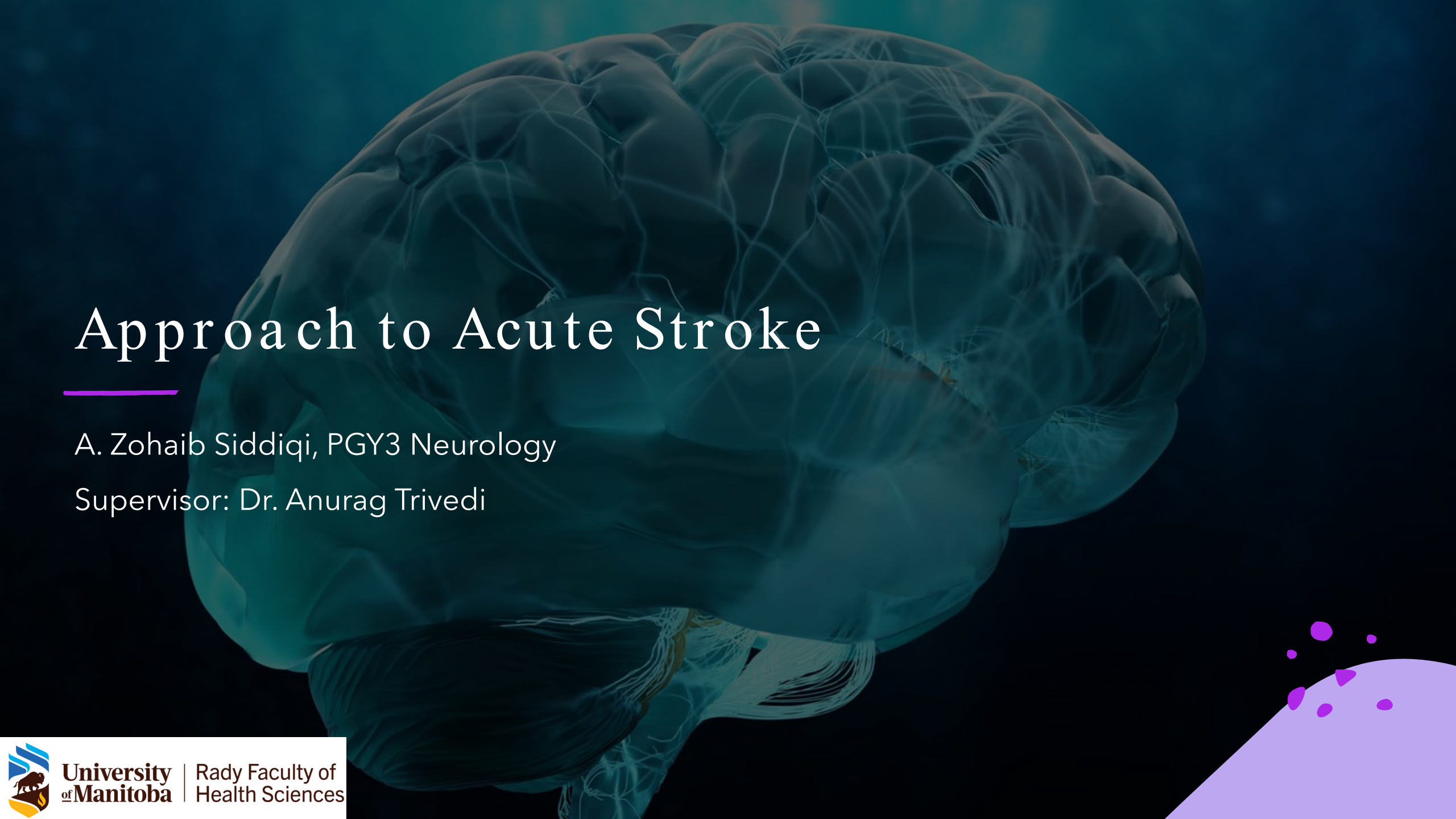

Approach to Acute Stroke

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Disclosures

None

Objectives

1. To learn how to approach a case of acute stroke
2. To review the ASPECTS system through our case
3. To review indications for thrombolysis through our case
4. To review indications for endovascular thrombectomy through our case

Case: HPI

- 77M, last seen normal at 4 AM
- Woke up at 6:30AM with left-sided weakness, left facial droop, and dysarthria
- Patients wife calls EMS as she is concerned patient having stroke
- Arrived at Health Sciences Center by 7 AM

