glucagon (glucagen) adults: 1 mg IM

- If patient does not have a secure, protected airway intubate per advanced airway procedure. Ventilate at normal rates – one breath every 5-6 seconds. Do not hyperventilate unless signs of herniation. Monitor CO2 levels per procedure.

KEY

| Basic EMT |
| Advanced EMT |
| Paramedic |
| Med Control |

FAST-ED STROKE SCALE

FACIAL DROOP – HAVE PATIENT SHOW TEETH OR SMILE
- Normal – both sides of face move equally
- Abnormal – one side of the face does not move as well as the other

ARM DRIFT – PATIENT CLOSES EYES AND HOLDS BOTH ARMS OUT STRAIGHT FOR 10 SECONDS
- Normal – both arms move the same or do not move at all
- Abnormal – one arm pronates or moves downward compared to the other

SPEECH – HAVE PATIENT SAY “YOU CAN’T TEACH AN OLD DOG NEW TRICKS”
- Normal – patient uses correct words with no slurring
- Abnormal – patient slurs words, uses wrong words, or is unable to speak or understand your instructions

GAZE DEVIATION – DETERMINE IF PATIENT HAS FULL RANGE OF MOTION OF BOTH EYES
- Normal – both eyes have full range of motion and move in unison
- Abnormal – both eyes are either partially or completely (“hard over”) deviated to one side, and the patient can only look to that side, regardless of any stimuli from the other direction.

“GAZE DEVIATION IS THE SINGLE MOST RELIABLE PREDICTOR OF LARGE VESSEL OCCLUSION STROKE!”

NEGLECT – DOES PATIENT RECOGNIZE AND ACT ON STIMULI COMING FROM BOTH SIDES OF THEIR ENVIRONMENT?
- Normal – patient can recognize incoming stimuli from both sides and follow commands to use both sides of their body.
- Abnormal – patient has no understanding or concept of one side of their world, makes no effort to move one side’s arm or leg (not out of weakness alone, but out of lack of understanding/perception that it exists), doesn’t process stimuli coming from that side either.