

ODEMSA Stroke Triage Plan

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Old Dominion EMS Alliance, Inc.
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Members of the Old Dominion EMS Alliance (ODEMSA) oversee this plan and is responsible for establishing a strategy through the development of a formal, region-wide, stroke triage system. All ODEMSA policies, procedures, and guidelines in this plan have received final approval from the Board of Directors.

Executive Summary

Under the *Code of Virginia § 32.1-111.3*, the Virginia Office of Emergency Medical Services (OEMS), acting on behalf of the Virginia Department of Health (VDH) has been charged with the responsibility of maintaining a *Statewide Stroke Triage Plan*. The Old Dominion EMS Alliance, Inc. (ODEMSA), is responsible for establishing a strategy through the development of a formal, region-wide, stroke triage system incorporating the region's geographic variations, spectrum of out-of-hospital provider expertise, hospital acute stroke care capabilities and resources including the mechanisms to transfer patients between designated/primary stroke center (PSC) stroke centers, comprehensive stroke centers (CSC), and non-designated hospitals.

The purpose of the ODEMSA Regional Council Stroke Triage Plan herein after referred to as "Plan" is to establish a consistent baseline of criteria for early recognition, triage, treatment, and transport of acute stroke patients. The plan uses all of the components of the formalized *Statewide Stroke Triage Plan* as its primary basis. The plan defines an "acute stroke patient" as a patient suspected of having an acute cerebral ischemic or hemorrhagic event. Quality stroke care is an ongoing process, requiring constant review, development and refinement. Therefore, the plan shall be subject to continual revision through the Stroke Steering Committee or its designated work group.

Recognition Section:

The primary goal of the Plan is: To develop a stroke emergency care system that will result in decreased stroke mortality and morbidity. In order to accomplish this, the ems provider needs to be able to:

- Identify patients presenting with symptoms of an acute stroke.
- If a patient has the following signs and symptoms: worse headache of their life, nausea and vomiting, consider hemorrhagic stroke.
- Identify time last known well.
- Perform "FAST", if positive, perform VAN scale within 10 minutes of patient contact.
- Check blood glucose within 10 minutes of patient contact.
- Identify the best hospital destination for the patient based on time of symptom onset and hospital capabilities.
- Contact hospital within five minutes of suspecting acute stroke patient with "Stroke Alert."
- Select mode of transportation to minimize the time of stroke symptoms to the provision of definitive care.
- Minimize scene time to twenty (20) minutes or less with a "load and go" approach.
- If within scope, establish a minimum of 2- 20 gauge IVs en route to hospital, preferably in the antecubital region.

Transport Section:

Each jurisdiction is unique in its availability of EMS and acute stroke care resources. Consideration should be given to the hospital(s) that are available in the region and the capabilities that they have available to treat acute stroke patients when developing agency triage guidelines. Any patient with a compromised airway or impending circulatory collapse must be transported to the closest hospital emergency department (ED).

Because stroke is a time-critical illness, EMS should immediately initiate transport once acute stroke is suspected. Consideration should also be given to pre-hospital resources including use of helicopter EMS (HEMS), transport time, traffic, and weather. Use of HEMS may facilitate acute stroke patients reaching a designated stroke center for treatment in a timeframe that allows for acute interventions. Each agency needs to evaluate the benefits of potential time savings and the risk of HEMS transport.

When considering a destination choice, providers are asked to keep in mind that Emergency Departments have an estimated assessment and treatment time of 30-60 minutes. Providers are asked to transport to the closest appropriate hospital with capabilities to provide the appropriate level of treatment based on time from last known well to estimated time of arrival at facility and positive stroke scale. **Considerations to be taken are:**

- a. less than 3.5 hours with positive and negative VAN
 - transport to any stroke certified hospital or stroke capable facility
- b. less than 3.5 hours with weakness and positive VAN (or any wake up stroke)
 - transport to comprehensive stroke center or primary stroke center with endovascular capabilities
- c. between 3.5 hours and 24 hours (any stroke)– transport to comprehensive stroke center or primary stroke center with endovascular capabilities
- d. greater than 24 hours (any stroke)
 - transport to any stroke certified hospital or stroke capable facility

HOSPITAL NOTIFICATION:

EMS providers shall contact the receiving hospital prior to or during transport to give facility staff as much advance notice as possible. Providers shall use the term “Stroke Alert” to denote the suspicion of a possible stroke patient, and to initiate the individual facility’s internal stroke preparations.

