



**KANSAS INITIATIVE FOR
STROKE SURVIVAL**
A PROJECT BY AND FOR KANSANS

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Cerebral venous sinus thrombosis

“First Tuesdays” Lecture Series
Sabreena Slavin, MD

Introduction and Goal of “First Tuesdays”

- 1st Tuesday of the month, **NEW TIME 12-12:30 PM**
- **WILL GIVE 0.5 CREDIT CE**
- 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.

Epidemiology

- Represents 0.5% of patients with stroke
- Median age 37, women 75% of cases
- 85% have at least one risk factor for thrombosis²
 - Hypercoagulable conditions
 - Pregnancy/peripartum
 - OCPs/hormone replacement
 - Drugs (eg: lithium, vitamin A, IVIG, ecstasy)
 - Cancer related
 - Infection (meningeal processes/otitis/sinusitis)
 - Mechanical precipitants (LP, intracranial hypotension)
 - Dehydration
 - Other systemic diseases

Clinical symptoms

- Symptoms of intracranial HTN (headaches, diplopia, visual impairment causing papilledema, decreased level of consciousness)
 - Headache present most commonly, headache by itself can present 15% of the time
- Focal neurological deficit
- Encephalopathy
- Seizures
- Hemorrhage present in 35-39% of patients

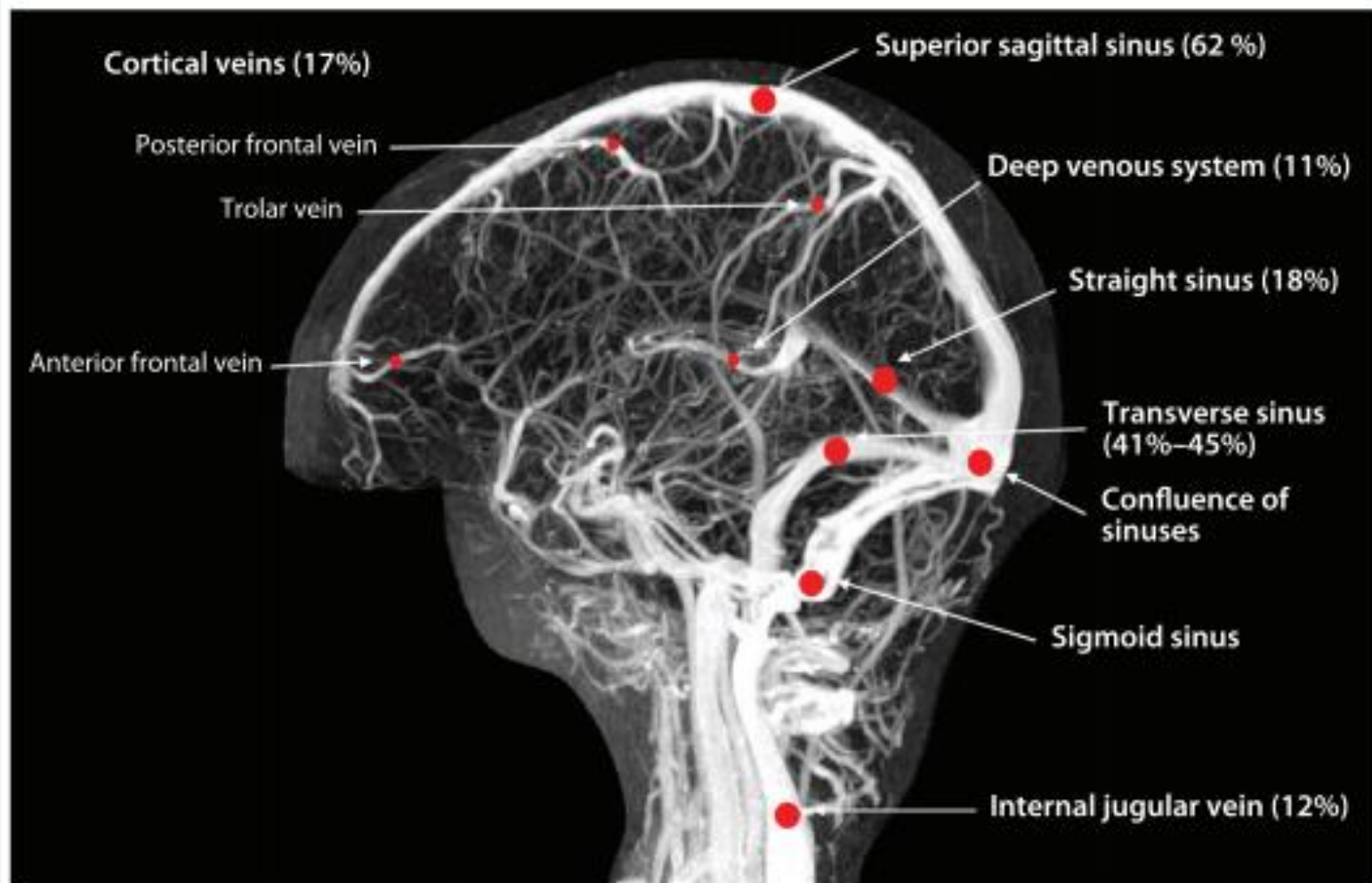


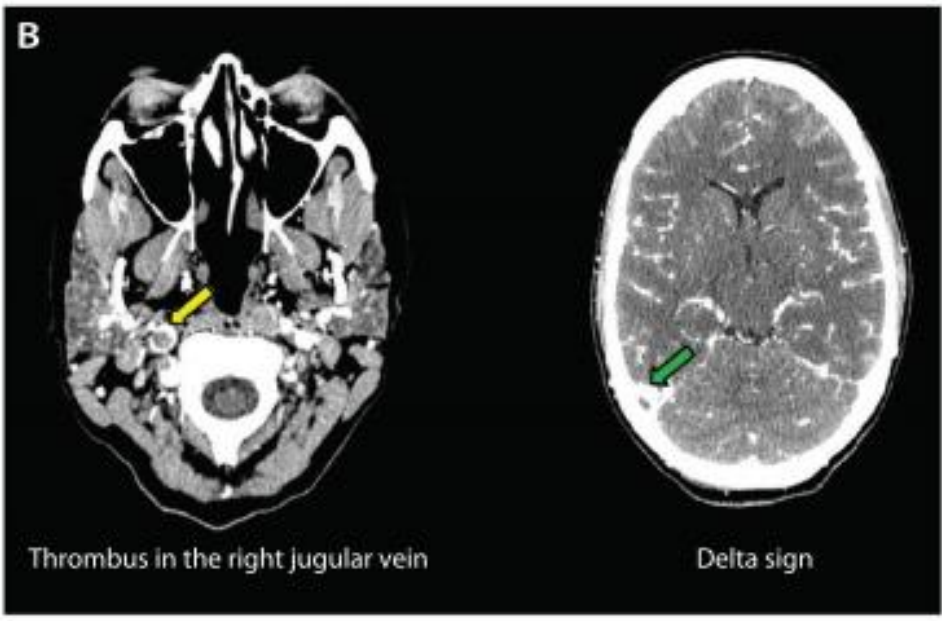
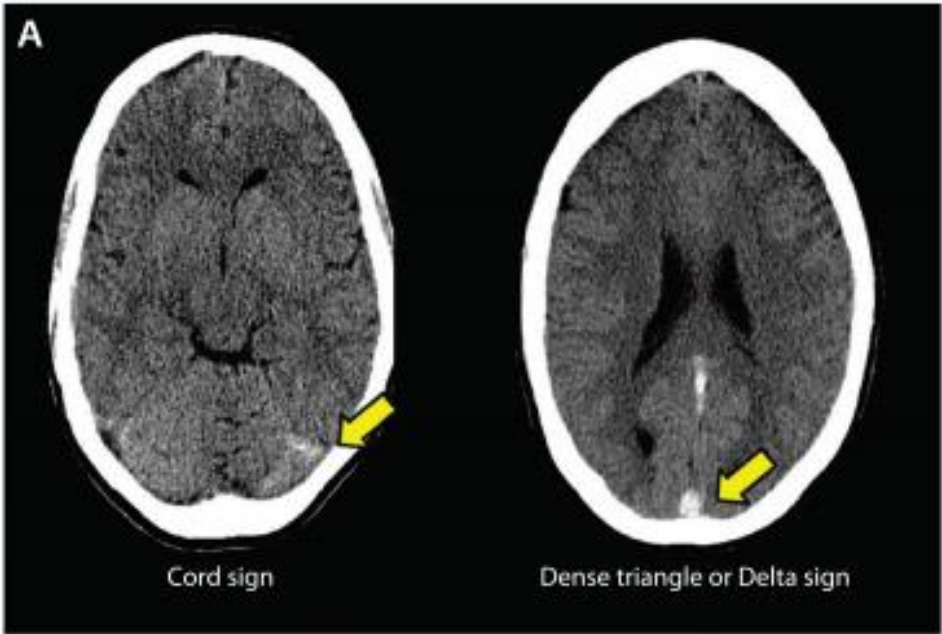
FIGURE 5-1

