

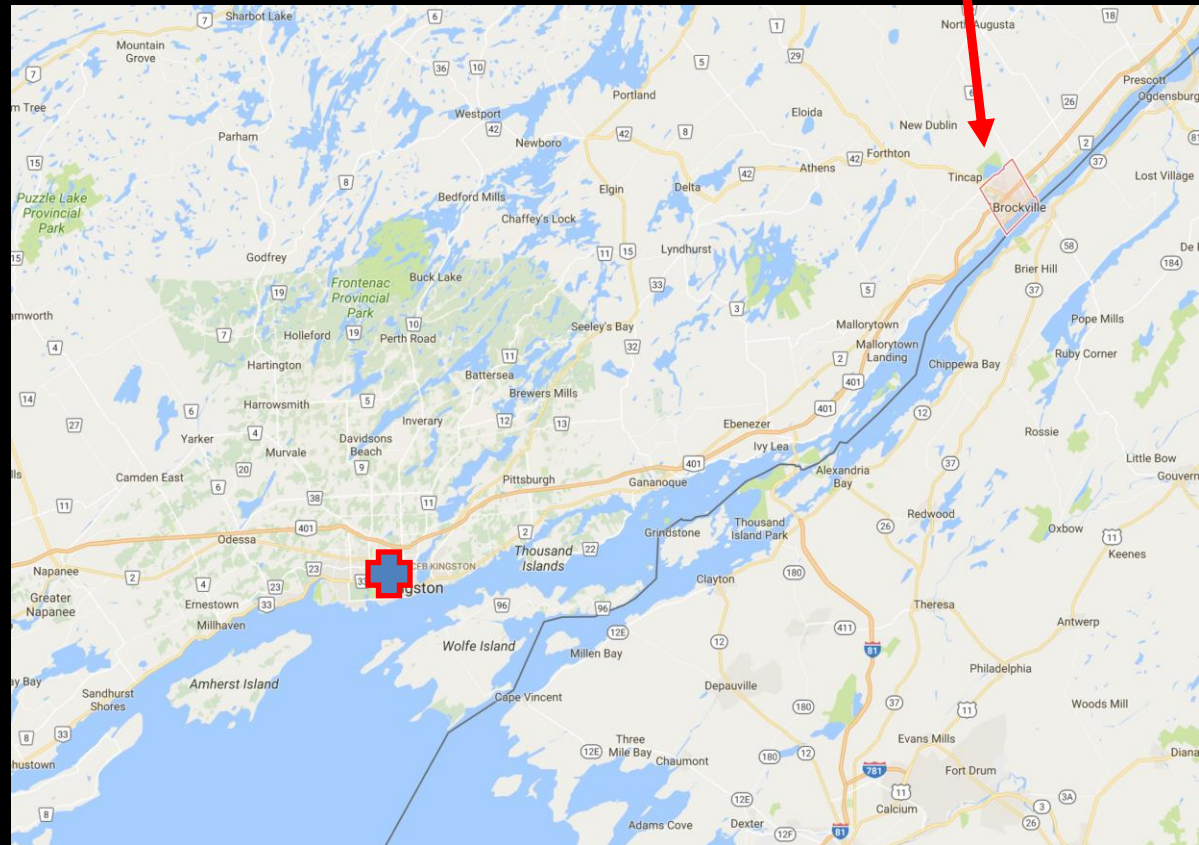
Mechanical Thrombectomy for Stroke

November 23 2016

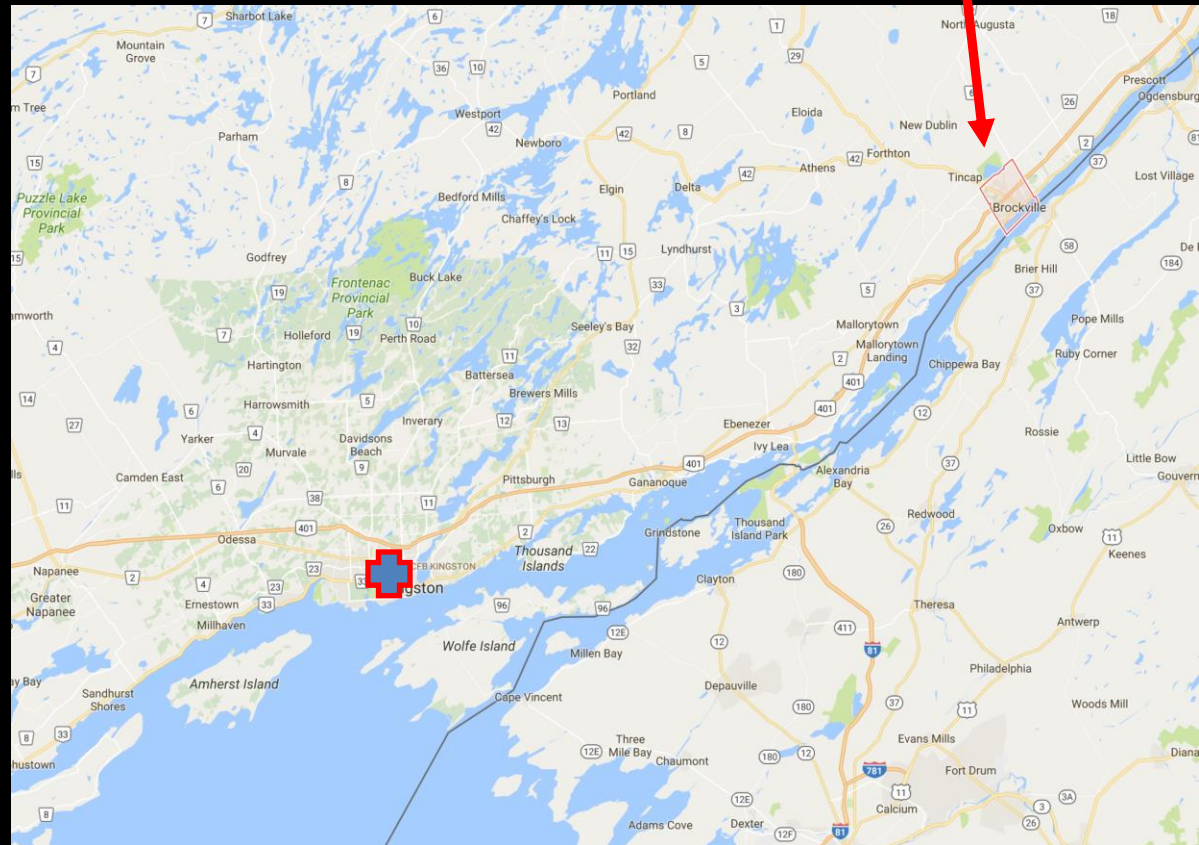
Al Jin

Alexandre Menard

- 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



CT Technologist,
Neuroradiologist



Two Paramedics
and Dispatch



Stroke neurologist



ER physician, charge
nurse, bedside nurse



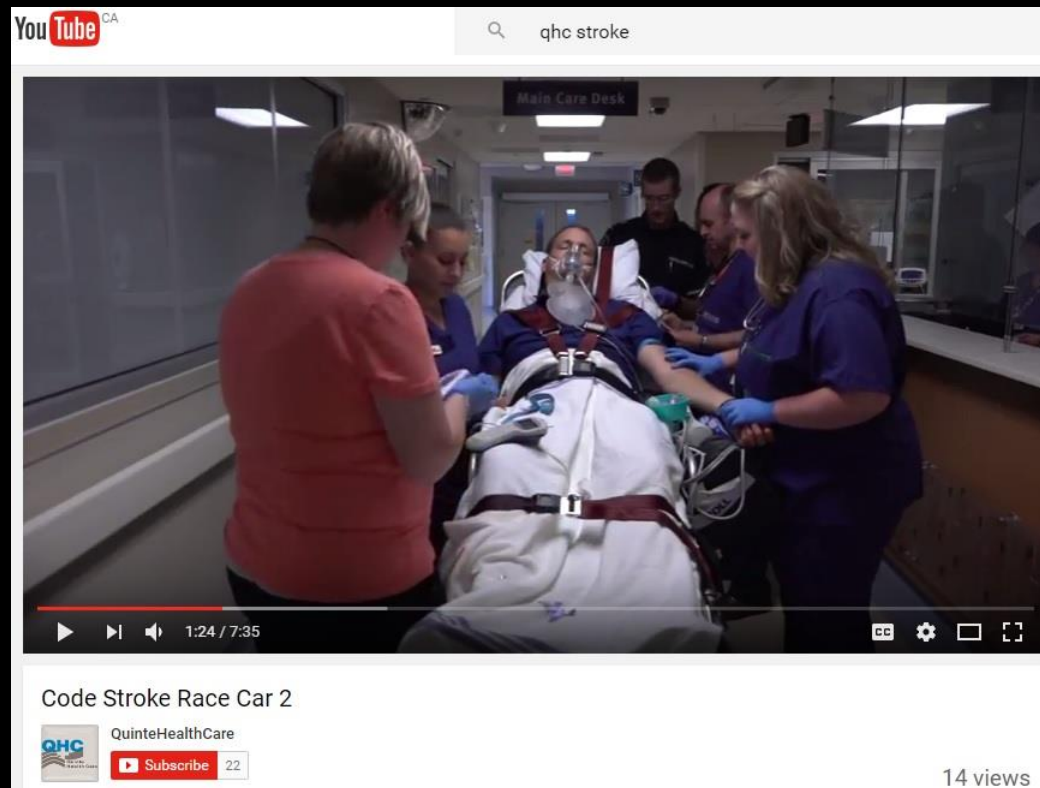
Hospital operator,
ER registration clerk

