



Acute Stroke Emergency Transfer Protocol

to Royal Victoria Regional Health Centre (RVH) or Muskoka Algonquin Healthcare (MAHC) Huntsville District Memorial Hospital Site (HDMH)

Patients who present with features of an acute ischemic stroke may be eligible for thrombolytic therapy and/or endovascular therapy.

Inclusion Criteria	Exclusion Criteria
<input type="checkbox"/> Patient has signs and symptoms consistent with ischemic stroke. <input type="checkbox"/> A clear & credible time of onset can be established & the patient can reach the RVH or HDMH: * Within 4 hours of the onset of stroke symptoms i. Pregnancy is NOT a contraindication. ii. Age <18 years is NOT a contraindication. *Time of onset is the time the patient was last seen normal. * Time is Brain. The sooner the patient arrives at RVH/HDMH the greater potential for better outcomes.	<input type="checkbox"/> Unknown onset of symptoms or patient last seen well >24 hours. <input type="checkbox"/> Complete resolution of neurological signs (TIA). <input type="checkbox"/> Serious co-morbidity with limited lifespan (e.g. advanced cancer, advanced dementia). * If uncertain about whether patient meets Acute Stroke Protocol criteria, contact Acute Stroke Team at RVH or HDMH.

If the patient meets the eligibility criteria and is stable for transfer follow the steps below.

Note if:

- Wake up stroke with witnessed last known well in past 24 hours OR
- Witnessed last known well within 4-24 hours of onset

Complete ACT-FAST screen and steps on page 2

Step 1. If possible, maintain ambulance availability/arrange for ambulance transfer by calling dispatch. Inform the dispatcher that patient fits “**Acute Stroke Protocol**”.

Step 2. As appropriate **call RVH** Locating at **705-728-9802** and follow the prompts as necessary OR **call HDMH** Switchboard at **705-789-2311 ext. 0**. Your call is a request to have the Acute Stroke Physician paged. Clearly identify the Hospital calling, a return phone number with extension and the Physician’s name that is calling.

Step 3. Report to the Acute Stroke Physician the NIHSS and a SBP>185 or DBP>110. Mutually agree that patient should be transferred to RVH or HDMH for consideration of hyperacute therapy.

Step 4. Transfer patient Code 4, to RVH or HDMH. It is recommended that the patient be transferred with:

- Ambulance cardiac monitor
- Oxygen therapy as needed

Complete the following if time permits (**never delay transfer to complete**):

A. Preferred:

- Saline lock #1 with 18 gauge needle in antecubital fossa unaffected arm
- Saline lock #2 with 18 gauge needle in antecubital fossa

Note: recommendations to use minimum size 20 gauge needle, antecubital fossa (above the hand), avoid IV extensions, and no glucose solutions unless required.

B. Optional (if time still permits):

- CBC, electrolytes, urea, creatinine, troponin, INR, PTT, glucose, pregnancy test (BHCG) (if indicated)
- 12 lead ECG

Step 5. Fax all relevant information & blood work if drawn to **RVH at 705-719-4929** or **HDMH at 705-789-6216**.

