

Suspected Stroke Protocol

A stroke or “brain attack” is a sudden interruption in blood flow to the brain resulting in neurological deficit. It affects 750,000 Americans each year, is the 3rd leading cause of death and is the leading cause of adult disability. With new treatment options available, EMS personnel should alert Medical Control as quickly as possible whenever a potential stroke patient is identified.

The most common causes of a stroke are:

- Cerebral thrombosis (a blood clot obstructing the artery).
- Cerebral embolus (a mass or air bubble obstructing the artery).
- Cerebral hemorrhage (ruptured artery / ruptured aneurysm).

Signs & symptoms of a stroke include:

- Hemiplegia (paralysis on one side of the body)
- Hemiparesis (weakness on one side of the body)
- Decreased sensation or numbness without trauma
- Facial droop
- Unequal grips
- Dizziness, vertigo or syncope
- Aphasia or slurred speech
- ALOC or seizures
- Sudden, severe headache with no known cause
- Visual disturbances (e.g. blurred vision, double vision)
- Generalized weakness
- Frequent or unexplained falls

Risk factors that increase the likelihood of stroke are:

- Hypertension
- Atherosclerosis / coronary artery disease
- Atrial fibrillation
- Hyperlipidemia
- Diabetes
- Vasculitis
- Lupus

To facilitate accuracy in diagnosing stroke and to expedite transport, an easy-to-use neurological examination tool is recommended. Although there are several different types available, the most “user-friendly” is the *Cincinnati Prehospital Stroke Scale*.

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Cincinnati Prehospital Stroke Scale / FAST

Cincinnati Prehospital Stroke Scale

Facial Droop (*ask the patient to show their teeth or smile*):

- Normal – Both sides of the face move equally.
- Abnormal – One side of the face does not move as well as the other.

Arm Drift (*ask the patient to close their eyes and hold both arms out straight for 10 seconds*):

- Normal – Both arms move the same or do not move at all.
- Abnormal – One arm does not move or one arm drifts downward compared to the other.

Speech (*ask the patient to say, "The sky is blue in Cincinnati"*):

- Normal – The patient says the phrase correctly with no slurring of words.
- Abnormal – The patient slurs words, uses the wrong words or is unable to speak.

FAST Test

Facial Droop
Arm Drift
Speech Abnormalities
Time of Onset

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First Responder Care

First Responder Care should be focused on assessing the situation and initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock.

1. Render initial care in accordance with the *Universal Patient Care Protocol*.
2. **Oxygen:** 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.
3. Check and record vital signs every *5 minutes* until the transporting unit arrives.

BLS Care

BLS Care should be directed at conducting a thorough patient assessment, initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock and preparing the patient for or providing transport.

1. Render initial care in accordance with the *Universal Patient Care Protocol*.
2. **Oxygen:** 6 L/min via nasal cannula if the patient has a patent airway and SpO₂ is >95%. If SpO₂ is <95%, administer oxygen at 15 L/min via non-rebreather mask. Be prepared to support the patient's respirations with BVM if necessary and have suction readily available.
3. Perform **blood glucose level test** to rule out low blood sugar as a reason for ALOC.
4. **Oral Glucose:** 15g PO if the patient's blood sugar is < 60mg/dL, the patient is alert to verbal stimuli, is able to sit in an upright position, has good airway control and has an intact gag reflex.
5. **Glucagon:** 1mg IM or (if available) 2mg IN if blood sugar is < 60mg/dL, the patient is unresponsive and/or has questionable airway control or absent gag reflex.
6. Initiate ALS intercept if needed and **transport without delay**.
7. Check and record vital signs and GCS every *5 minutes*.
8. Contact receiving hospital as soon as possible to notify of possible stroke if **FAST** exam is positive (based on 1 or more elements of the exam) and communicate the **time of onset**.

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ILS Care

ILS Care should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. Render initial care in accordance with the *Universal Patient Care Protocol*.
2. **Oxygen:** 6 L/min via nasal cannula if the patient has a patent airway and SpO₂ is >95%. If SpO₂ is <95%, administer oxygen at 15 L/min via non-rebreather mask. Be prepared to support the patient's respirations with BVM if necessary and have suction readily available.
3. Obtain **12-Lead EKG** and transmit to receiving hospital.
4. Perform **blood glucose level test** to rule out low blood sugar as a reason for ALOC.
5. **Oral Glucose:** 15g PO if the patient's blood sugar is < 60mg/dL, the patient is alert to verbal stimuli, is able to sit in an upright position, has good airway control and has an intact gag reflex.

Dextrose 50%: 25g IV if blood sugar is < 60mg/dL.

Glucagon: 1mg IM or (if available) 2mg IN if blood sugar is less than 60mg/dL, the patient is unresponsive and/or has questionable airway control or absent gag reflex.

