# Charles E. Schmidt College of Medicine

Presenters do not have a financial interest/arrangement with one or more organization that could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation.

# Case

- 54 YO M with no PMH or Hospitalizations
- Went to bed at 6:00 in normal state and woke up at 14:00 with facial drooping, dysphagia, dysarthria and generalized weakness
- Denied CP, SOB, HA, and changes in vision. The patient reports no recent infection and no prior stroke.
- Does not see a doctor regularly. Denies ever having routine screening or blood work
- No recent or past history of seizure, trauma, or syncope.

# Additional History

- Umbilical Hernia repair 4 years prior
- No allergies or current medications
- Family history significant for:
  - Father (87) - DMII; atrial fibrillation; MI at age 75
  - Mother (83) - Atrial fibrillation; otherwise healthy
- Single, never married, no children, not sexually active
- Lives with his parents. Able to all perform ADL's
- Previously in Army/Air Force
- Denies current or past use of cigarettes, alcohol or recreational drugs

# Physical Examination:

- VITALS: 130/73mmHg, HR 70, RR 18, temp 98.1F-oral, 97% O2 sat on room air
- GENERAL: Well-developed, well-nourished male, AAOx3
- HEENT: NC/AT, Moist mucosa, no LA or JVD
- HEART: RRR, No MGR
- LUNGS: CTA BL
- ABDOMEN: ND/NT, +BS
- MUSCULOSKELETAL: no muscle atrophy, no joint redness or swelling

# Physical Examination:

- VASCULAR: 2+ DP pulses bilaterally, no edema
- NEUROLOGIC: good visual acuity, PERRL, EOMI, sensation intact throughout all 3 divisions of the face, muscles of mastication in tact, facial drooping on the left side which spares the forehead; uvula midline, no deviation of tongue, strength 5/5 throughout; Speech fluent and appropriate

