

Cerebral Venous Sinus Thrombosis (CVT)

Karen Furie, MD, MPH

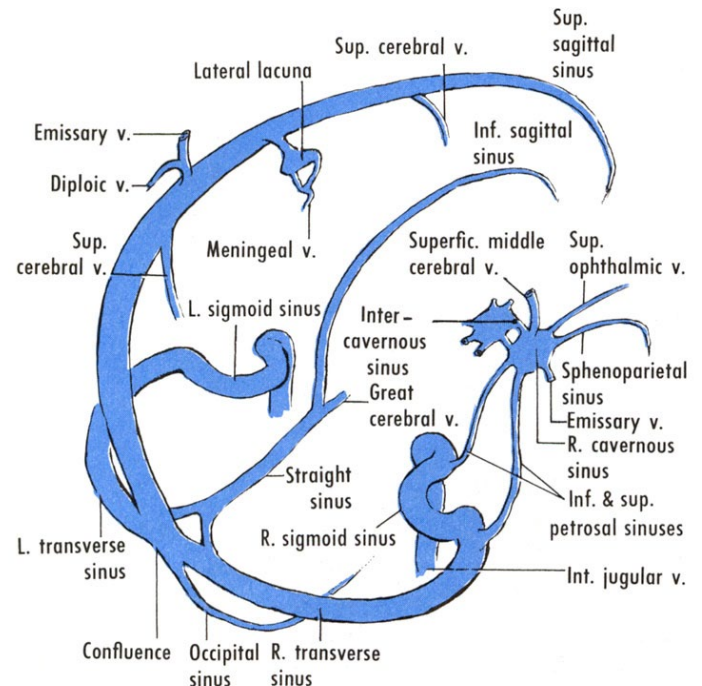
Neurologist-in-Chief, Rhode Island Hospital, The Miriam Hospital and Bradley Hospital

Samuel I Kennison, MD, and Bertha S. Kennison Professor of Clinical Neuroscience and

