UK & ROI ACUTE STROKE SIMULATION COURSE

Imaging in Acute Stroke

Dr Ingrid Kane

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Imaging

UK AND ROI ACUTE STROKE SIMULATION COURSE

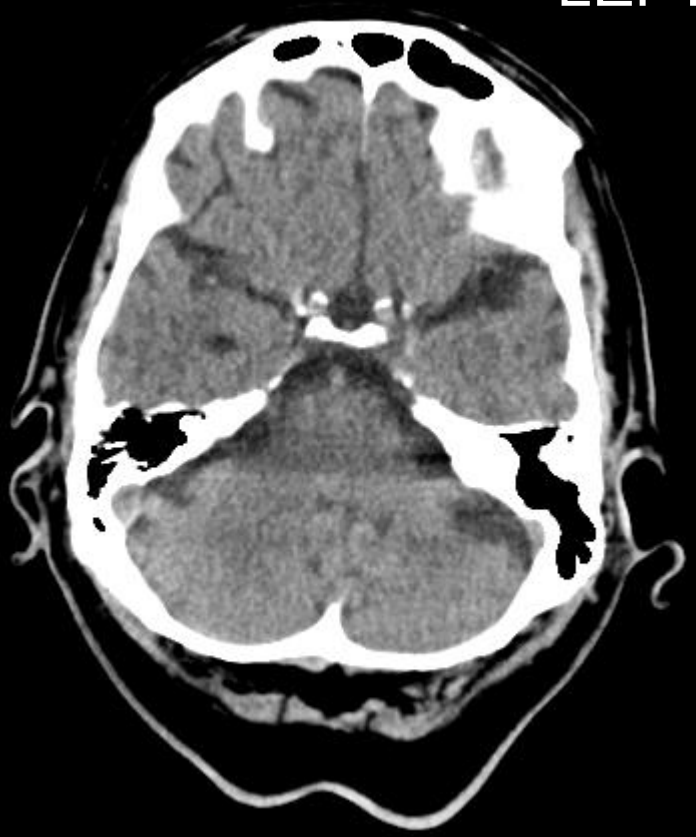
- Helps confirm clinical diagnosis

- CT most common
  - Quick
  - Patients usually tolerate well
  - Good for detecting blood in acute stage

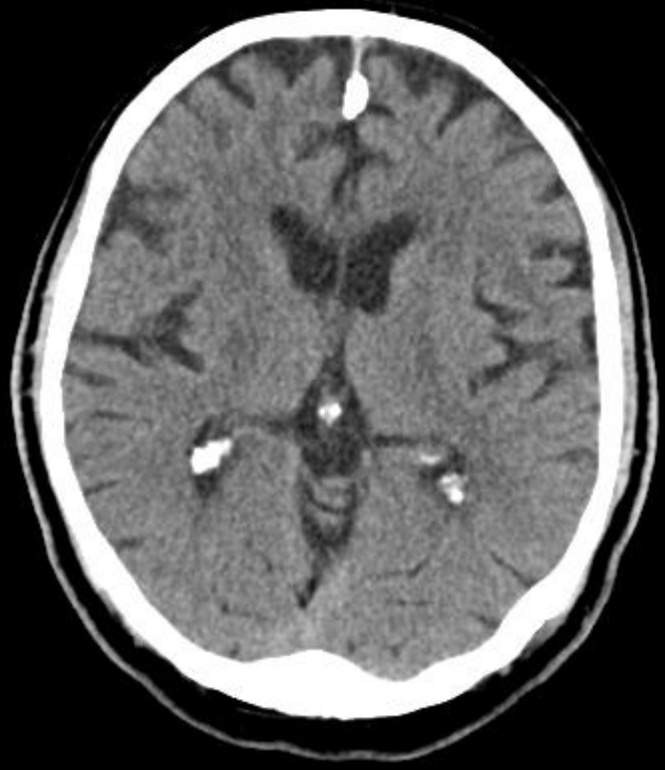
Plain CT head

UK AND ROI ACUTE STROKE SIMULATION COURSE

RIGHT LEFT



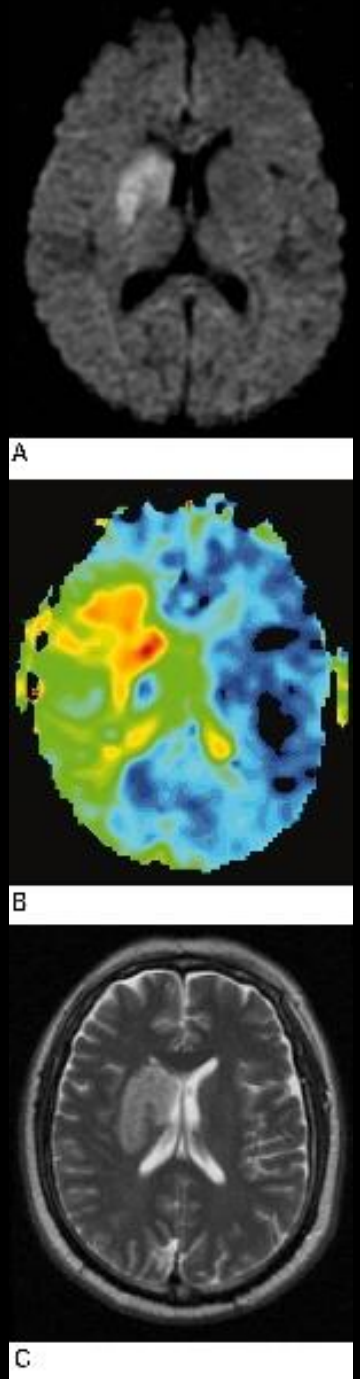
RIGHT LEFT



Imaging (cont)

UK AND ROI ACUTE STROKE SIMULATION COURSE

- MRI
  - Takes longer to acquire images
  - Reasonable proportion of patients unable to tolerate
  - May help select patients for treatments such as thrombolysis
  - Get some fancy pictures!



The Penumbra

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- A: DWI image
- B: Perfusion image
- C: T2 image at 5 days (post thrombolysis)

