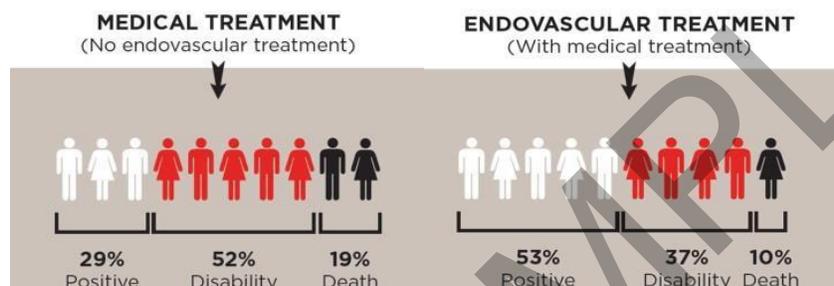


## Stroke Endovascular Thrombectomy KGH Pilot Study: Communiqué

As a Regional Stroke Centre, KGH delivers tertiary level evidence-based stroke care. The current standard of IV tissue plasminogen activator (tPA) treatment is effective for many patients presenting with an acute ischemic stroke. Given new evidence, KGH has approved a Pilot Project to deliver **Endovascular Thrombectomy (EVT) using mechanical clot retrieval for patients with an acute ischemic stroke that meet specific selection criteria**. This new treatment can be given with or without IV tPA.

Five landmark trials were released in 2015 supporting strong evidence for endovascular mechanical clot retrieval (thrombectomy) in hyperacute stroke care. The evidence supports significant improvement in functional outcomes and reduced mortality for select patients that otherwise might respond poorly to IV thrombolysis. Selection criteria include patients with large proximal clots and adequate collateral circulation evident on imaging. These trials have led to the identification of this treatment as a new standard of hyperacute stroke care in the July 2015 update of the Canadian Best Practice Recommendations for Stroke Care (Heart and Stroke Canada).

One landmark trial, the ESCAPE trial, demonstrated improved outcomes in select cases (Figure 1):



M. Hill (ESCAPE) 2015 Figure 1

**Time is brain.** The potential to save brain tissue is highly time dependent necessitating a coordinated response with an extremely well designed process. Those with implementation experience from the study trials highlight the use of clear protocol as a key to success.

### EVT Pilot Study at KGH to Begin May 2016

KGH will begin a pilot study of EVT with 10 patients that meet the ESCAPE trial selection criteria beginning May 2, 2016. To begin with, the treatment will be administered during weekday hours only (Monday-Friday: 0800-1600h). The learning from completion of the 10 cases will inform future planning.

### What is Involved?

EVT consists of arterial catheterization and mechanical removal of large clots occluding a vessel in the brain thus directly promoting reperfusion by recanalization of the artery. This treatment is provided with or without IV tPA. EVT involves a catheter and retrievable stent being inserted into the femoral artery through to the intracranial occlusion. The clot is then pulled out via the retrievable stent device. EVT is an “awake” or conscious sedation procedure performed in the Interventional Radiology (IVR) suite.



Endovascular Mechanical Clot Retrieval retrieved from [www.dicardiology.com](http://www.dicardiology.com)

## Key Endovascular Thrombectomy (EVT) Best Practice Process Elements

### A. Transfer to a Stroke Centre

1. Continue public awareness of stroke signs & symptoms (*Face, Arms Speech, Time- "FAST"*).
2. Rapid recognition of stroke symptoms by paramedics with initiation of Acute Stroke Protocol (ASP) per provincial paramedic prompt card.
3. Patients presenting with potentially disabling acute neurological symptoms suggestive of an acute stroke within 4.5 hours of symptom onset to administration of IV tPA should be considered potential candidates for IV tPA +/-EVT. Paramedics perform glucometer check.
4. Initiate pre-notification to ED as soon as possible.
5. Do not delay transport but when possible, once en route, insert 2 IVs (1 IV with 18 Gauge needle in right antecubital fossa (ACF) is preferred - if unable, use 20 Gauge; second can be in left ACF; must be above the hand). Additional updates to ED en route to include establishment of IVs.