Chair of Neurology, The Warren Alpert Medical School of Brown University



THE WARREN ALPERT
Medical School
BROWN UNIVERSITY

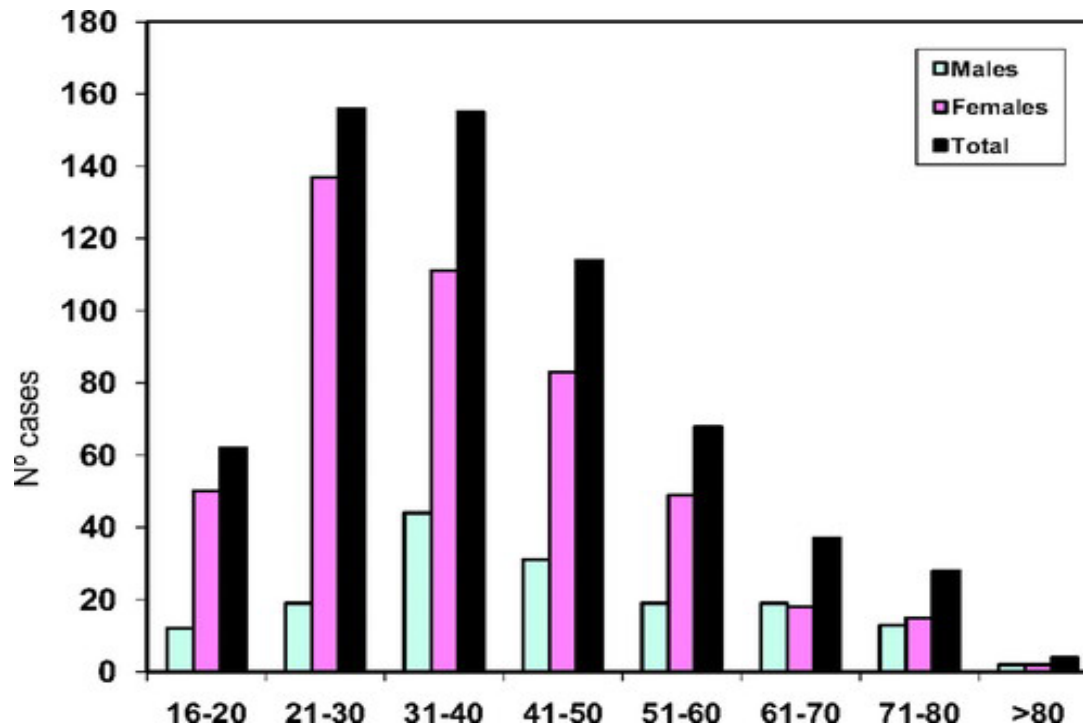


Disclosures

Janssen/BMS
JNNP

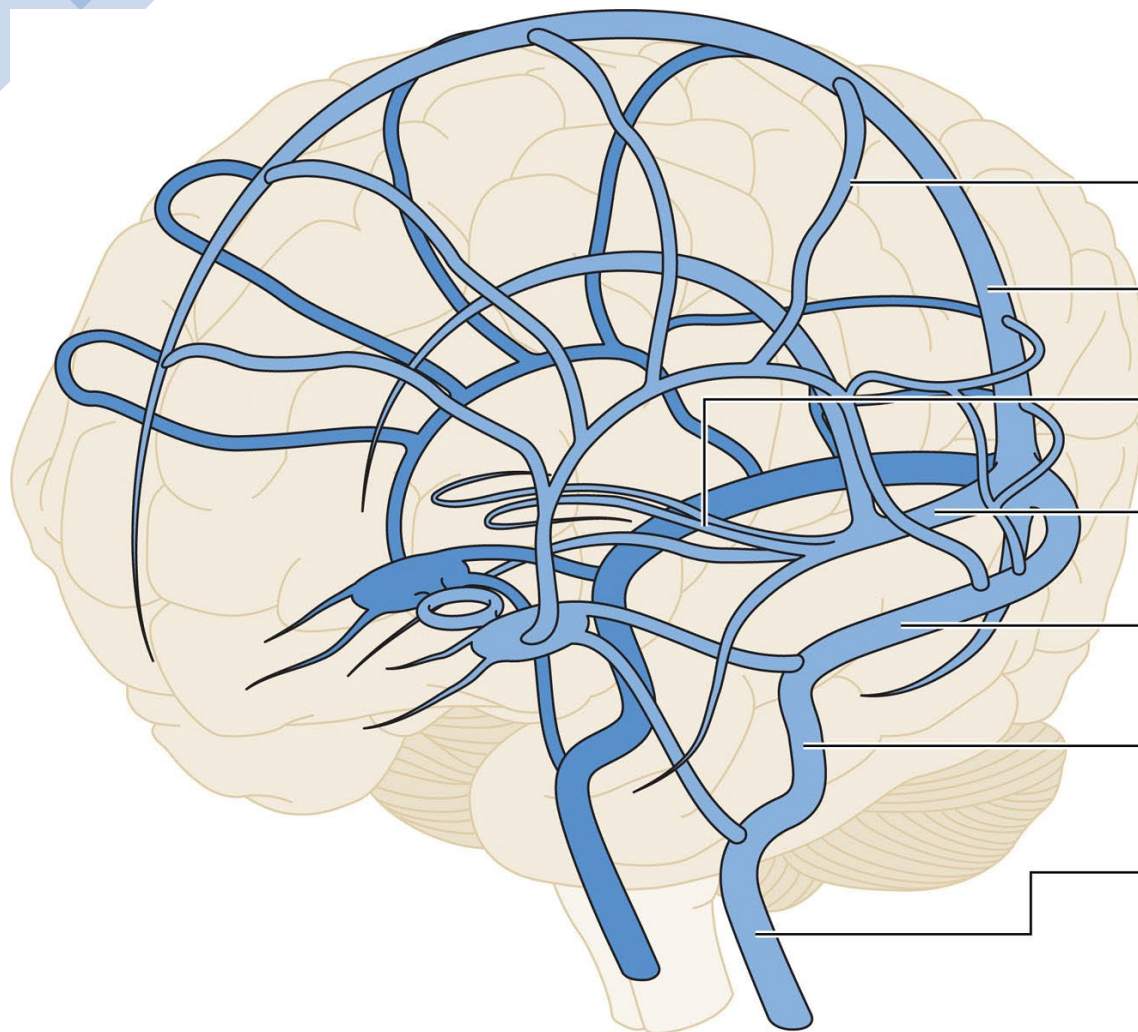
CVT is Rare

- 5 cases/million/year
- 0.5-3% of all stroke



Risk Factors

- Prothrombotic states
- Pregnancy
- Oral contraceptives
- Drugs (hormones, lithium, vit A, ecstasy, IVIG)
- Cancer
- Infection
- Inflammatory disorders
- Dehydration
- Mechanical



