Mechanical Thrombectomy for Stroke

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• Tuesday, 9h15 am
• 75 y.o. woman develops immediate right arm and leg weakness, and can’t speak.
• 9h27 : paramedics arrive at the house
• Assessment is supportive of acute stroke.
• Decision is made to take directly to KGH ER
• 10h55 am (1h40 min after onset of symptoms)
• Ambulance arrives at KGH ER
• Stroke neurologist and team already notified and waiting for the patient
How many people does it take to treat one stroke in the **first 10 minutes**?

- Patient
- Two Paramedics and Dispatch
- ER physician, charge nurse, bedside nurse
- Hospital operator, ER registration clerk
- CT Technologist, Neuroradiologist
- Stroke neurologist
Hyperacute stroke care kind of looks like this...
QHC’s “pit stop” model

- [https://www.youtube.com/watch?v=ibHm-VE8JAI](https://www.youtube.com/watch?v=ibHm-VE8JAI)
The brain is dying...

- Every minute of ischemia results in the loss of...
  - 2 million neurons
  - 12 km myelinated fibre
  - 14 billion synapses
  - For every hour of ischemia, the brain loses as many neurons as it does over 3.6 years of normal life
Time is Brain

- Door to CT: < 10 minutes
- Door to Needle: < 30 minutes
- CT to start of EVT: < 60 minutes
- CT to reperfusion: < 90 minutes

- For every 9 minutes of delay in reperfusion, 1 out of 100 will have a worse outcome
• 11h00 am (1h45 min after onset of symptoms)
• Patient immediately brought to CT
• Non contrast head CT and multiphase CTA performed.
A = anterior circulation
P = posterior circulation
C = caudate
L = lentiform
IC = internal capsule
I = insular ribbon
MCA = middle cerebral artery
M1-M6 = Territories of MCA cortex
Next stop: IV tPA

• How effective is IV tPA for proximal MCA clot?

• Recall the IV tPA arm of the ESCAPE trial...
Randomized Assessment of Rapid Endovascular Treatment of Ischemic Stroke

- Published Feb 2015
- The inclusion/exclusion criteria are used in the KGH EVT program
- This shows what can be achieved with EVT in an optimized stroke system
IV tPA doesn’t work well for large proximal clots

- Recanalization rate 31.2%
  - With EVT, 72.4%

- NIHSS 0-2 at 90 days 23.1%
  - With EVT 51.6%

- Mortality at 90 days 19%
  - With EVT 10%
Back to the case...

- NIHSS = 22
  - Global aphasia
  - Right hemiplegia
  - Right homonymous hemianopia
- IV tPA given at 1127h (7 minutes after CT)
- Door-needle time: 32 minutes
- Next stop: Angiography suite
Benefits of EVT

- ARR = 23.7%
- NNT = 4 (to live independently)
- Risk of ICH = 3%
The Exit Strategy

• The success of hyperacute stroke care relies on efficient patient flow and smooth transitions from one team to the next

• When these transitions are delayed, the likelihood of something going wrong increases
“Constantly moving...”

Ambulance → Emergency → Interventional Radiology → Intensive Care Unit/Acute Stroke Unit

CT Scanner
Moving to ICU and Acute Stroke Unit

• Communication and planning are essential

• Patient stayed in Angiography Suite for less than one hour total

• Transfer to ICU 17 minutes after reperfusion was achieved
Leaving KGH

• Transitioned to Acute Stroke Unit 27 hours after ICU admission

• Vision and strength returned almost to normal within 2 days

• Walked independently by day 3

• Transferred to Brockville General Hospital Acute Stroke Unit
Leaving Brockville General Hospital

- Patient stayed for three more days in BGH
- Discharged home on day 3
What have we learned?

- Endovascular therapy for acute ischemic stroke is feasible in our region
- Communication and group understanding is critical for success
- EVT changes what is possible in stroke care and saves patients who couldn’t be saved before