Hyperacute stroke care kind of looks like this...



QHC's “pit stop” model

- <https://www.youtube.com/watch?v=ibHm-VE8JAI>



The brain is dying...

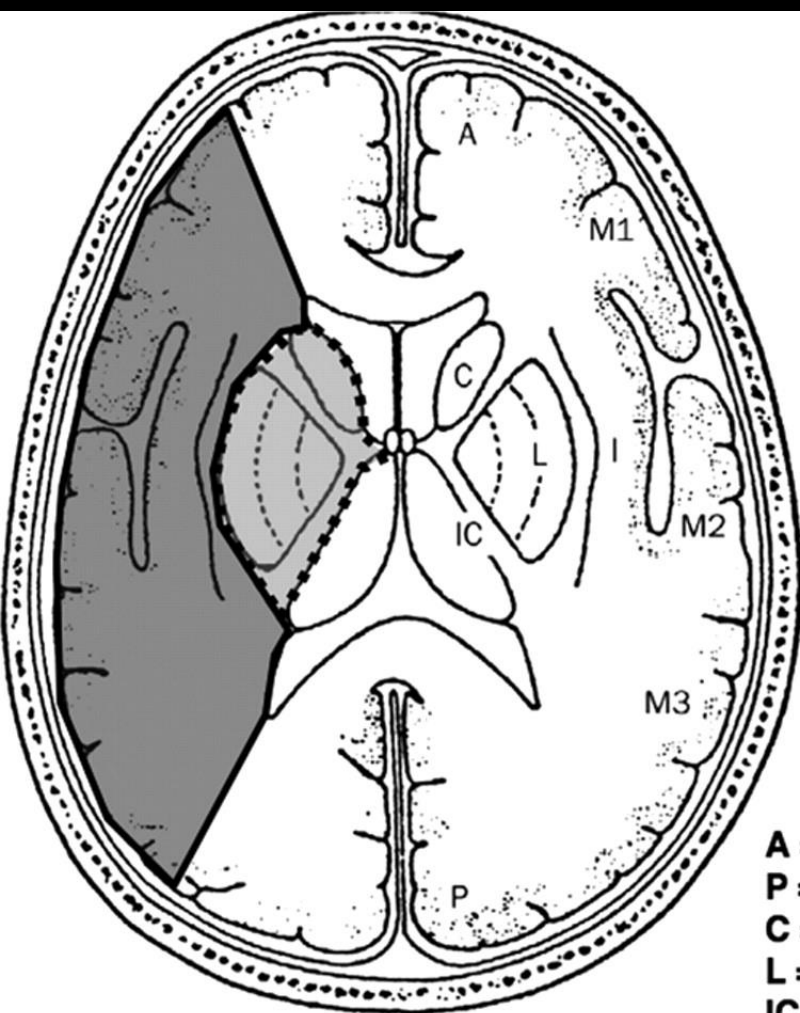
- Every minute of ischemia results in the loss of...
- 2 million neurons
- 12 km myelinated fibre
- 14 billion synapses
- For every hour of ischemia, the brain loses as many neurons as it does over 3.6 years of normal life

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**

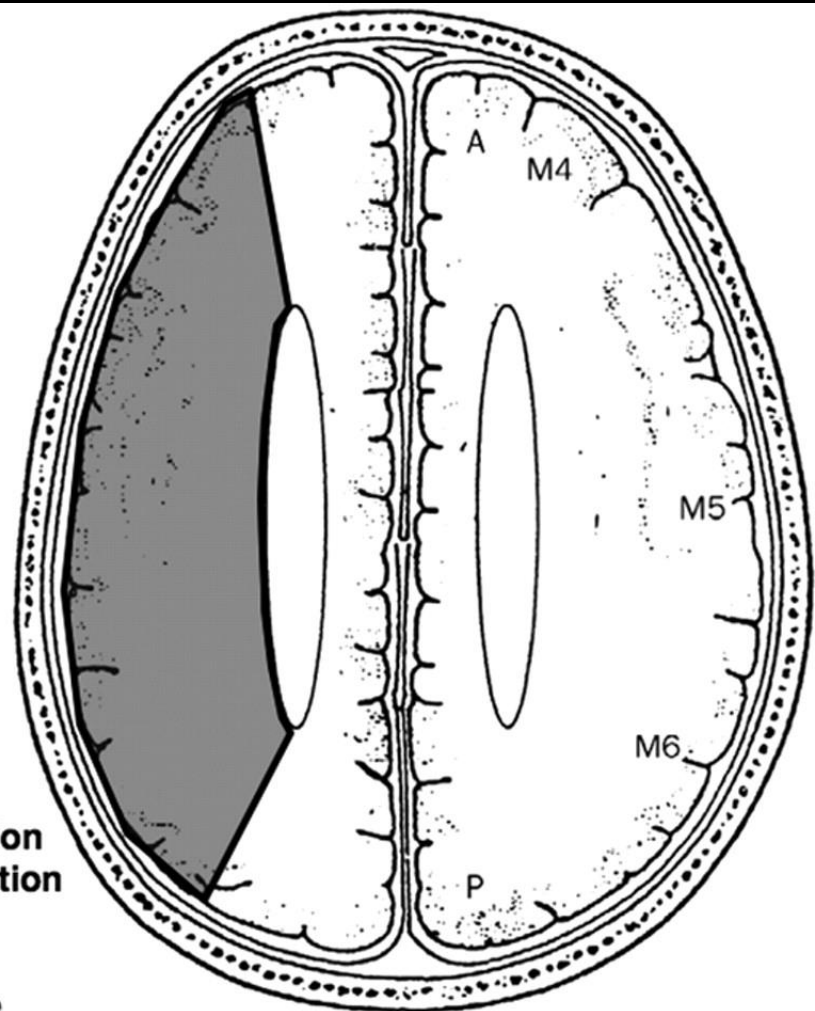
- 11h00 am (1h45 min after onset of symptoms)
- Patient immediately brought to CT
- Non contrast head CT and multiphase CTA performed.