Case: Past Medical Hx and Meds

- DM
- HTN
- BPH
- OSA

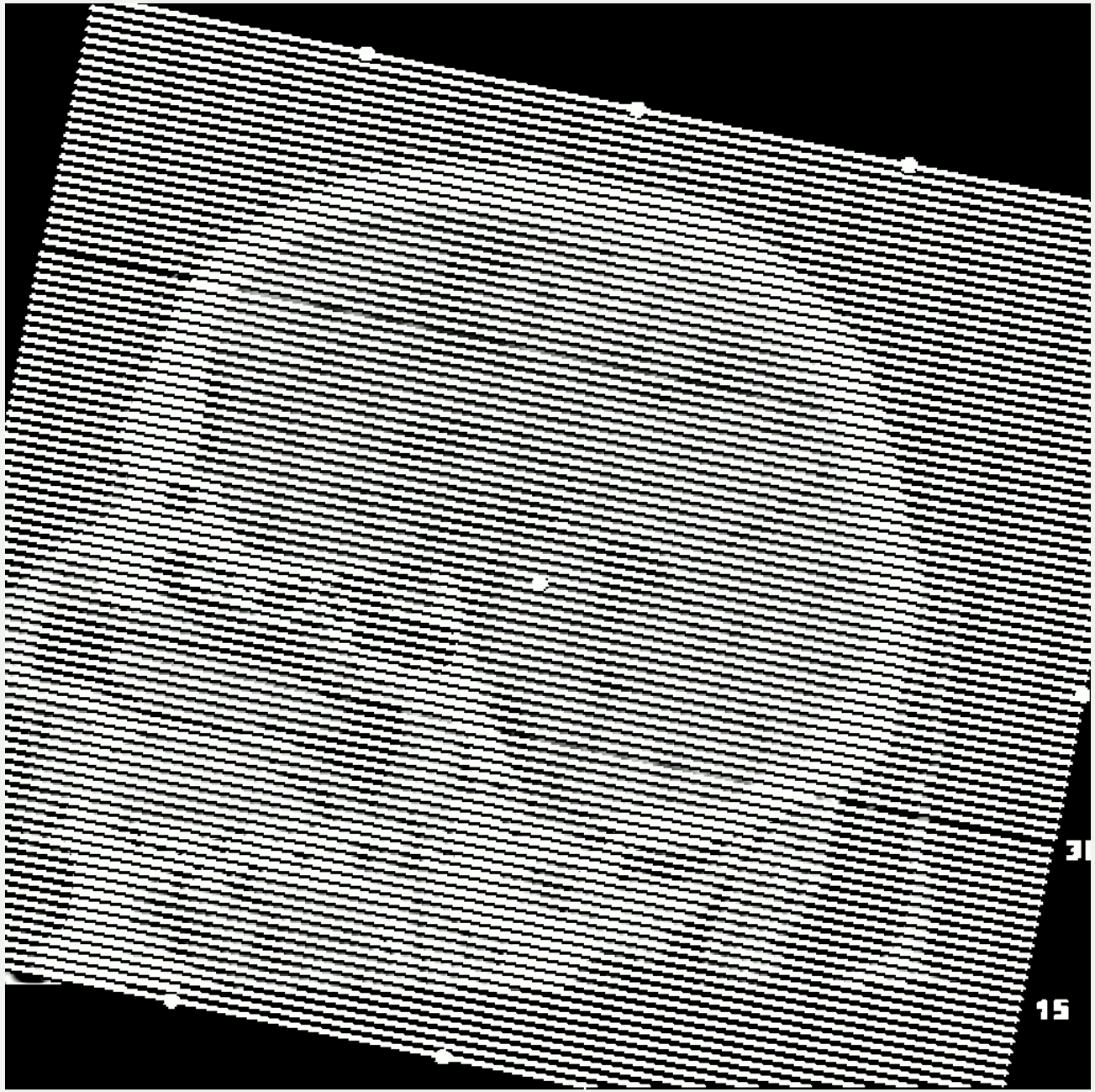
- Metformin 1000mg daily
- Rosuvastatin 5mg daily
- Dutasteride 0.5mg po daily
- Candesartan 2mg daily

National Institute of Health Stroke Scale (NIHSS)

LOC: alert, keenly responsive 0
Answers month and name: 0
Follows commands: 0
Normal horizontal extraocular movements: 0
Visual fields - no visual loss: 0
Minor paralysis with smile asymmetry: **+1**
Left arm drift hits bed: **+2**
No right arm motor drift: 0
Left leg drift hits bed: **+2**
No right leg drift: 0
No limb ataxia: 0
No sensory loss: 0
No aphasia: 0
Dysarthria mild-moderate: **+1**
Significant extinction/inattention: **+2**

Total = 8

CT Brain



Poll 1: What is the ASPECTS?