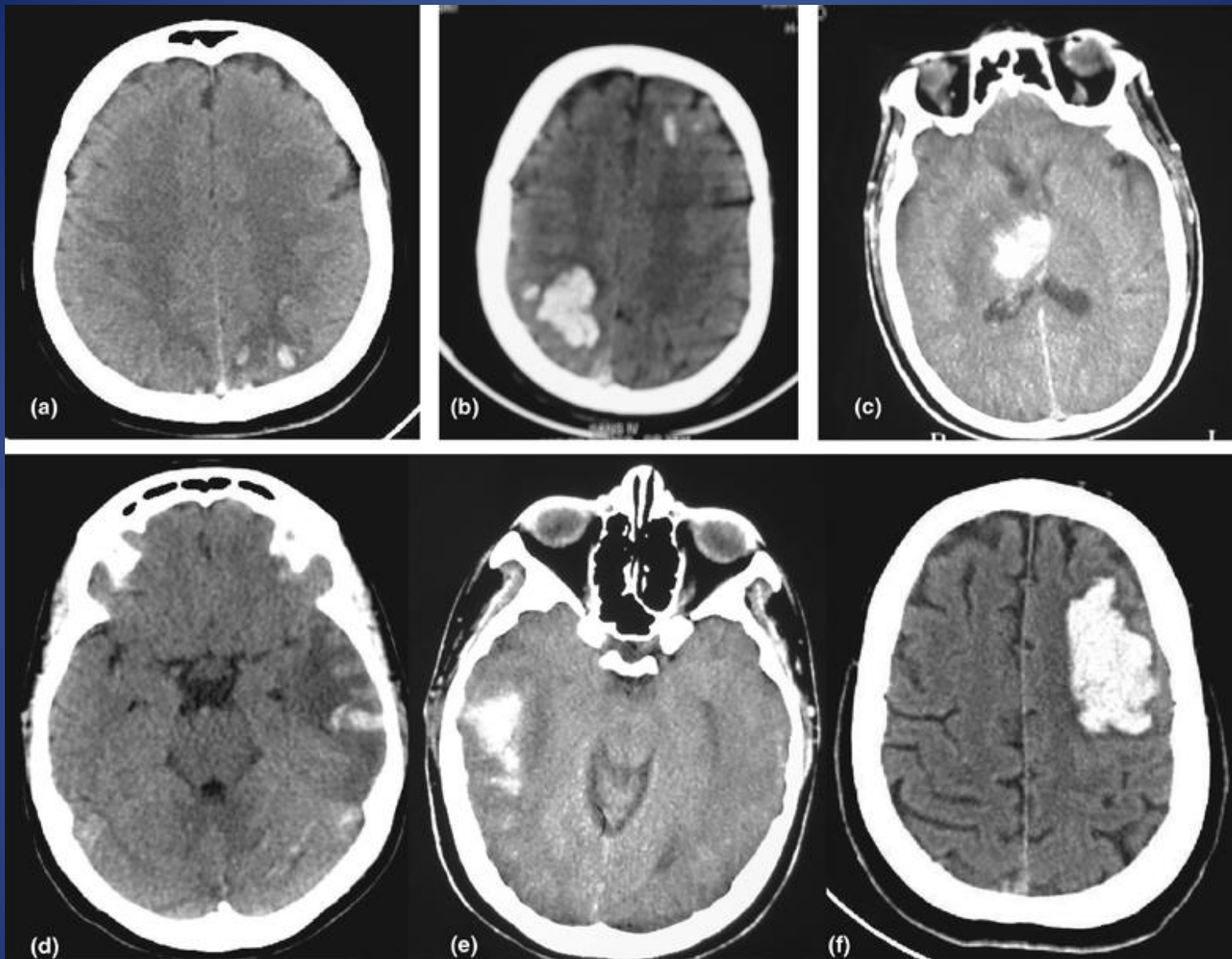
Cerebral venous thrombosis: most commonly affected sinuses. The sagittal sinus is the most commonly affected, followed by the transverse sinuses.