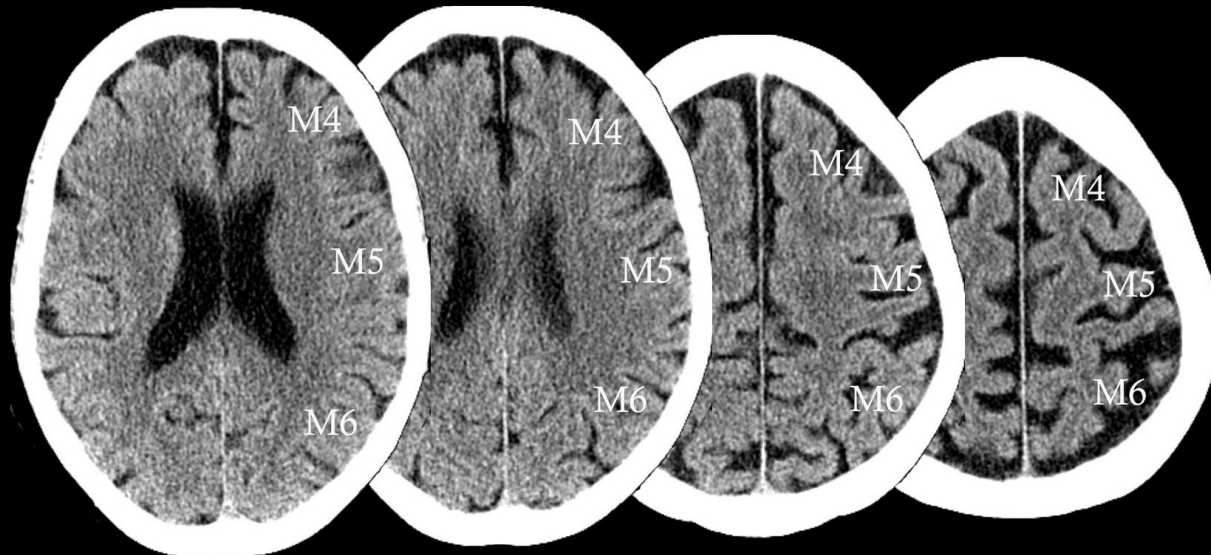
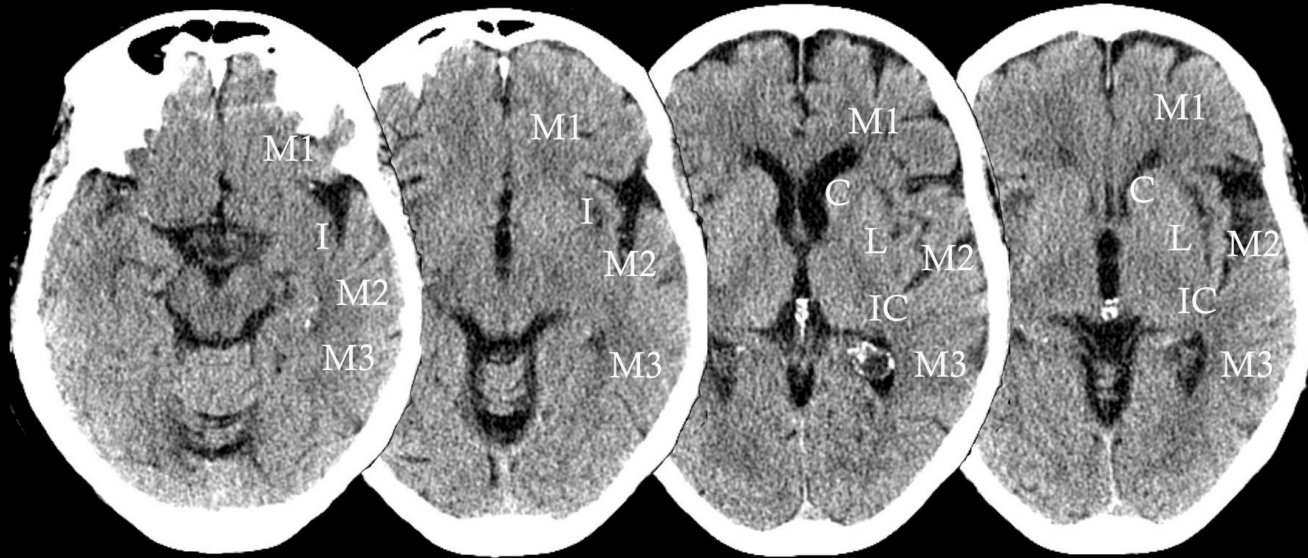


✱ **Subcortical Structures**
 ○ **MCA cortex**

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

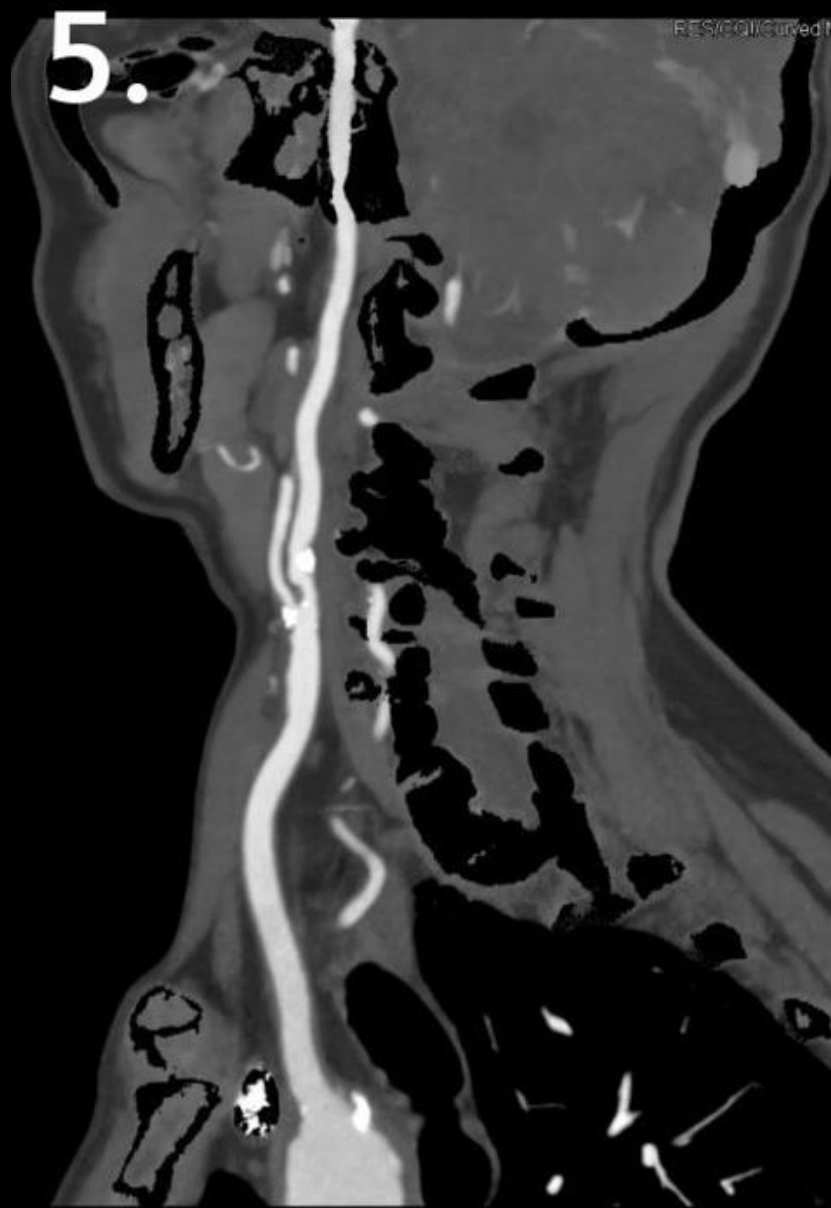
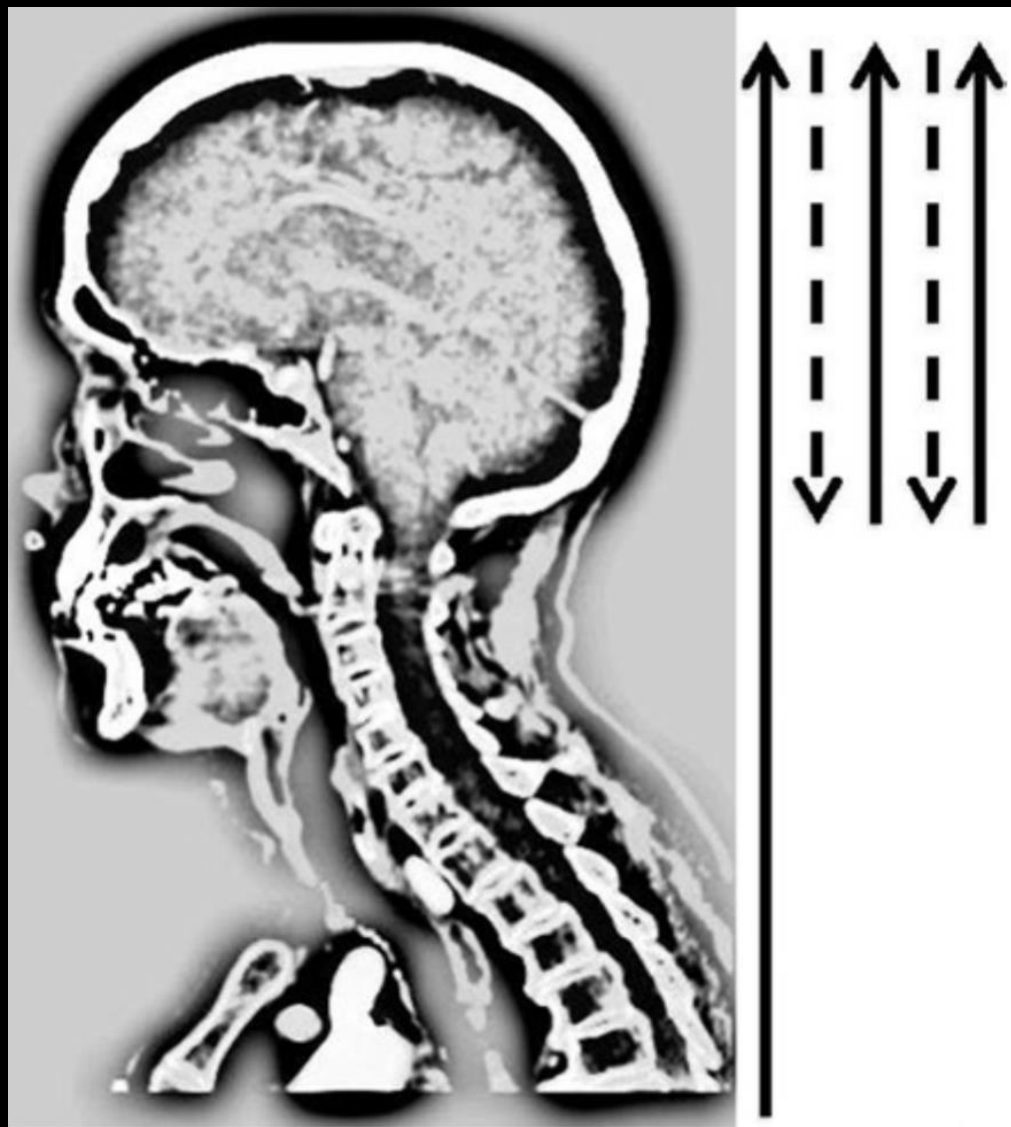