Early infarct signs on CT

UK AND ROI ACUTE STROKE SIMULATION COURSE

- Swelling
  - Loss of grey/white matter differentiation
- Dense vessels

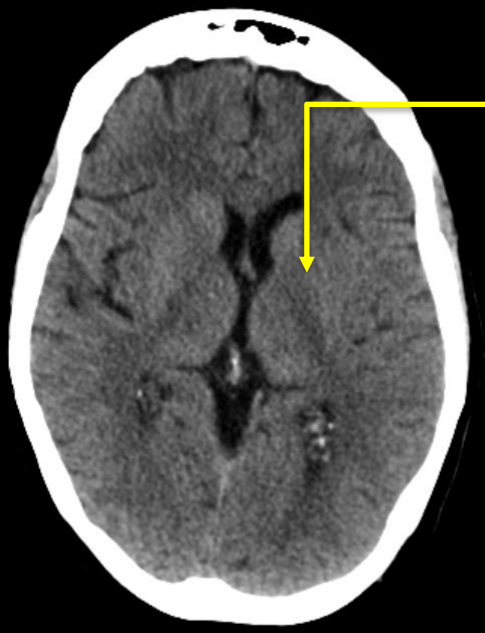
Hyperacute & acute infarct

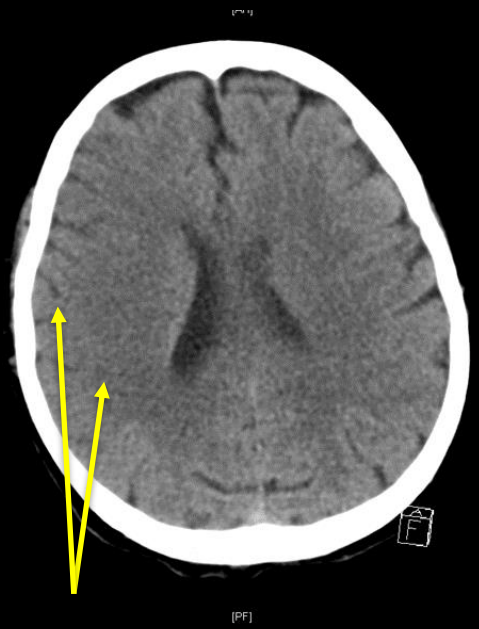
1. Low Density

loss of grey/white definition

loss of insula

loss of basal ganglia eg lentiform





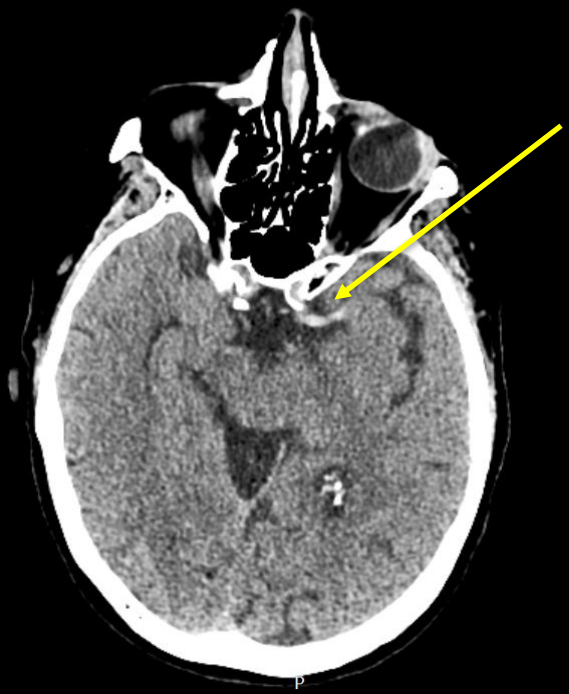
2. Swelling

loss of sulci

midline shift

effacement of ventricles

3. Hyperdense Artery



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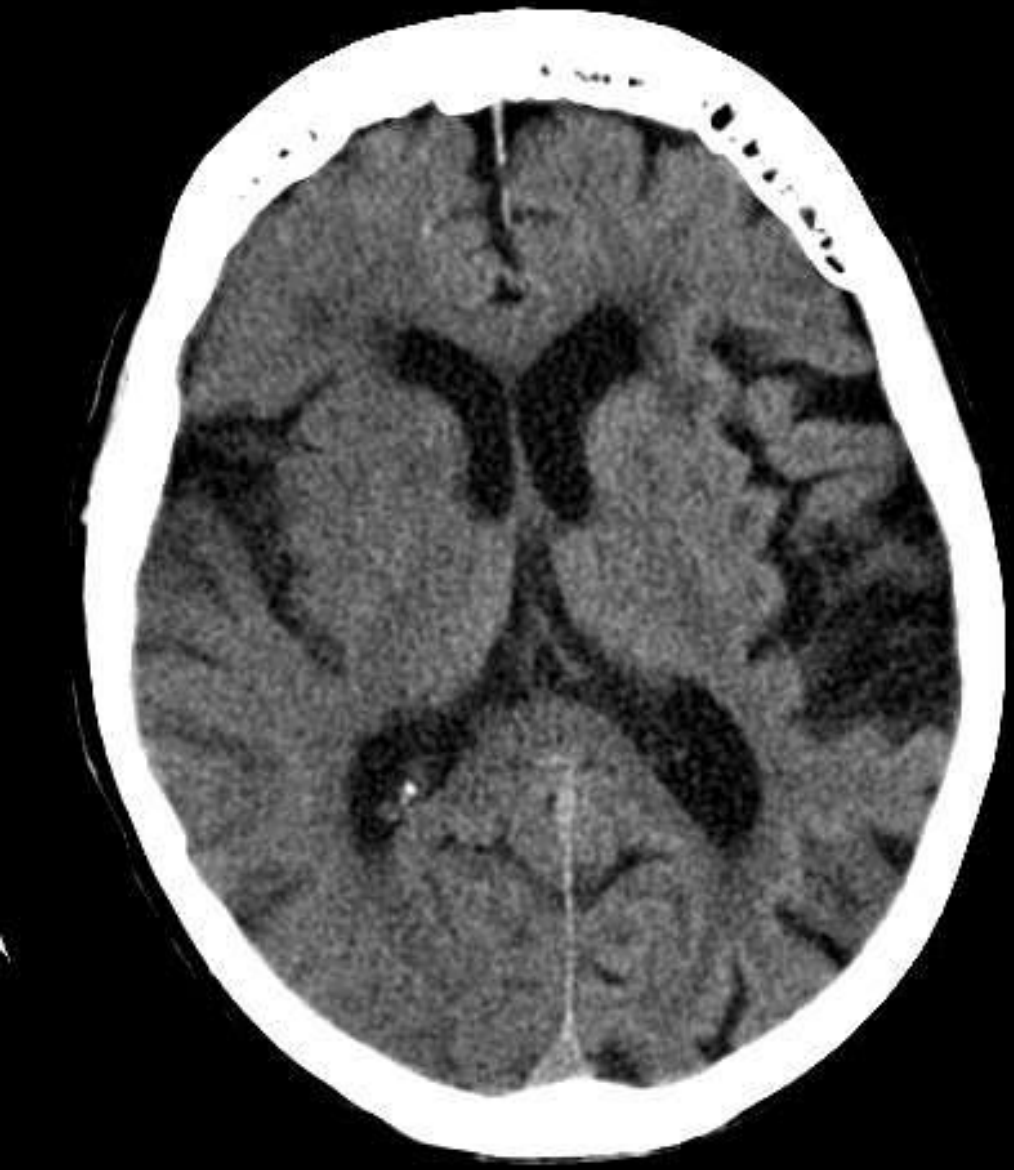
Case: 80 yr old male found collapsed with L sided weakness. No clear time of onset



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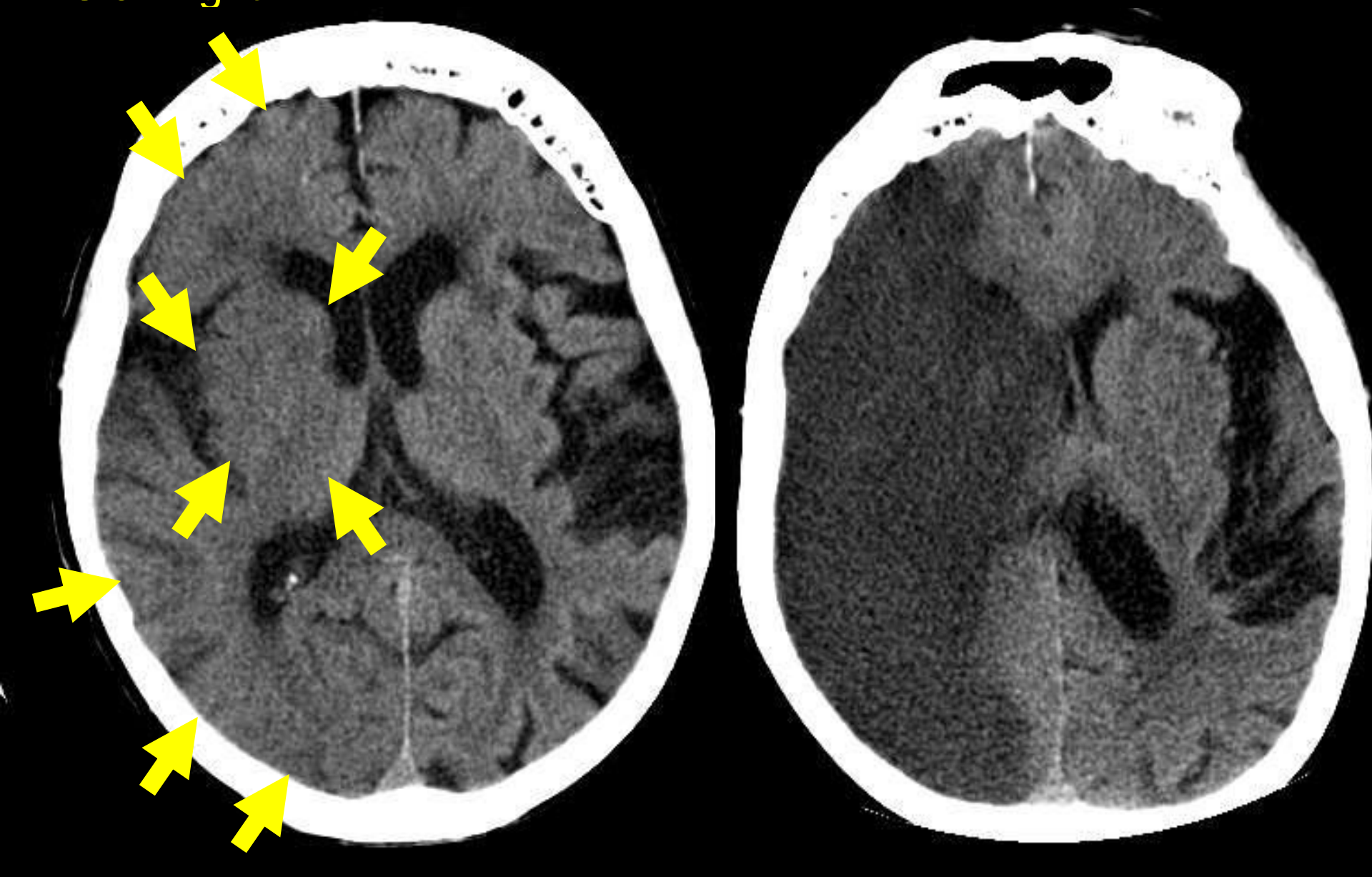
Findings: Right subtle low density and swelling. F/U image at 24 hrs on right.



