



KANSAS INITIATIVE FOR
STROKE SURVIVAL
A PROJECT BY AND FOR KANSANS

Phone (913) 588-1554 • Fax (913) 945-8892

Imaging Selection in Acute Stroke

“First Tuesdays” Lecture Series
Sabreena Slavin, MD

Introduction and Goal of “First Tuesdays”

- Didactic lecture series as part of the Kansas Initiative for Stroke Survival (KISS)
- Updates in Practice and FAQ's on Acute Stroke Care
- 20 minute didactic, 10 minutes for questions/discussion

Review of Acute Stroke Interventions

- IV alteplase (tPA) for all patients who have **disabling symptoms** of acute stroke
- Mechanical thrombectomy: **only for large vessel occlusions (LVO)**. Only hospitals with capabilities (eg: comprehensive stroke center) can perform thrombectomy.
 - A higher NIHSS (10 or more) can be indicative of a large vessel occlusion

CT brain without contrast

- Required for all patients presenting to ED with stroke-like symptoms
- Required prior to giving IV tPA to rule out hemorrhage
- Can also see early signs of stroke (developing hypodensity) or signs of LVO (hyperdense vessel)
- EMS/triage → straight to CT is best





CTA chest

- Required for all patients with consideration of tPA if complaining of **chest pain** or other signs of aortic dissection prior to giving tPA
- Aortic dissection can extend to carotids and cause a stroke

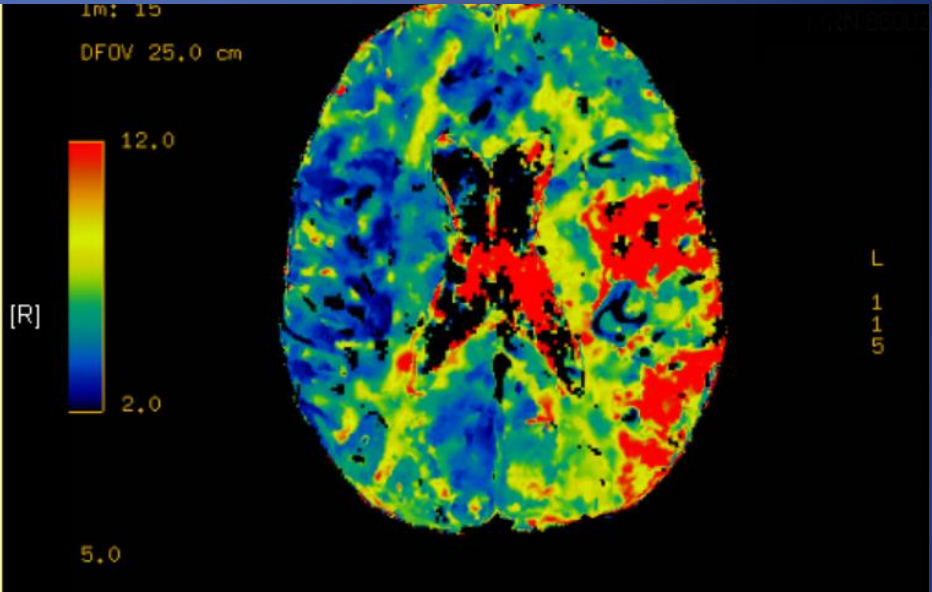
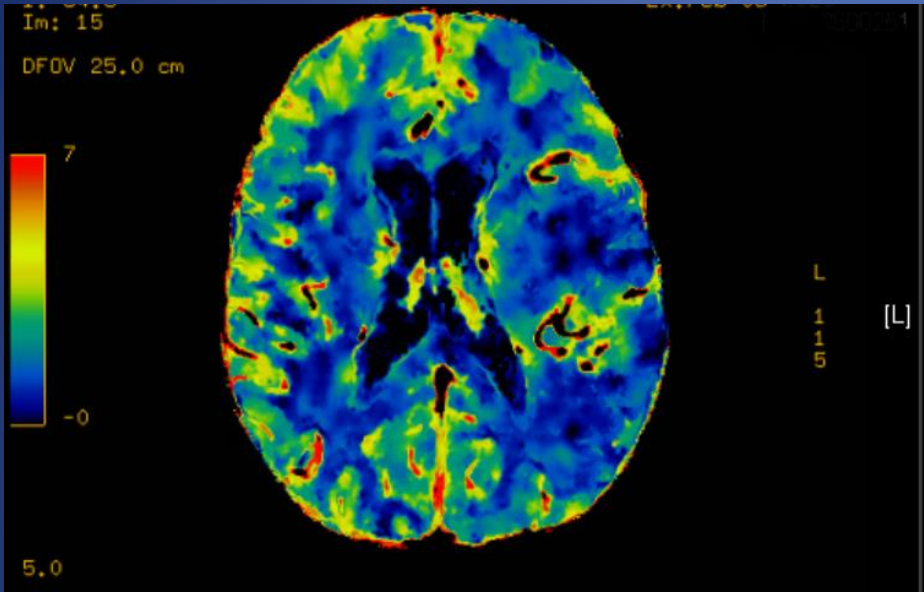