Ganglionic Level



Supraganglionic Level





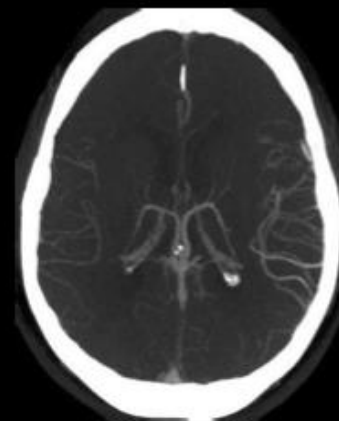
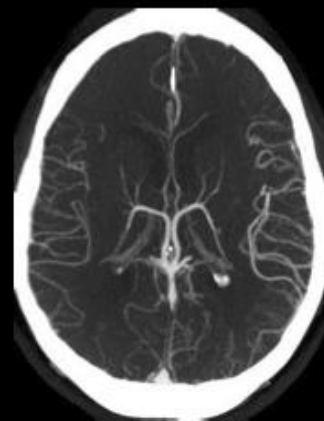
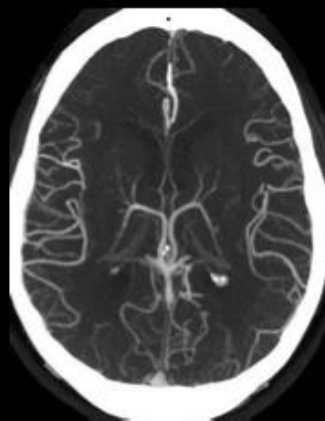
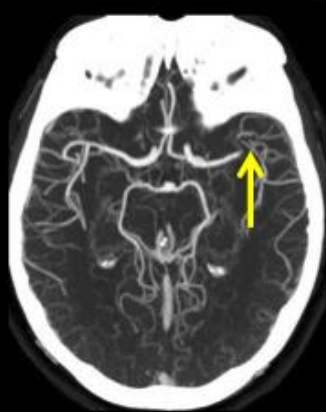
Site of Occlusion

Phase 1

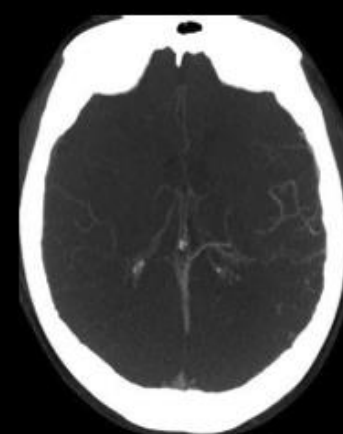
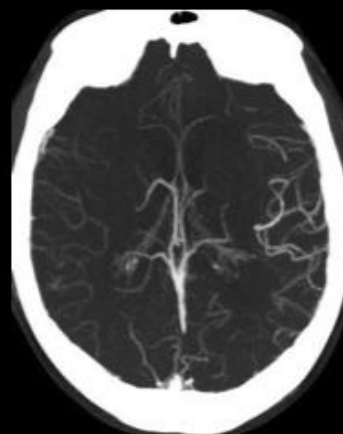
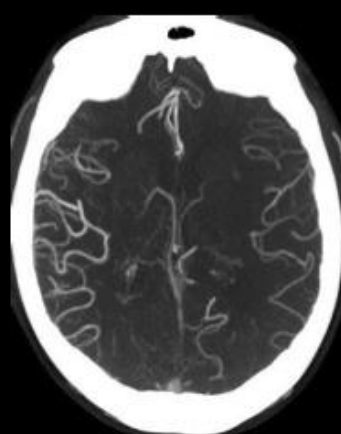
Phase 2

Phase 3

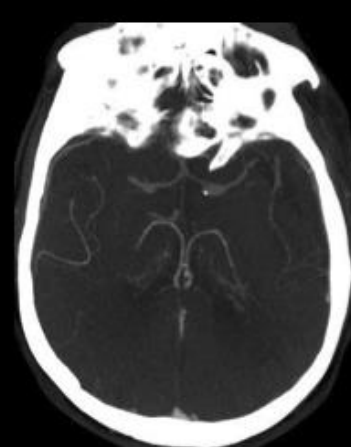
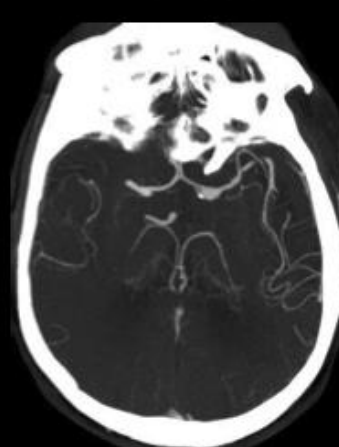
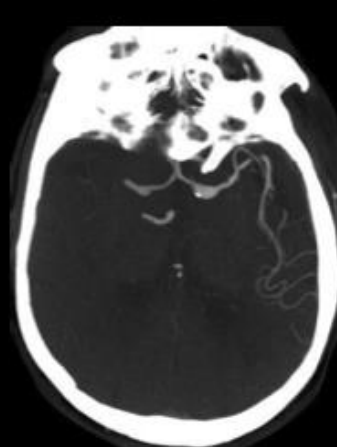
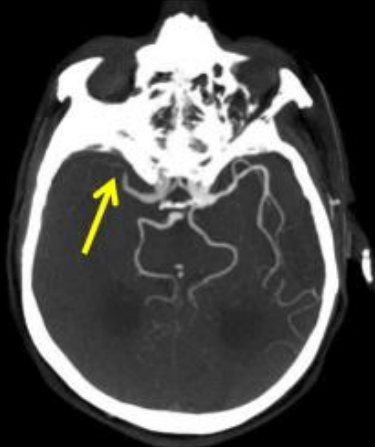
Good
collaterals