Case: 23 yr old female. Witnessed onset of dysphasia and R sided weakness

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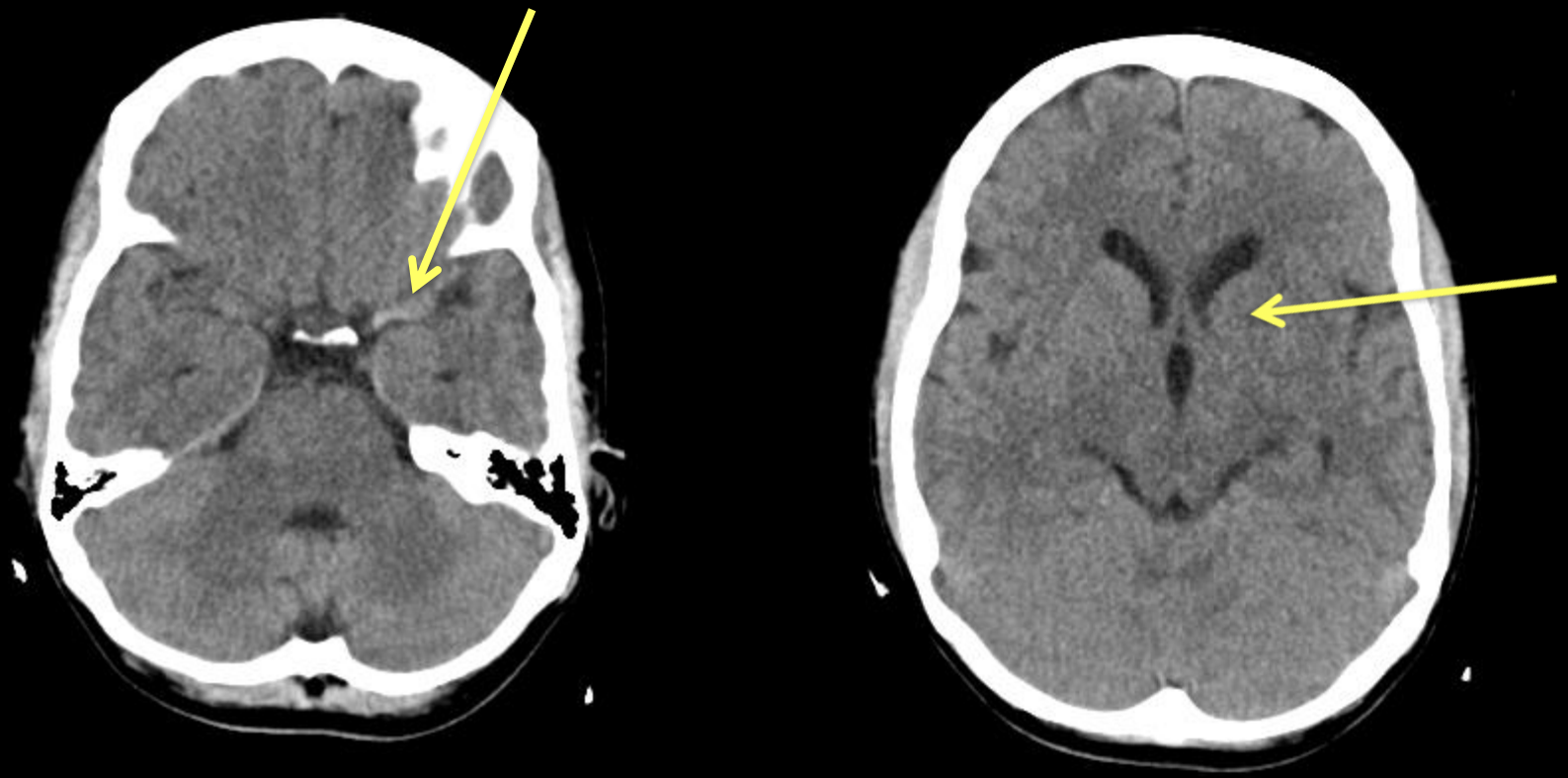

Findings: post thrombolysis and thrombectomy

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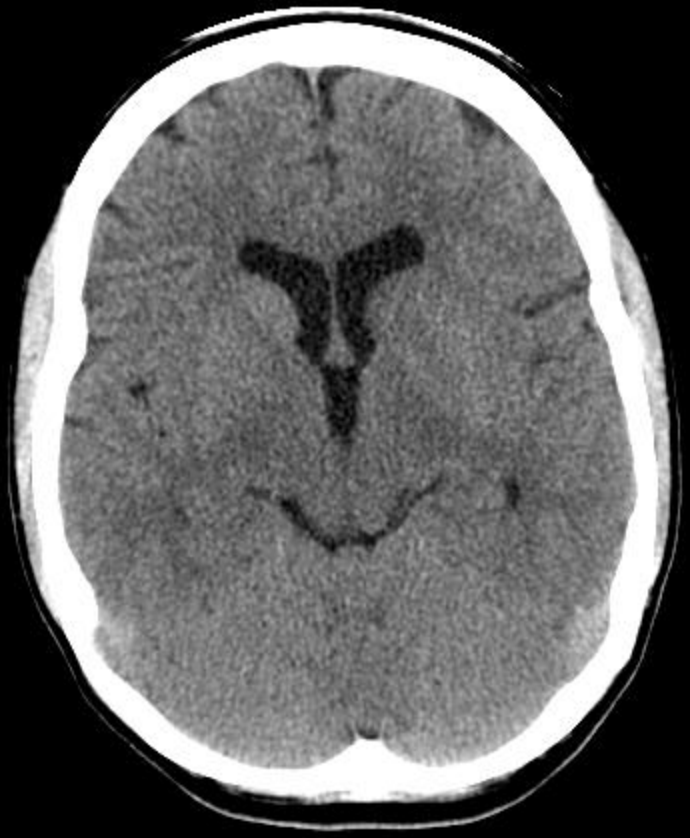
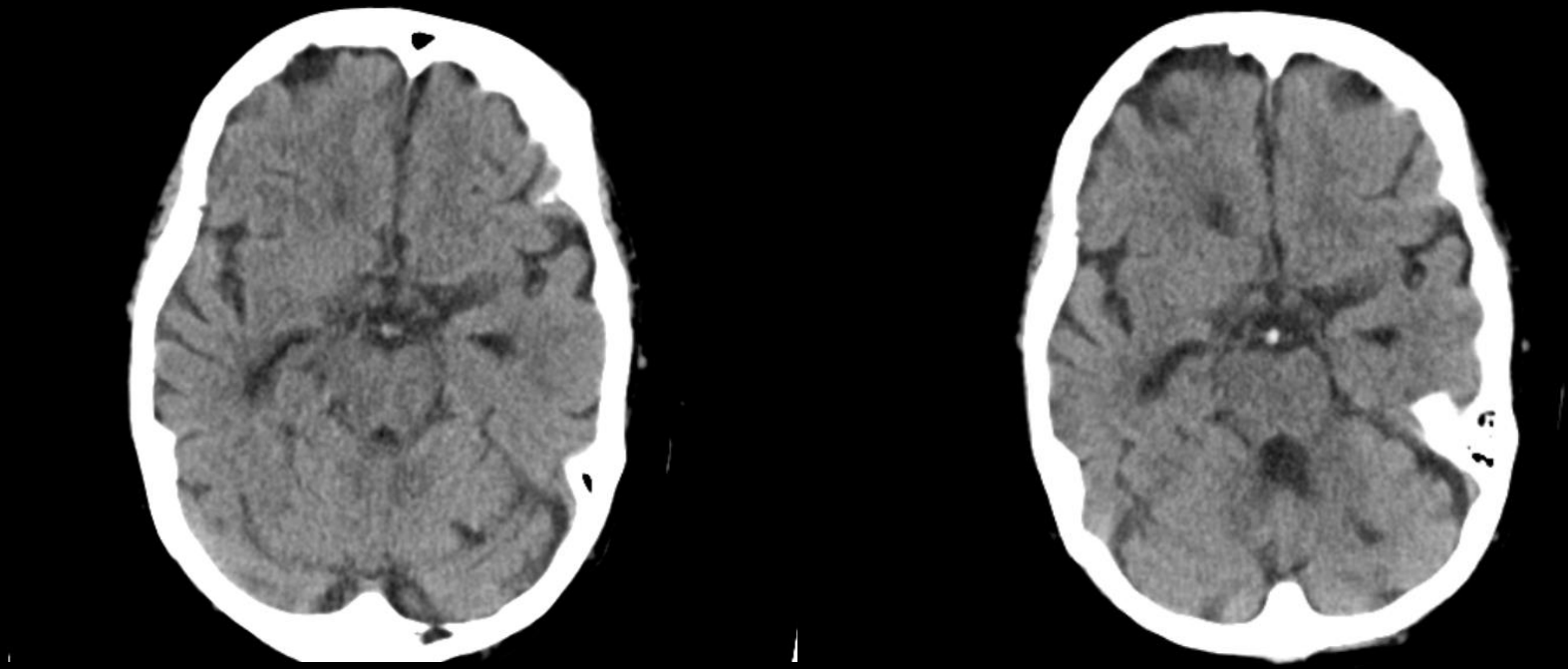


Early infarct signs:
Same person, images 1 week apart



CT Angiogram (CTA)