CT angiogram head and neck with contrast

- Required for all patients **acutely** if an LVO is suspected (higher NIHSS, hemispheric syndrome, basilar syndrome), but do not delay IV tPA to get CTA if they are still a candidate.
- Vessel imaging with CTA or MRA required for all patients with suspected stroke or TIA during hospitalization – if can do in ED for all patients despite NIHSS, this can be helpful
- Looking for large vessel occlusion to decide on thrombectomy: **intracranial ICA, A1, M1 or M2, P1, basilar**

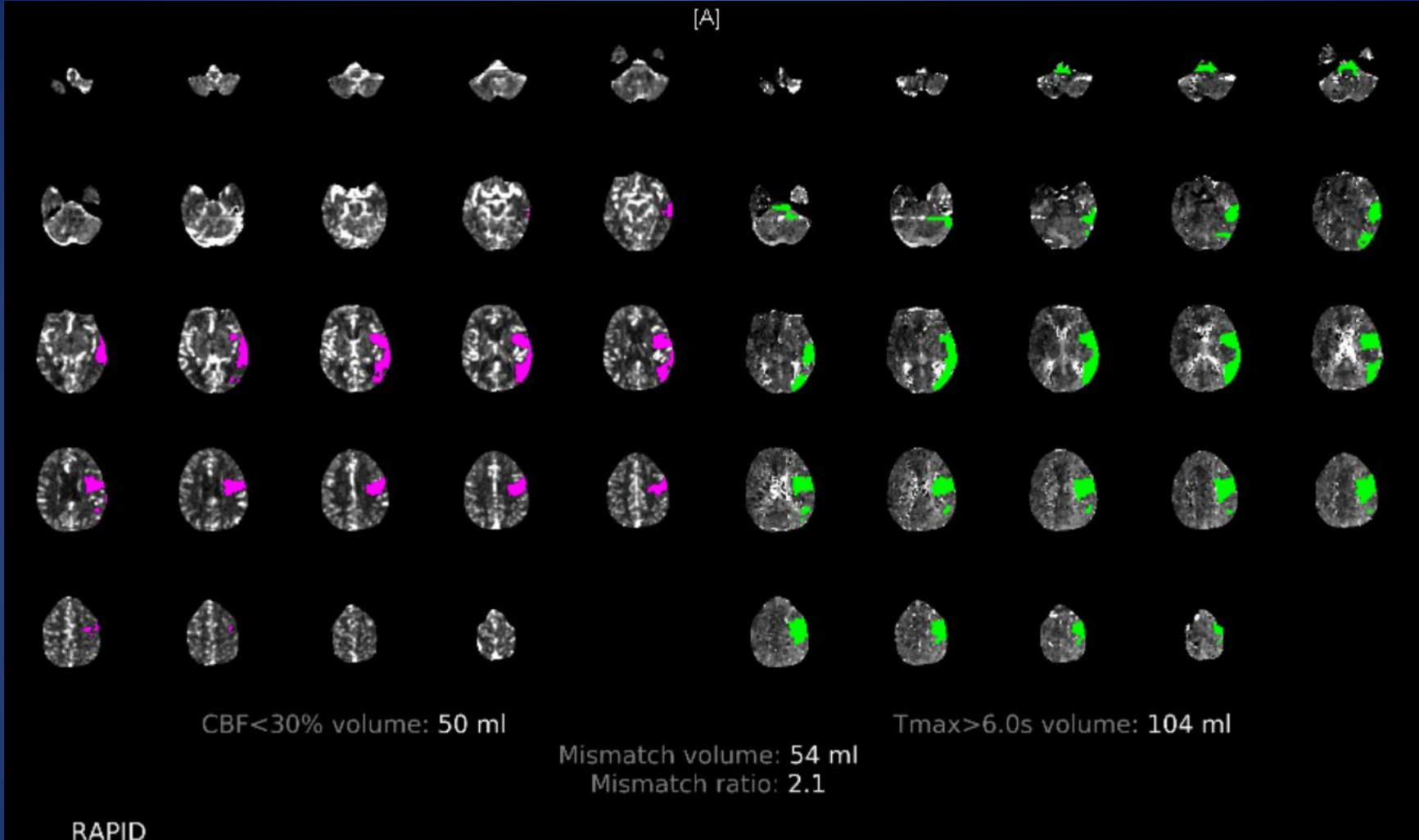
CTP with contrast

- Required for all patients **acutely** who have LVO and **if last well 6-24 hours**
 - If lsw less than 6 hours prior to potential thrombectomy time, likely do not need CTP to decide on EVT
 - If transfer time to thrombectomy capable hospital is \geq 2 hours, do not do CTP at sending
- CT perfusion is used to find a **mismatch** between ischemic core (area already damaged) and ischemic penumbra (area at risk of damage).