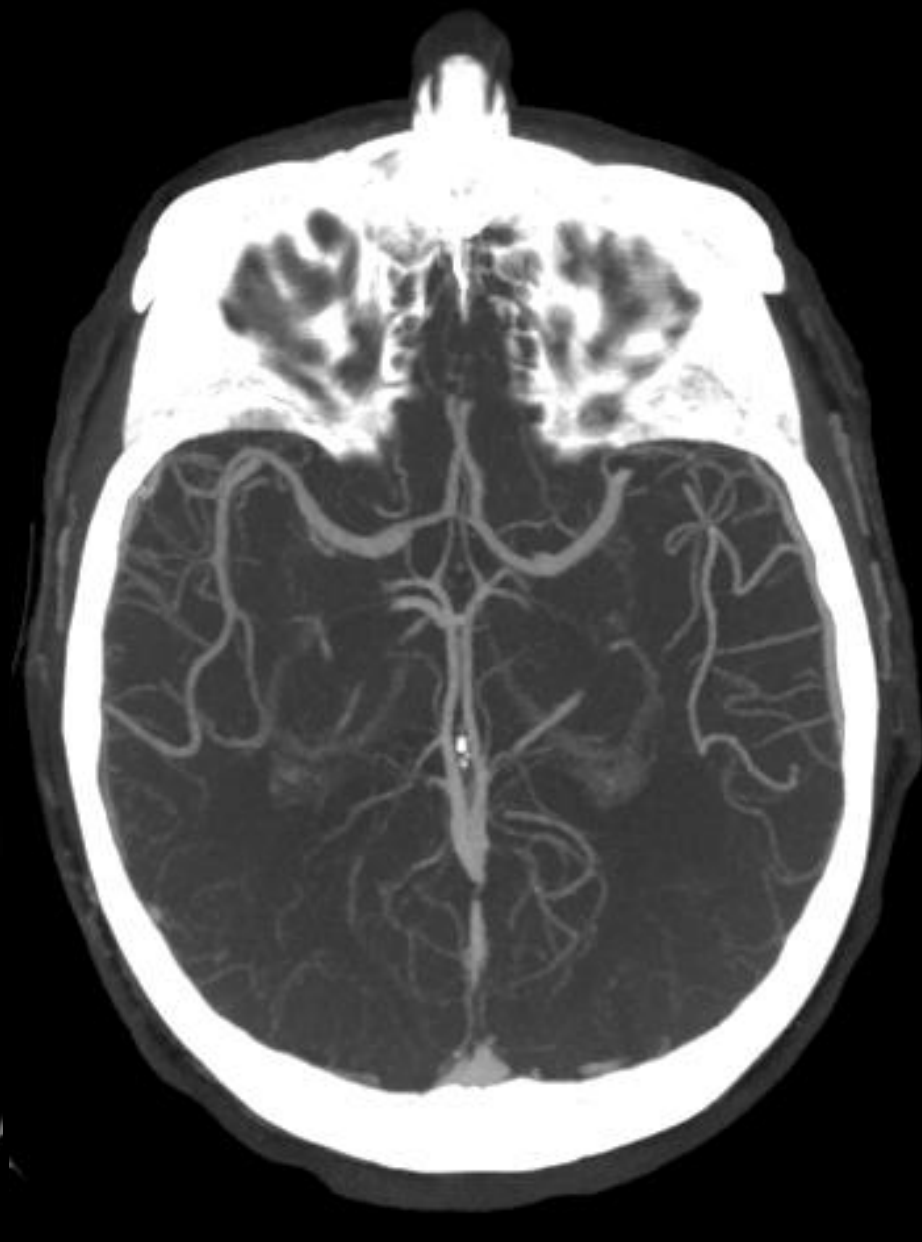
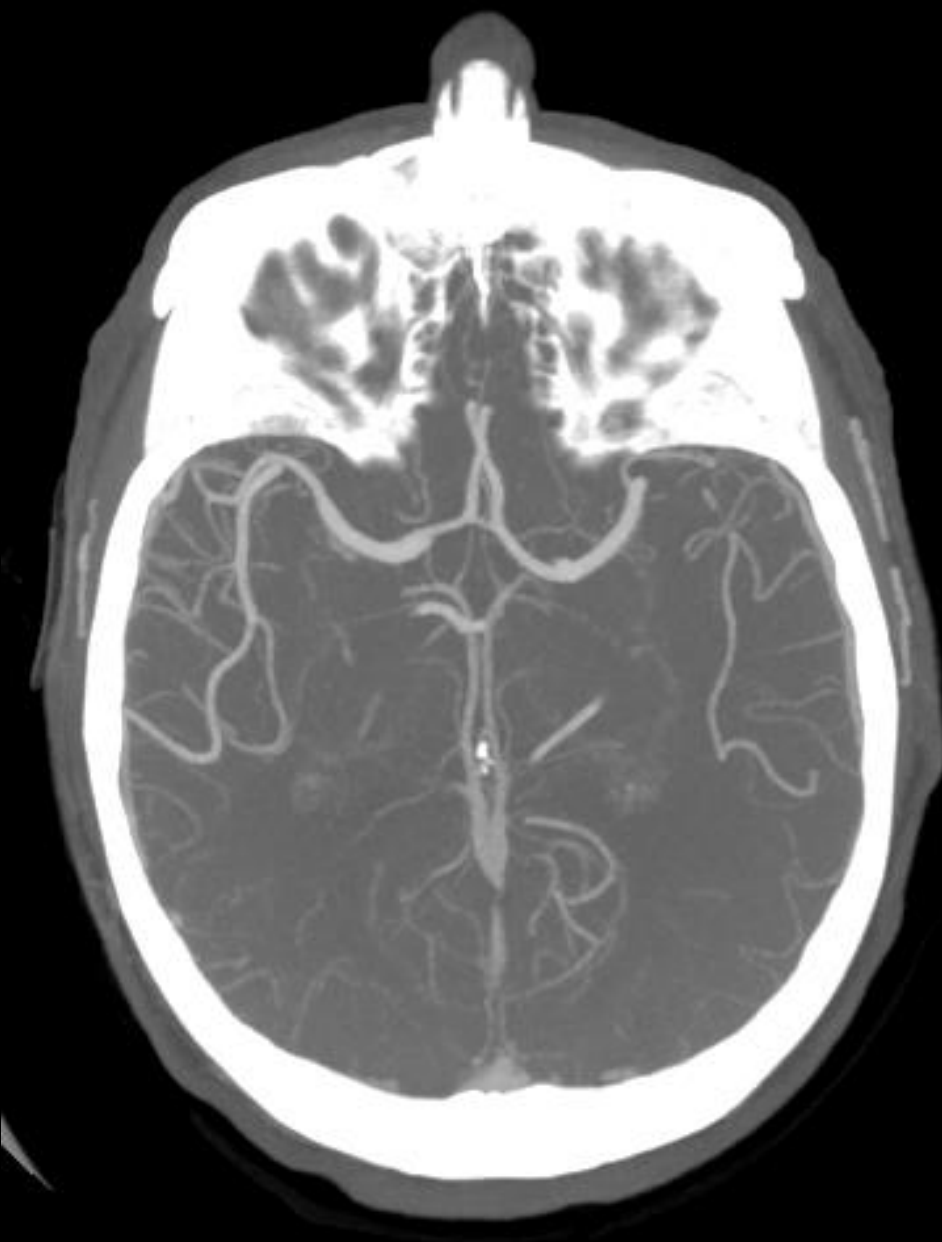