a) Excellent: 8-10

b) Moderate: 6-7

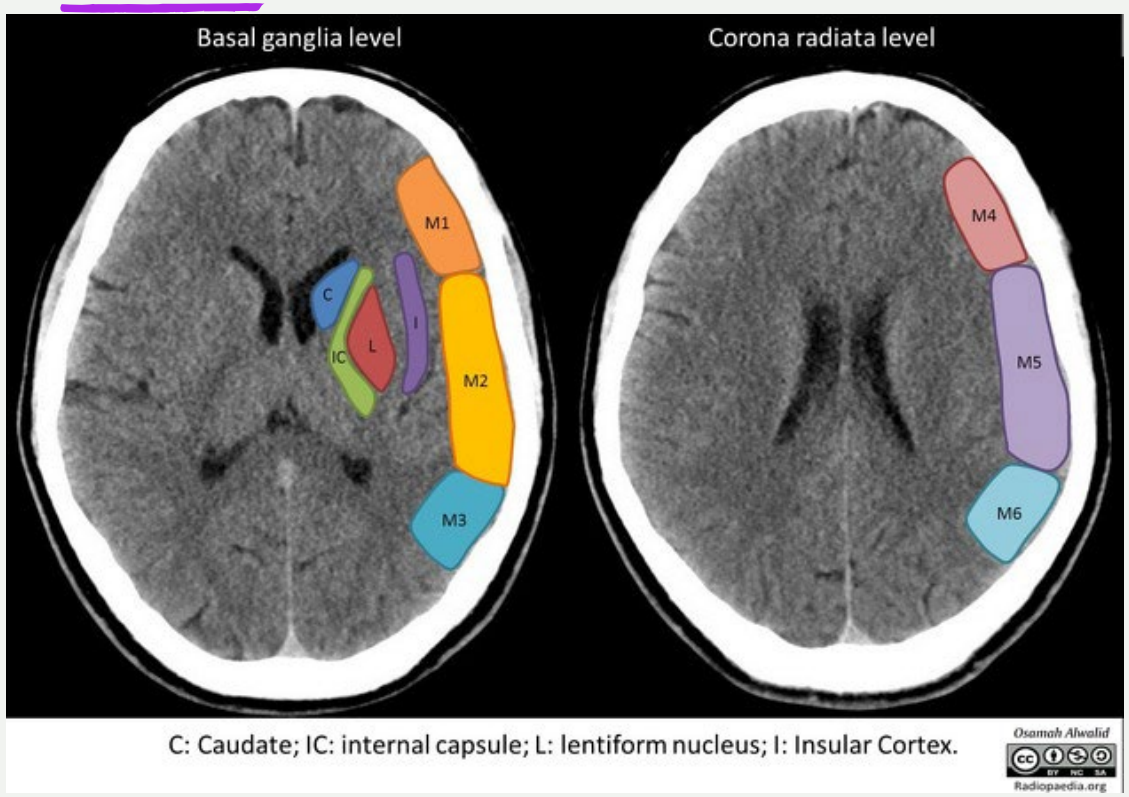
c) Low: 3-5

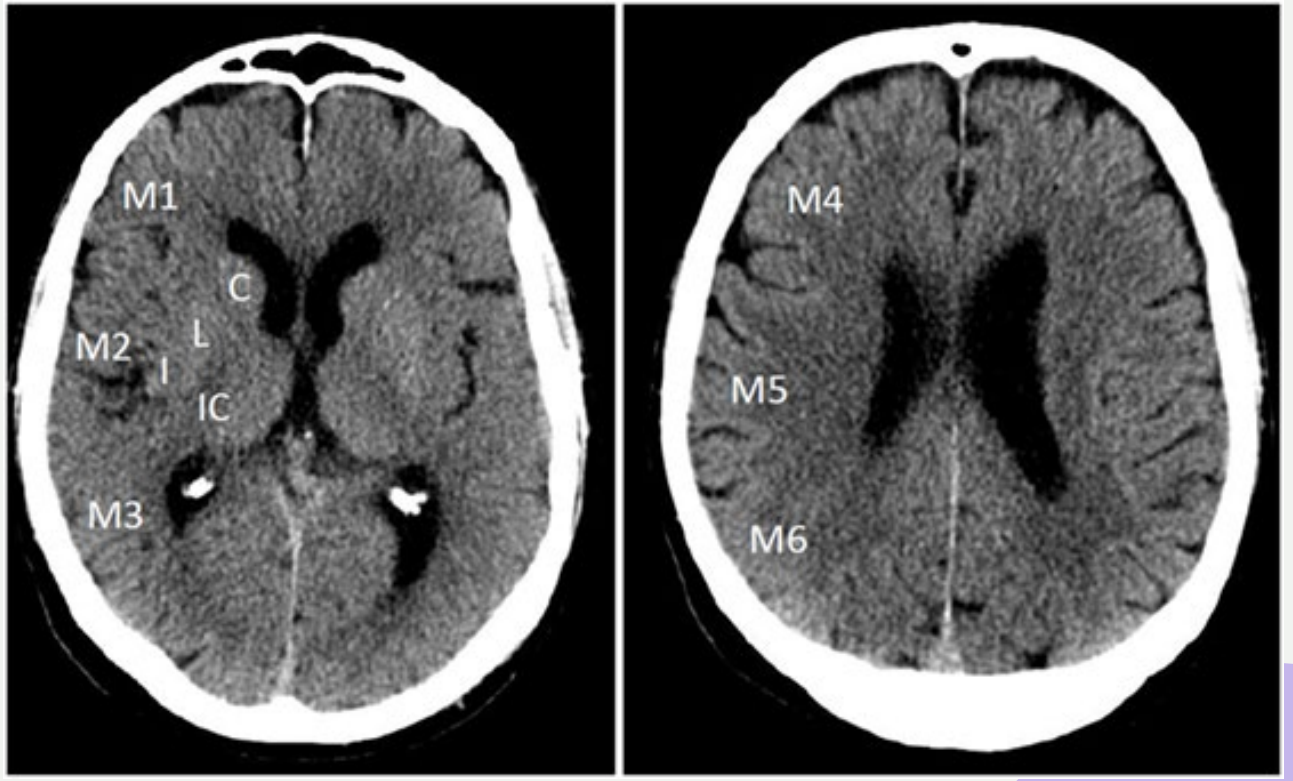
d) Poor: 0-2

e) I have no idea what ASPECTS is.

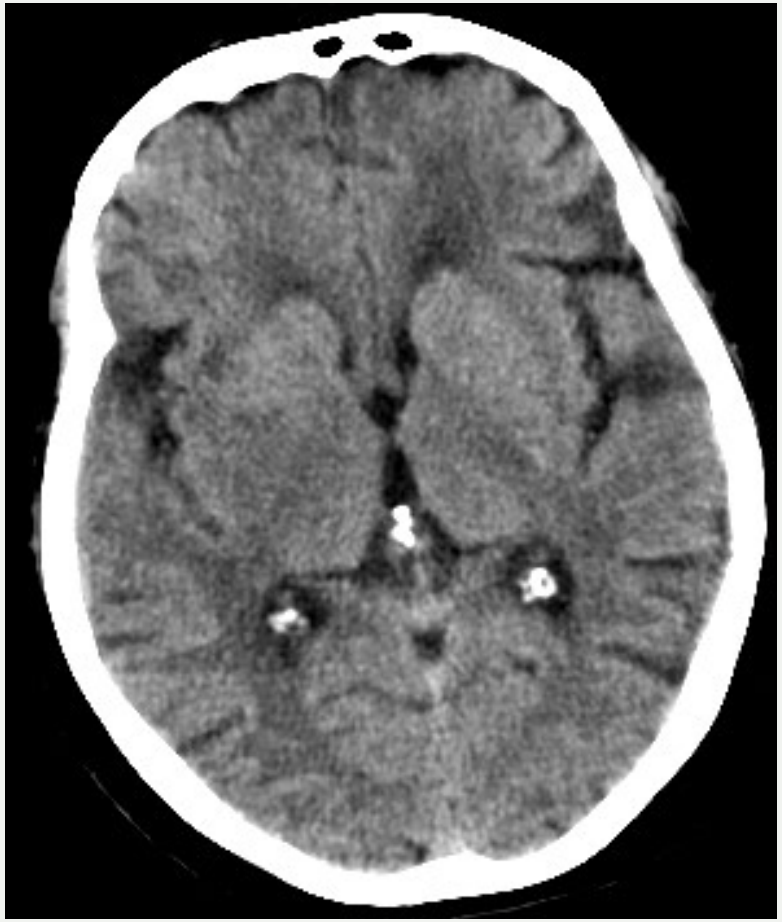
1. Alwalid O, MCA - Alberta stroke program early CT score (ASPECTS) illustration. Case study, Radiopaedia.org
2. Schroder and Thomalla, Front. In Neurol, 2017
3. Barber et al., Lancet, 2000