# Differential Diagnosis

- TIA
- Stroke
- Seizure
- Infection
- Malignancy
- Psychiatric
- Bell's Palsy

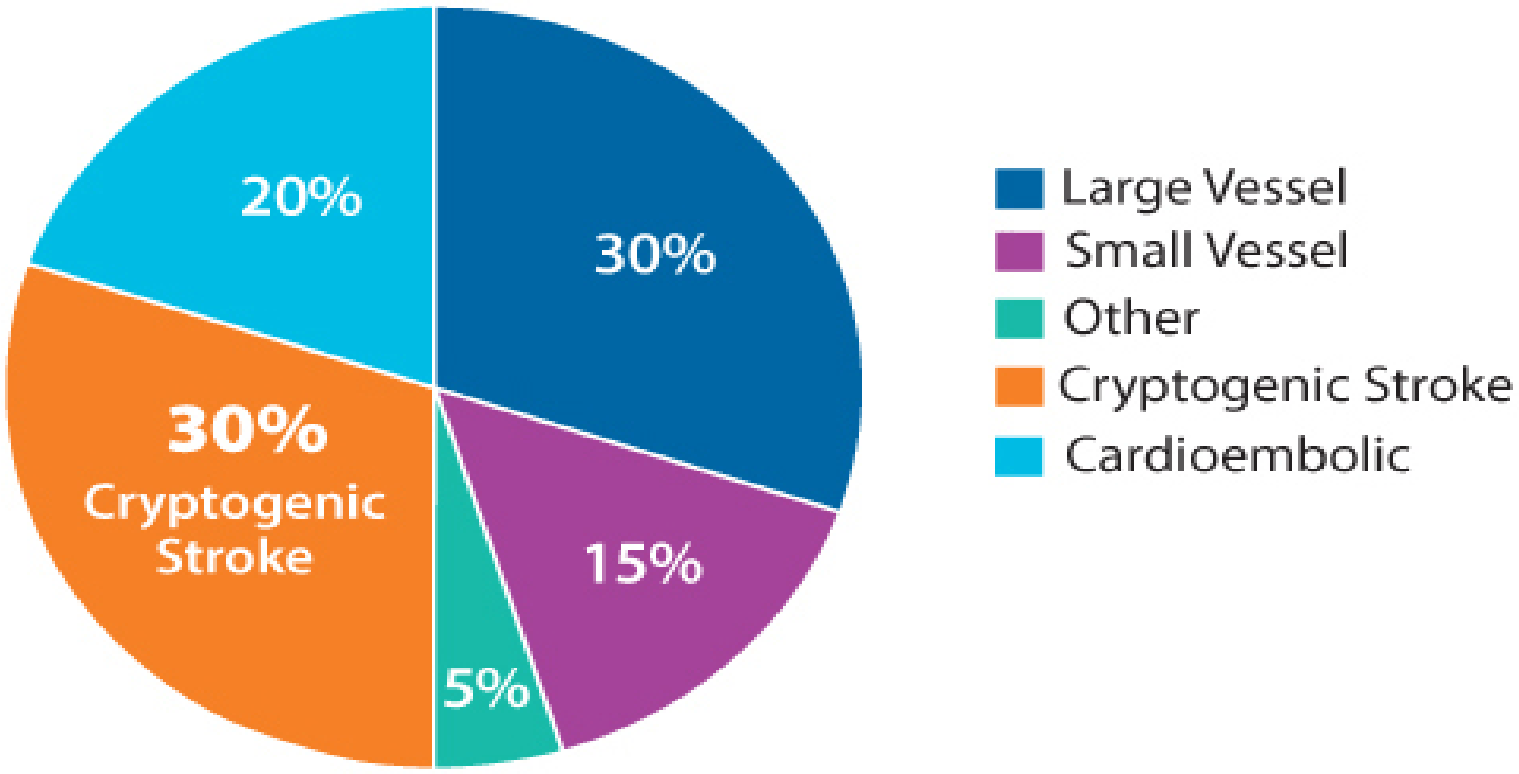
# Work Up

- CBC
- CMP
- CXR
- EKG
- UA
- Drug Screen
- TSH
- HbA1c
- Coagulation Profile
- ESR
- Lipid Panel
- CT Brain
- Perfusion Scan
- TTE/TEE
- Carotid Doppler
- CT Neck Angio

# Types of Strokes

- Ischemic Stroke 83%
  - Cryptogenic 30%
  - Lacunar 25%
  - Atheroembolic 20%
  - Embolic 20%
- Hemorrhagic Stroke 17%
  - Intracerebral Hemorrhage 59%
  - Subarachnoid Hemorrhage 41%