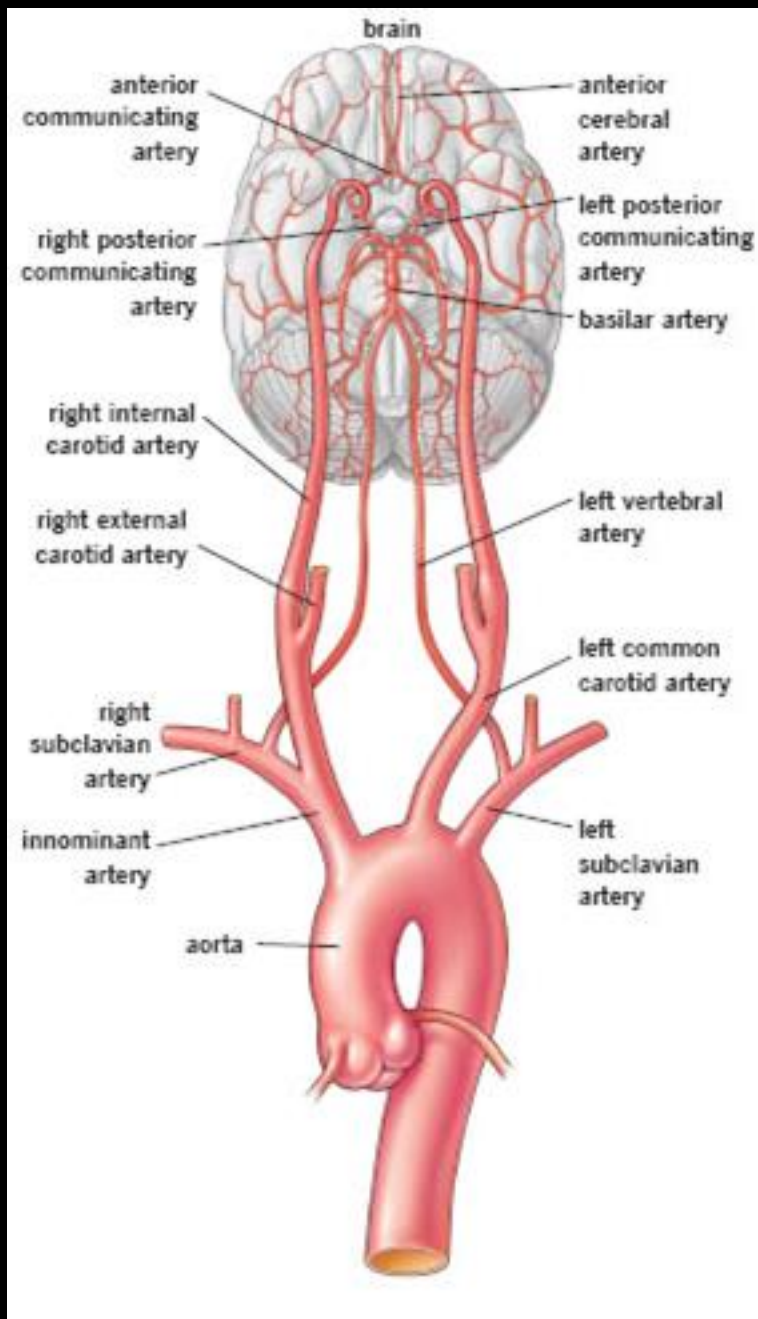
Intermediate
collaterals

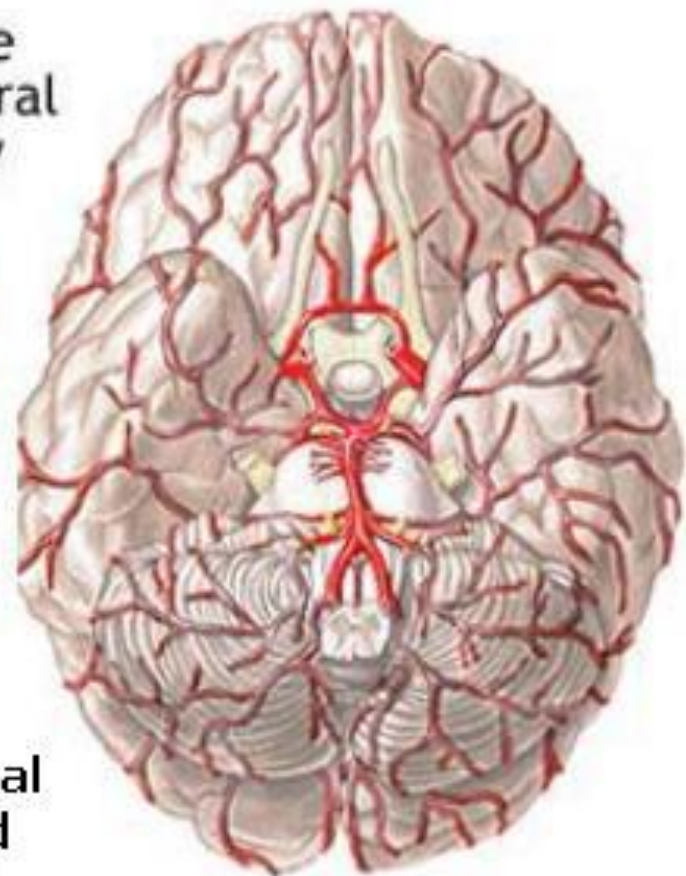
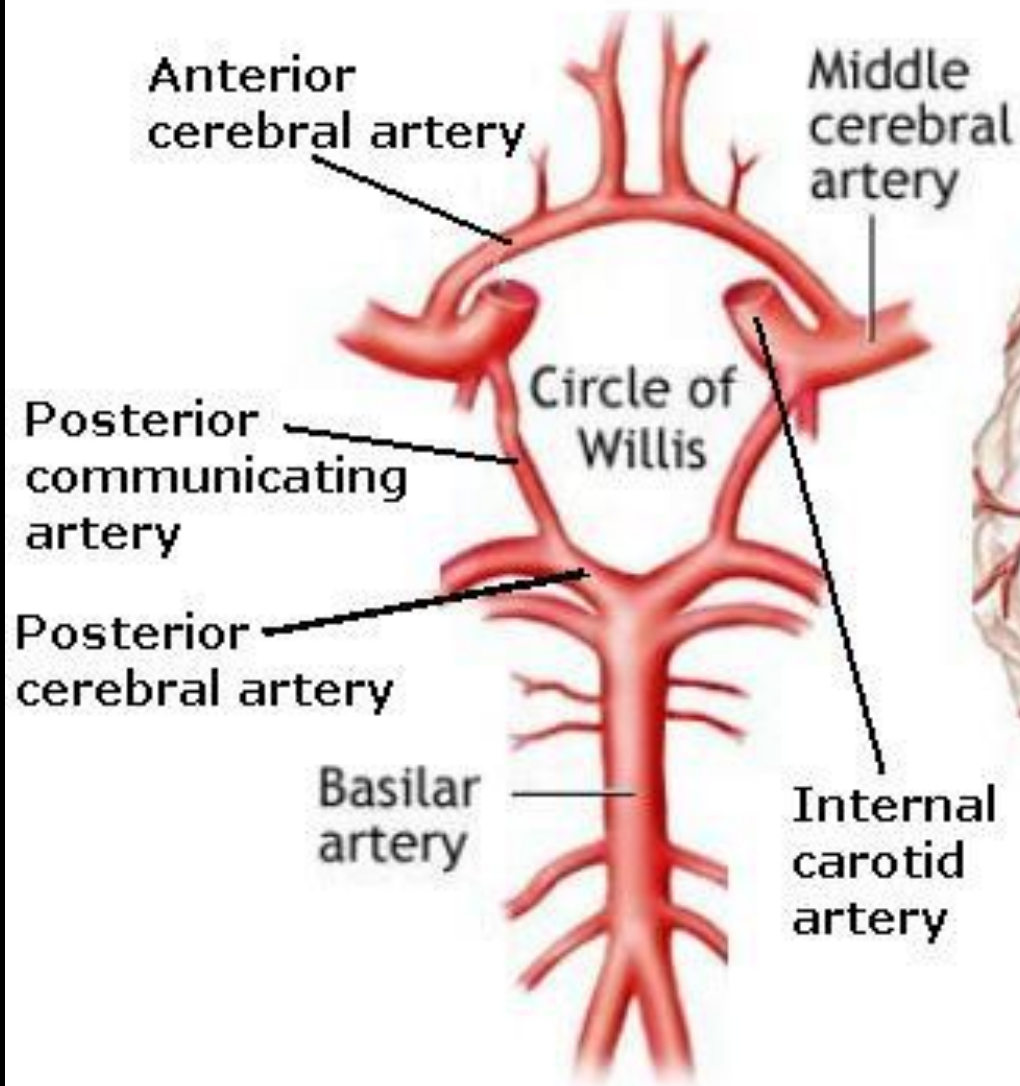


Poor
collaterals









Bottom view of brain

Next stop: IV tPA

- How effective is IV tPA for proximal MCA clot?
- Recall the IV tPA arm of the ESCAPE trial...