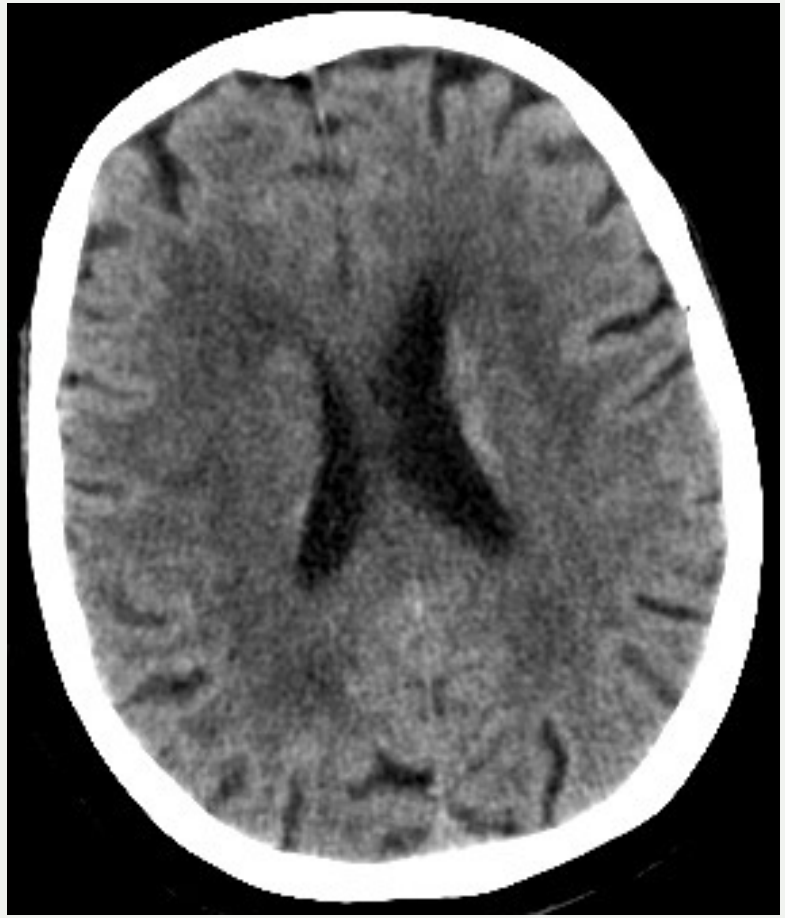
ASPECTS



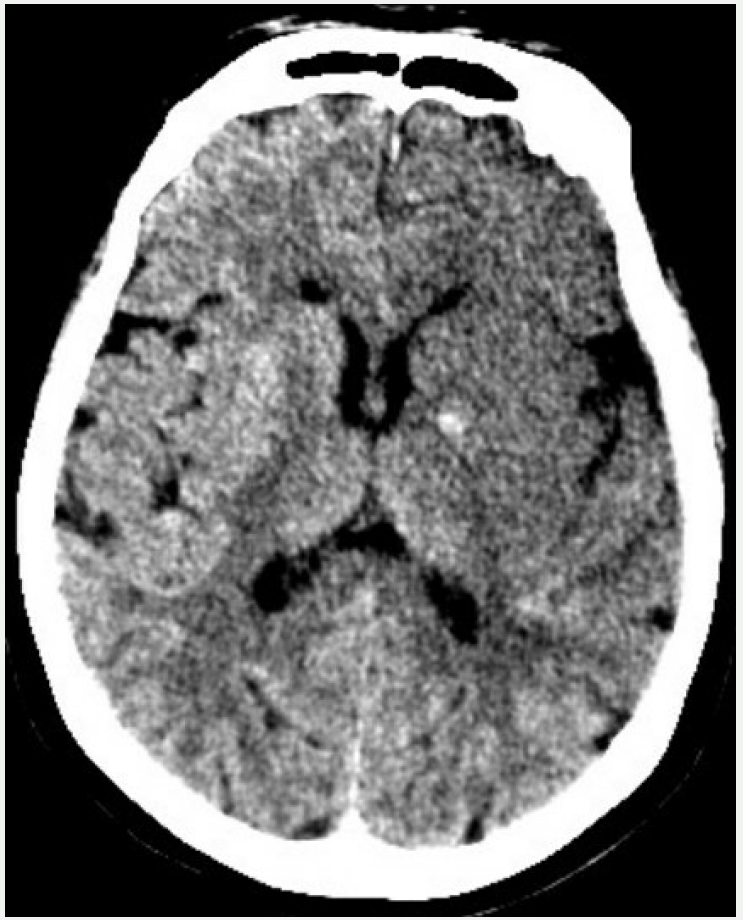


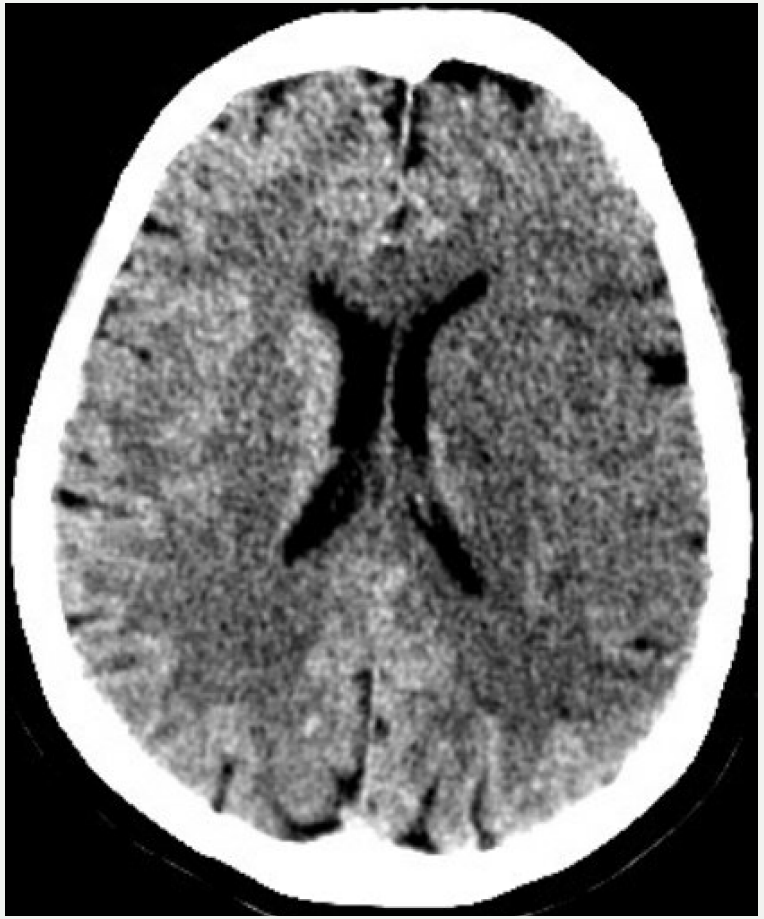
Good ASPECTS



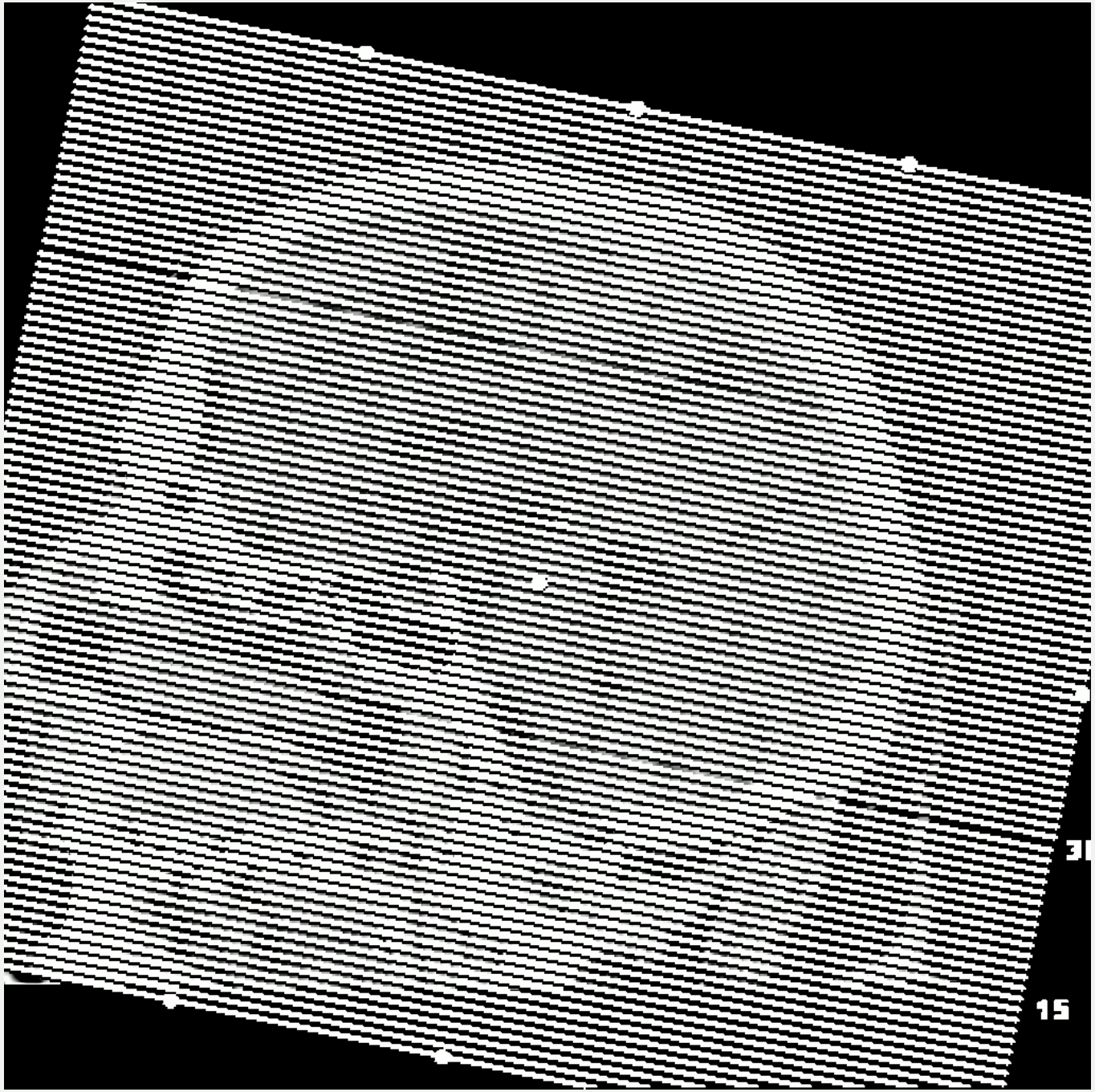


Poor ASPECTS

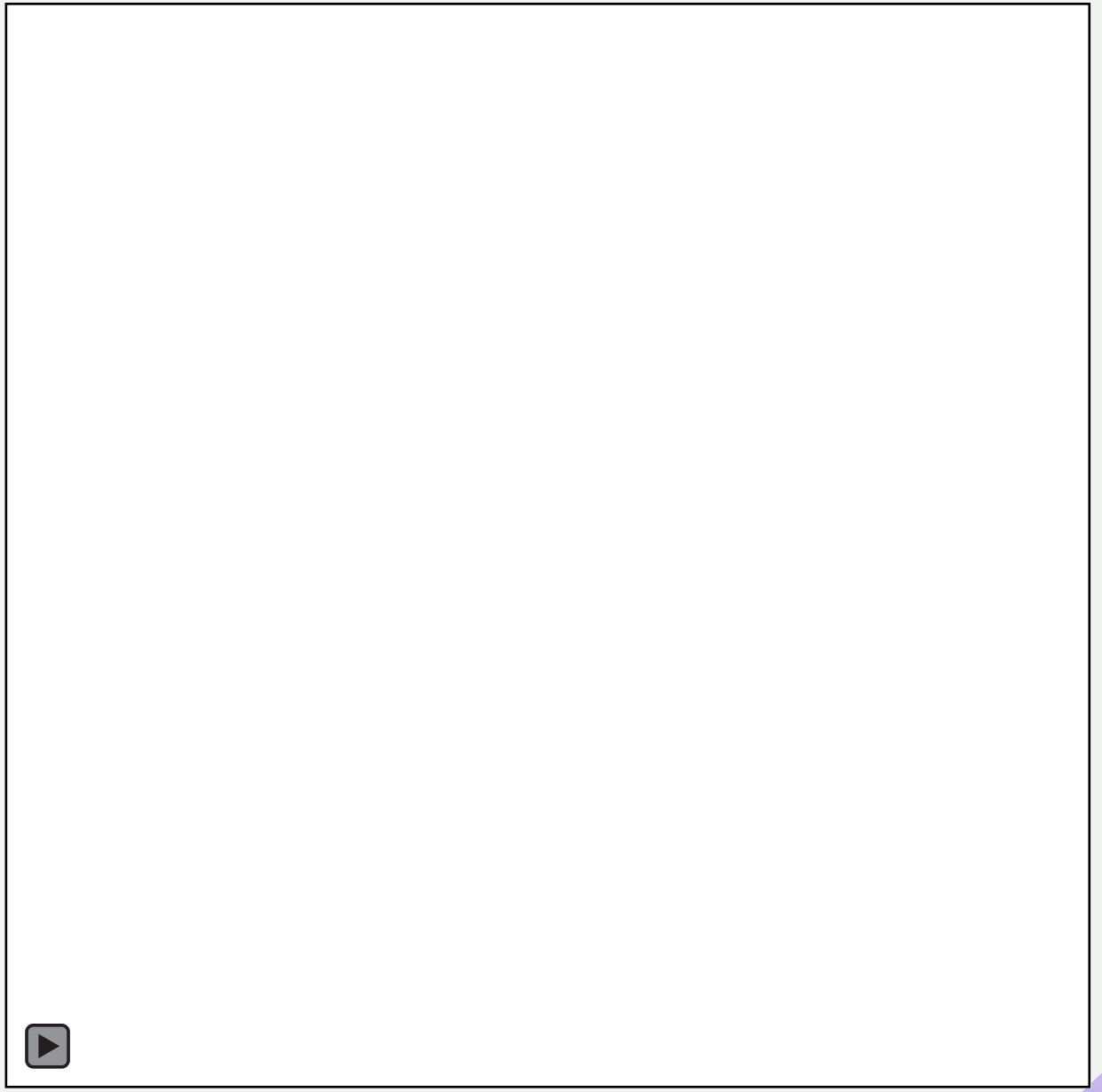




CT Brain



CT-Angiogram



Poll 2: How would you manage this patient?

a) tPA only

b) Direct to EVT

c) tPA then transfer for EVT

d) Antiplatelet therapy

e) Heparin infusion

Thrombolysis

- Alteplase (tPA) or Tenecteplase (TNK)
  - Recombinant tissue plasminogen activators
  - **Average ~3-6%** risk of life-threatening bleed inside brain
- Inclusion Criteria
  - Presenting within 4.5 hours of last seen normal
  - NIHSS>5 OR **Disabling stroke**

Tanswell et al., 2002, Clin Pharmacokin
Emberson et al., Lancet, 2014, Lancet