Modified from Saposnik G, et al, *Stroke*.⁷ © 2011 American Heart Association, Inc. stroke.ahajournals.org/content/42/4/1158.long.

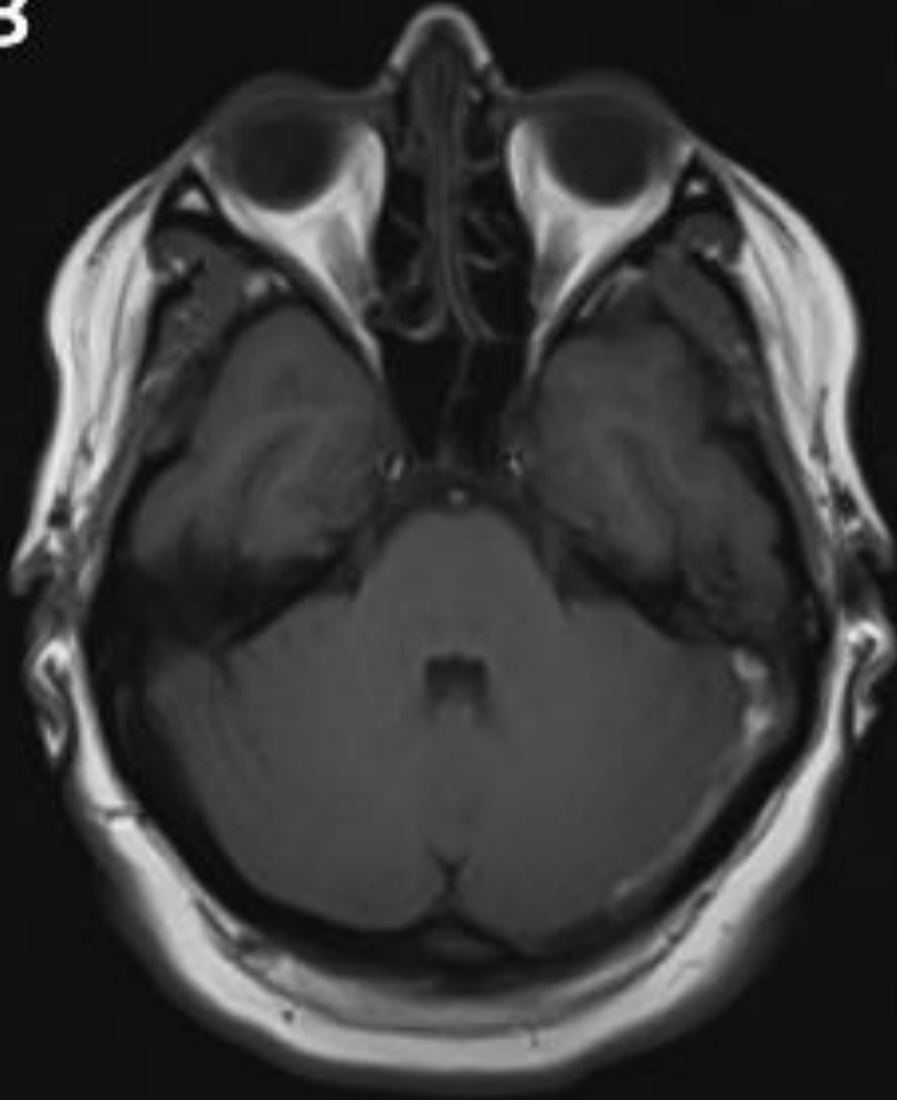
Diagnosis

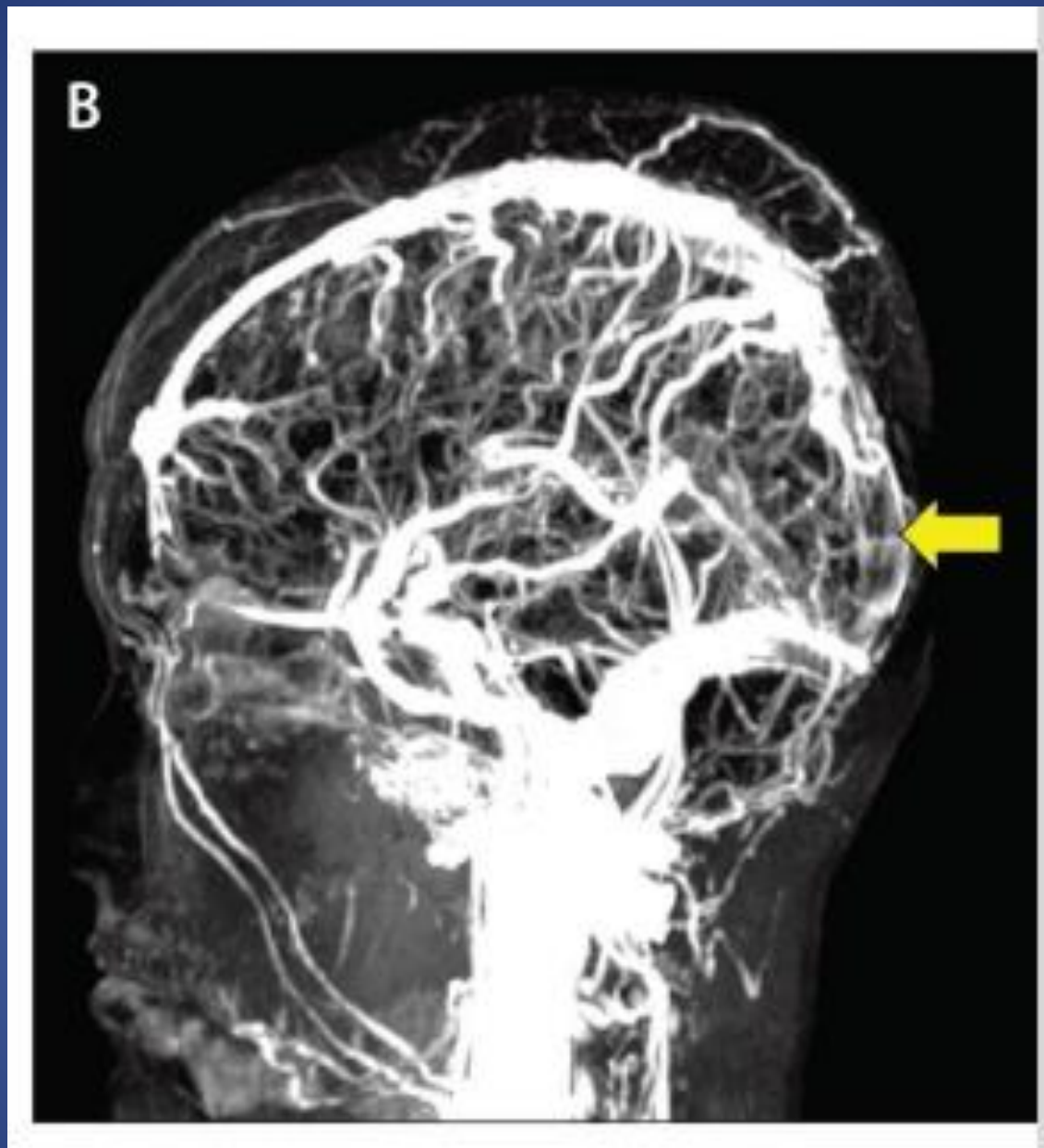
- MRI and MRV with contrast when suspicious. This is preferred to CT/CTV because MRI has imaging sequences that improve detection of smaller cortical vein thrombosis
- MRI can show parenchymal changes (edema/hemorrhage/infarction) and signal changes in thrombosed veins
 - However, occasionally patients (1/15 in one study¹) may not have MRI changes, in which case MRV will be needed to diagnose