ORIGINAL ARTICLE

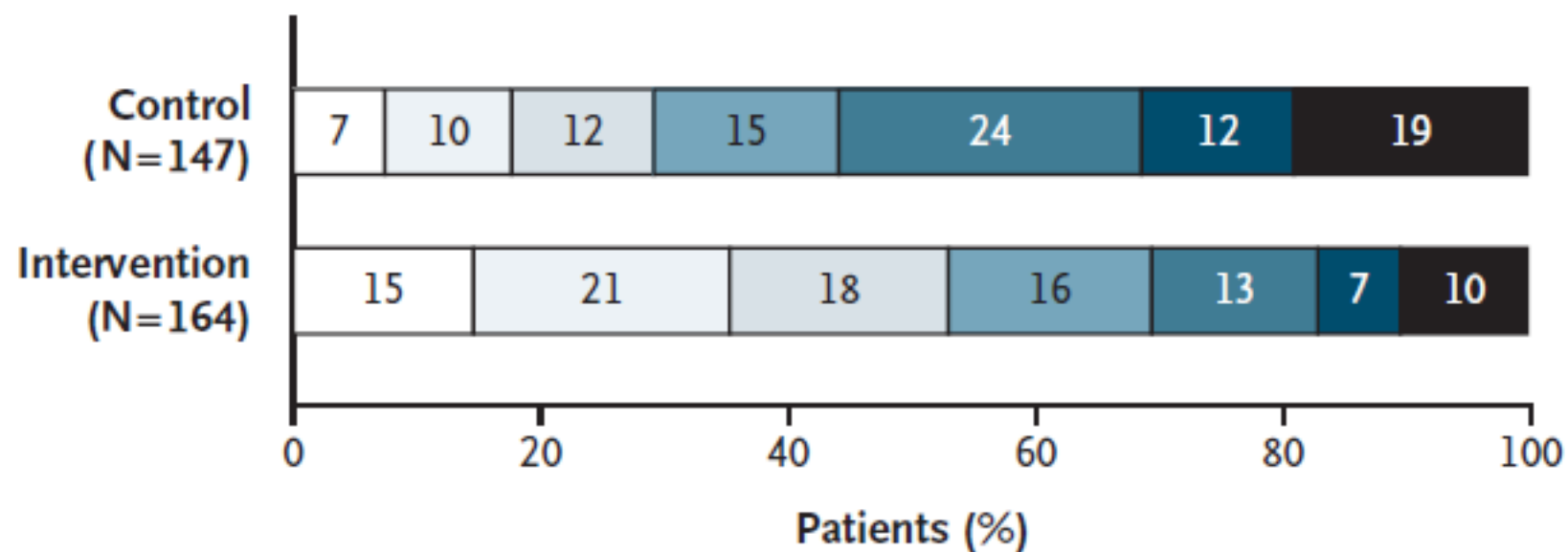
Randomized Assessment of Rapid
Endovascular Treatment of Ischemic Stroke

- 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

Modified Rankin Scale Score

0 1 2 3 4 5 6

A Overall

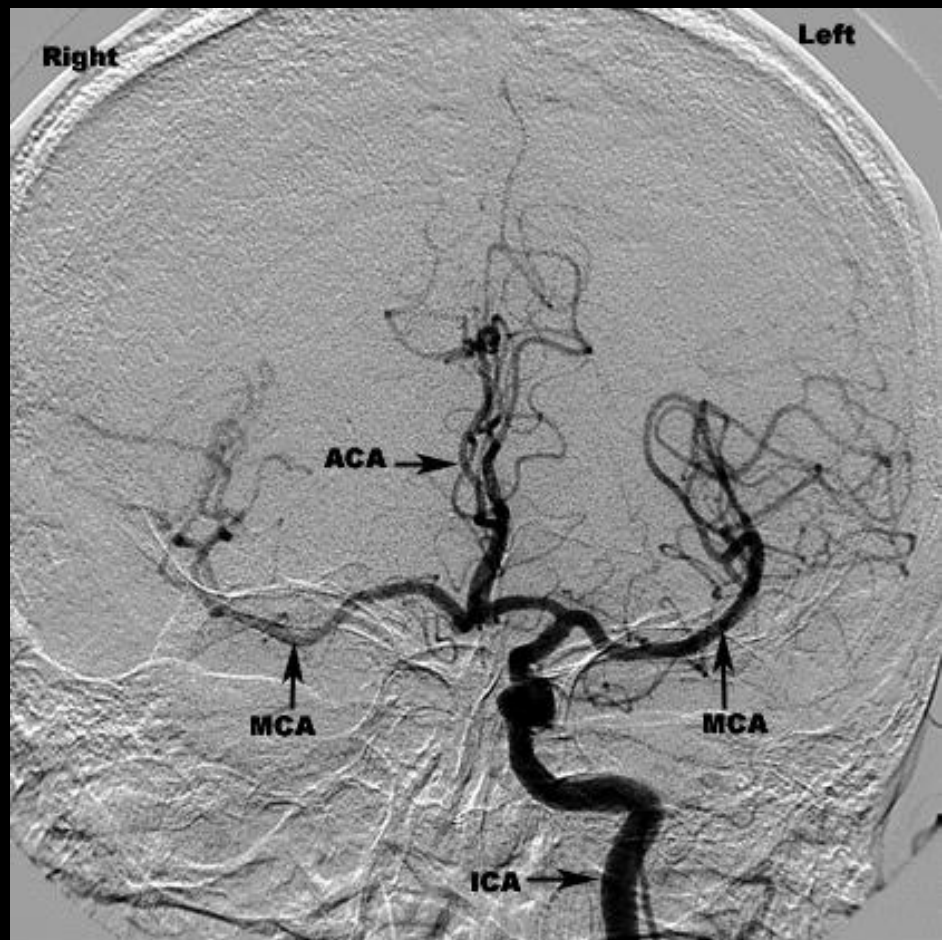


IV tPA doesn't work well for large proximal clots

- 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%**

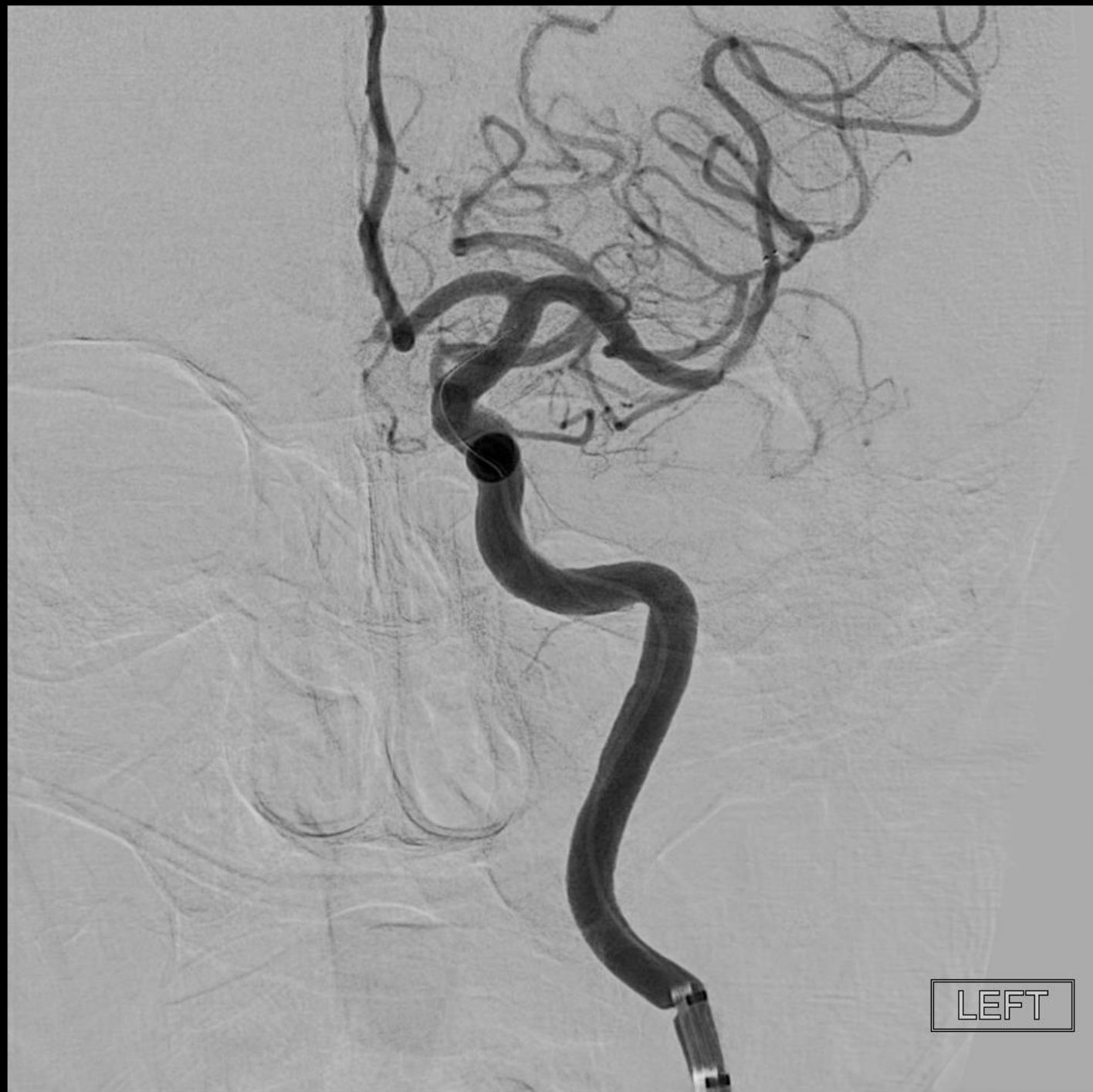
Back to the case...