Menon et al., 2022, Lancet
Canadian Stroke Best Practices: Acute Stroke Management 2022

Thrombolysis

Absolute Exclusion Criteria

- Any source of active hemorrhage or any condition that could increase the risk of major hemorrhage after intravenous thrombolysis administration.
- Any hemorrhage on brain imaging.

Historical

- History of intracranial hemorrhage.
- Stroke or serious head or spinal trauma in the preceding 3 months.
- Major surgery (e.g., cardiac, thoracic, abdominal, or orthopedic) in the preceding 14 days. Risk varies according to the procedure.
- Arterial puncture at a non-compressible site in the previous 7 days.

Clinical

- Stroke symptoms due to another non-ischemic acute neurological condition such as seizure with post-ictal Todd's paralysis or focal neurological signs due to severe hypo- or hyperglycemia.
- Hypertension refractory to aggressive hyperacute antihypertensive treatment such that target blood pressure <180/105 cannot be both achieved and maintained.
- Currently prescribed and taking a direct non-vitamin K oral anticoagulant. *Refer to Section 5.2 Clinical Considerations for additional information.*

CT or MRI Findings

- CT showing early signs of extensive infarction (e.g., >1/3 of middle cerebral artery [MCA] territory, or ASPECTS score <6).

Laboratory

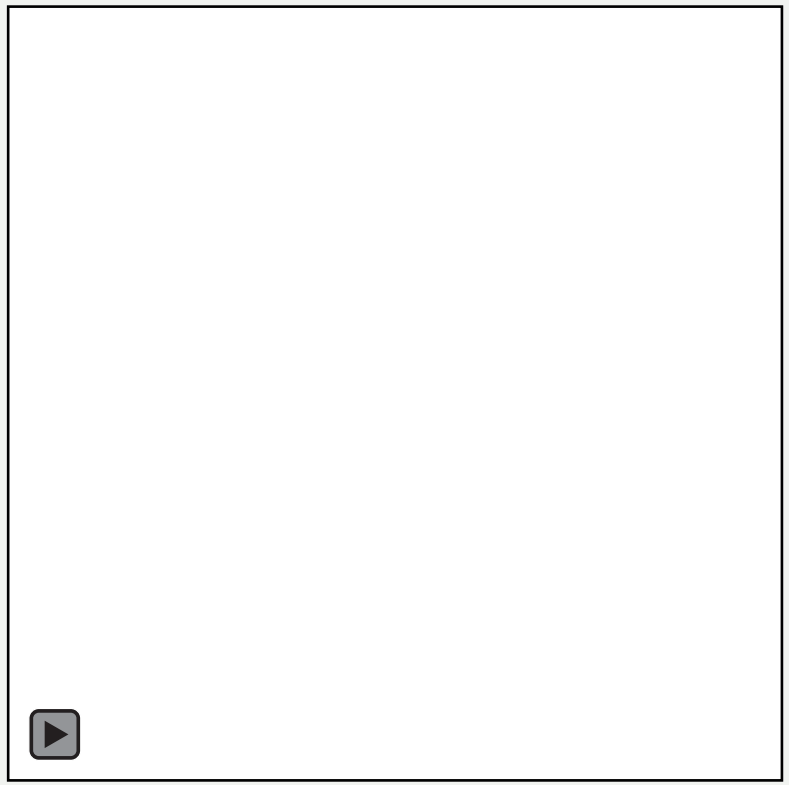
- Blood glucose concentration <2.7 mmol/L or >22.2 mmol/L.
- Elevated activated partial-thromboplastin time.
- International Normalized Ratio >1.7.
- Platelet count <100,000 per cubic millimetre.