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Bushnell et al, *Continuum Neurology* 2014

Workup

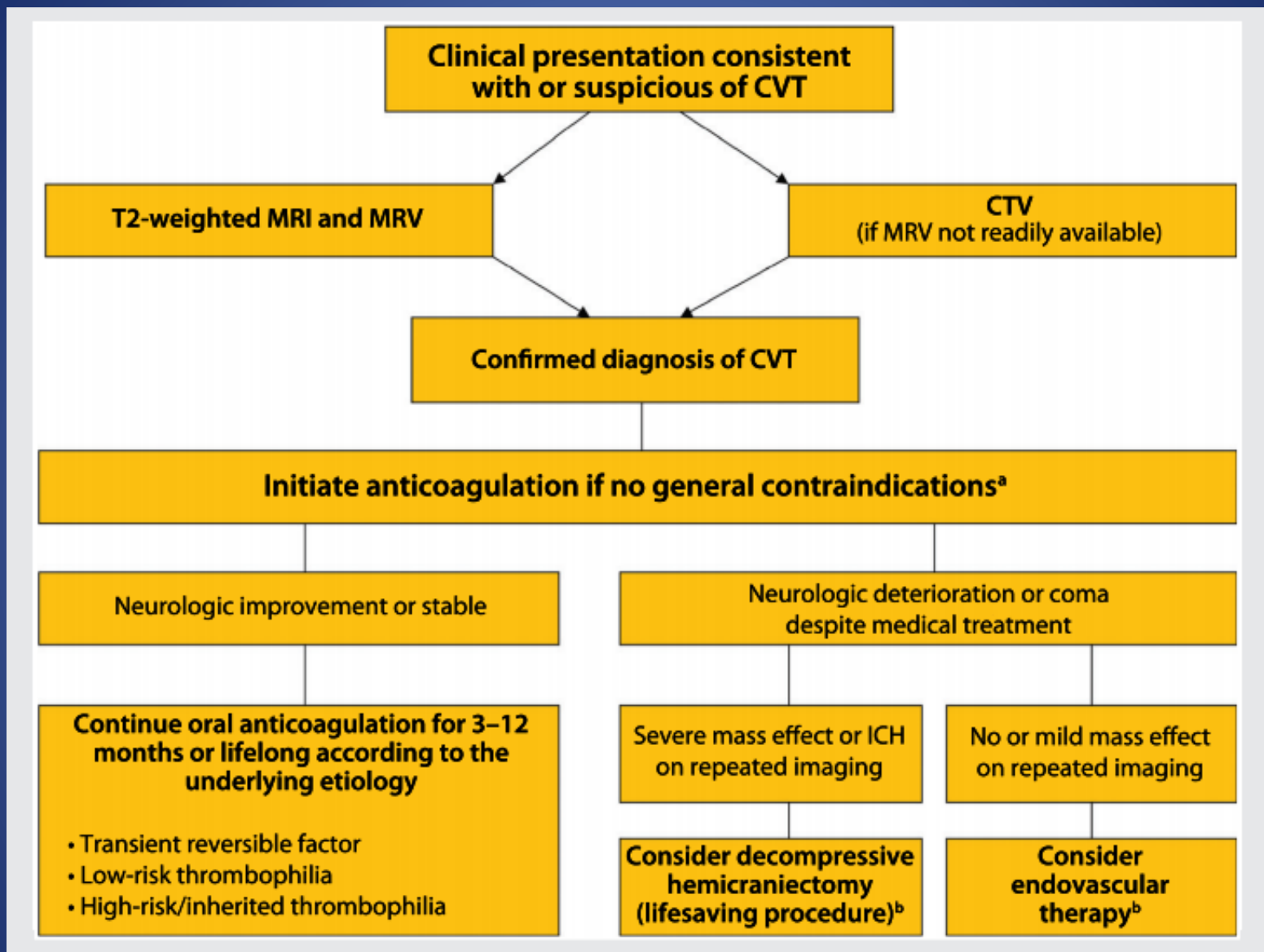
- MRI/MRV with contrast if suspicious
- Once diagnosed, stop the offending drug/treatment (eg: OCP's)
- Hypercoagulable panel as outpatient: protein S/C deficiency, antithrombin III deficiency, antiphospholipid antibody syndrome, increased factor VIII, factor V leiden mutation, prothrombin mutation
- Some will have multiple precipitants

