ACUTE STROKE PROTOCOL FOR OAK VALLEY HEALTH – UXBRIDGE SITE

Patients who present at Oak Valley Health – Uxbridge site with features of an acute ischemic stroke may be eligible for thrombolytic therapy and/or endovascular therapy up to 24 hours from the onset of symptoms.

INCLUSION CRITERIA	EXCLUSION CRITERIA

• Patient has signs/ symptoms consistent with acute ischemic stroke
  ○ Unilateral motor weakness (face, arms, and/or legs)
  ○ Speech disturbance
  ○ Hemibody sensory loss/weakness
  ○ Sudden visual field changes
  ○ Sudden lack of coordination and/or ability to judge distance or scale
• A clear/ credible time last seen well can be established and is:
  ○ Within **3.5 hours** of onset of stroke symptoms
  ▪ Pregnancy is NOT a contraindication
  ▪ Prior use of antithrombotic is NOT a contraindication for EVT
  ▪ Age <18 years is NOT a contraindication, but if age <18 (contact Criticall for pediatric consult): OR
  ○ Between **3.5-24 hours** of onset with confirmed positive ACT-FAST Screen
	• Unknown time of onset of symptoms or patient last seen well >24 hours
	• Complete resolution of neurological signs (TIA)
	• Serious co-morbidity with limited lifespan (e.g. advanced cancer, advanced dementia, palliative)