Important to look for a large vessel occlusion

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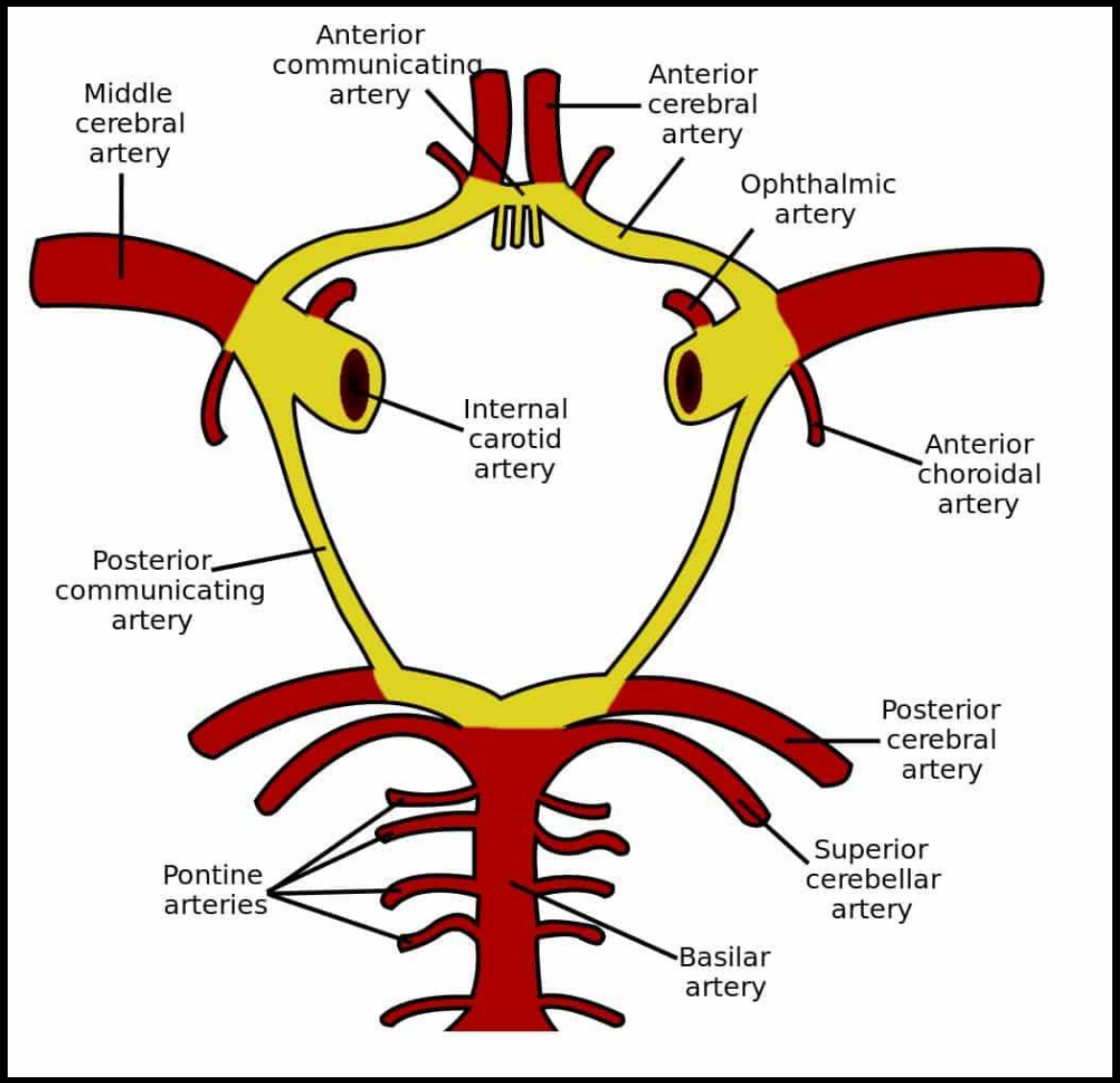

Large vessel occlusion

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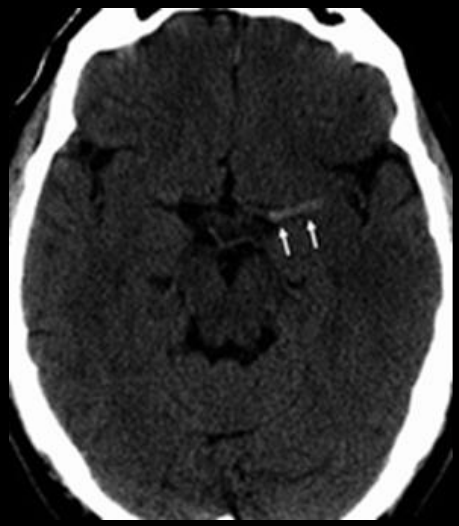
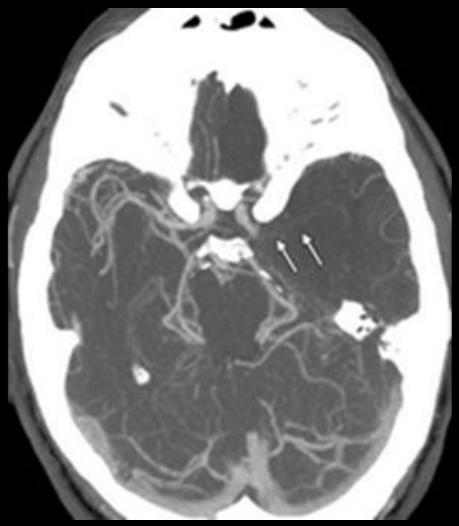
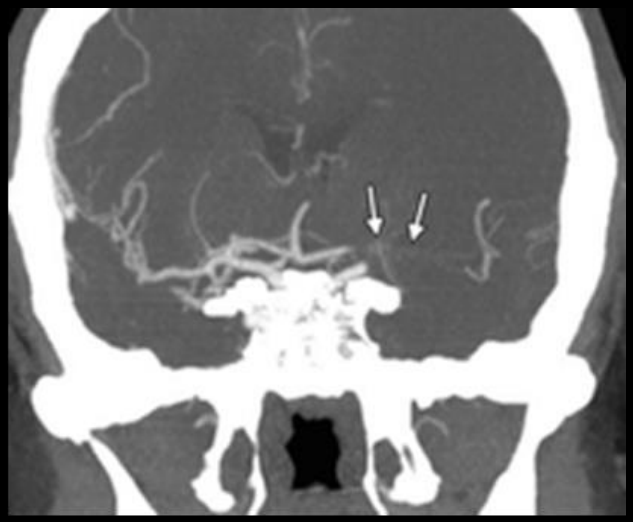
- Important to detect to decide if target for mechanical thrombectomy
  - NIHSS >5
  - mRs <3
  - Consider up to 24hrs after symptom onset depending on history and imaging

Example of CTA







CT perfusion

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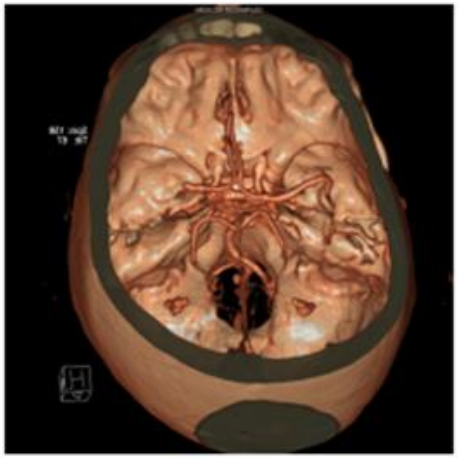
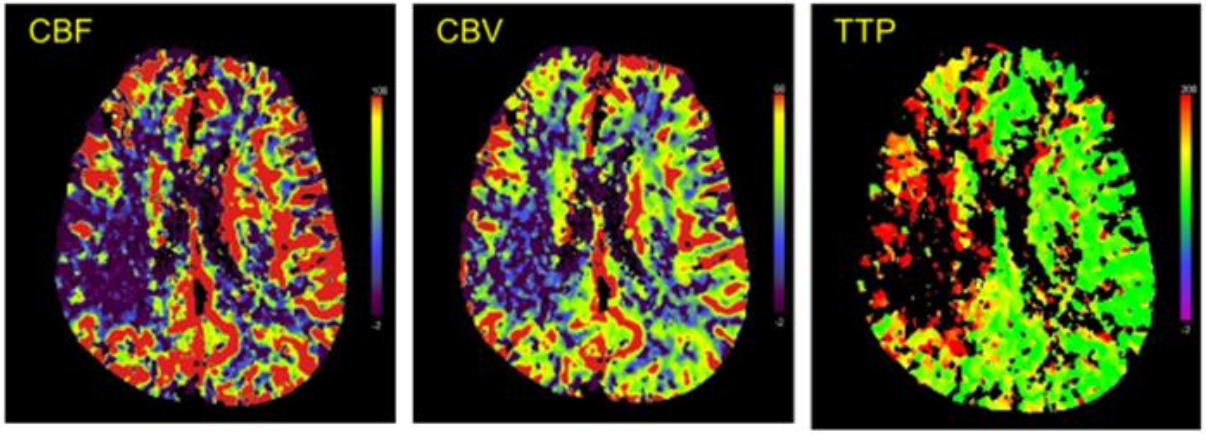
- Dynamic contrast enhanced scan
- Looks for salvageable brain and infarcted brain
- Is there a mismatch ie penumbra