Frequencies:

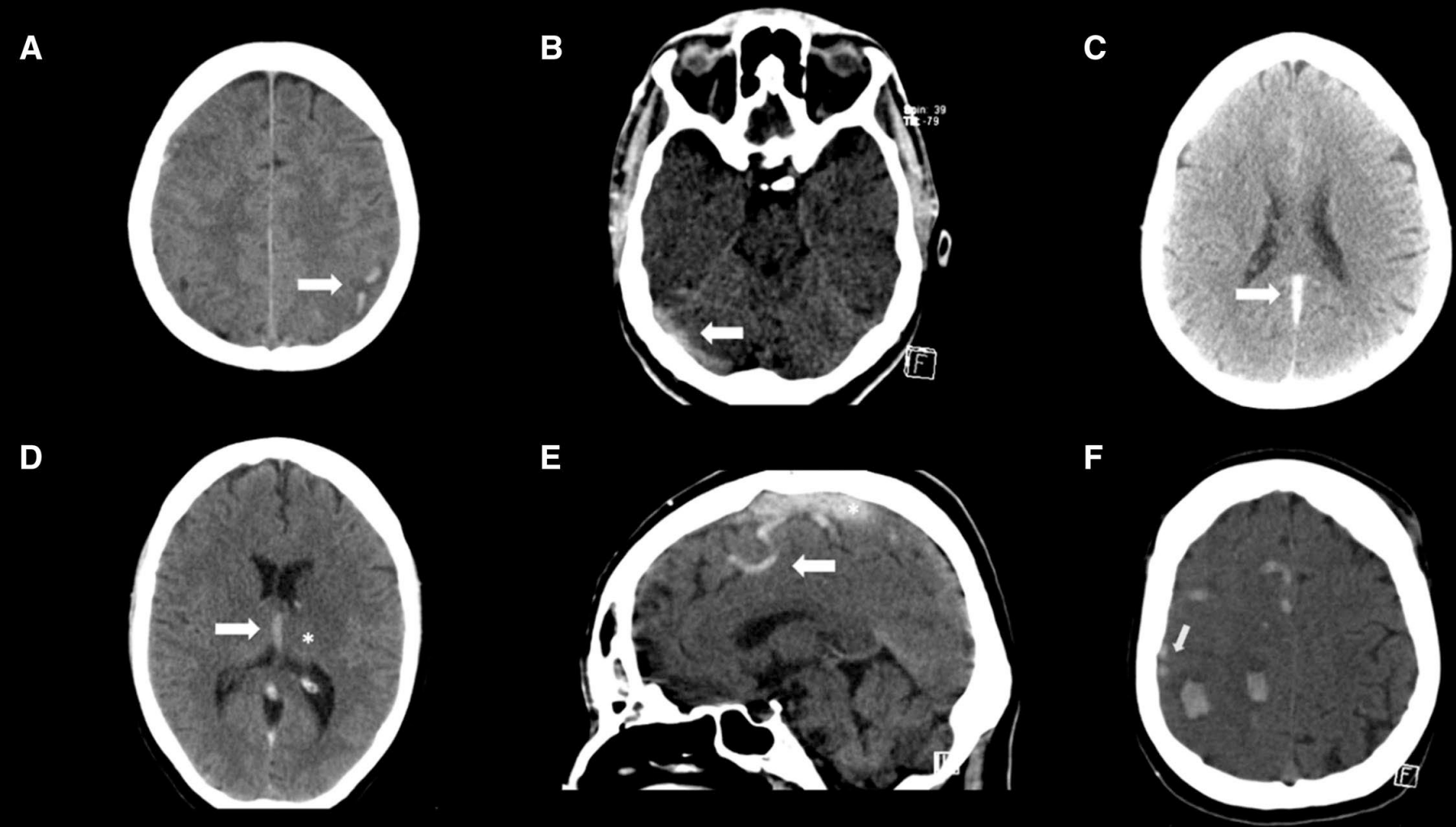
- Cortical veins: 15-17%
- Superior sagittal sinus: 25-45%
- Deep venous system: 10%
- Straight sinus: 15-18%
- Transverse sinus: 25-60%
- Sigmoid sinus 5-15%
- Internal jugular vein 10%
- Multiple sinuses: 18-50%

