Paramedic Prompt Card for Acute Stroke Protocol

This prompt card provides a quick reference of the *Acute Stroke Protocol* contained in the *Basic Life Support Patient Care Standards* (BLS PCS). Please refer to the BLS PCS for the full protocol.

Indications under the Acute Stroke Protocol

Redirect or transport to the **closest** Designated Stroke Centre* will be considered for patients who meet **ALL** of the following:

1. Present with a new onset of at least one of the following symptoms suggestive of the onset of an acute stroke:
   a. Unilateral arm/leg weakness or drift.
   b. Slurred speech or inappropriate words or mute.
   c. Unilateral facial droop.
2. Can be transported to arrive at a Designated Stroke Centre as follows:
   a. if Endovascular Therapy (EVT) is not regionally available, within 4.5 hours of a clearly determined time of symptom onset or time the patient was last seen in his/her usual state of health; **OR**
   b. if EVT is regionally available, within 6 hours of a clearly determined time of symptom onset or time the patient was last seen in his/her usual state of health.

*A Designated Stroke Center is a Regional Stroke Centre, District Stroke Centre or a Telestroke Centre regardless of EVT capability.

Contraindications under the Acute Stroke Protocol

ANY of the following exclude a patient from being transported under the Acute Stroke Protocol:

1. CTAS Level 1 and/or uncorrected airway, breathing or circulatory problem.
2. Symptoms of the stroke resolved prior to paramedic arrival or assessment**.
3. Blood sugar <3 mmol/L***.
4. Seizure at onset of symptoms or observed by paramedics.
5. Glasgow Coma Scale <10.
6. Terminally ill or palliative care patient.
7. Duration of out of hospital transport will exceed two hours.

**Patients whose symptoms improve significantly or resolve during transport will continue to be transported to a Designated Stroke Centre.

*** If symptoms persist after correction of blood glucose level, the patient is not contraindicated.

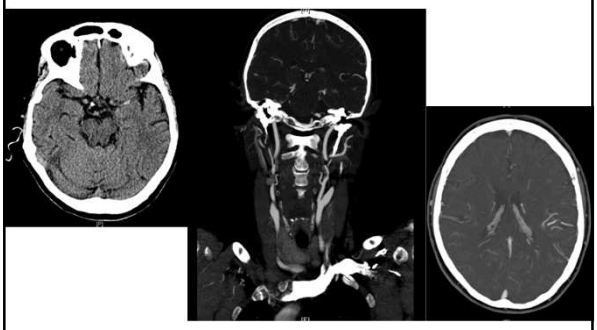
CACC/ACS will authorize the transport once notified of the patient's need for redirect or transport under the Acute Stroke Protocol.

"Clot Alert"

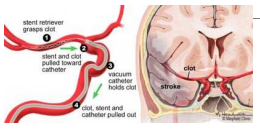
Acute Stroke Protocol

Multiphase CTA Imaging Protocol

- Arterial
  - 0 sec
- Midvenous
  - 11 sec
- Late venous
  - 19 sec



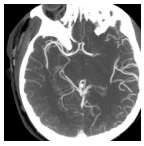
CT Head, CT Angiogram (Arch to Vertex), Delayed Imaging



Clot Retrieval

Who is Eligible?

- 20 % of stroke patients
- With or without IV-tPA
- Disabling stroke
- Stroke symptoms within 6 hours of time last seen normal
- Large blood vessel blockage with a reachable clot.
- Brain tissue that is still alive

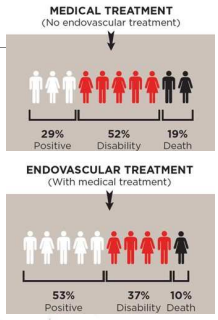


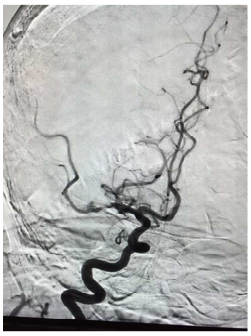
Benefits of EVT

ARR = 23.7%

NNT = 4 (to live independently)