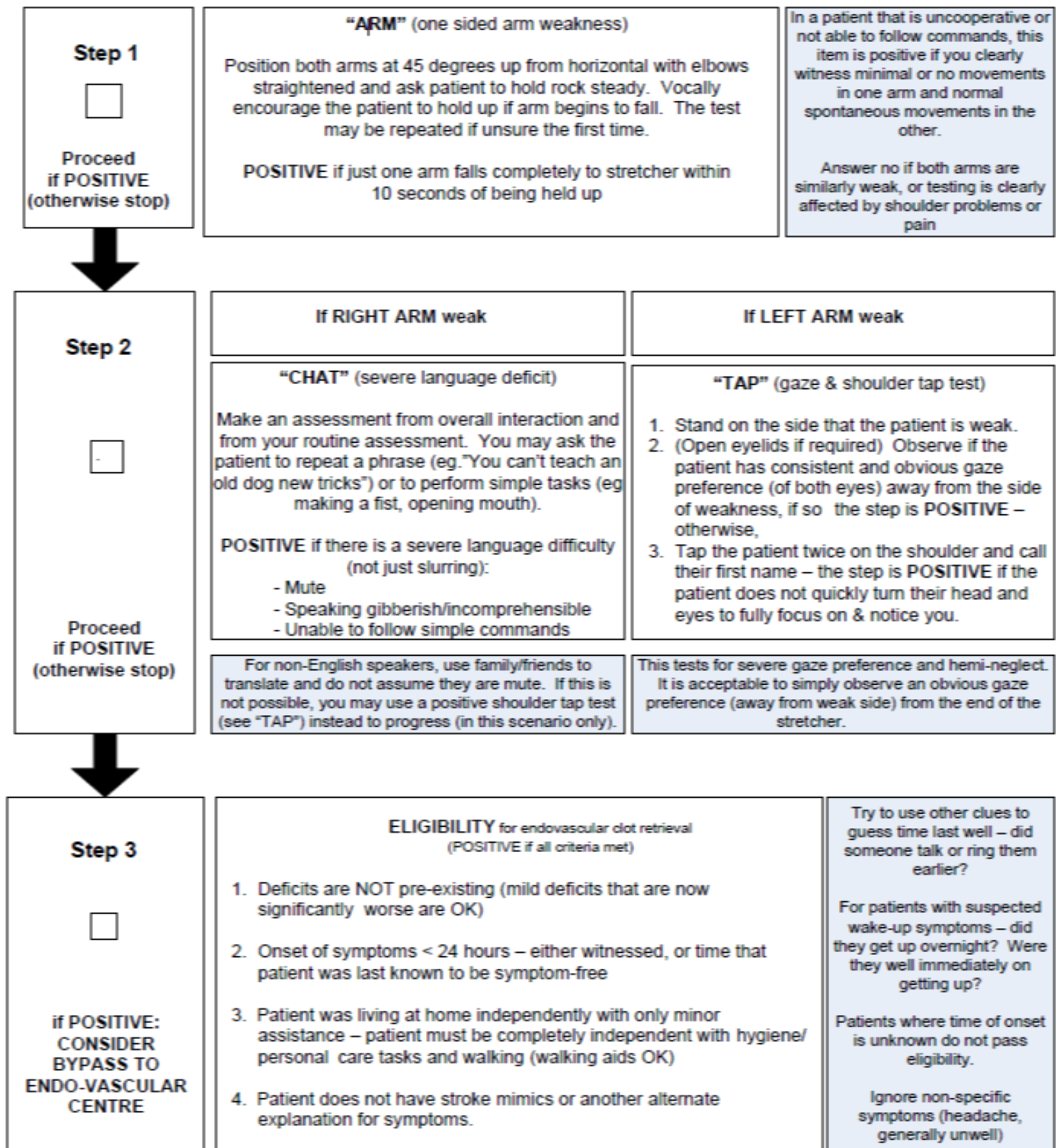
If at all possible the family member with Power of Attorney for Personal Care or the Substitute Decider should travel with the patient in the ambulance to RVH/HDMH. In the event this is not possible, the family should keep the phone free. The Stroke Centre Hospital may need to call them to provide consent for treatment. This contact number needs to be included with the transfer documentation.

** Approximately 30 minutes is required for receiving District Stroke Centre assessment & CT scanning

“ACT FAST”- Clinical Triage Tool for Acute Stroke caused by Large-Vessel Occlusions

Adapted from “Ambulance Clinical Triage for Acute Stroke Treatment” Zhao et al. Stroke 2018;49-945-951

* Changes made to Step 3: Point 2 - time window changed from 6 to <24 hours & Point 4 – wording change



Step 1 and 2. Act-FAST Screen completed by ED RN. Notify ED Physician.

Step 3. Act-FAST Screen EVT Eligibility and NIHSS completed by ED Physician.

Step 4. If **ACT-FAST positive: Immediate Imaging** as per the Provincial CT/mCTA Protocol (**goal within 15 minutes of arrival**) (Appendix A)

1. Non-enhanced CT head
2. CTA neck & head (acquired from aortic arch to the vertex)

Step 5. Complete 'Patient Information and Medication' Section of the Stroke EVT Transfer Communication Form (**Appendix B**). Start Stroke EVT Order Set as appropriate for organization (based on EVT Order Set Recommendations **Appendix C**).

Step 6. ED Physician contact CritiCall Ontario for consultation with ‘Stroke Endovascular Team’. If patient is accepted as an EVT candidate, a confirmation of Life or Limb status is indicated. CritiCall Ontario agent shall facilitate transport coordination by contacting ORNGE or the Central Ambulance Communication Centre. Note it is recommended that land transfer is utilized whenever possible to support timely management of these patients – request land transport directly with CritiCall Ontario.