Certified Stroke Centers

The process of Stroke 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. Certification 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. Neither the Commonwealth of Virginia government, nor the Virginia State Stroke System Task Force (VSSTF) certifies stroke centers. To ensure hospitals are appropriately stratified, for the purposes of the regional plan, ODEMSA should be notified of level of stroke care offered. Hospitals which have received certification as a PSC or CSC shall provide written notification to ODEMSA. Hospitals will update the electronic hospital diversion software if the facility capabilities have short term/temporary changes which last more than 12 hours. For permanent changes in capabilities, the facility shall provide ODEMSA with written notification. See appendix A for most current list of hospital capabilities. Per the State Stroke Triage Plan, facilities are encouraged to obtain certification and EMS providers are recommended to transport to facilities that have met certification.

Link to DNV Certified Stroke Centers

- <https://www.dnvghealthcare.com/certifications/stroke-certifications>

Virginia Stroke System Web page

- <http://www.vdh.virginia.gov/stroke/virginia-stroke-systems-task-force/>

Virginia Office of EMS Stroke Web page

- <http://www.vdh.virginia.gov/emergency-medical-services/trauma-critical-care/virginia-stroke-system/>

American Heart Association

- http://www.strokeassociation.org/STROKEORG/Professionals/Stroke-Resources-for-Professionals_UCM_308581_SubHomePage.jsp#

Centers for Disease Control and Prevention:

- <https://www.cdc.gov/stroke/>

Inter-hospital Transfer

The ODEMSA Board of Directors strongly encourage hospitals (for stroke care) within ODEMSA boundaries to develop transfer guidelines, and have in place agreements for the expeditious and appropriate management of acute strokes when the care required exceeds facility capabilities. ODEMSA staff remains poised to assist in hosting collaborative discussions between system stakeholders in the development of such documents and commit to sharing and dissemination of such information throughout the EMS agency network. Appendix B shows an example of a post-IV Alteplase transfer sheet that may be used to help facilitate the transfer of such patients. That notwithstanding, ODEMSA Regional Council does not presume to direct hospitals with regard to the inter-facility transfer of patients.

Stroke Related Resources

The American Stroke Association: <http://www.strokeassociation.org/STROKEORG/>

DNV GL Web Page: <http://dnvglhealthcare.com/>

International Stroke Conference Web Page: <http://www.strokeconference.org/>

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

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

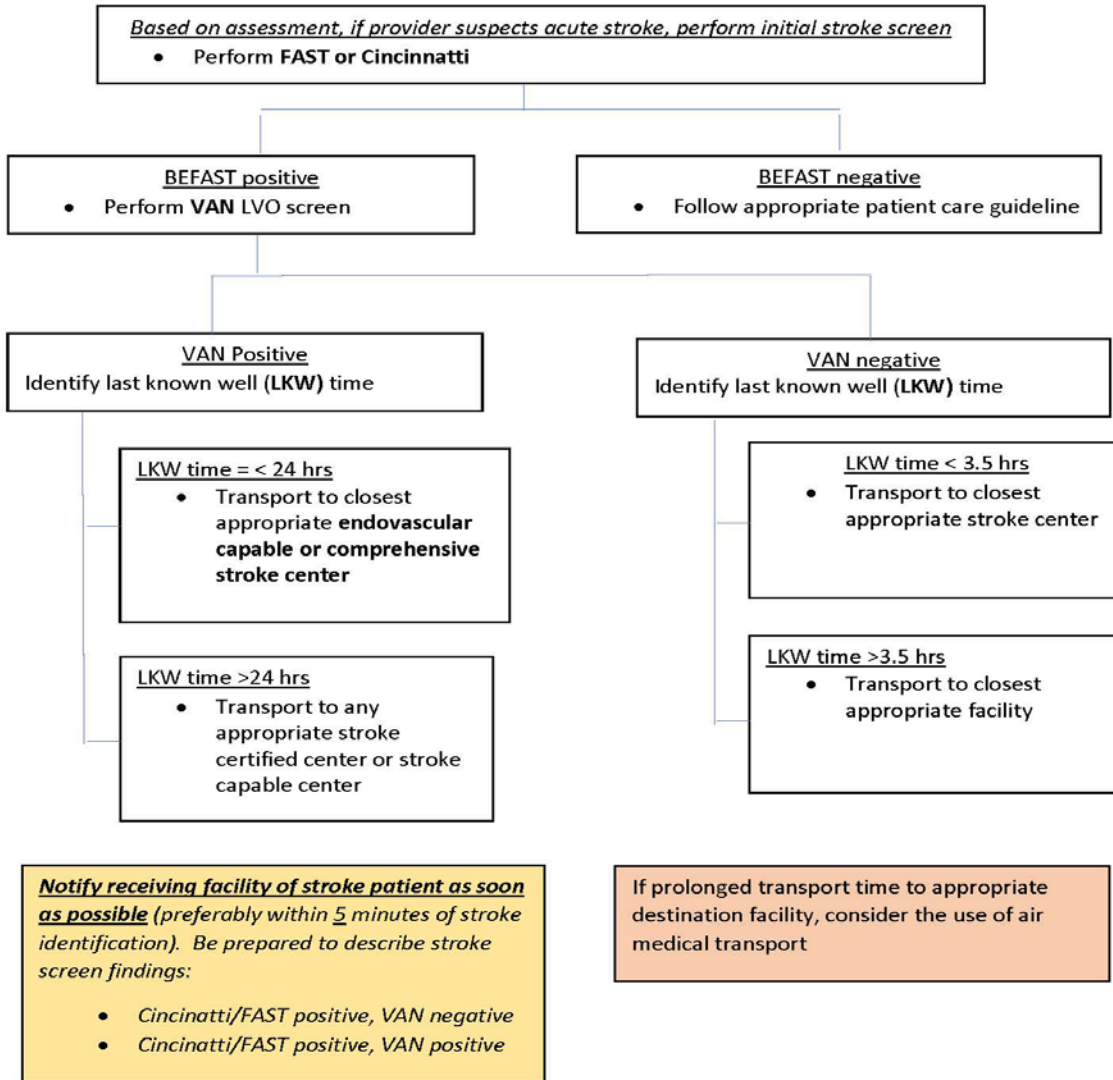
Virginia Stroke System Task Force Web page: <http://www.vdh.virginia.gov/stroke/virginia-stroke-systems-task-force/>