Risk of ICH = 3%





The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

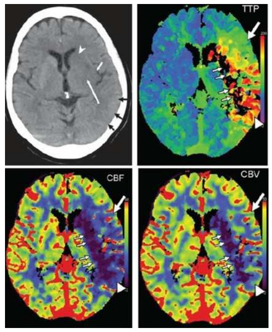
Thrombectomy for Stroke at 6 to 16 Hours with Selection by Perfusion Imaging

G.W. Albers, M.P. Marks, S. Kemp, S. Christensen, J.P. Tsai, S. Ortega-Gutierrez, R.A. McTaggart, M.T. Torbey, M. Kim-Tenser, T. Leslie-Mazwi, A. Sarraj, S.E. Kasner, S.A. Ansari, S.D. Yeatts, S. Hamilton, M. Mlynash, J.J. Heit, G. Zaharchuk, S. Kim, J. Carrozzella, Y.Y. Palesch, A.M. Demchuk, R. Bammer, P.W. Lavori, J.P. Broderick, and M.G. Lansberg, for the DEFUSE 3 Investigators*

The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812 JANUARY 4, 2018 VOL. 378 NO. 1

Thrombectomy 6 to 24 Hours after Stroke with a Mismatch between Deficit and Infarct

R.G. Nogueira, A.P. Jadhav, D.C. Haussen, A. Bonafe, R.F. Budzik, P. Bhuva, D.R. Yavagal, M. Ribo, C. Cognard, R.A. Hanel, C.A. Sila, A.E. Hassan, M. Millan, E.I. Levy, P. Mitchell, M. Chen, J.D. English, Q.A. Shah, F.L. Silver, V.M. Pereira, B.P. Mehta, B.W. Baxter, M.G. Abraham, P. Cardona, E. Veznedaroglu, F.R. Hellinger, L. Feng, J.F. Kirmani, D.K. Lopes, B.T. Jankowitz, M.R. Frankel, V. Costalat, N.A. Vora, A.J. Yoo, A.M. Malik, A.J. Furlan, M. Rubiera, A. Aghaebrahim, J.-M. Olivot, W.G. Tekle, R. Shields, T. Graves, R.J. Lewis, W.S. Smith, D.S. Liebeskind, J.L. Saver, and T.G. Jovin, for the DAWN Trial Investigators*



Hyperacute Stroke Management: The New Era

Objectives

After this session participants will be able to understand:

1. Time is Brain - The New Era
2. Identification of Patients for Stroke Transfer
3. The Important Role of the Paramedic at the Scene
4. The Factors that Improve Stroke Treatment Times
5. Improving Door in to Door Out Time

Paramedics Interpret Prompt Card with 98% Accuracy

Impact of Expanding the Prehospital Stroke Bypass Time Window in a Large Geographic Region

Ian G. Stiell, MD, MSc; Catherine M. Clement, RN; Kristy Campbell, PCP; Mukul Sharma, MD; Doug Socha, PCP, BSc, MA; Marco L.A. Sivilotti, MD, MSc; Albert Jin, MD; Jeffrey J. Perry, MD; Jim Lumsden, BScPT, MPA; Cally Martin, BScPT, MSc; Mark Froats, MD; Richard Dionne, MD; John Trickett, RN, BScN

Background and Purpose—The Ontario Acute Stroke Medical Redirect Paramedic Protocol (ASMRPP) was revised to allow paramedics to bypass to designated stroke centers if total transport time would be <2 hours and total time from symptom onset <3.5 hours. We sought to evaluate the impact and safety of implementing the Revised ASMRPP.
Methods—We conducted a 12-month implementation study involving prehospital patients presenting with possible stroke symptoms. A total of 1317 basic and advanced life support paramedics, of 9 land services in 10 rural counties and 5 cities, used the Revised ASMRPP to take appropriate patients directly to 6 designated stroke centers.
Results—We enrolled 1277 patients with 98.8% paramedic compliance in form completion. Of these, 755 (61.2%) met the redirect criteria and had these characteristics: mean age 72.1 (range 16–101), male 51.1%, mean time scene to hospital 16.7 minutes (range 0–92). Paramedics demonstrated excellent interobserver agreement (κ, 0.94; 95% confidence interval, 0.91–0.96) and 97.9% accuracy in interpretation of the Revised ASMRPP. Prehospital adverse events occurred

and Pre-hospital Preparation

- Establish strong relationship with each paramedic service
- Early recognition; establish time last seen normal; prompt card
- **Pre-notification as soon as Paramedics go in service** notify receiving ER – arriving under *Acute Stroke Protocol X minutes out* (60% of our patients outside of Kingston)