# Ischemic Stroke

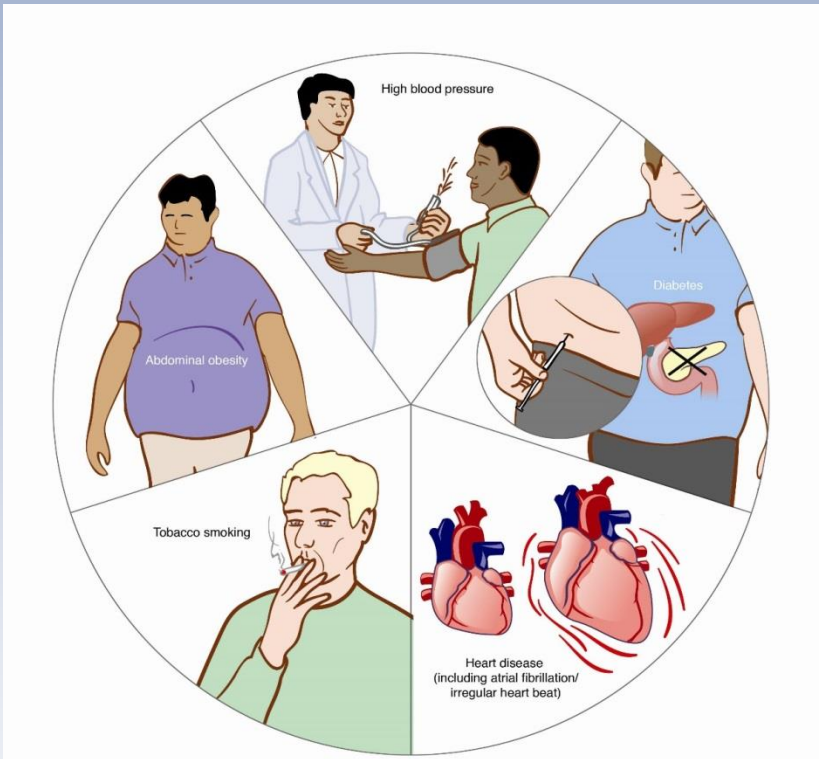


# Cryptogenic Stroke

- 30 to 40 percent of ischemic strokes
- ~800,000 new or recurrent strokes yearly
- 690,000 ischemic strokes every year in the US
- Approximately 200,000 cryptogenic strokes (CS) annually

# Epidemiology And Risk Factors

- Age
- Gender
- Race and ethnicity
- Atrial septal abnormalities
- Cardiac disease
- Diabetes
- Family history
- Hypertension
- Homocysteine
- Inflammatory and infectious causes
- Lipids
- Prior TIA
- Pulmonary shunts
- Smoking