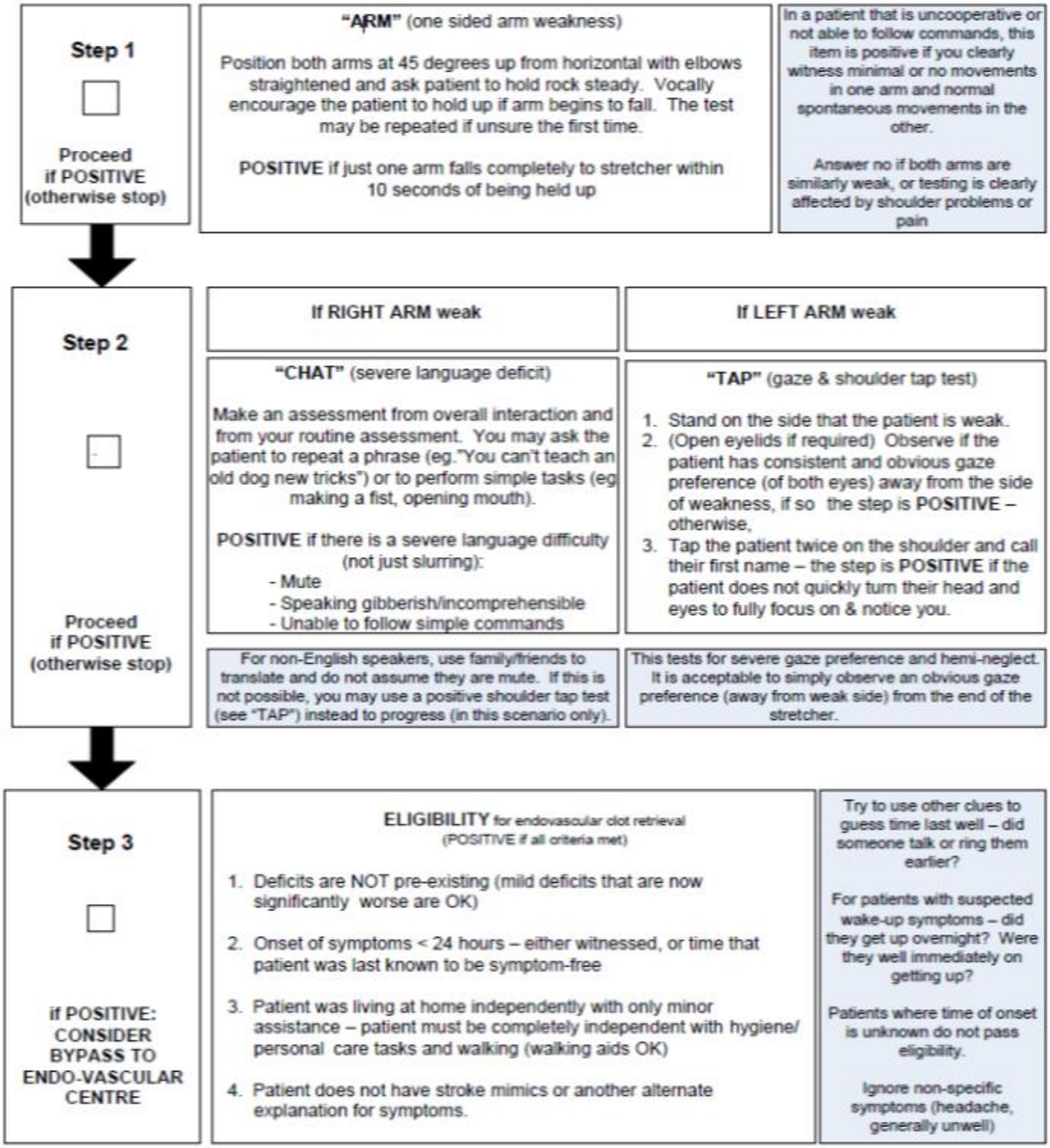
PROCESS FOR ONSET BETWEEN 0-3.5 HOURS

If the patient meets inclusion criteria with onset between 0-3.5 hours prior to arrival and is stable for transfer:
TIME is BRAIN: The sooner the patient arrives at Lakeridge Health - Oshawa the greater potential for better outcomes. Approximately 30 mins is required for receiving District Stroke Centre assessment and brain imaging.

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	Call Lakeridge Health Oshawa (LHO) Locating at **905-576-8711 ext. 33200** and 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	Transfer the patient to LHO. It is recommended that patient is transferred with: • Cardiac monitor • Oxygen therapy A family member with Power of Attorney or Substitute Decision Maker should travel with the patient or be accessible via telephone and the contact phone number be included with transfer documentation in case LHO needs to obtain consent for treatment.
STEP 4 (if time permits - **do NOT**	Complete the following if time permits (**never delay transfer to complete**): • Insert IV: use minimum size 18-gauge needle, antecubital fossa (above the hand), avoid IV extensions, and no glucose solution unless required • Labs: CBC, electrolytes, urea, creatinine, troponin, INR, PTT, glucose, pregnancy test (if indicated)

delay transport to complete)	• 12 lead ECG * Do **NOT** hold patient transfer awaiting results. If patient leaves prior to results, call LHO ED with blood results at **905-576-8711 ext 34560** and fax them as per step 5 below
STEP 5	Fax appropriate information & blood work if drawn to **905-721-4749.** Durham EMS team will provide pre-notification to LHO ED prior to arrival as per EMS protocols.
PROCESS FOR ONSET BETWEEN 3.5-24 HOURS	
If the patient meets inclusion criteria with onset between 3.5-24 hours prior to arrival, and is stable for transfer: • If patient is wake up stroke and last seen normal <24 hours; or • Witnessed last known well 3.5-24 hours of onset **Goal for EVT eligible patients: door in door out <45 mins**	
STEP 1	Triage nurse: • Complete steps 1 and 2 of ACT-FAST LVO screen *(Appendix A)* • Notify ED MD if ACT-FAST is positive
STEP 2	ED MD: • Confirms step 1 and 2 of ACT-FAST LVO screen • Complete step 3 EVT eligibility criteria of ACT-FAST LVO Screening tool • Complete NIHSS • Start Stroke EVT orderset (as appropriate) *(Appendix B)*:
STEP 3	Order STAT imaging as per Provincial CT/mCTA Protocol. *(Appendix C)* ***Goal is <15 mins of arrival*** a. If imaging can be completed within 30 minutes of arrival proceed with STEP 4 b. If imaging **cannot** be completed within 30 minutes of arrival proceed with transfer to *Oak Valley Health – Markham Stouffville* site for appropriate brain imaging and EVT candidacy assessment. Arrange ambulance transfer and inform Oak Valley Health – Markham Stouffville of transfer.
STEP 4	ED physician completes "patient information and medication" section of EVT Transfer Communication Form *(Appendix D)*
STEP 5	ED Physician contacts 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. A family member with Power of Attorney or Substitute Decision Maker should travel with the patient or be accessible via telephone and the contact phone number be included with transfer documentation in case the EVT Centre Hospital needs to obtain consent for treatment
STEP 6	If patient is a candidate for EVT ensure completed EVT Transfer Communication Form accompanies patient
STEP 7	If clinically unstable, patient will be accompanied by appropriate staff as per ordering physician *(Appendix E).*

Appendix A:


Step 1
Proceed if POSITIVE (otherwise stop)
"ARM" (one sided arm weakness)
Position both arms at 45 degrees up from horizontal with elbows straightened and ask patient to hold rock steady. Vocally encourage the patient to hold up if arm begins to fall. The test may be repeated if unsure the first time.
POSITIVE if just one arm falls completely to stretcher within 10 seconds of being held up
In a patient that is uncooperative or not able to follow commands, this item is positive if you clearly witness minimal or no movements in one arm and normal spontaneous movements in the other.
Answer no if both arms are similarly weak, or testing is clearly affected by shoulder problems or pain
Step 2
Proceed if POSITIVE (otherwise stop)
If RIGHT ARM weak
"CHAT" (severe language deficit)
Make an assessment from overall interaction and from your routine assessment. You may ask the patient to repeat a phrase (eg."You can't teach an old dog new tricks") or to perform simple tasks (eg making a fist, opening mouth).
POSITIVE if there is a severe language difficulty (not just slurring):
- Mute
- Speaking gibberish/incomprehensible
- Unable to follow simple commands
For non-English speakers, use family/friends to translate and do not assume they are mute. If this is not possible, you may use a positive shoulder tap test (see "TAP") instead to progress (in this scenario only).
If LEFT ARM weak
"TAP" (gaze & shoulder tap test)
1. Stand on the side that the patient is weak.
2. (Open eyelids if required) Observe if the patient has consistent and obvious gaze preference (of both eyes) away from the side of weakness, if so the step is POSITIVE – otherwise,
3. Tap the patient twice on the shoulder and call their first name – the step is POSITIVE if the patient does not quickly turn their head and eyes to fully focus on & notice you.
This tests for severe gaze preference and hemi-neglect. It is acceptable to simply observe an obvious gaze preference (away from weak side) from the end of the stretcher.
Step 3
if POSITIVE: CONSIDER BYPASS TO ENDO-VASCULAR CENTRE
ELIGIBILITY for endovascular clot retrieval
(POSITIVE if all criteria met)
1. Deficits are NOT pre-existing (mild deficits that are now significantly worse are OK)
2. Onset of symptoms < 24 hours – either witnessed, or time that patient was last known to be symptom-free
3. Patient was living at home independently with only minor assistance – patient must be completely independent with hygiene/ personal care tasks and walking (walking aids OK)
4. Patient does not have stroke mimics or another alternate explanation for symptoms.
Try to use other clues to guess time last well – did someone talk or ring them earlier?
For patients with suspected wake-up symptoms – did they get up overnight? Were they well immediately on getting up?
Patients where time of onset is unknown do not pass eligibility.
Ignore non-specific symptoms (headache, generally unwell)

Appendix B:

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	☒ Insert peripheral IV (minimum of 20 gauge)
Diagnostic Imaging	☒ Non-enhanced CT head STAT ☒ CTA neck & head (acquired from aortic arch to the vertex) STAT ☒ 12 Lead EKG (if time permits)
Lab Investigation	☒ Blood glucose concentration upon arrival to ED ☒ CBC, electrolytes, urea, creatinine, troponin, INR, PTT, glucose, BHCG (if indicated)
Vitals & Monitoring	☒ Canadian Neurological Scale (CNS) and vital signs q15 minutes x 1 hour, then q30 min and prn ☒ Notify MRP if: ☒ CNS score decreases by greater than 1 point in ED notify MRP ☒ New acute or worsening headache, new hypertension, nausea, vomiting, or seizures ☒ Continuous cardiac monitoring ☒ 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	☒ NPO
Continence	The use of chronic indwelling urethral catheters should generally be avoided due to the risk of urinary tract infections

Appendix C:

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.

CorHealth (January 2022). Acute Stroke CT/mCTA Imaging Protocol for Endovascular Treatment [PDF]. Retrieved from https://www.corhealthontario.ca/Stroke-CTmCTA-Imaging-Protocol-for-Endovascular-Treatment.pdf.

Appendix D: Stroke Endovascular Treatment Form

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 (MD to 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 (MD to complete prior to contacting CritiCall)

☐ Antiplatelet Agents (e.g. EC ASA, Clopidogrel)

☐ Anticoagulation Agents (e.g. Dabigatran, Rivaroxaban, Apixaban, Edoxaban, Warfarin) _____

Thrombolysis delivery site ☐ Yes ☐ No

Alteplase administered ☐ Yes *(dd/mm/yy)* ____/____/____ *(hh:mm)* ____:____

☐ 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:

☐ Remove patient's clothing and change into a gown (if time allows)

☐ Photocopy/Print/Fax/Send entire chart to EVT Stroke Centre, including:

☐ Diagnostic Investigations ☐ Consultation Note ☐ Nursing Notes/ CNS

☐ Labs ☐ List of Medications ☐ Pre-printed orders

(note: CT imaging is shared through ENITS, CD copy is not required)

☐ Pre-Notify EVT Stroke Centre, include: Name/ Sex/ DOB/ HCN/ Time patient leaving referring centre

☐ 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.

Appendix E:

Medical Escort Requirements

A medical escort is requirement when on 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 transportation 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 escorts(s) are available and it is deemed medically appropriate, Ornge[2] 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.