



Virginia Department of Health  
Office of Emergency Medical Services  
Division of Trauma/Critical Care  
Prehospital and Interhospital  
State Stroke Triage Plan



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## Executive Summary

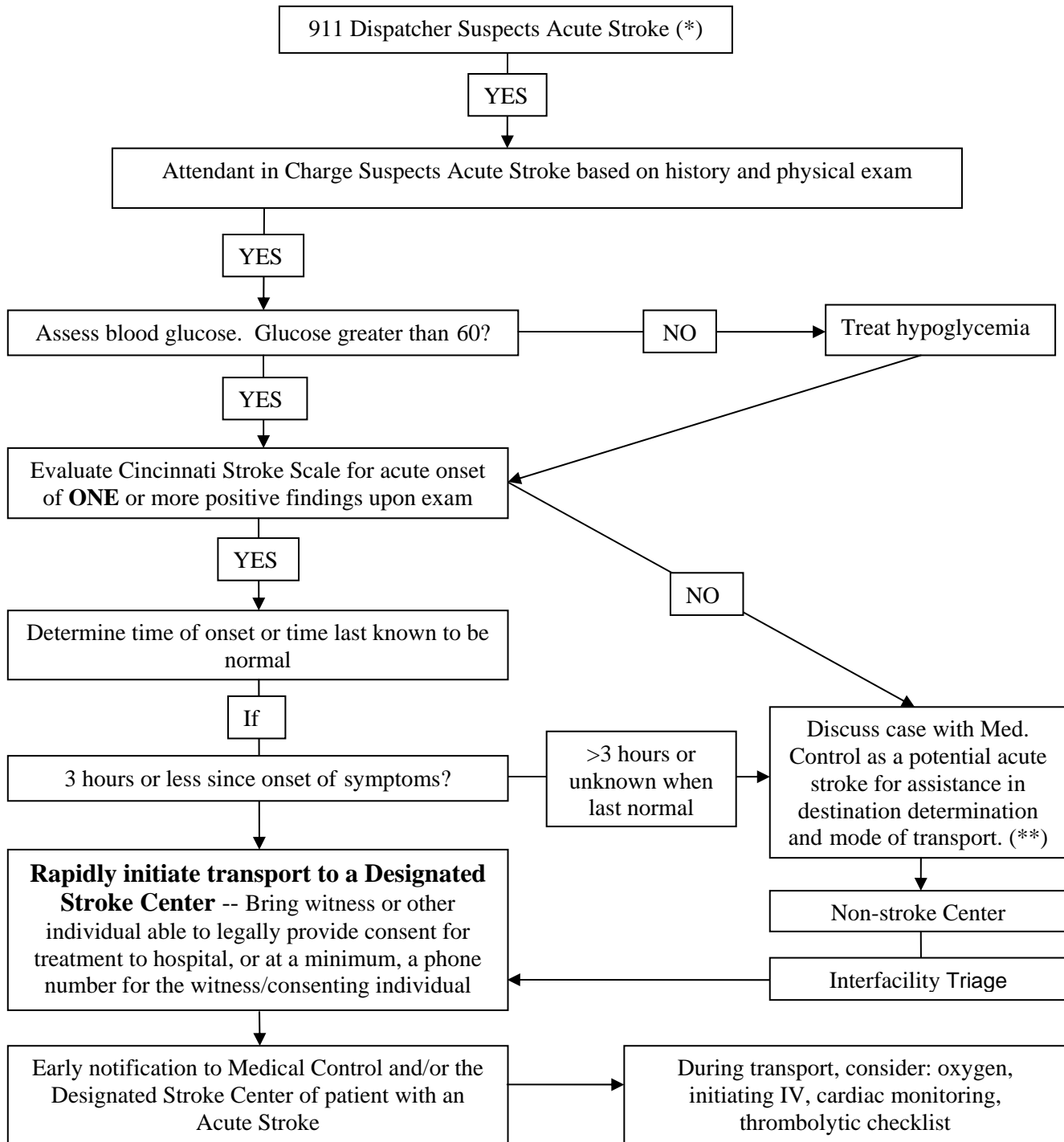
Under the *Code of Virginia* § 32.1-111.3, The Office of Emergency Medical Services acting on behalf of the Virginia Department of Health has been charged with the responsibility of maintaining a Statewide Stroke Triage Plan. The Statewide Stroke Triage Plan establishes a strategy through formal regional stroke triage plans that incorporate each region's geographic variations and acute stroke care capabilities and resources, including hospitals designated as "Primary Stroke Centers" through certification by the Joint Commission or a comparable process consistent with the recommendations of the Brain Attack Coalition. The Statewide Stroke Triage Plan is to include guidelines for prehospital patient care as well as inter-hospital patient transfers.