CVT Clinical Presentation

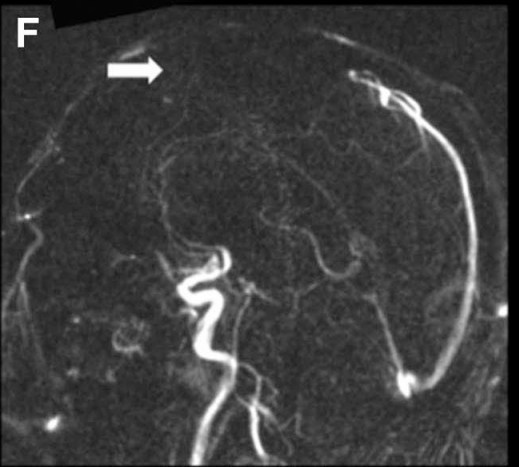
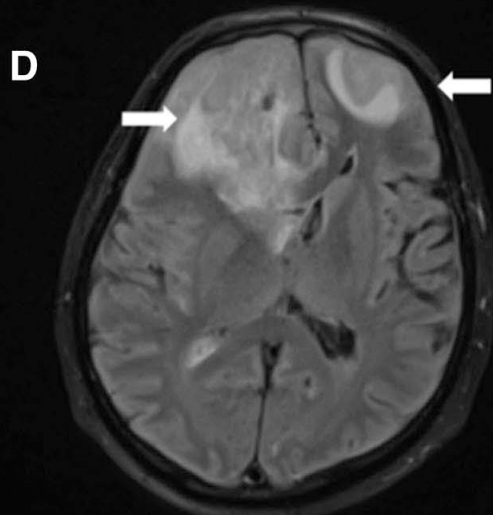
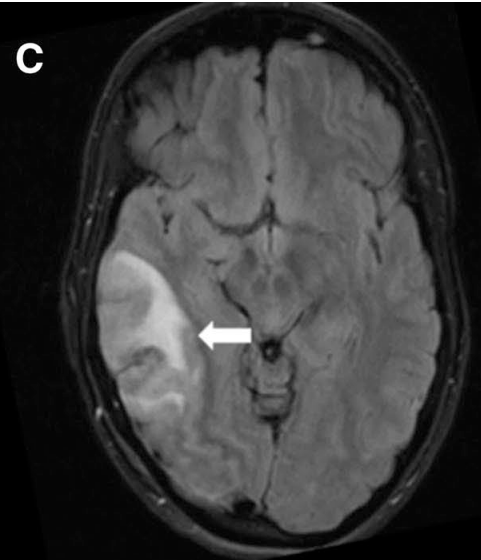
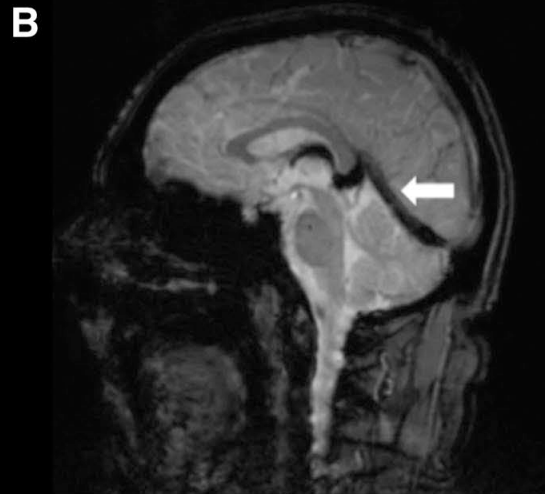
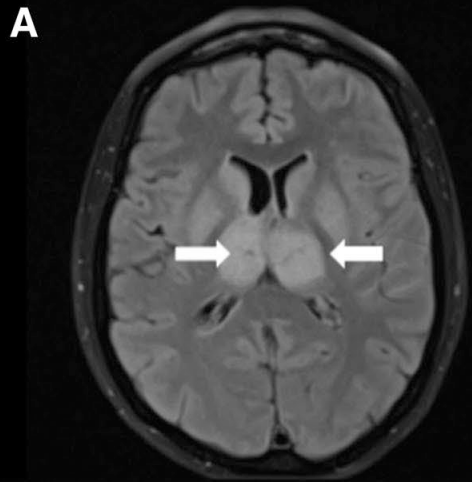
- Headache*
- Increased intracranial pressure/papilledema/diplopia
- Ischemic stroke
- Intracerebral hemorrhage
- Seizure
- Altered level of consciousness

*Headache is usually diffuse and progressive over days to weeks.
Can mimic migraine or present as thunderclap headache.
25% have isolated headache.