ODEMSA Stroke Education Website: www.emsstroketraining.com

Treatment Section:

EMS providers are encouraged to follow local protocols and to keep up to date with developing stroke care practices. The ODEMSA Stroke Committee suggests establishing a secondary IV, if possible. In addition, the Committee suggests seeking guidance from the operational medical director for any questions regarding treatment and transport decisions. The following decision scheme is given as a guideline for the potential treatment and transport of patients suffering suspected acute stroke. The FAST and VAN scales are used to determine the possibility of a stroke as well as delineate a possible Small Vessel Occlusion versus Large Vessel Occlusion. Treatment for both are identical, however, based on scale results, providers are asked to consider transport to facilities with the capability of treating the patient in line with the magnitude of the stroke etiology.

ODEMSA Stroke Triage Decision Scheme



Appendix A Hospital Listing of Capabilities – (updated 01/2021)

ODEMSA's Stroke Committee directs EMS providers to transport to facilities that are stroke care certified as marked in the below tables.

Facilities With Stroke Certification

Hospital/ Freestanding ED	Acute Stroke Ready Certified	Primary Stroke Centers (PSC)	Endovascular Capable Centers	Comprehensive Stroke Center (CSC)
Bon Secours/Memorial Regional Med Center	✓	✓		
Bon Secours/Richmond Community Hospital	✓	✓		
Bon Secours/St Francis Medical Center	✓	✓		
Bon Secours/St Mary's Hospital	✓	✓	✓	✓
Centra/Southside Community Hospital	✓			
Bon Secours Southern Virginia Med Center	✓			
Bon Secours Southside Medical Center	✓	✓		
HCA/CJW Medical Center- Chippenham	✓	✓		
HCA/CJW Medical Center- Johnston Willis	✓	✓	✓	✓
HCA/Henrico Doctor's Hospital - Forest	✓	✓	✓	
HCA/John Randolph Medical Center	✓	✓		
HCA/Parham Doctor's Hospital	✓	✓		
HCA/Retreat Doctor's Hospital	✓	✓		
HCA/TriCities Emergency Center	✓			
McGuire VA Medical Center	✓			
Sentara Halifax Regional Hospital	✓			
SOVAH Health-Danville	✓	✓		
VCU Community Memorial Hospital	✓	✓		
VCU Health System	✓	✓	✓	✓
HCA – Swift Creek Freestanding ED	✓			

Facilities Without Stroke Certification that are stroke capable.