Cardinal Stroke Risk Factors

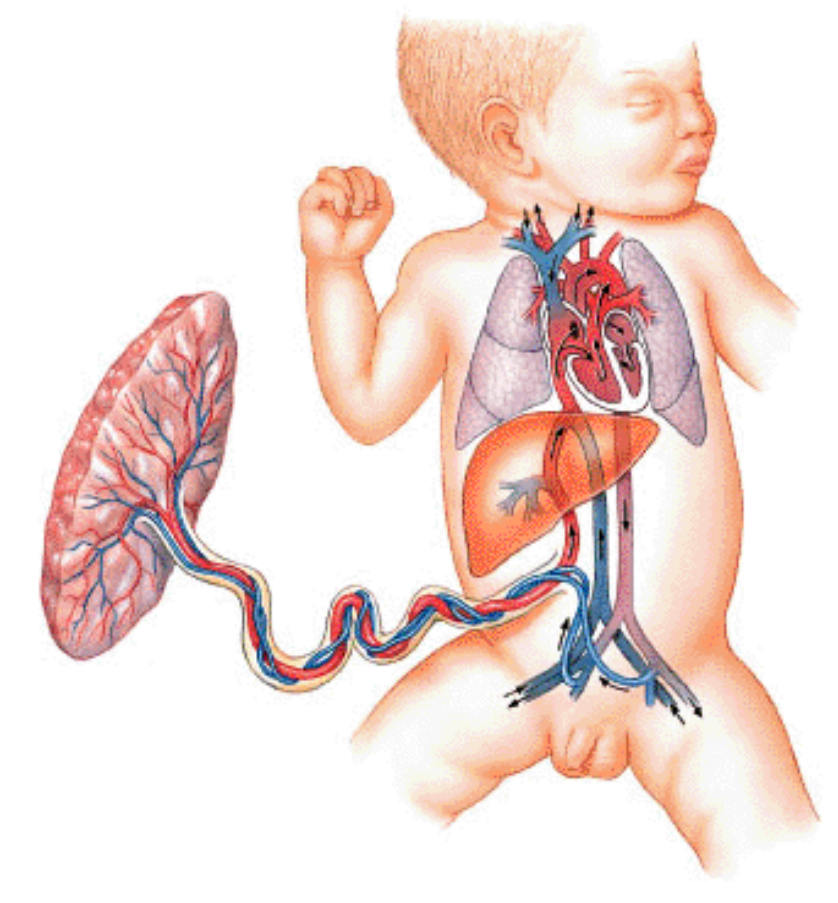
# Pathogenesis

- Occult cardiac embolism secondary to paroxysmal atrial fibrillation, aortic atheromatous disease, or other cardiac sources
- Paradoxical embolism secondary to patent foramen ovale (PFO) or other atrial septal abnormalities
- Thrombophilia (hypercoagulable states including those related to antiphospholipid antibodies or to occult cancer with hypercoagulability of malignancy)
- Preclinical or subclinical cerebrovascular disease (ie, intracranial and extracranial vascular changes)
- Potentially inflammatory processes (e.g, elevated C-reactive protein or chronic infections)

# Treatment of Strokes

- Ischemic Strokes:
  - tPA within 3 hours(and up to 4.5 hours in certain eligible patients) for ischemic strokes
  - Mechanical thrombectomy, within six hours of acute stroke symptoms, and only after a patient receives tPA.
  - Acute management of cryptogenic stroke should not differ from other ischemic stroke subtypes.
- Hemorrhagic Strokes:
  - Anticonvulsants - To prevent seizure recurrence
  - Antihypertensive agents - To reduce BP and other risk factors of heart disease
  - Osmotic diuretics - To decrease intracranial pressure in the subarachnoid space

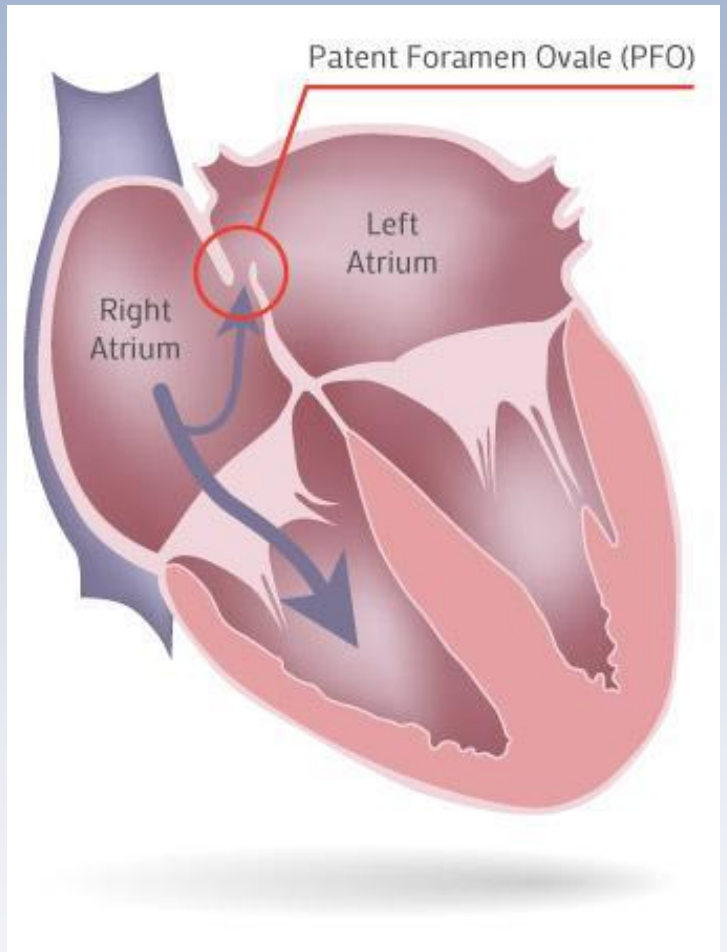
# Patent Foramen Ovalis



- Required during fetal development to allow oxygenated blood to flow from the RA to the LA