### B. ED Medical Evaluation

1. Upon arrival, patient is registered; notify CT of patient arrival in ED; ambulance triage by RN; print blood labels.
2. Rapid handover from paramedics to ED stroke team (if patient walks into ED, perform rapid triage with recognition of stroke symptoms & initiation of Acute Stroke Protocol).
3. Rapid assessment of all patients with suspected stroke using NIHSS.
4. Establish 2 IVs unless previously started by paramedics (see A5 above)
5. Draw Bloodwork – tubes available in ASP packages for CBC, lytes, urea, creatinine, glucose, INR, PTT, troponin, Type & Hold 2 units & pregnancy test (βHCG) if indicated. Waiting for blood results should not delay treatment with IV tPA +/- EVT unless there is a specific clinical reason.
6. When possible obtain INR using Point-of-Care (POC) device (skill not performed by ED RN).
7. Patient to remain on EMS stretcher until patient is transferred to CT.
8. ED stretcher, monitor, IV pump, transport kit, and tPA from Omnicell-all taken to CT suite
9. Transport to CT department immediately. New target is 10 minutes from ED door (arrival) to CT scan. ED stretcher and monitor to follow patient.
10. Neurologist initiates process for consent for thrombolysis +/- thrombectomy.

Synchronous

### C. Imaging

1. The goal is rapid access to and assessment of brain and vascular imaging.
2. Switch EMS monitor to ED wheeled monitor.
3. Place patient on CT table using CT transfer board. Paramedic(s) leave with EMS stretcher (if not already done, ensure report has been given to nurse prior to leaving).
4. CT Tech to hook up injector for contrast before starting CT-Neurologist to confirm proceeding with IV contrast with CT Tech.
5. Non -Contrast CT and Multiphase CT Angiography (mCTA) are recommended for all patients with acute ischemic stroke.
6. If candidate for IV tPA as per non-contrast CT, mix tPA, prepare bolus & infusion in CT suite prep area. If patient is not a candidate for IV tPA, tPA to be returned to ED Omnicell
7. Selection criteria for EVT is based on **all** 3 of the following:
  - I. Non-Contrast CT of brain - ASPECTS score of 6 or higher (small infarct core); &
  - II. CTA (arterial phase from aortic arch to vertex of the head) - intracranial large proximal artery occlusion in anterior circulation including middle cerebral artery (MCA) trunk and

its immediate branches with or without intracranial occlusion of the internal carotid artery (ICA); &

III. mCTA - moderate to good collateral circulation

8. Post CT+mCTA, administer tPA bolus by physician in CT Suite. Document time tPA bolus was given. IV tPA is still the standard of care. There should be no delay initiating IV tPA when appropriate as per ASP selection criteria. Canadian Stroke Best Practices recommend new door-to-needle (for IV tPA) time of 30 minutes.
9. Transfer patient to CT Suite prep room while mCTA is interpreted.
10. Contact IVR if potential candidate for EVT.
11. Remove clothes.
12. Insert Second IV and draw Bloodwork if not already done prior to CT (see B4 & B5 above).
13. Insert Foley Catheter prior to IV tPA Infusion only if potential EVT candidate.
14. Initiate IV tPA infusion. If patient is not a potential candidate for EVT, return to ED after tPA infusion started (no foley required).
15. Continuous cardiac & SpO2 monitoring; CNS & BP q 15 minutes during IV tPA infusion.
16. Once mCTA interpretation has been completed (see C4 above) and decision made to proceed to EVT, initiate bed planning-notify K2ICU Charge & K2ICU Intensivist.
17. Transfer patient to IVR when IVR suite is ready.
18. Inform family to wait in IVR waiting room.

D. Procedure in IVR

1. Prepare IVR suite while tPA is being started in CT Suite. EVT is indicated in patients who have received IV tPA and those who are not eligible for IV tPA.
2. EVT should not be performed when general anesthesia and intubation is required. Conscious procedural sedation is all that is needed in most cases.
3. Continuous cardiac, blood pressure and SpO2 monitoring.
4. Time from the first slice of non-contrast CT to groin puncture should be 60 minutes or less.
5. Time from 1<sup>st</sup> slice of non-contrast CT to onset of reperfusion time (TICI 2b/3 revascularization) should be 90 minutes or less.
6. In most cases, femoral sheath is removed in IVR with Angio-Seal placed.

E. Post Procedure Management

1. Patients require care in K2ICU unit as soon as possible.
2. Follow Ischemic Stroke Collaborative Care Plan which includes remaining NPO for 24 hours after which time the Screening Tool for Acute Neurological Dysphagia (STAND) is performed.
3. ECG to be done within 6 hours post EVT if not done in ED.
4. Consider CXR to be done within 24 hours if required.
5. Repeat CT non-contrast 24 hours post procedure.
6. Remove foley catheter 24 hours post procedure.
7. After at least 24 hours or the need for intensive monitoring is no longer needed, patients are transferred to the Acute Stroke Unit (ASU) on Kidd 7 to be cared for by the ASU interprofessional team.



**Key elements for success: TEAMWORK, PROTOCOL, COORDINATION & SPEED**