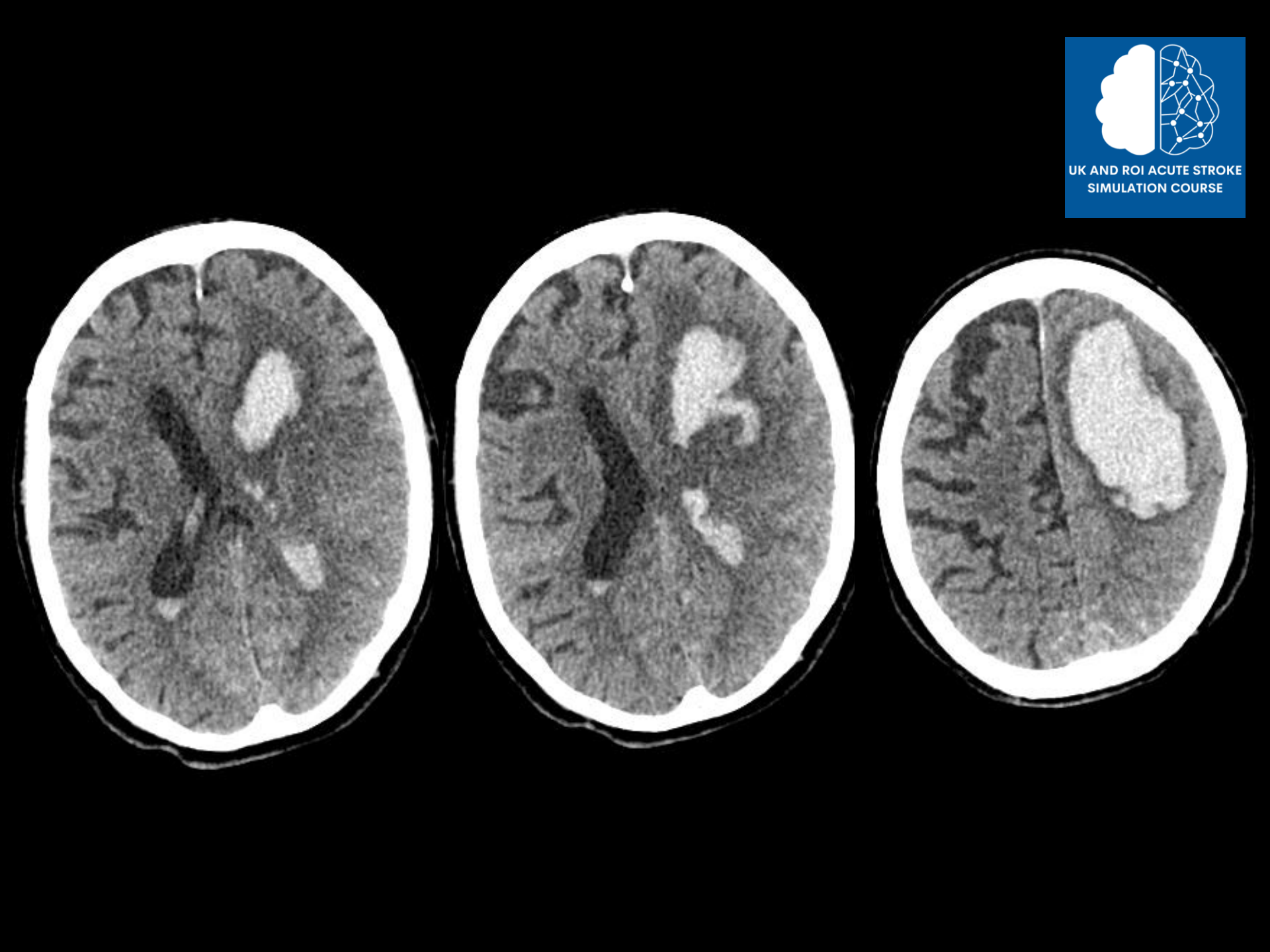
Example of CT perfusion

UK AND ROI ACUTE STROKE SIMULATION COURSE

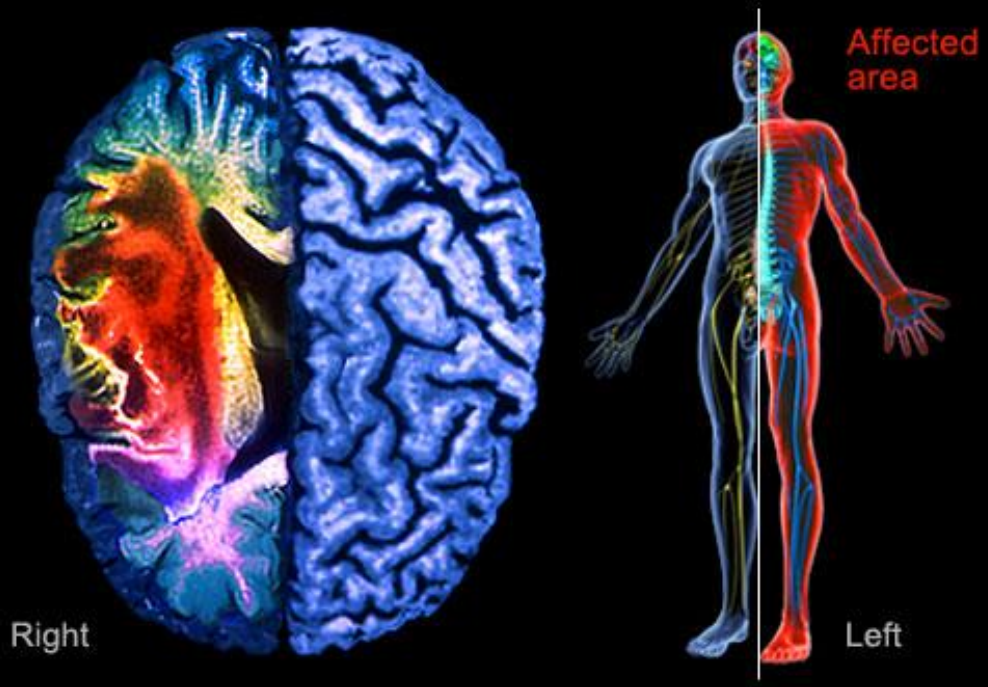




What about blood on CT?


UK AND ROI ACUTE STROKE
SIMULATION COURSE

UK AND ROI ACUTE STROKE SIMULATION COURSE



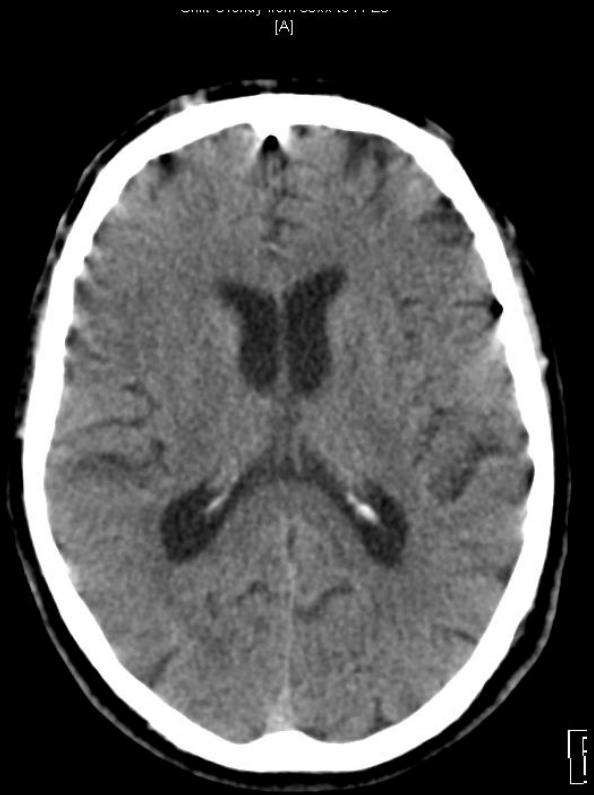
CASES

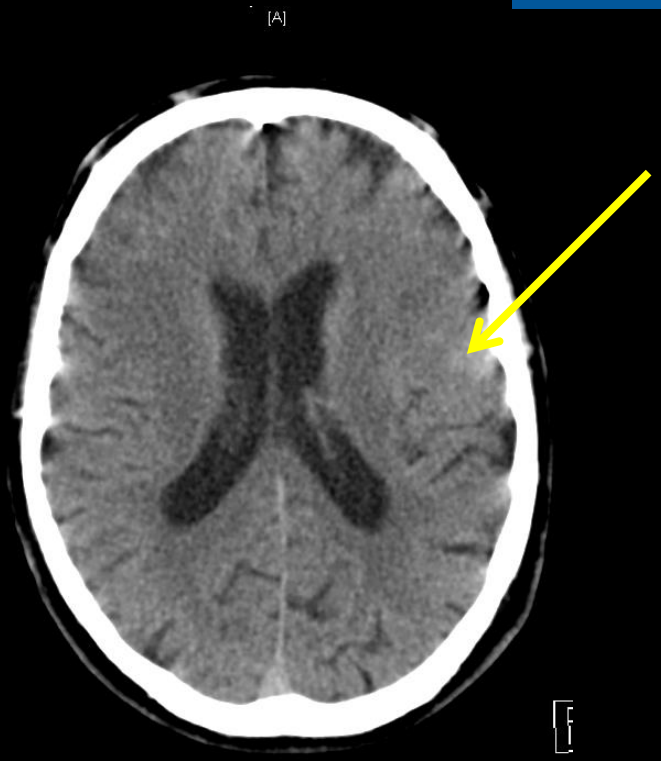
Mr WB

- 71 year old
- 16:30
  - sudden onset expressive dysphasia
  - R facial droop
  - Since then some twitching R face and arm
  - 3 years ago ‘neck cancer’ - cured
- Arrived in A&E 18:00