CBV

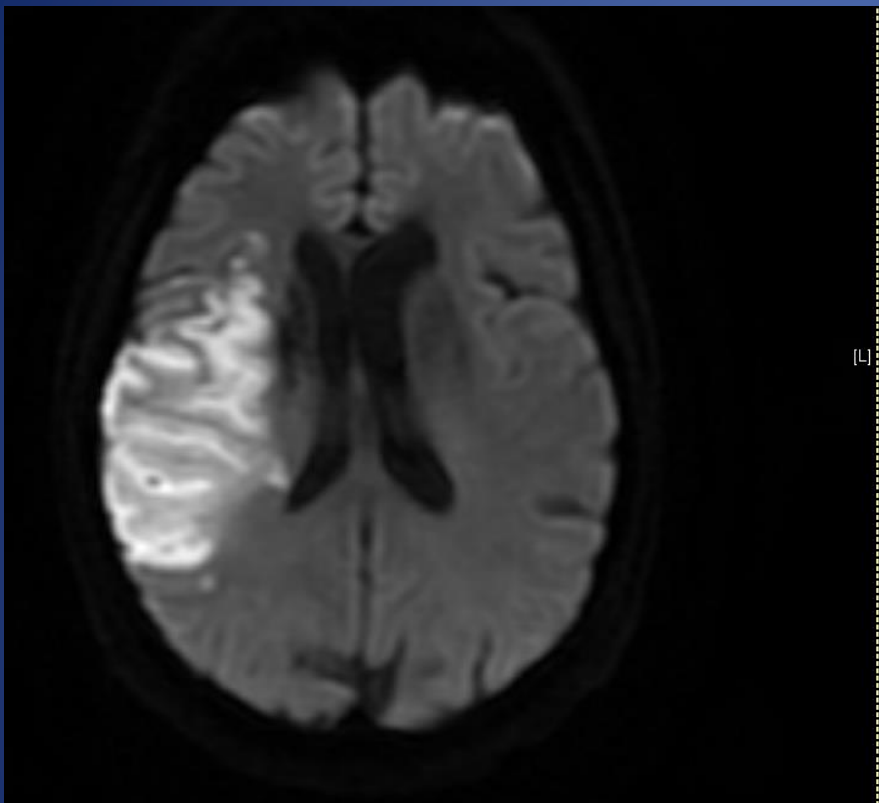
Tmax



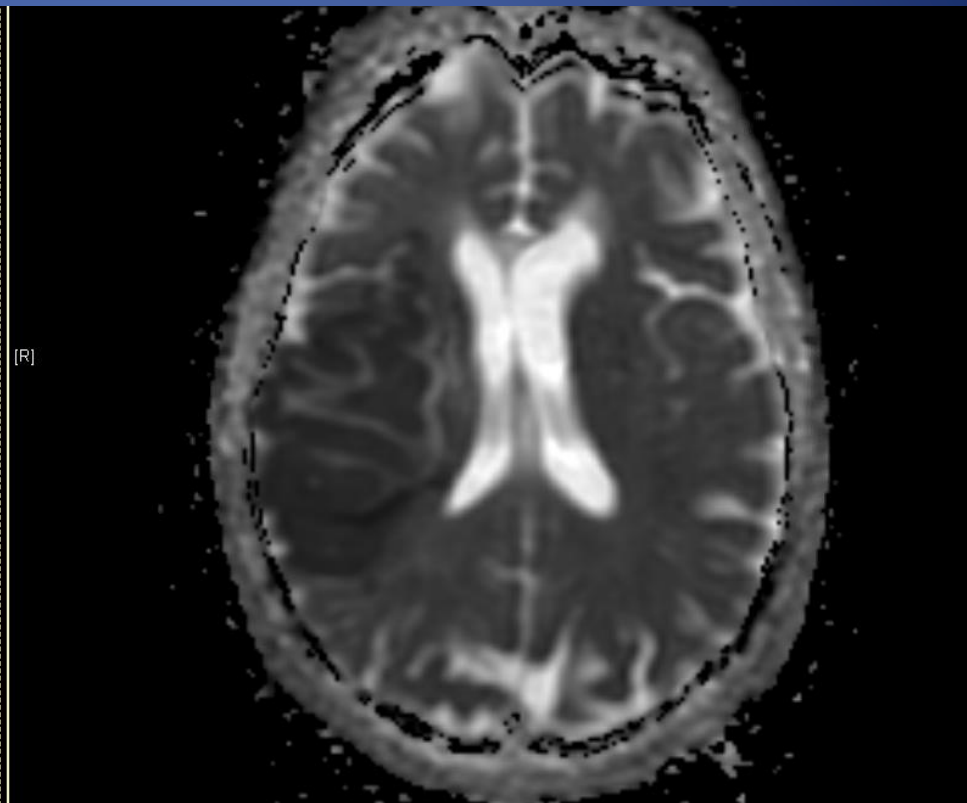
Take to EVT if: core is less than 70, mismatch is greater than 1.6. If core greater than 70, we have studies they can be enrolled in