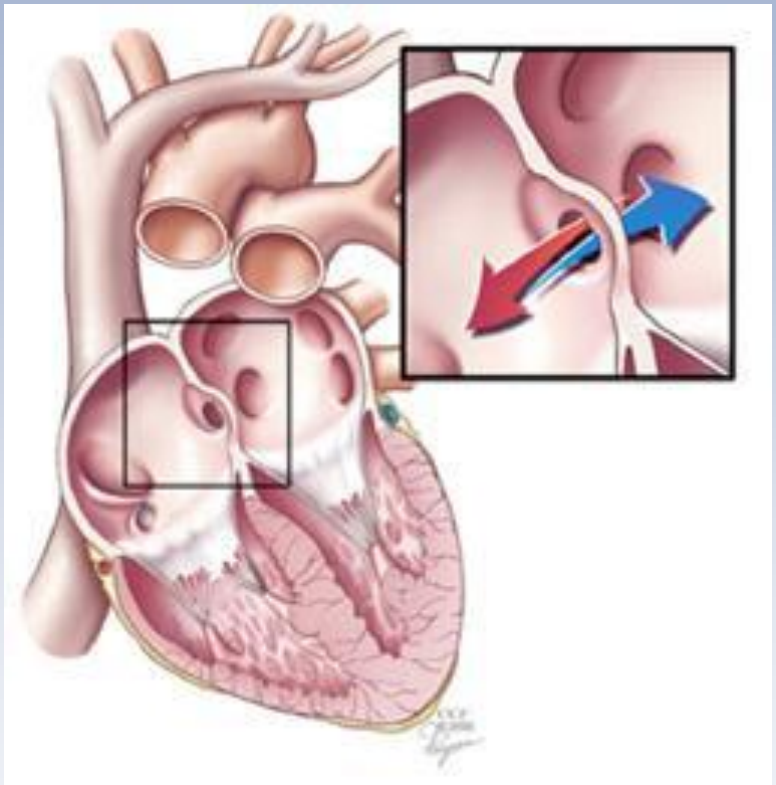
# Patent Foramen Ovale

- Fusion usually occurs by age 2
- Complete closure occurs in 75%
- Remaining 25% having a PFO



# Atrial Septal Aneurysm

- Defined as a redundant and mobile tissue in the area of the fossa ovalis.
- Rare. Prevalence is <2%.
- Usually an incidental finding on routine TTE
- Commonly asymptomatic.
- Most likely to be congenital rather than acquired.



# Classification of ASA

- 1R protrudes to the right atrium throughout the cardiorespiratory cycle
- 2L protrudes to the left atrium throughout the cardiorespiratory cycle
- 3RL Protrudes to right atrium with a lesser excursion towards the left atrium throughout the cardiorespiratory cycle
- 4LR Protrudes left atrium with a lesser excursion towards the right atrium throughout the cardiorespiratory cycle
- 5 The aneurysm excursion is bidirectional and equidistant to the right and the left atrium throughout the cardiorespiratory cycle

# Atrial Septal Aneurysm

- Cryptogenic stroke is among the most concerning manifestations of ASA.
- Patients with ASA and no ASD are unique because they lack an intracardiac shunt.
- Almost all patients with ASA have at least one additional source/cause for the patient's cryptogenic emboli.