CVT on NCCT

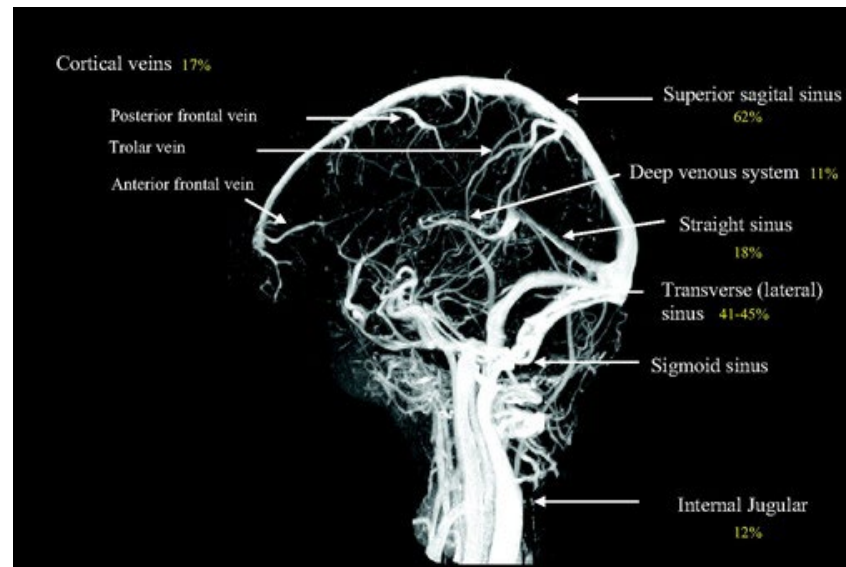


CVT on MRI



Diagnostic Studies

- CT+CTV: sensitivity 95%, specificity 91%
- MRI+MRV



CVT Treatment

- Acute SQ LMWH with transition to VKA or DOAC for 3-12 months
- Endovascular rescue treatment
- Decompressive craniectomy in cases of impending herniation to decrease mortality

CVT Treatment: Special populations

- **Pediatric**
 - More common in neonates
 - Treatment similar to that in adults for at least 6 weeks
- **Pregnant women**
 - LMWH or VKA for entire pregnancy and at least 6 weeks post-partum (cumulative 3 month minimum)
 - Prophylaxis for future pregnancies

Vaccine Induced Thrombotic Thrombocytopenia (VITT)

Adenoviral vectors encode spike glycoprotein

- Ad26.COVS.S (Janssen)- human
- ChAdOx1 nCoV-19 (Astra Zeneca)- chimpanzee

mRNA

- BNT162b2 (Pfizer)
- mRNA-1273 (Moderna)

CVST with COVID-19

CVST with COVID infection: 39 cases/million (95% CI 25.2-60.2)

Risk of CVST 5-12 x higher with COVID infection vs. vaccination

Unique Management of Vaccine-Associated CVT with thrombocytopenia

- Complete blood count with platelet count and peripheral smear, PT/PTT, fibrinogen, D-dimer, PF4 antibody ELISA (can be confirmed with a serotonin release assay, p-selectin assay, or HIPA)
- Hematology consult
- Avoid heparin products unless HIT negative
- Acute anticoagulation with argatroban, lepirudin, desirudin, bivalirudin, danaparoid, or fondaparinux
- IVIg (1 g/kg) for 2 days
- Consider steroids (prednisone 1-2 mg/kg)
- Avoid platelet transfusions (unless surgery required)
- Once platelet count normalizes, transition to oral anticoagulant (DOAC preferred)

CVT Outcomes

- Residual headache, depression, fatigue
- 10-15% rate of death or dependence
- >10% epilepsy
- Recurrent CVT 1-2 %/year
- Recurrent VTE 2-4%/year

Thank you!