Examination

- Assessed via telemedicine
- Expressive dysphasia
- R UMN VII
- Twitching R side of face
- Sinus rhythm
- BP 195/74


[A]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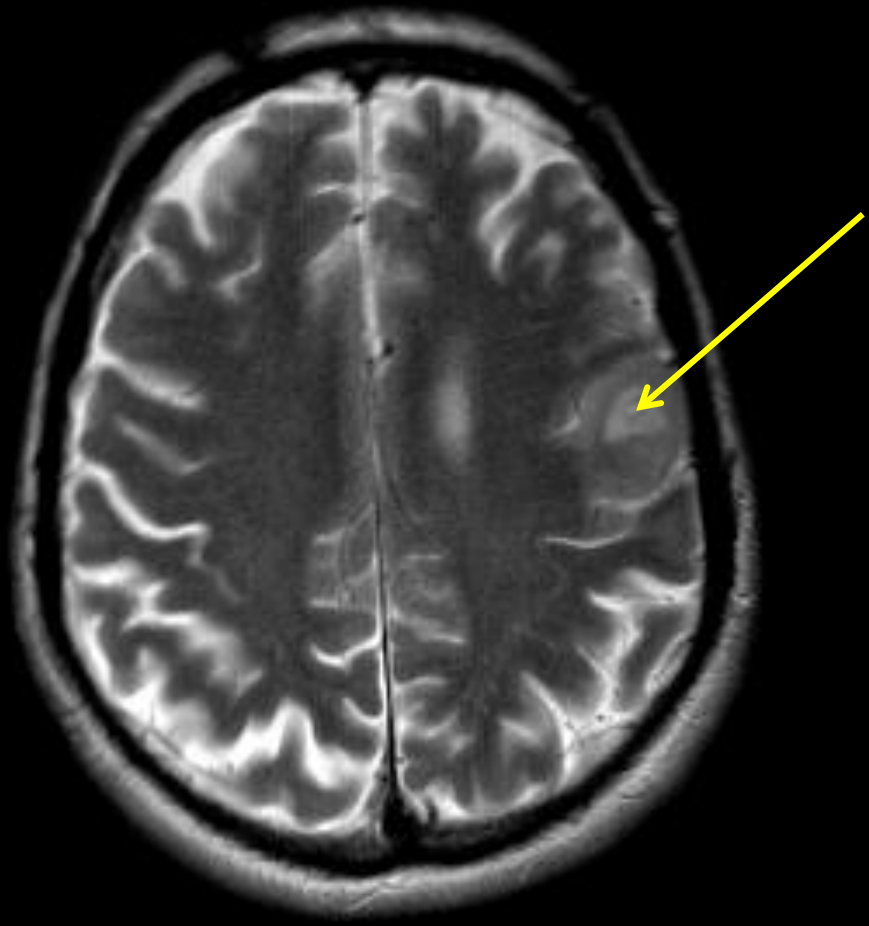
What would you do next?

UK AND ROI ACUTE STROKE SIMULATION COURSE

- Diazepam – settled seizure activity
- Stat dose of aspirin
- Admit to stroke unit
- MRI

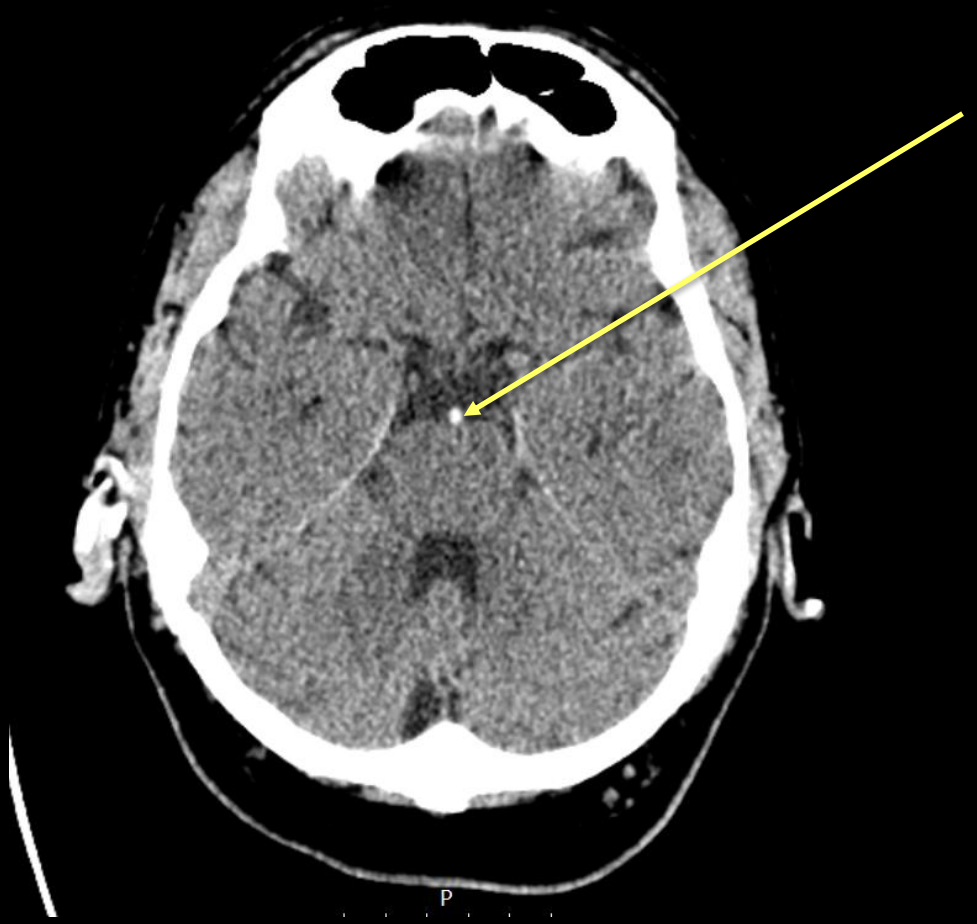


UK AND ROI ACUTE STROKE SIMULATION COURSE

Mr TE

- 48-year-old man, usually fit and well
- Woke (4am) with dysarthria, abnormal eye movements and mild left sided weakness NIHSS 6
- Neurology deteriorated in ED – NIHSS 14
- History of injury in collapsed rugby scrum 1 week earlier with headaches since then