- **Start 2 IVs if possible:**
  for ACP or for PCP trained in autonomous IV starts:
  - 1st in Right AC #18g (#20g min) - used for CT contrast dye
  - 2nd in Left arm above the hand - used for tPA
- **Second patch** 15 minutes out to give update to receiving facility (for those traveling a distance).

"Acute Stroke Protocol" ASP Activation Starts Pre-hospital

- ED Charge nurse/staff receives EMS call
- ED Charge/staff activates ASP through switchboard
- Switchboard activates calls to stroke team (neuro), CT, lab, registration, charge nurses etc
- Team gets ready based on ETA:
  - Stroke team prepares to meet patient/EMS on ED arrival
  - CT prepares for next on scan
  - ED Nurse readies portable monitor, IV/blood draw equipment, Stroke package

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Upon arrival in ED

- Immediate registration
- CT notified of arrival
- Ambulance triage and rapid handover to Stroke team who meet patient at offload; **patient stays on EMS stretcher/monitor**
- Neuro performs NIHSS, may use POCT device
- Nurse starts IVs if not already started and draws blood – right side IV takes priority

Kingston Health Sciences Centre

Move straight to CT within 5 mins Door to 1st CT slice: <10 mins

- Move patient to CT on EMS stretcher
- Nurse/team follow with:
  - ED stretcher
  - ED monitor
  - IV pump
  - Transport kit
  - tPA from Omnicell
  - Stroke package

Kingston Health Sciences Centre

Upon arrival in CT

- Neurologist initiates process for consent
- Entire team assists with transfer to CT table using transfer board; EMS monitor switched to ED transport monitor
- Patient prepared for CT
- EMS Report given to RN; Paramedics leave

Original Article

Improving Door-to-Needle Times for Acute Ischemic Stroke

Effect of Rapid Patient Registration, Moving Directly to Computed Tomography, and Giving Alteplase at the Computed Tomography Scanner

Noreen Kamal, PhD, PEng; Jessalyn K. Holodinsky, MSc; Caroline Stephenson, RN; Devika Kashayp, BA; Andrew M. Demchuk, MD, FRCPC; Michael D. Hill, MD; Renee L. Vilneff, BNSc, MN, RN; Erin Bugbee, BScN, RN; Charlotte Zerna, MD, MSc; Nancy Newcommon, RN, MN, NP; Eddy Lang, MD; Darren Knox, PT; Eric E. Smith, MD, MPH

(*Circ Cardiovasc Qual Outcomes*. 2017;10:e003242. DOI: 10.1161/CIRCOUTCOMES.116.003242.)

Improving DTN

19	18	7	11
Treatment near CT scan	Stretcher to CT offload	Patient registered as unknown	Single stroke activation

Within CT Suite
Door to Needle - target <20 mins

- Multi-phase CTA protocol
- Stroke team informs ER RN if IVtPA candidate.
- RN or neuro mixes tPA + prepares bolus.
- Neuro monitors patient while ER RN prepares tPA infusion.
- Pump may be programmed to receive bolus followed by infusion
  OR neuro administers tPA Bolus.
- RN begins infusion in CT suite – no delay
- RN documents time of bolus/infusion
- If not tPA candidate, tPA returned to Omnicell by ED RN.

Work in Parallel

Kingston Health Sciences Centre

Key to the success of the trials: Speedy interventional teams!

Onset of Symptoms/Last Seen Well		
ABC 2 IVs Prenotification		
Referral Site ED Door		

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Where is EVT Performed?