- 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

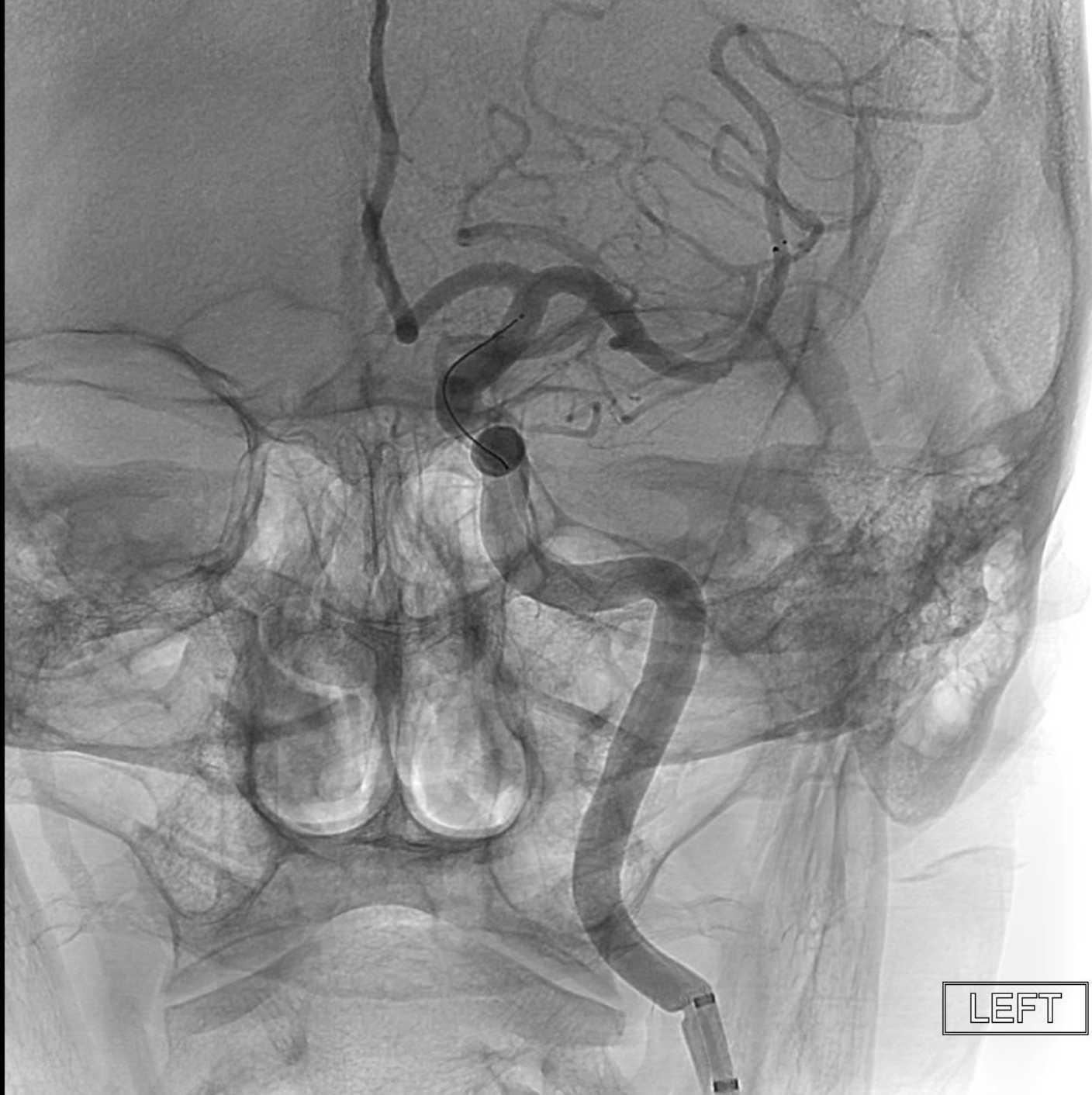




LEFT



LEFT



LEFT



LEFT



Search Participants

Participants: 2

Brian van Adel

(Guest) KNG_KGH_0318_K...

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Acquisition | Reference 1 | LIVE

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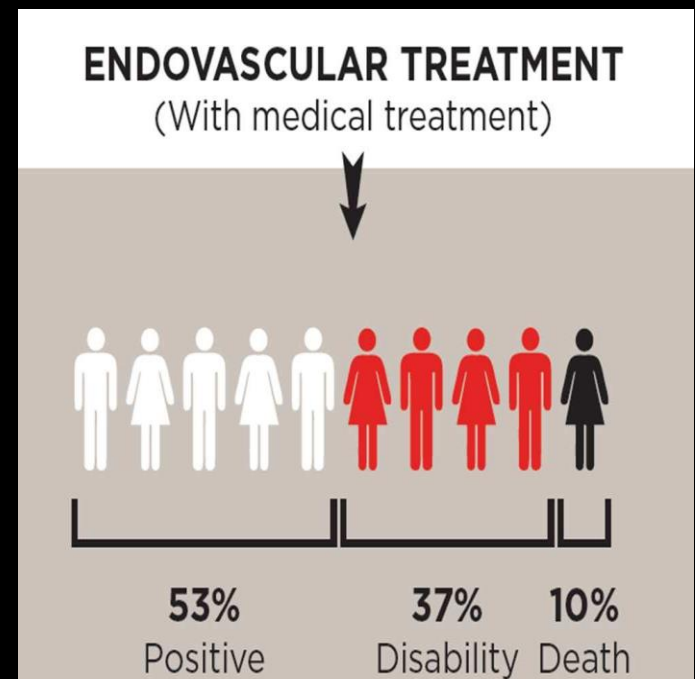
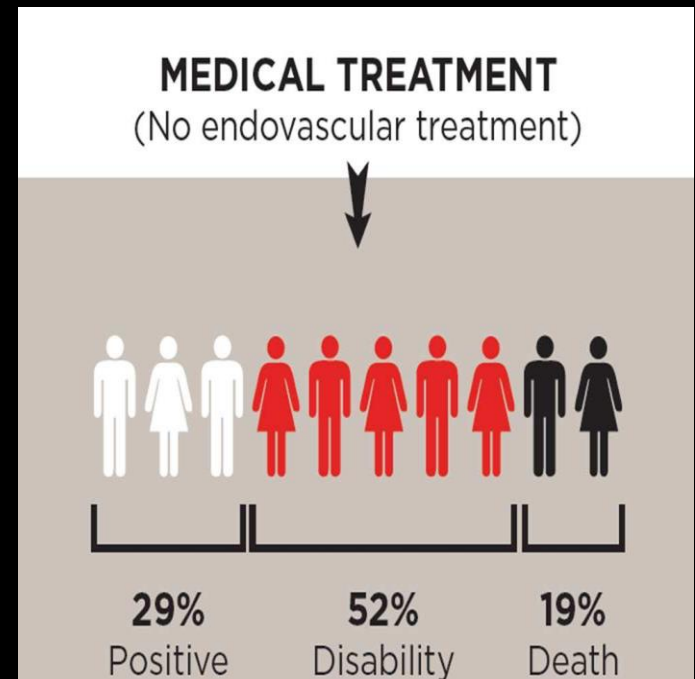




1728 x 1234

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



CT Scanner



Emergency



Interventional Radiology



Intensive Care Unit/
Acute Stroke Unit

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