Imaging



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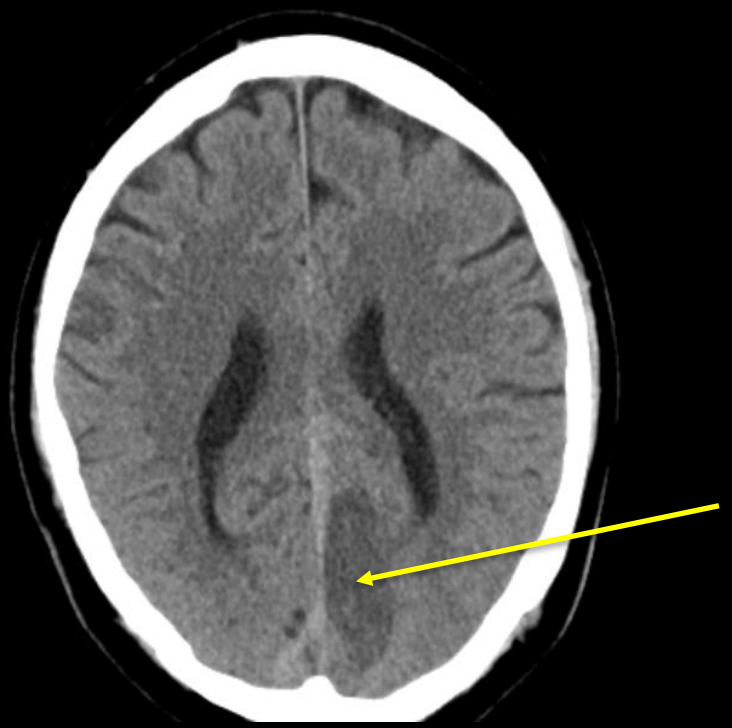
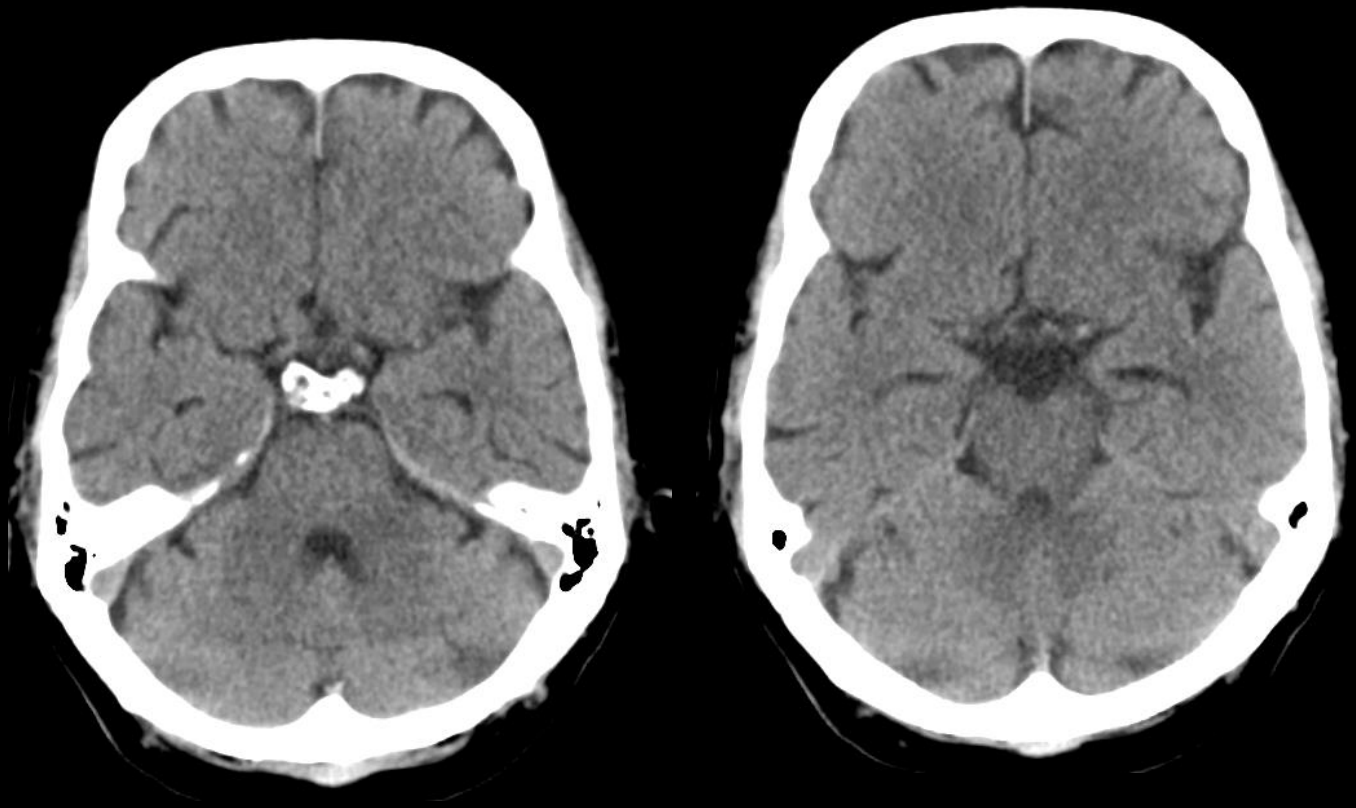
Management

- Thrombolysed
- Thrombectomy

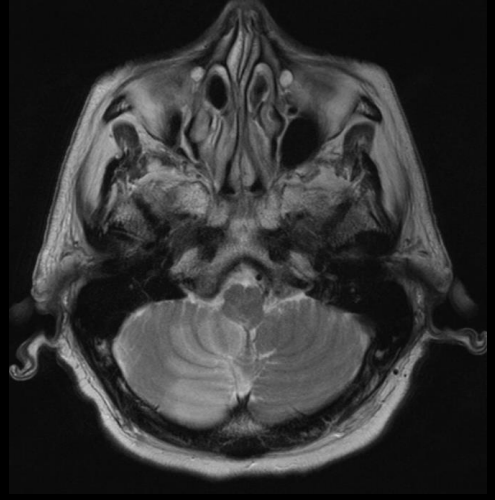


UK AND ROI ACUTE STROKE SIMULATION COURSE

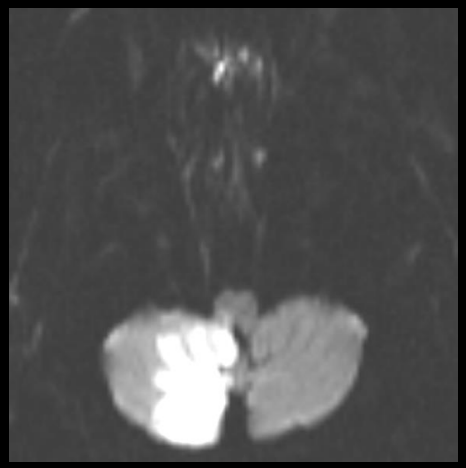
81 year old man. Woke and was unable to get out of bed due to dizziness. He also complained of an occipital headache and slurred speech. He was ataxic. BP 200/90



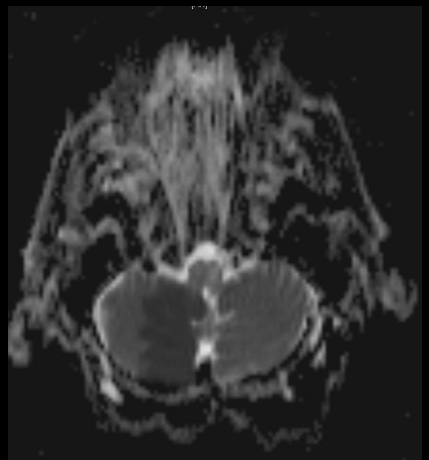
Clinically a POCS



T2



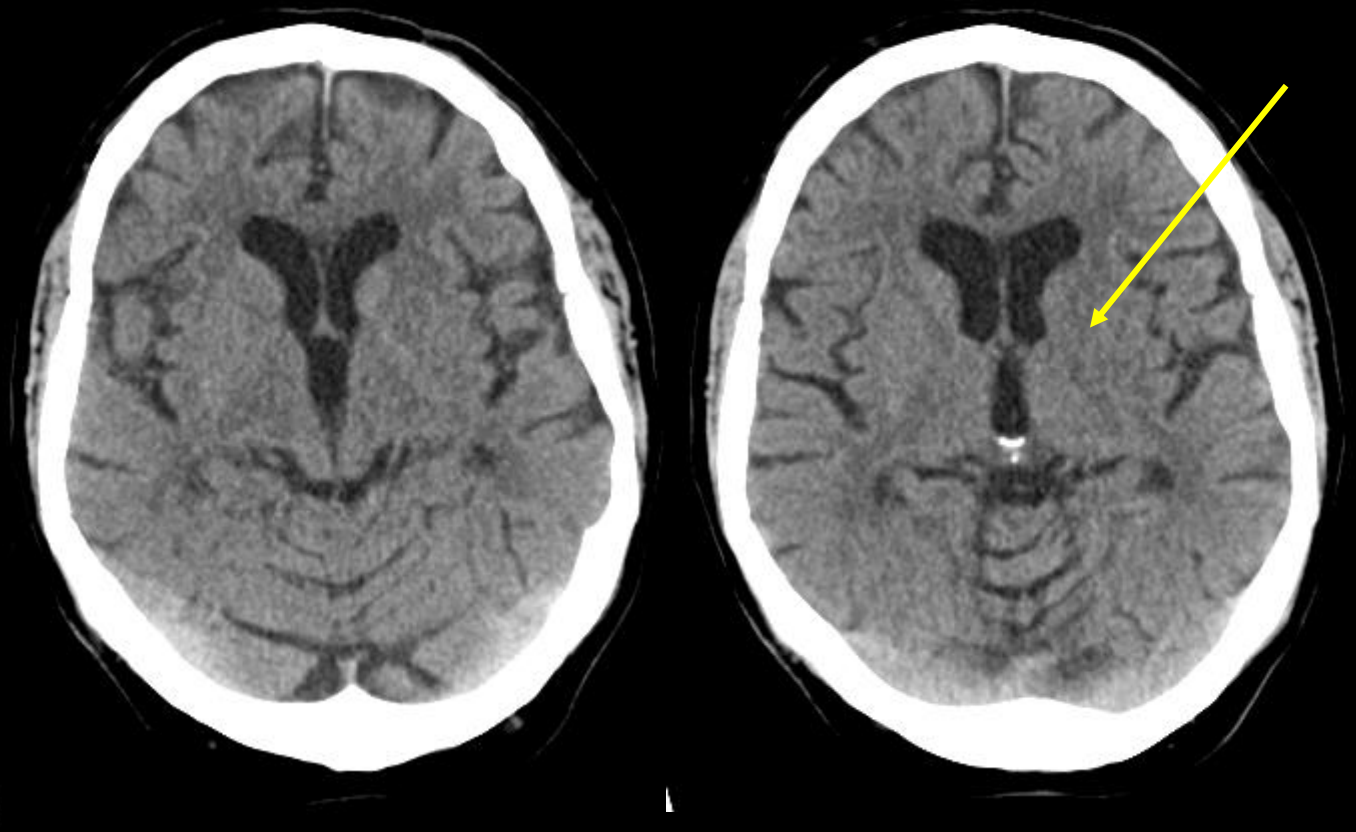
DWI



ADC

UK AND ROI ACUTE STROKE SIMULATION COURSE

Case: 55 year old man presenting with right sided weakness, slurred speech and expressive dysphasia. Last seen well at 8pm. At 8.30pm wife found him not speaking and lager can, usually in his R hand, on the floor