6. Perform a 2nd **blood glucose level test** to re-evaluate blood sugar 5 minutes after administration of Dextrose or Glucagon. Repeat Dextrose if BS is < 60mg/dL.
7. **Midazolam (Versed):** 2mg IV over 1 minute for seizure activity. May repeat Midazolam (Versed) 2mg IV every **5 minutes** as needed to a total of 10mg.

Midazolam (Versed): 5mg IM *if the patient is seizing and attempts at IV access have been unsuccessful.* May repeat dose one time in **15 minutes** if the patient is still seizing.

Midazolam (Versed): Intranasal if unable to obtain IV access. (See intranasal dosing sheet).

8. Initiate ALS intercept if needed and **transport without delay**.
9. Check and record vital signs and GCS every 5 minutes.

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ILS Care (continued)

10. Contact receiving hospital as soon as possible to notify of possible stroke if **FAST** exam is positive (based on 1 or more elements of the exam) and communicate the **time of onset**.

ALS Care

ALS Care should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. Render initial care in accordance with the *Universal Patient Care Protocol*.
2. **Oxygen:** 6 L/min via nasal cannula if the patient has a patent airway and SpO₂ is >95%. If SpO₂ is <95%, administer oxygen at 15 L/min via non-rebreather mask. Be prepared to support the patient's respirations with BVM (and intubate) if necessary and have suction readily available.
3. Obtain **12-Lead EKG** and transmit to receiving hospital.
4. Perform **blood glucose level test**.
5. **Oral Glucose:** 15g PO if the patient's blood sugar is < 60mg/dL, the patient is alert to verbal stimuli, is able to sit in an upright position, has good airway control and has an intact gag reflex.

Dextrose 50%: 25g IV if blood sugar is < 60mg/dL.

Glucagon: 1mg IM or (if available) 2mg IN if blood sugar is less than 60mg/dL, the patient is unresponsive and/or has questionable airway control or absent gag reflex.

6. Perform a 2nd **blood glucose level test** to re-evaluate blood sugar 5 minutes after administration of Dextrose or Glucagon. Repeat Dextrose if BS is < 60mg/dL.
7. **Narcan:** 2mg IV/IM if no response to Dextrose or Glucagon within 2 minutes and narcotic overdose is suspected. May repeat 2mg IV or IM if no response in **5 minutes**.

Narcan: 2mg Intranasal if unable to obtain IV access.

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ALS Care (continued)

8. **Midazolam (Versed):** 2mg IV over 1 minute for seizure activity. May repeat Midazolam (Versed) 2mg IV every **5 minutes** as needed to a total of 10mg.

Midazolam (Versed): 5mg IM *if the patient is seizing and attempts at IV access have been unsuccessful*. May repeat dose one time in **15 minutes** if the patient is still seizing to a total of 10mg.

Midazolam (Versed): Intranasal if unable to obtain IV access. (See **Versed Intranasal Dosing Sheet**).

Ativan (Lorazepam) 1mg IV push, titrating 1mg at a time until the seizure stops; or until 4mg is given.

Ativan (Lorazepam): 2 mg IM every 5 min for total of 4 mg.

9. Transport without delay.
10. Check and record vital signs and GCS every **5 minutes**.
11. Contact receiving hospital as soon as possible to notify of possible stroke if **FAST** exam is positive (based on 1 or more elements of the exam) and communicate the **time of onset**.

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Critical Thinking Elements

- Stroke onset time (defined as the last time the person was known to be normal) is key in determining the eligibility of IV TPA. EMS personnel should ask family members or bystanders the stroke onset time if the patient is unable to provide that information.
- IV TPA must be given within **180 minutes** of the onset of ischemic stroke so do not delay transport. **TIME IS BRAIN!!**
- Interventional angiography can be performed up to **6 hours** after onset of symptoms.
- Maintain the head/neck in neutral alignment. Elevate the head of the cot 30 degrees if the systolic BP is > 100mmHg (*this will facilitate venous drainage and help reduce ICP without reducing cerebral perfusion pressure*).
- Bradycardia may be present in a suspected stroke patient due to increased ICP. **Do NOT give Atropine if the patient's BP is normal or elevated.** Contact Medical Control for consultation.
- Spinal immobilization should be provided if the patient sustained a fall or other trauma.
- Monitor and maintain the patient's airway. Have suction readily available.
- Communicate acute stroke/suspected stroke early in radio transmission to the receiving hospital or Medical Control (Stroke code = 333).
- Document in the PCR whether the FAST exam is negative or positive. If positive, document "FAST exam positive" along with what components make it such (*e.g.* left-sided facial droop, slurred speech, positive arm drift, etc).
- Do **NOT** administer Nitroglycerin (NTG) to a suspected stroke patient with elevated blood pressure in attempt to lower blood pressure. NTG may lower cerebral perfusion pressure (CPP) too much and actually increase ischemia to the brain tissue.