Treatment

- Anticoagulation, even in the presence of ICH
- Preference for low molecular weight heparin (eg: Enoxaparin) over unfractionated Heparin initially.
- Long term: warfarin vs DOAC
 - Dabigatran vs warfarin was tested in one study with 120 patients² No recurrent VTE or worsening of CVT occurred in either group
 - 60% had improvement in CVT with Dabigatran; 67% had improvement in warfarin
 - Bleeding occurred in 20% in both groups
 - Other smaller studies showed good outcomes with Apixaban and Rivaroxaban³
- Duration: 3-6 months in provoked; 6-12 months in unprovoked; lifelong in recurrent or severe hypercoagulable disorder⁴

Interventional treatment

- Endovascular thrombolysis or mechanical thrombectomy can be an option if deterioration occurs despite anticoagulation
 - Invasive procedures carry risk of bleeding
 - 67 patients randomized to thrombectomy vs anticoagulation. At 12 months, 67% of intervention patients vs 68% of medical patients had functional independence. Mortality was not statistically different.



COVID-19 vaccination and thrombosis

- Oxford-Astrazeneca vaccine has been associated with cerebral venous sinus thrombosis and thrombocytopenia in Europe, along with other venous thrombosis events.
- Johnson&Johnson/Janssen vaccine now in the US also has shown few cases of cerebral venous thrombosis and severe thrombocytopenia, along with elevated D-dimer, prolonged PTT, and reduced fibrinogen.
- These cases can be refractory to Heparin due to the severe thrombocytopenia and lead to hemorrhage.
- Cases have been treated with IVIG.

Questions?

- Call for help anytime!
- BAT phone: 913-588-3727
- <http://www.kissnetwork.us/>
- email at sslavin2@kumc.edu