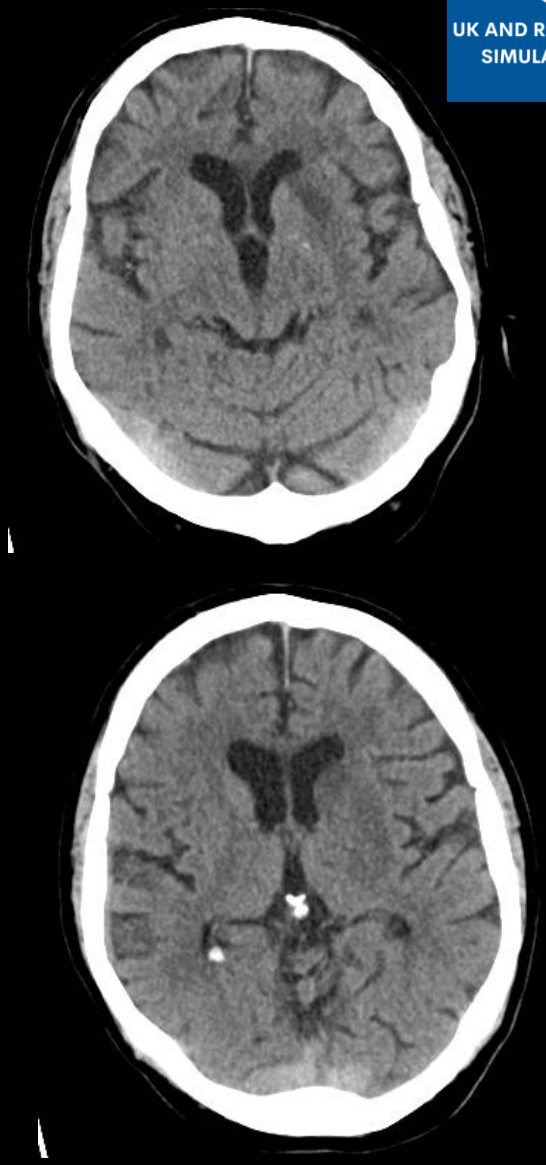


Clinically a left hemisphere PACS

UK AND ROI ACUTE STROKE SIMULATION COURSE

Management

- Thrombolysed after telemedicine assessment
- Much improved following day
- Home day 4



UK AND ROI ACUTE STROKE SIMULATION COURSE

Case: Mr RF

- 69 year old male
- Intermittent ‘problems with left arm’
- Stopped playing golf
- Occasional dull headache
- History of hypertension
- Wife reported he ‘was just not his normal self’

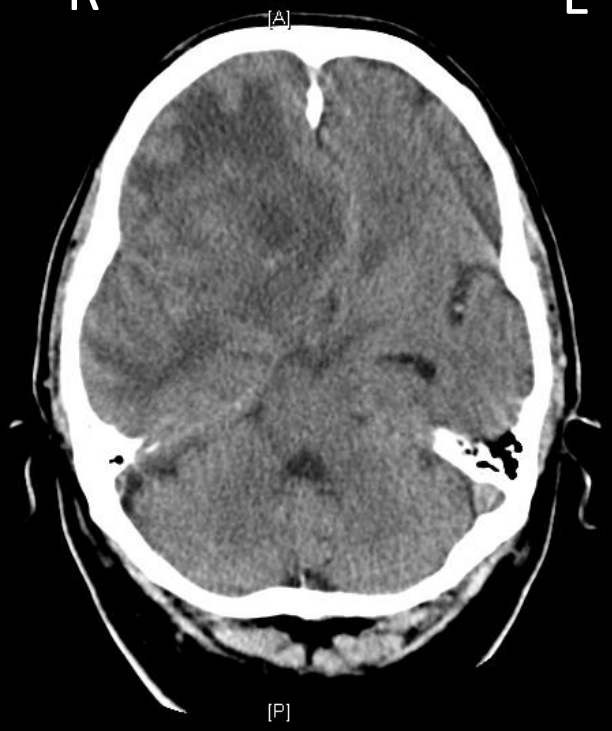
Mr RF (cont)

- Mild pronator drift L arm
- BP 148/90

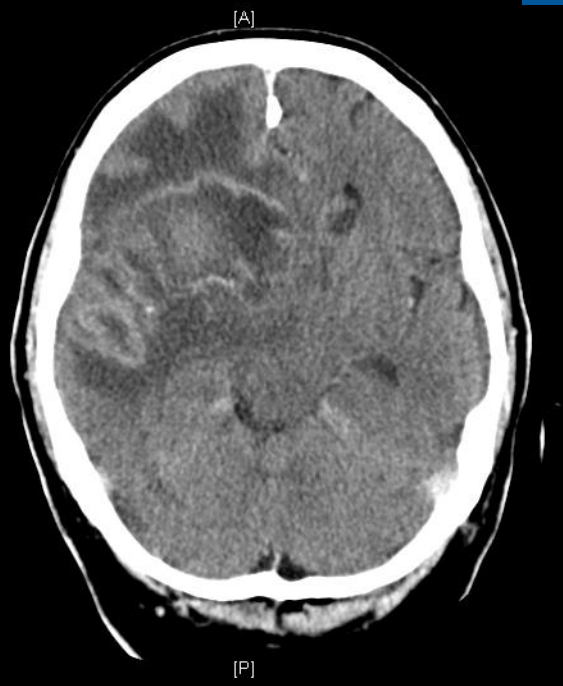
Any thoughts?

UK AND ROI ACUTE STROKE SIMULATION COURSE

R L



Pre contrast



Post contrast

Case: Miss JB

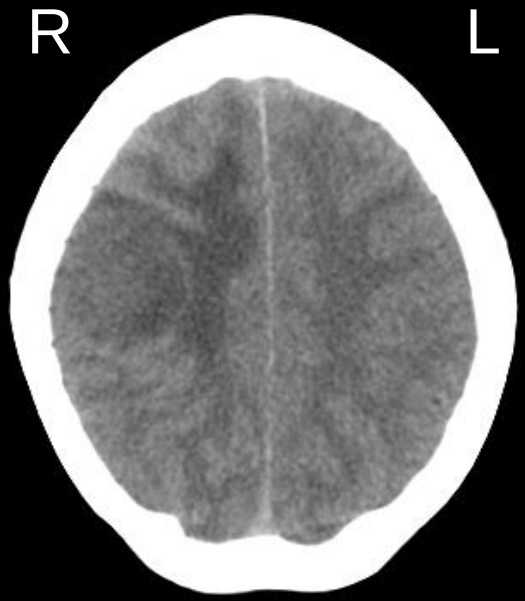
- 39 year old female
- Working full time
- Tingling L arm, hand and leg
  - sudden onset, odd ‘creeping feeling’
  - 4-5 episodes over a few days, couldn’t use L hand to change gear
  - lasted minutes to hours
  - Associated with dull headache
- Seen in another A&E dept – told ‘hemiplegic migraine’

Miss JB (cont)

- Normal examination
- ECG normal

Any thoughts?

UK AND ROI ACUTE STROKE SIMULATION COURSE



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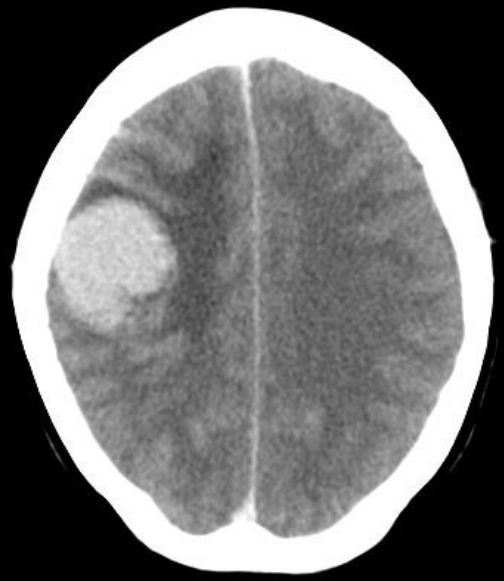
Pre contrast



[P]

Post contrast

In summary

- Imaging a vital step in our investigation of stroke, particularly if considering thrombolysis/thrombectomy
- BUT history still the most important thing
- Without a clear history it can be difficult to interpret the imaging