Step 7. If patient is accepted as an EVT candidate, ED physician to complete remainder of Stroke EVT Order Set and Stroke EVT Transfer Communication Form.

Step 8. If clinically unstable patient shall be accompanied by appropriate staff as per the ordering physician. (**goal door in door out 45 minutes**) (**Appendix D** Medical Escort Requirements from CorHealth EVT Referral and Transport Process Memo)

Appendix A

Acute Stroke CT/mCTA Imaging Protocol

Minimum Image Set for Initial Telestroke or Endovascular Treatment Consultation

Reformatted scans are derived from 0.5- or 0.6-mm axial images from aortic arch to the vertex. **Do not transfer these thin axial images to ENITS.**

The following images, in this order, should be sent to the ENITS server:

1. **Non-enhanced CT head**
 - a. Axial 3 mm images
 - b. Coronal 3 mm images
 - c. Sagittal 3 mm images

2. **CTA neck & head**
(acquired from aortic arch to the vertex, peak bolus and ~ 10 second delays)
 - a. First phase
 - i. Axial 2 mm thick x 2 mm (head and neck)
 - ii. Coronal 5 mm thick x 2 mm MIP (head and neck)
 - iii. Sagittal 5 mm thick x 2 mm MIP (head and neck)
 - iv. Axial 30 mm thick x 2 mm MIP (head only)
 - b. Second phase (delay)
 - i. Axial 2 mm thick x 2 mm (neck and head)
 - ii. Axial 30 mm MIP x 2 mm (head only)
 - c. Third phase (delay) [optional]
 - i. Axial 30 mm MIP x 2 mm (head only)

Notes: 3D-reconstructions are not required. Multiphase CTA includes only the head with thick MIPs (30 mm). However, ideally the delayed CTA (second phase) should also include the 2 mm axial cuts from the arch to the vertex in addition to the thick axial MIPs of the head.

Perfusion Imaging: The literature references the use of automated imaging software to generate CT perfusion maps to select patients for Endovascular therapy, especially in the late time windows. Sites using CT perfusion imaging should utilize software that provides reproducible objective measurements of ischemic core and penumbra. To date, only iSchemaView RAPID automated CT Perfusion software has been used in clinical trials and has been recommended by the Ontario Health Technology Advisory Committee. If available, the RAPID Summary Maps should be also sent to ENITS.

Appendix B

STROKE Endovascular Treatment Transfer Communication Form


Place patient label here

All patients who are eligible for Endovascular Treatment MUST have the Transfer Communication Form completed by the referring site prior to transfer and placed on top of patient's copied chart.
****DO NOT DELAY TRANSPORT****

Patient Information (Complete prior to contacting CritiCall)		
Allergies:		
Isolation Precautions:	COVID-19: Screening status: Testing status:	
Date and Time Last Seen Well: ____/____/____ (dd/mm/yy) ____:____ (hh:mm)		
Deficit and Severity (describe visual, speech, motor deficits):		
NIHSS:		
Medications (Complete prior to contacting CritiCall)		
<input type="checkbox"/> Antiplatelet Agents (e.g. EC ASA, Clopidogrel) <input type="checkbox"/> Anticoagulation Agents (e.g. Dabigatran, Rivaroxaban, Apixaban, Edoxaban, Warfarin) _____		
Thrombolysis delivery site <input type="checkbox"/> Yes <input type="checkbox"/> No		
Alteplase administered <input type="checkbox"/> Yes (dd/mm/yy) ____/____/____ (hh:mm) ____:____		
<input type="checkbox"/> No, reason, (e.g. recent head injury, outside treatment window) _____		
EVT Stroke Centre	EVT Stroke Centre Physician	Date of Referral: (dd/mm/yy)
SHSC SMH TWH		
Referring Centre Name	Referring Physician	Referring Physician Contact #
Referring Centre - Prior to departure please check off each section as is completed:		
OHIP number:		
Family Contact Name and Number:		
<input type="checkbox"/> Remove patient's clothing and change into a gown (if time allows) <input type="checkbox"/> Photocopy/Print/Fax/Send entire chart to EVT Stroke Centre, including: <input type="checkbox"/> Diagnostic Investigations <input type="checkbox"/> Consultation Note <input type="checkbox"/> Nursing Notes/ CNS <input type="checkbox"/> Labs <input type="checkbox"/> List of Medications <input type="checkbox"/> Pre-printed orders (note: CT imaging is shared through ENITS, CD copy is not required) <input type="checkbox"/> Pre-Notify EVT Stroke Centre, include: Name/ Sex/ DOB/ HCN/ Time patient leaving referring centre <input type="checkbox"/> Provide EVT Brochure pamphlet to family or substitute decision maker		
EVT Centre Contact Information:		
Sunnybrook Health Sciences Centre (SHSC)	P: 416-480-6100 x88093	F: 416-480-6846
St. Michaels Hospital (SMH)	P: 416-864-6060 x45634 or 49255	F: 416-964-5138
Toronto Western Hospital (TWH)	P: 416-603-5190	F: 416-603-5288
Note: The above EVT Transfer Communication form MUST be completed in its entirety prior to transfer.		