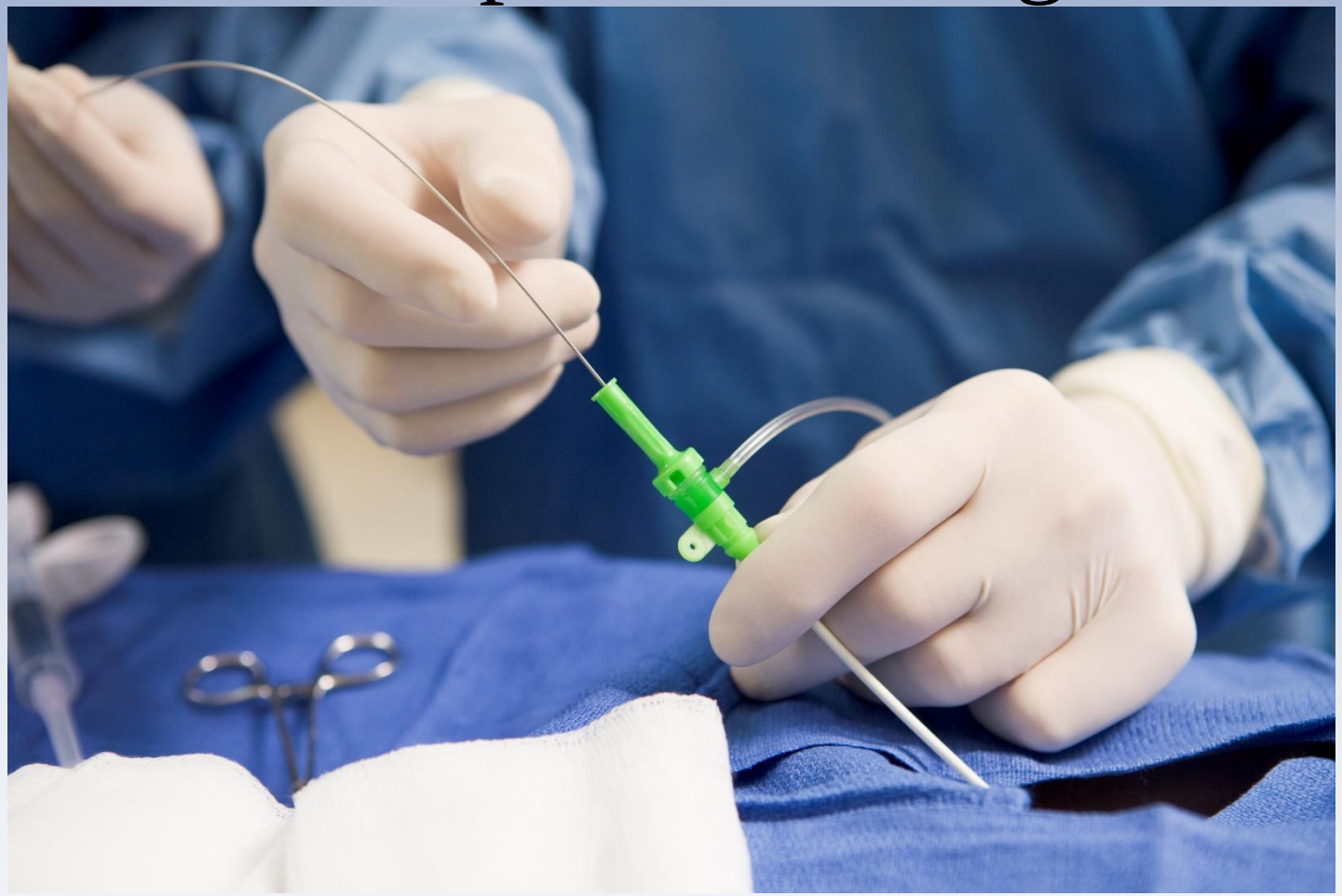
# Atrial Septal Aneurysm

- An ASD with a diameter greater than 4mm correlates with an increased risk of multiple strokes in different time periods and TIA.
- Leads to the question: How should these defects be managed?

