

Process for Non-tPA Hospitals (i.e. community hospitals) to Access Stroke Consultation and/or EVT Services for Patients Presenting within 6-24 Hours of Stroke Symptom Onset.

Background

“Time is brain,” a common mantra used to describe the urgent nature of stroke care, reflects the startling reality that 1.9 million brain cells die with each minute that treatment is delayed.¹ Recognizing the urgent nature of stroke, it is critical that stroke patients are identified and triaged by Emergency Medical Services (EMS) and emergency department (ED) hospital personnel in a timely manner.

The Cerebrovascular Accident (CVA, “Stroke”) Standard and associated prompt card in the Basic Life Support Patient Care Standards (BLS PCS) v3.2 enables EMS personnel (i.e. paramedics) to identify patients exhibiting the signs and symptoms of stroke and bypass local community hospitals in favor of hospitals capable of administering tissue plasminogen activator (tPA) or Endovascular Thrombectomy (EVT). This protocol is limited to patients presenting within 6 hours of stroke symptom onset. Patients who do not call 911 within 6 hours of stroke symptom onset do not qualify for redirection and are therefore taken, in most regions, to the closest hospital, which may be a community hospital, without stroke expertise (non-tPA hospitals). In most regions, community hospitals have processes in place to expedite the transfer of patients that ‘walk-in’ to the nearest stroke designated hospital (under “walk-in” protocols”), however, these protocols are also often limited to patients presenting within 6 hours of symptom onset due to the 4.5-hour treatment windows for tPA and the historical treatment window for EVT (i.e. 6 hours).

In 2018, the Heart and Stroke Foundation of Canada updated the Canadian Stroke Best Practice Recommendations to include an expanded treatment window for EVT (i.e. 6-24

¹ Saver, J. Time is Brain – Quantified. *Stroke*. 2006;37:263-266. Available at <https://www.ahajournals.org/doi/10.1161/01.STR.0000196957.55928.ab>

hours). This means select patients presenting to community (non-tPA) hospitals by ambulance or as “walk-ins” 6-24 hours post stroke onset may still be eligible for EVT. To date, provincial standards have not been established to support appropriate response to these patients.

Issue

Clear direction with respect to the recommended processes for community hospitals (non-tPA hospitals) to access stroke consultation and/or EVT services for patients presenting within the 6-24-hour time window of symptom onset is required to progress the responsiveness of the health system, optimize patient outcomes, and encourage adequate planning and resource allocation.

Standards

These Standards were developed through the collaborative efforts of CorHealth Ontario, the EVT Implementation Task Group and the provincial Hyperacute Stroke Steering Committee (previously EVT Steering Committee). Due to variations in regional access to advanced imaging (i.e. automated CT perfusion imaging), the focus of these standards is on the identification of potentially eligible patients at the non-tPA site and subsequent use of regional processes to facilitate access to the nearest appropriate imaging and/or treatment. In addition to these standards, stroke regions should develop strategies to improve access to advanced imaging throughout the region.

Note: These standards are not intended to address practices for patients presenting within 6 hours of stroke symptom onset. It is expected that community hospitals have already established processes consistent with their regional stroke system of care and designated tpa/EVT hospitals to respond to patients who may be eligible for tPA (i.e. present within 4.5 hours of stroke symptom onset) or EVT. This infrastructure ensures stroke patients receive access to highly specialized, quality stroke care that is timely, safe and effective.

1.0 Patients Presenting in the 6-24 Hour Time Window of Stroke Symptom Onset

1.1 Initial ED Evaluation

- 1.1.1 All patients with suspected ischemic stroke who arrive within 6-24 hours of stroke symptom onset should be screened using a validated Large Vessel Occlusion Screening Tool (e.g. ACT FAST).

1.2 Neurovascular Imaging – Imaging and NonImaging Hospitals

- 1.2.1 Patients with a probable Large Vessel Occlusion Stroke, based on the Large Vessel Occlusion Screening Tool, should undergo immediate brain imaging (within 15 min) as per the established provincial imaging protocol of non-contrast computerized tomography (NCCT), immediately followed by multiphase CT angiography (CTA) (see Appendix A for standard imaging protocol). Note: current evidence for selecting patients for EVT up to 24 hours of symptom onset utilized CT Perfusion (CTP) with quantitative software however this is only currently available at a limited number of designated stroke hospitals.

IMAGING CAPABLE SITES ²	NON-IMAGING SITES
After obtaining imaging, regional stroke processes should be followed to support image interpretation, diagnosis, and rapid transfer of eligible patients to the nearest advanced imaging site and/or EVT capable site.	If immediate NCCT, mCTA imaging is not available, regional stroke processes should be followed to ensure timely transfer of the patient to the most appropriate designated stroke hospital to complete necessary imaging. Note: community hospital should arrange transportation as per local/regional processes.

- 1.2.2 CritiCall Ontario is to be informed if regional processes require their services to facilitate stroke consultation. ‘Life or Limb’ patient consultations require the use of CritiCall.³ If required, a mapping of non-tPA hospitals to the appropriate consultation hospital (e.g. Regional Stroke Centre or District Stroke Centre) should be provided to CritiCall.

² To be considered imaging capable, the site must be able to obtain the appropriate imaging (i.e. Acute Stroke CT/mCTA Imaging Protocol, appendix A) within 15 minutes of patient's presentation.

³ CCSO Life or Limb Policy (2013) and Implementation Guide.

2.0 Regional Processes

The following guiding principles should be considered when developing regional processes.

- 1) Optimize patient experience by ensuring appropriate patient selection and avoiding unnecessary transfers
- 2) Represents an expectation that can be achieved safely, effectively and efficiently
- 3) Reflect best practice
- 4) Enable equitable geographic access
- 5) Ensure responsible use of resources

Note: Regional processes that require cross-region collaboration should be not be developed in isolation. All stakeholders impacted by the process should be involved in the decision-making process.

Written/Submitted by/Date:

These standards were developed in November 2019 and approved by CorHealth's Provincial Hyperacute Stroke Steering Committee in January 2020.

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 (head and neck)
- II. Coronal 5 mm MIP (head and neck)
- III. Sagittal 5 mm MIP (head and neck)
- IV. Axial 30 mm MIP (head only)

b) Second phase (delay)

- I. Axial 2 mm (neck and head)
- II. Axial 30 mm MIP (head only)

c) Third phase (delay) [optional]

- i. Axial 30 mm MIP (head only)