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Appendix C

 Ornge Stroke Network	
Endovascular Therapy Order Set Recommendations for Non tPA Hospitals Order Set shall be used at non-tPA hospital on admission to ED and during transfer for all ischemic stroke patients who are potential candidates for Endovascular Thrombectomy Treatment	
Recommendations based on the current Canadian Stroke Best Practice Recommendations for Acute Stroke Management Update 2018 (https://www.strokebestpractices.ca/recommendations/acute-stroke-management). Always refer to the most current guidelines as they are updated every two years.	
Intravenous Therapy	<input checked="" type="checkbox"/> Insert peripheral IV (minimum of 20 gauge)
Diagnostic Imaging	<input checked="" type="checkbox"/> Non-enhanced CT head STAT <input checked="" type="checkbox"/> CTA neck & head (acquired from aortic arch to the vertex) STAT <input checked="" type="checkbox"/> 12 Lead EKG (if time permits)
Lab Investigation	<input checked="" type="checkbox"/> Blood glucose concentration upon arrival to ED <input checked="" type="checkbox"/> CBC, electrolytes, urea, creatinine, troponin, INR, PTT, glucose, BHCG (if indicated)
Vitals & Monitoring	<input checked="" type="checkbox"/> Canadian Neurological Scale (CNS) and vital signs q15 minutes x 1 hour, then q30 min and pm <input checked="" type="checkbox"/> Notify MRP if: <ul style="list-style-type: none"> <input checked="" type="checkbox"/> CNS score decreases by greater than 1 point in ED notify MRP <input checked="" type="checkbox"/> New acute or worsening headache, new hypertension, nausea, vomiting, or seizures <input checked="" type="checkbox"/> Continuous cardiac monitoring <input checked="" type="checkbox"/> Continuous SpO2 monitoring
Blood Pressure Management	Extreme blood pressure elevation SBP >220mmHg or DBP >120mmHg should be treated to reduce the blood pressure by approximately 15%, and not more than 25% over the first 24 hours with further gradual reduction thereafter to targets for long-term secondary stroke prevention Avoid rapid or excessive lowering of blood pressure because this might exacerbate existing ischemia or might induce ischemia. ****This section to be developed in collaboration with local pharmacy and physician input.
Nutrition	<input checked="" type="checkbox"/> NPO
Continence	The use of chronic indwelling urethral catheters should generally be avoided due to the risk of urinary tract infections

Appendix D

Medical Escort Requirements

A medical escort is required when one of the following conditions is met:

- the patient requires more than saline at 100 cc per hour during transport
- the patient requires mechanical ventilation during transport
- the patient is at risk of deteriorating during transport and may require specialized intervention (e.g. risk of angioedema, seizures, anaphylaxis, reduced level of consciousness)
- the patient is receiving a tPA infusion or the patient has completed a tPA infusion

Note: An escort may be required by some paramedic services in the absence of the above conditions, please review protocols with your local EMS providers.

If the decision is made to transfer by air, the referring hospital should make attempts to have an appropriate medical escort(s) available to transport the patient to the airport or offsite helipad to shorten overall transport time. If appropriate escort(s) are available and it is deemed medically appropriate, Ornge² will make arrangements with the local land ambulance to pick up the patient and escort(s) and transport them to the airport/helipad to meet the aircraft.