The purpose of the Statewide Stroke Triage Plan is to establish a uniform set of criteria for the prehospital and inter-hospital triage and transport of acute stroke patients. Formal regional or local stroke triage plans may augment the State Stroke Triage Plan to acknowledge and address variations with each region's EMS and hospital resources. This State Stroke Triage Plan, and the related regional plans, addresses patients experiencing an "acute stroke." For the purposes of this document, "acute stroke" is defined as any patient suspected of having an acute cerebral ischemic event or stroke with the onset of any one symptom within a three hour period. The primary focus of the plan is to provide guidelines to facilitate the early recognition of patients suffering from acute stroke and to expedite their transport to a Designated Stroke Center able to provide definitive care within an appropriate time window.

It is very important to note that because of the continuing evolution of scientific evidence indicating successful management of acute stroke greater than the three-hour time window, *real-time contact with on-line medical control should be freely used to discuss individual cases outside the three-hour window*. In selected cases it may be determined that expeditious transfer or transport directly to a Designated Stroke Center may be of beneficial for a specific patient.

Some selected acute stroke types may benefit from intervention *up to 24 hours* following symptom onset. Regardless of time of onset the sooner an acute stroke is treated, the better the potential outcome ("Time is Brain"). Based on a individual patient's time of onset and following discussion with on-line medical control, consider what mode of transport would be most appropriate to transport the patient expeditiously to a Designated Stroke Center.

## Field Stroke Triage Decision Scheme



(\*) See Appendix A for guidance regarding dispatch protocols

(\*\*) If time from symptom onset is more than 3 hours, discuss case with Medical Control as a potential acute stroke for destination determination. Recall that patients with specific acute stroke types may benefit from intervention up to 24 hours, although the sooner an acute stroke is treated, the better the potential outcome. Based on patient time of onset and discussion with Medical Control, consider whether use of helicopter EMS will offer potential benefit to the patient, either in time to Designated Stroke Center, or for critical care management expertise. EMS does not determine whether a patient is excluded from any or all therapeutic options. Final decisions regarding patient eligibility for any given intervention will be determined by the receiving physician(s).

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## Guidance Documents

### NIH/Cincinnati Prehospital Stroke Scale (CPSS)

All patients suspected of having an acute stroke should undergo a formal screening algorithm such as the NIH/CPSS. Use of stroke algorithms has been shown to improve identification of acute strokes by EMS providers up to as much as 30 percent. The results of the NIH/CPSS should be noted on the prehospital medical record. ANY abnormal (positive) finding which is suspected or known to be acute in onset is considered an indicator of potential acute stroke.

F-(face)	<b>FACIAL DROOP:</b> Have patient smile or show teeth. (Look for asymmetry) <b>Normal:</b> Both sides of the face move equally or not at all. <b>Abnormal:</b> One side of the patient's face droops.
A-(arm)	<b>MOTOR WEAKNESS:</b> Arm drift (close eyes, extend arms, palms up) <b>Normal:</b> Remain extended equally, drifts equally, or does not move at all. <b>Abnormal:</b> One arm drifts down when compared with the other.
S-(speech)	"You can't teach an old dog new tricks" (repeat phrase) <b>Normal:</b> Phrase is repeated clearly and correctly. <b>Abnormal:</b> Words are slurred (dysarthria) or abnormal (aphasia) or none.
T-Time	Time of SYMPTOM ONSET: _____

\* Results of the F.A.S.T. should be included on the patient's prehospital medical record

### EMS Patient Care Protocols

EMS patient care protocols for a patient suspected of having an acute stroke should include:

- An initial/primary assessment
- Focused assessment including:
  - Blood glucose level (if authorized to perform skill)
  - Documented time of onset or time last known to be normal
  - Cincinnati Prehospital Stroke Scale
  - SAMPLE history to include mention of acute stroke mimics (i.e. seizures, migraines, hypo/hyperglycemia and others as deemed appropriate)
  - SAMPLE history to include potential thrombolytic exclusions (i.e. pregnancy, seizure at onset, terminal illness and others as deemed appropriate as on check sheet)
- Appropriate treatment for hypoglycemia. IV access and cardiac monitoring if available, reassessment of neurologic exam and stroke scale. Contact with medical control and/or the receiving hospital to advise them that you are transporting a potential acute stroke patient.
- Transport criteria that direct acute stroke patients with a stable airway and without hypotension to Designated Stroke Centers if time of onset is within 3 hours of EMS assessment. If symptoms are acute, but over the 3 hour window, on-line medical control should be freely used to discuss the individual patient case to determine whether transport directly to a Designated Stroke Center would be of benefit in that specific patient.
- EMS patient care protocols need to incorporate specific strategies appropriate to their area to assure that acute stroke patients evaluated more than 3 hours from symptom onset can still potentially access specialty resources for acute stroke intervention and management. Examples may include partnerships with acute stroke specialists at the Designated Stroke Center who can provide input on specific patient cases in a timely manner to either the on-line medical control physician or EMS provider/unit directly.

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- For agencies or regions wishing to include a thrombolytic checklist in their EMS patient care protocols see Appendix A for Sample Acute Stroke Thrombolytic Checklist. EMS does not determine whether a patient is excluded from any or all therapeutic options. Final decisions regarding patient eligibility for any given intervention will be determined by the receiving physician(s).

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## Acute Stroke Patient Transport Considerations

**MODE OF TRANSPORTATION:** EMS Patient Care Protocols should address mode of transport considerations. Each jurisdiction is unique in its availability of EMS and acute stroke care resources. Consideration should be given to the hospital(s) that is/are available in the region and the resources that they have available to acute stroke patients when developing plans and protocols, as well as EMS system capacity.

**RAPID TRANSPORTATION:** Because stroke is a time-critical illness, time is of the essence, and EMS should rapidly initiate transport once acute stroke is suspected. Consideration should also be given to prehospital resources including use of helicopter EMS (HEMS) available at the time of the incident, and other conditions such as transport time and weather conditions. Use of HEMS can facilitate acute stroke patients reaching Designated Stroke Centers in a timeframe that allows for acute treatment interventions. **The likelihood of benefit of acute stroke therapy decreases with time, but there are several therapy options which offer definite benefit outside the standard 3 hour window.** Interventions may include any or all of the following: specialty physician or ICU capability, medical therapy (such as tPA or new experimental therapies), radiologic evaluation and procedures (MRI, intraarterial thrombolytics, mechanical thrombectomy), or life-saving emergent surgery (hemispherectomy, large artery thrombus extraction).

Field transports of acute stroke patients by helicopter as defined in this plan:

1. Should significantly lessen the time from scene to a Designated Stroke Center compared to ground transport
2. Should be utilized to achieve the goal of having acute stroke patients expeditiously transported to a Designated Stroke Center, ideally within three hours of symptom onset.
3. Should only be to non-stroke centers in very unusual circumstances and after consultation with on-line medical control. If a HEMS resource is used, the patient should be transported directly to a Designated Stroke Center.

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## Designated Stroke Centers

The Commonwealth of Virginia defines a Designated Stroke Center as a hospital that has achieved Primary Stroke Center Certification by the Joint Commission. The process of Stroke Designation/Certification is entirely voluntary on the part of the hospitals and identifies hospitals that have established and maintain an acute stroke program that provides a specific level of medical, technical, and procedural expertise for acute stroke patients. Designation ensures that the hospital is prepared to provide definitive acute stroke care at all times and has an organized approach to providing clinical care, performance improvement, education etc. The list of Designated Stroke Centers in Virginia includes:

<b>Augusta Medical Center</b>	Richmond	<b>Inova Loudoun Hospital Center</b>	Leesburg
<b>Bon Secours Maryview Med. Ctr.</b>	Portsmouth	<b>Inova Mount Vernon Hospital</b>	Alexandria
<b>Bon Secours Memorial Regional MC</b>	Richmond	<b>Martha Jefferson Hospital</b>	Charlottesville
<b>Bon Secours Richmond Community</b>	Richmond	<b>Mary Washington Hospital</b>	Fredericksburg
<b>Bon Secours St. Francis Med. Ctr.</b>	Midlothian	<b>Riverside Regional Medical Center</b>	Newport News
<b>Bon Secours St. Mary's Hospital</b>	Richmond	<b>Sentara Leigh Hospital</b>	Norfolk
<b>Carilion Roanoke Memorial Hospital</b>	Roanoke	<b>Sentara Norfolk General Hospital</b>	Norfolk
<b>Centra Lynchburg General</b>	Lynchburg	<b>Sentara Virginia Beach General</b>	Virginia Beach
<b>Chesapeake Regional Medical Center</b>	Chesapeake	<b>University of Virginia Health System</b>	Charlottesville
<b>CJW Medical Center</b>	Richmond	<b>VCU Health Systems</b>	Richmond
<b>Henrico Doctors' Hospital</b>	Richmond	<b>Virginia Hospital Center</b>	Arlington
<b>Inova Alexandria Hospital</b>	Alexandria	<b>Winchester Medical Center</b>	Winchester
<b>Inova Fairfax Hospital</b>	Falls Church		

*Note:* The list of hospitals becoming designated as stroke centers is increasing. A current list of The Joint Commission Primary Stroke Centers that meet the definition of Virginia Designated Stroke Centers is available at <http://virginiastrokesystems.org/> or by entering the state of interest at <http://www.qualitycheck.org/consumer/searchQCR.aspx>



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## **Interhospital Triage Criteria**

When acute stroke patients cannot be transported directly to a Designated Stroke Center in a timely manner, ideally within the three-hour window, consideration may be given to transport to a closer hospital. Various hospitals meet many of the components of a Designated Stroke Center based on national survey results and would be the next logical choice. The closest hospital may not be the most appropriate hospital. Resource information via self-reported data on the level of acute stroke care provided by hospitals which are not Designated Stroke Centers is available at <http://virginiastrokesystems.org/>.

These considerations should be addressed specifically within the regional plan in a manner consistent with this state stroke plan, and should be updated as hospital resource availability changes. The default destination for acute stroke patients should be a Designated Stroke Center. Stroke triage plans should provide guidance for situations where patients would be transported to non-stroke centers, as well as specific guidance for use of HEMS for transport to Designated Stroke Centers.

**Non-stroke center hospitals should have transfer guidelines and agreements in place for the expeditious and appropriate management of acute strokes when the care required exceeds their capabilities. This is especially critical for transfer of patients following thrombolysis since specific protocols must be followed to diminish the risk of cerebral or systemic hemorrhagic complications.**

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## **Stroke Triage Quality Monitoring**

The Virginia Office of EMS, acting on behalf of the Commissioner of Health, will report aggregate acute stroke triage findings on an intermittent basis, but no less than annually, to assist EMS systems and the Virginia Stroke Systems Task Force to improve the agency, regional, and Statewide Stroke Triage Plans. A de-identified version of the report will be available to the public and will include, minimally, as defined in the statewide plan, the frequency of (i) over and under triage to Designated Stroke Centers in comparison to the total number of acute stroke patients delivered to hospitals and (ii) interfacility transfers that do not meet criteria for transfer to Designated Stroke Centers (iii) HEMS utilization. The program reports shall be used as a guide and resource for health care providers, EMS agencies, EMS regions, the Virginia Office of EMS, and the Virginia Stroke Systems Task Force. Additional specific data points to be collected within the EMS prehospital patient care report (written or electronic) will be established collaboratively between OEMS and VSSTF. Information to be contained in routine reports on both system and patient-level indicators and outcomes will be developed by OEMS to guide further system development in a patient focused way.

Hospitals, EMS agencies, and EMS Regions are encouraged to utilize their performance improvement programs to perform quality monitoring and improve the delivery of acute stroke care within their regions.

Annual reporting on the State Stroke Triage Plan will typically be provided through the OEMS, Division of Trauma/Critical Care's "Trends" report and on an ad-hoc basis in response to appropriate inquiries.

## **Stroke Related Resources**

Virginia Stroke System Web page: <http://virginiastrokesystems.org/>

Virginia Office of EMS Stroke Web page: <http://www.vdh.virginia.gov/OEMS/Trauma/Stroke.htm>

Joint Commission: <http://www.jointcommission.org/CertificationPrograms/PrimaryStrokeCenters/>