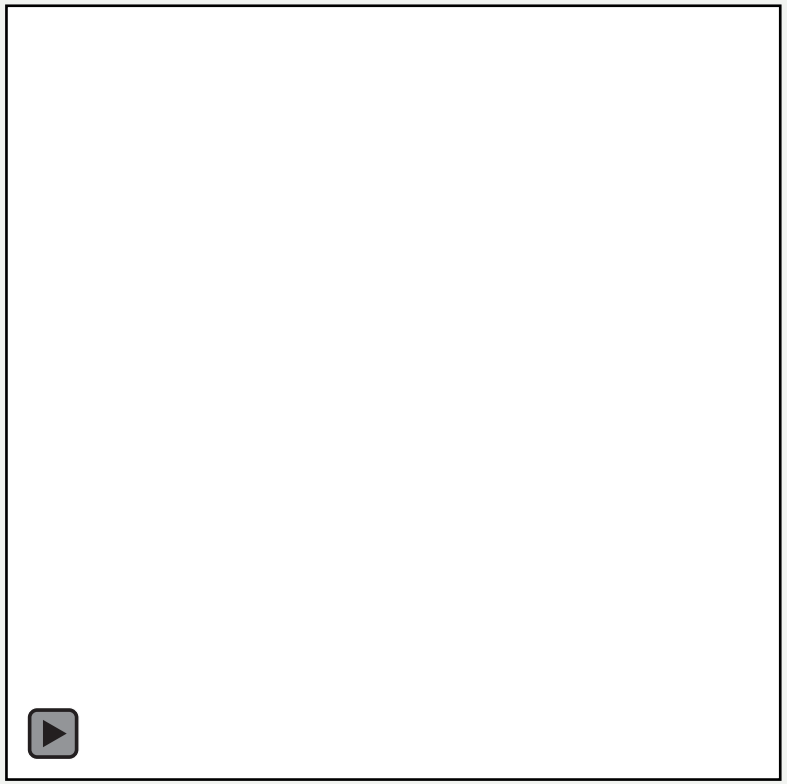
Canadian Stroke Best Practices: Acute Stroke Management 2022

Endovascular Thrombectomy (EVT) Eligibility

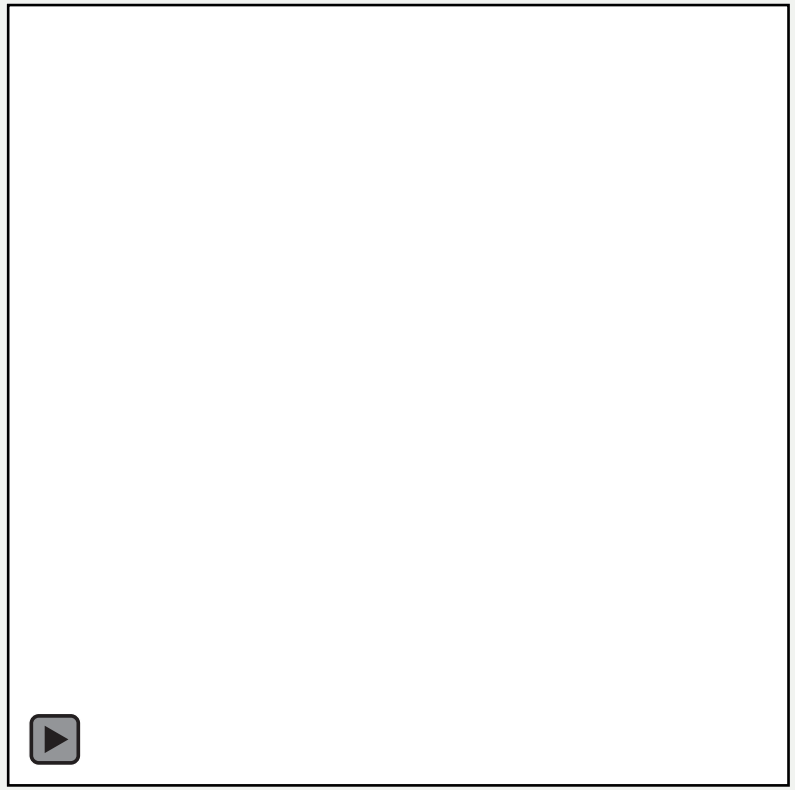
- Large Vessel Occlusion (LVO)
  - Distal Internal Carotid Artery, M1, Basilar
- NIHSS>4 or **significantly disabling**
- Strong evidence for medium to Good ASPECTS (6-10)
  - Now, strong evidence for low ASPECTS (3-5)
  - Low evidence for poor ASPECTS (0-2)
- Good baseline function
  - As per evidence→ functionally independent
- Ideally, aim for both treatments as per current evidence