	Acute Stroke Capable	Primary Stroke Centers	Endovascular Capable Centers	Comprehensive Stroke Center (CSC)
Bon Secours – Short Pump Emergency Center				
Bon Secours – Westchester Emergency Center				
HCA – Hanover Emergency Department				
HCA – West Creek Emergency Department				
Bon Secours - Southside Emergency Center	✓			

Appendix B

Post-IV Alteplase EMS Transfer Sheet (designed to be printed as a one-page double-sided sheet)

ODEMSA Stroke Post-IV Alteplase EMS Transfer Check Sheet

Note: Patient will be transported with minimum of paramedic-level care

All questions regarding patient care must be referred to the receiving physician

Receiving Hospital: _____

Physician: _____

Phone Number: _____

Contact Number for family: _____

Prior to Departure – to be completed together by ED staff and transferring paramedic

- Verify SBP < 180; DBP < 105 – sending hospital must stabilize if above limit
- Perform and document neurological exam to establish baseline neurological status
- If Alteplase to continue during transport, complete “Alteplase Dosing and Administration Communication Form” on back of this sheet
- If IV pump tubing is not compatible with transport pump:
 - o Add extension tubing with a cartridge adaptable to transport pump, if available OR
 - o Hold patient in ED until Alteplase infusion is completed

During Transport

- Replace Alteplase bottle with 0.9% NS when bottle is empty and before pump alarms “air in line” or “no flow above”
- Continue infusion at current settings until preset volume is completed
- Continuous cardiac monitoring
 - o Call receiving physician if hemodynamically unstable or symptomatic from tachycardia or bradycardia
- Continuous pulse oximetry monitoring
 - o Apply oxygen to maintain O2 sat > 94%
- Maintain NPO including medications
- Perform and record neuro checks every 15 mins
 - o Cincinnati Pre-Hospital Scale
 - o GCS and pupil exam
 - o Include assessment for changes in initial or current symptoms or onset of new stroke-like symptoms
- Monitor and document vital signs every 15 mins on **opposite arm from Alteplase infusion site**
- Maintain head of bed 30 degrees

- Avoid venipuncture or other invasive procedures unless absolutely necessary after Alteplase start due to risk of bleeding

Blood Pressure Management

- Keep SBP < 180 and DBP < 105
 - o Turn off pump and call receiving physician for further instructions
 - o IV Labetalol (10 mg) (provided by hospital) Increase by 2mg/min every 10 mins (to a max of 8mg/min) until SBP < 180 and/or DBP < 105
 - o IV Nicardipine (0.1 mg/mL) infusion (provided by hospital) Increase dose by 2.5mg/hr every 5 mins (to max of 15mg/hr) until SBP < 180 and DBP < 105

Complication Management

- Monitor for acute worsening of neurological condition or severe headache, acute hypertension, nausea, or vomiting
 - o Stop Alteplase infusion if still being administered
 - o Call receiving physician for further instructions and to update receiving hospital
 - o Continue to monitor vital signs and perform neurological exam every 15 mins
- Monitor for signs of allergic reaction: mouth or throat edema, difficulty breathing, etc
 - o Stop Alteplase infusion if still being administered
 - o Treat allergic reaction according to agency protocol
 - o Notify receiving hospital
- Monitor for other bleeding or hematomas at infusion/puncture sites or in urine or emesis
 - o Apply direct pressure to any sites
 - o Notify receiving hospital

Additional Instructions

NOTE: Leave copy of MIVT or ePCR, EKG strips, and serial vital signs/neuro checks with RN at receiving hospital

Transferring Physician Signature

Date/Time

Patient Sticker – sending hospital

Patient Sticker – receiving hospital

Appendix B (continued)

ODEMSA Stroke Post-IV Alteplase EMS Transfer Check Sheet

Alteplase Dosing and Administration Communication Form

- This page is to be completed by transferring RN and EMS Transport team
- Verify/confirm the following dosing and pump settings prior to departure:

		ED RN Initials	EMS Transport Initials
Total Alteplase dose to be given: _____mg			
Excess Alteplase discarded before hanging on pump: _____mg Amount remaining at time of transport: _____mL			
Bolus dose: _____mg Time given: _____			
Continuous Infusion:			
• Dose: _____mg Time started: _____			
• Rate: _____mg/hr Estimated time of completion: _____			
Actual stopped/completed time: _____			
Stopped early due to: _____			
Total amount Alteplase received: _____mg EMS administered _____mL in transport **Switch to bag of 0.9% NS at _____ (recommended: same as Alteplase rate) after Alteplase is finished**			
Signature/Title	Initials	Signature/Title	Initials

EMS Transport Team to hand off this completed medical record to RN at receiving hospital

Patient Sticker – sending hospital

Patient Sticker – receiving hospital

Appendix C

Stroke Steering Committee

The policies and procedures of the plan will be developed and managed by the ODEMSA Stroke Steering Committee. The committee will involve area experts within all phases of care and/or create work groups to develop and foster the regional stroke system.