MRI brain without contrast

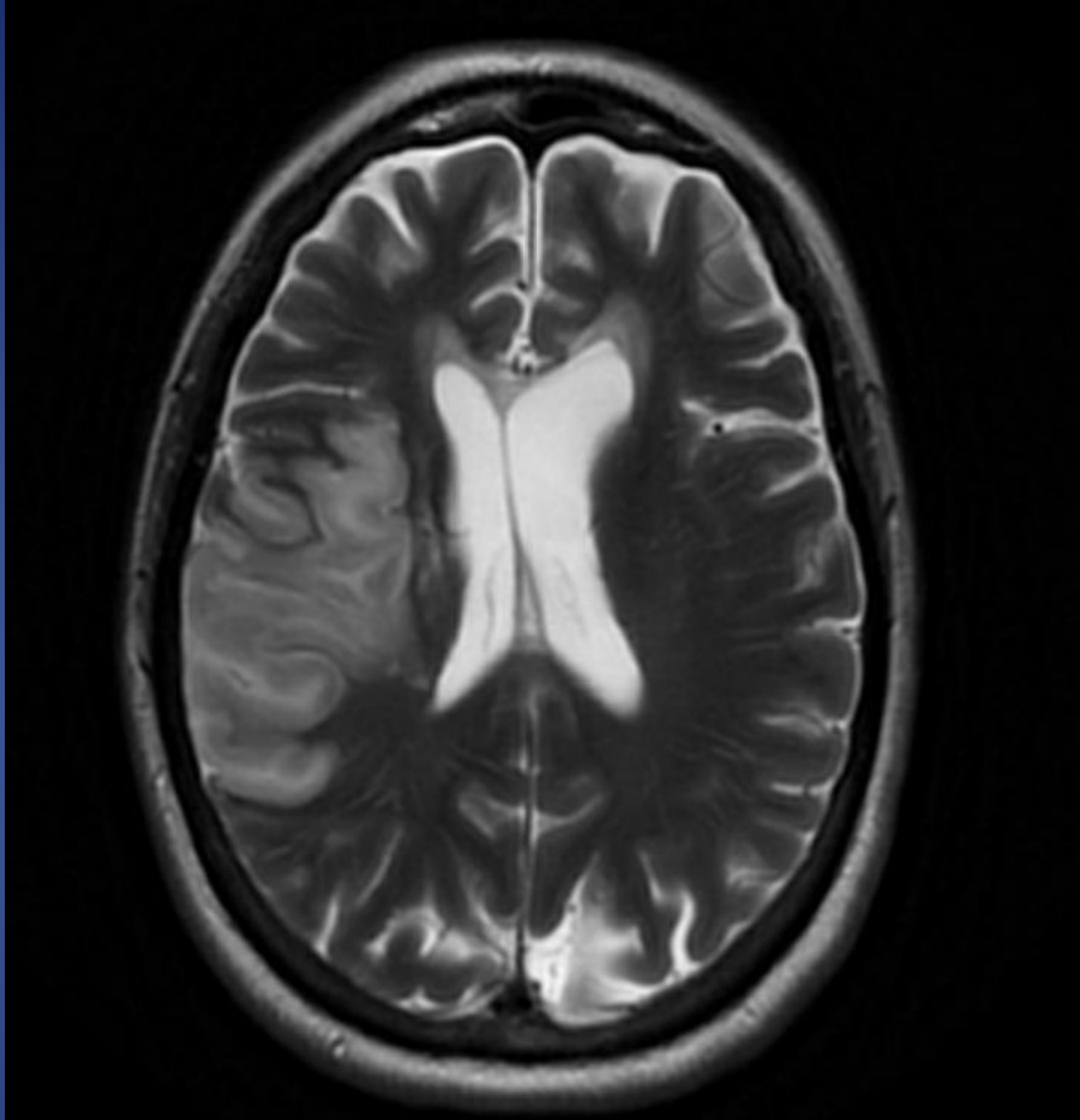
- Required for most patients with suspected stroke/TIA while hospitalized
- Should **not** be completed in ED in most cases, especially prior to deciding on acute interventions
- Special cases where **acute** MRI is helpful:
 - If severe reaction to contrast (anaphylaxis), can do MRA/MRP instead of CTA/CTP prior to deciding on intervention
 - If concerning for functional/psychogenic etiology or difficulty interpreting symptoms in setting of previous stroke and there are risks to IV tPA, can obtain MRI to diagnose stroke
- Most sensitive to diagnose stroke, but may be negative in hyperacute period
- Can get without contrast in most cases
- Diagnosis of acute stroke = **hyperintensity in DWI** with corresponding **hypointensity in ADC**