- In Ontario, there are currently ten hospitals providing EVT.
- Eight provide EVT 24/7 and two provide EVT with an alternate model

EVT Hospitals 24/7:

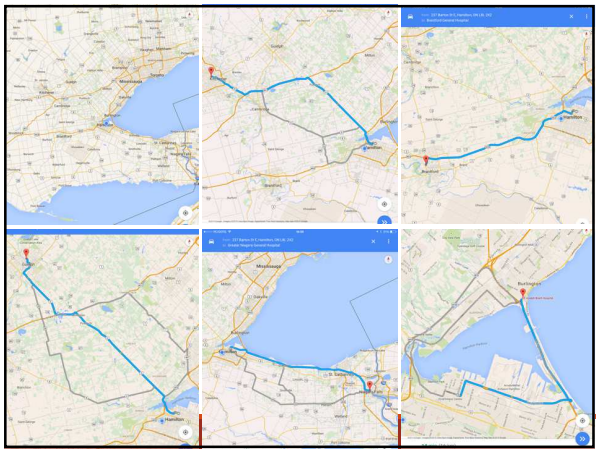
- Hamilton Health Sciences
- London Health Sciences Centre
- St. Michael's Hospital
- Sunnybrook Health Sciences Centre
- The Ottawa Hospital – Civic Campus
- Trillium Health Partners
- University Health Network – Toronto Western
- Kingston Health Sciences Centre

EVT Hospitals Non 24/7:

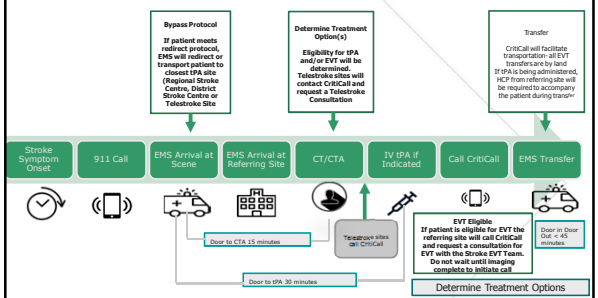
- Thunder Bay Regional Health Centre
- Windsor Regional Hospital

Central South Regional StrokeNetwork

25



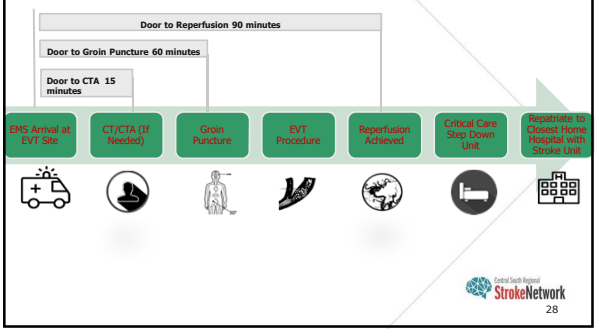
TPA Referring Site



Central South Regional StrokeNetwork

27

EVT Site



28

Canadian Best Practice Targets

Referring Centre and/or tPA Site:

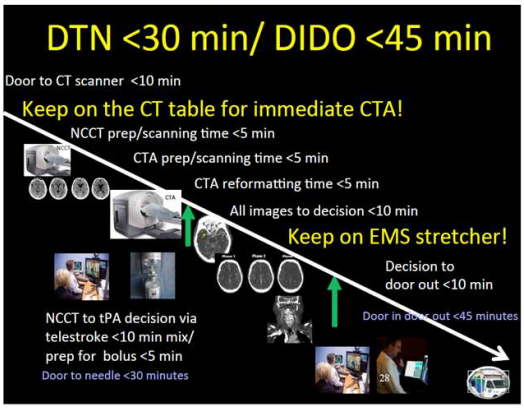
- Door to CTA: 15 minutes
- Door to Needle: 30 minutes
- Door In Door Out: 45 minutes

EVT Site:

- Door (EVT Site) to arterial puncture: 60 minutes
- ED Arrival (EVT Site) to first reperfusion: 90 minutes

29

DTN <30 min/ DIDO <45 min



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QUESTIONS?

McMaster University | MacNeurology
Excellence in Care, Education, and Research