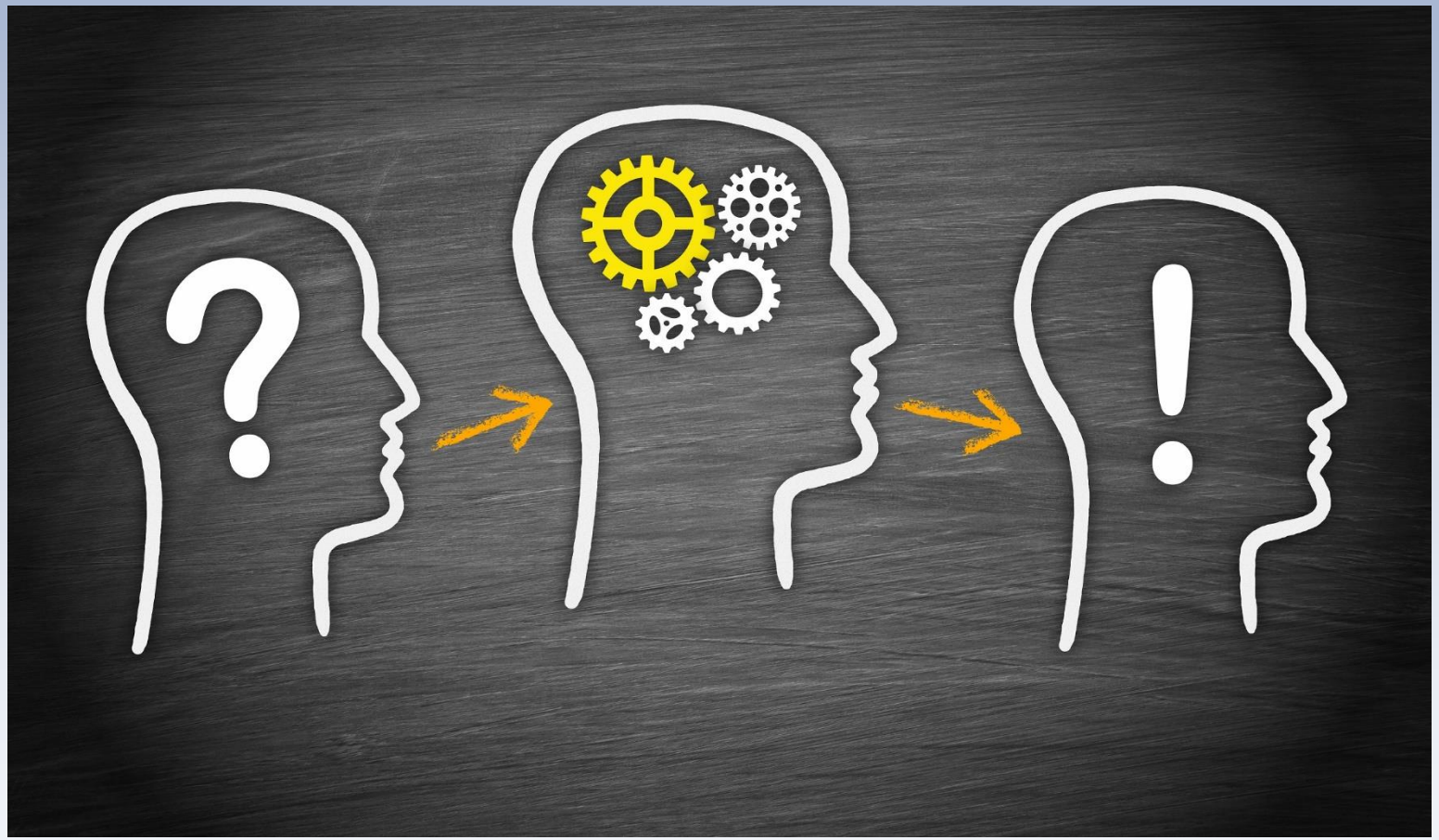
# Conclusion

- Treatment is not well established.
- Medical management is currently preferred over surgical intervention. Specifically, antiplatelet and anticoagulation treatments are most frequently used.
- Anticoagulation is only indicated in those who simultaneously are found to have a DVT or hypercoagulable state. If anticoagulation is contraindicated an inferior vena cava filter should be considered
- In cases where antiplatelet therapy or anticoagulation therapy fails to prevent recurrence of stroke/TIA surgical correction is a plausible option.

# How was this patient managed?



# Questions



# Thank you!

- Presenters
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