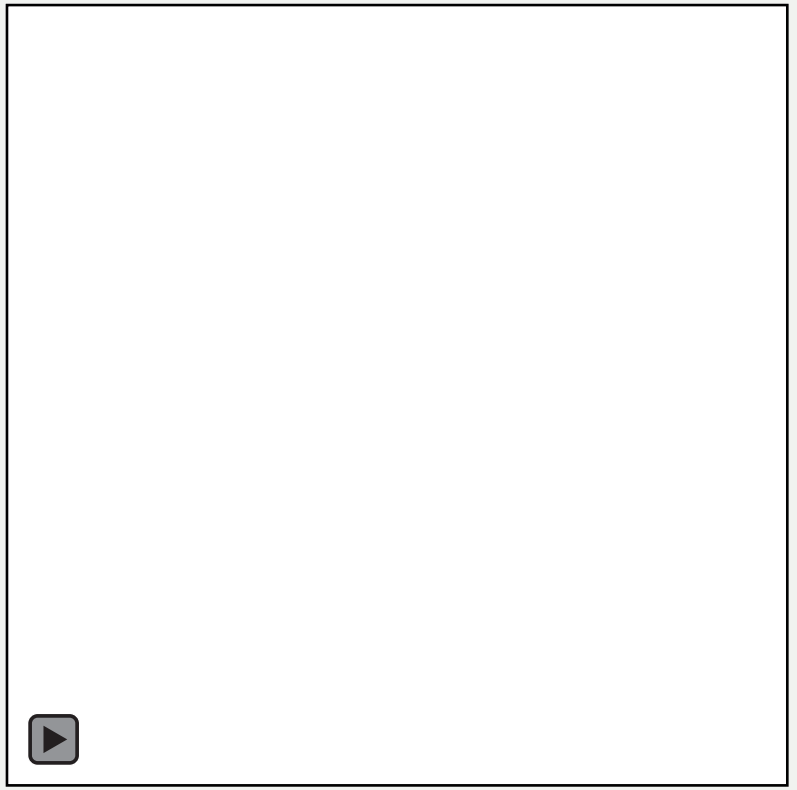
Case Continued: EVT Pre





EVT Post

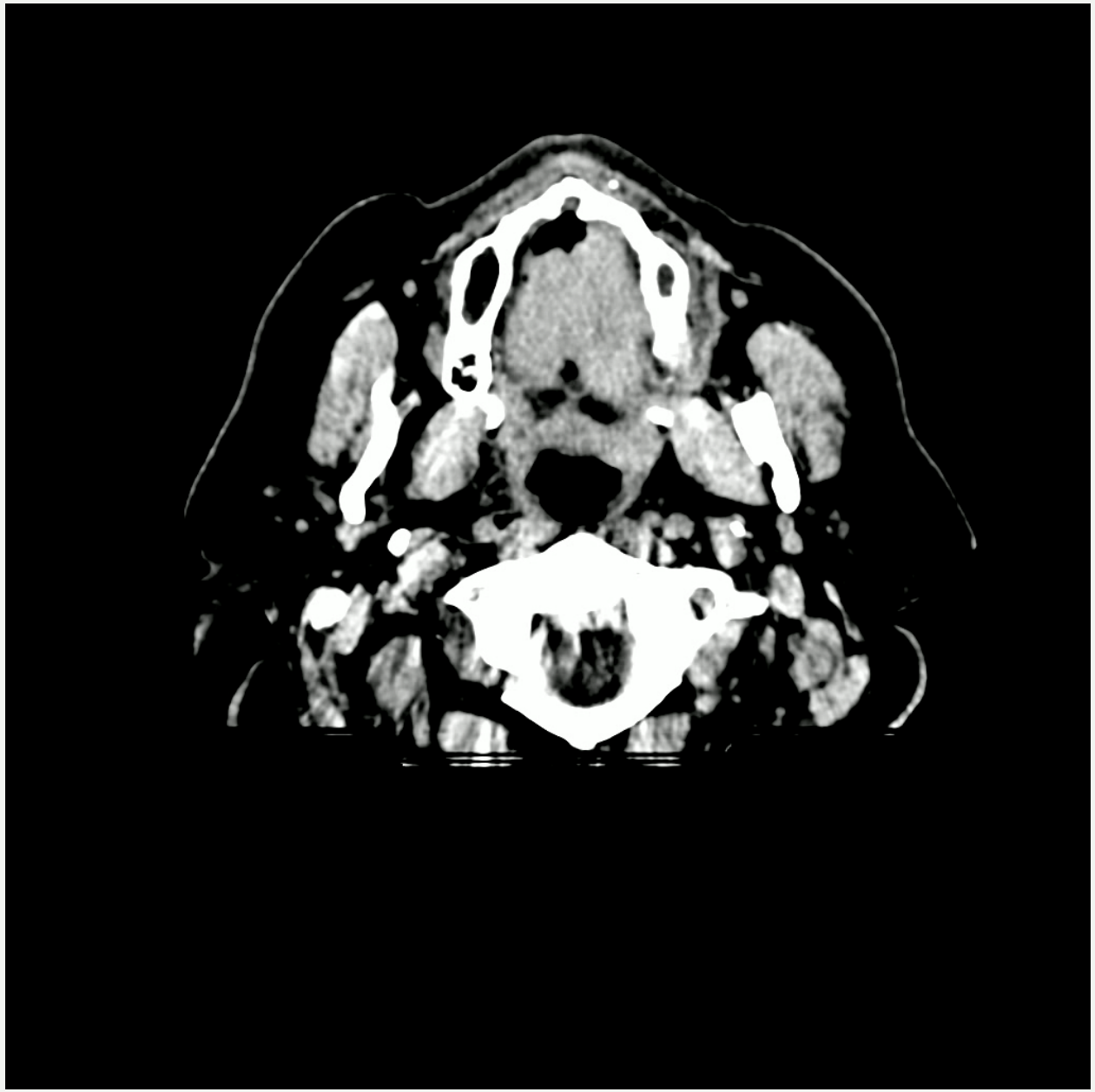




Case Continued

- HSc Arrival: 0655
- TPA Bolus: 0729
- ER Departure for EVT: 0730
- EVT -TICI 3
  - Complete reperfusion

Repeat Imaging



Case continued

- NIHSS=0 at discharge
- Found to have paroxysmal atrial fibrillation
- Discharged on apixaban 5mg BID
- Returned home

Take aways

- Prompt recognition of stroke symptoms allows:
  1. Quick transfer and triage
  2. Higher likelihood of eligibility for treatment
  3. Higher likelihood of treatment efficacy
- Success in stroke involves:
  - Patient→family→EMS→Primary care/ED→Stroke physician→Interventionalist→ Other physicians/Nurses/PTs/OTs/SLPs and others!
- When in doubt, get help
  - Canada best practice guidelines

Questions?

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