The Stroke Steering Committee will be comprised of:

1. Chair(s)
2. Representatives from each health system with facilities in the ODEMSA region
 - a. Bon Secours Health System (BSHSI)
 - b. Centra Health (Centra)
 - c. Community Health System (CHS)
 - d. Hospital Corporation of America (HCA)
 - e. Virginia Commonwealth University Health Systems (VCU)
 - f. Representative from non-stroke designated hospital, such as, but not limited to,
 1. Sentara Halifax Regional Health System
 2. Hunter Holmes McGuire Veterans Affairs Medical Center
3. Non-voting representatives from primary stroke centers and non-stroke designated hospitals
4. EMS operational medical director
5. HEMS agency
6. Fire based EMS agency
7. Career EMS agency
8. Volunteer EMS agency
9. Emergency Communications/Public Safety Answering Point (PSAP)

Quorum is defined as 7 members excluding the Chair(s). All decisions voted on by the group must pass with simple majority approval by all voting members.

Stroke Triage Quality Monitoring

A workgroup will develop stroke triage quality measures and report back to the committee.

Appendix D

FAST and VAN Stroke Scales

All patients suspected of having an acute stroke should undergo a formal screening algorithm such as the BE FAST and VAN scale. 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 BE FAST and VAN scale should be noted on the pre-hospital medical record. ANY abnormal (positive) finding which is suspected, or known, to be acute in onset is considered an indicator of potential acute stroke.

B- (balance)	<p>BALANCE: Ask about patient's ability to walk and recent fall history.</p> <ul style="list-style-type: none"> • Normal: No changes in patient's ability to walk. • Abnormal: Sudden difficulty walking, sudden dizziness, or a recent history of frequent falls.
E- (eyes)	<p>EYES: Ask about patient's vision and check pupils.</p> <ul style="list-style-type: none"> • Normal: No sudden vision changes. • Abnormal: Sudden vision change or loss in one or both eyes.
F- (face)	<p>FACIAL DROOP: Have patient smile or show teeth. (Look for asymmetry)</p> <ul style="list-style-type: none"> • Normal: Both sides of the face move equally or not at all. • Abnormal: One side of the patient's face droops.
A- (arm)	<p>MOTOR WEAKNESS: Arm drift (close eyes, extend arms, palms up)</p> <ul style="list-style-type: none"> • Normal: Remain extended equally, drifts equally, or does not move at all. • Abnormal: One arm drifts down when compared with the other.
S- (speech)	<p>"YOU CAN'T TEACH AN OLD DOG NEW TRICKS": (repeat phrase)</p> <ul style="list-style-type: none"> • Normal: Phrase is repeated clearly and correctly. • Abnormal: Words are slurred (dysarthria) or abnormal (aphasia) or none.
T- (time)	<p>TIME OF SYMPTOM ONSET:</p> <ul style="list-style-type: none"> • The time the patient was last known at baseline is critical in the triage process.
V – (visual)	<p>VISUAL: Ask patient to look left, right, up and down</p> <ul style="list-style-type: none"> • Normal: No changes in vision • Abnormal: Field cut (which side) (4 quadrants), Double vision, Blind new onset
A – (aphasia)	<p>APHASIA: Can the patient understand and speak coherently</p> <ul style="list-style-type: none"> • Normal: patient can understand language • Abnormal: inability to speak or periphrastic errors, unreceptive (not understanding or following commands such as close eyes, make fist)
N – (neglect)	<p>NEGLECT: Is the patient forcibly gazing to the right or left and not acknowledging the other side</p> <ul style="list-style-type: none"> • Normal: Able to maintain vision fields • Abnormal: Forced gaze or inability to track to one side, unable to feel both sides at the same time, or unable to identify own arm, Ignoring one side

* If the patient has weakness and any other positive finding among the vision, aphasia, or neglect category, they are considered VAN positive.