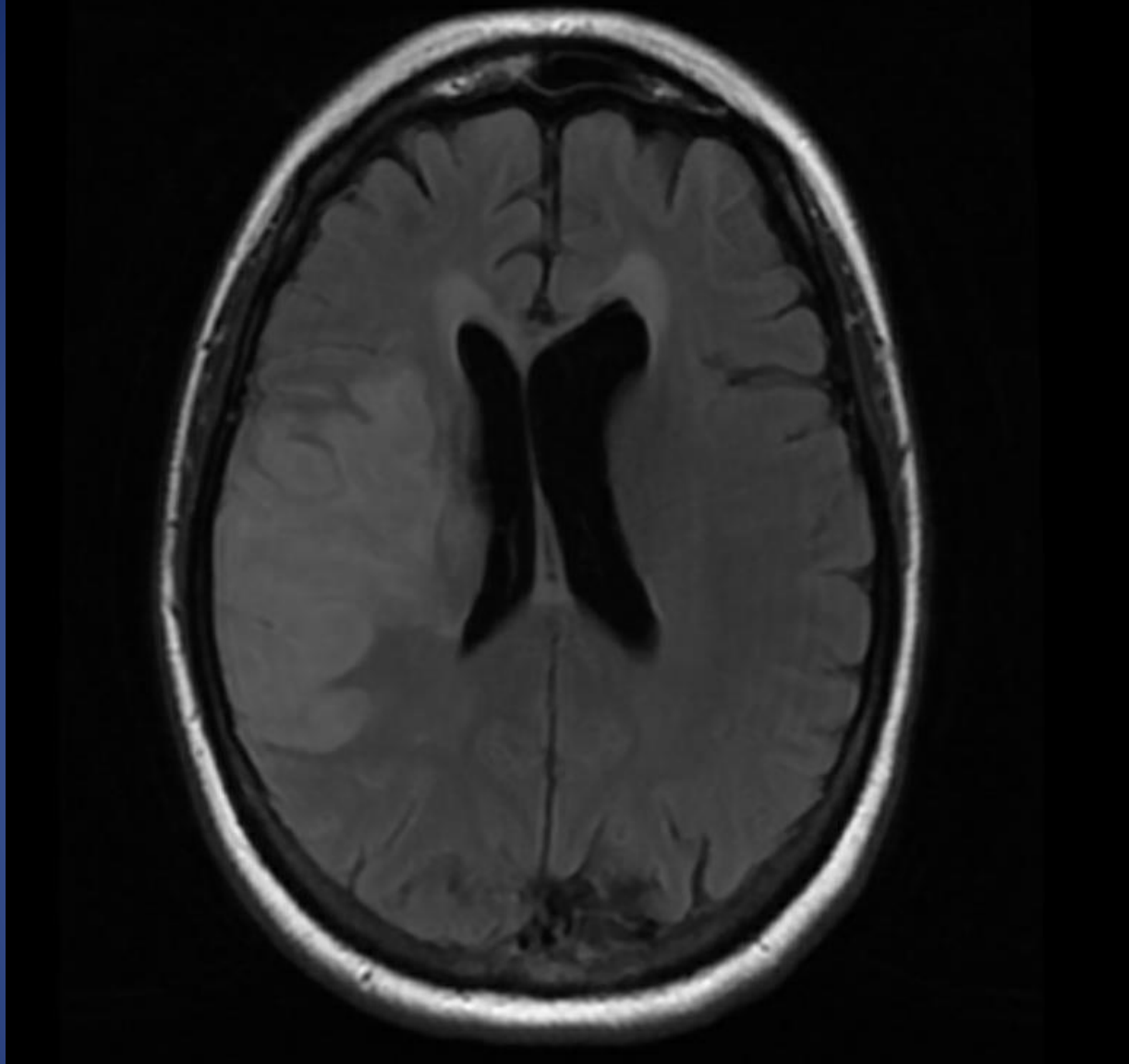
DWI (Diffusion weighted imaging)



ADC (Apparent diffusion coefficient)



T2



FLAIR (Fluid attenuation inversion recovery)

Review

- CT brain w/o contrast for all patients
 - CTA chest with contrast in patients with concern for aortic dissection
- CTA head/neck with contrast for all patients and **acutely** in cases of suspected LVO
- CTP with contrast in cases with suspected or proven LVO and lsw between 6-24 hours or unknown
- MRI brain w/o contrast usually never in ED

Questions?

- Call for help anytime!
- <http://www.kissnetwork.us/>
- email at sslavin2@kumc.edu