

Atrial Fib

- Calculate CHA₂DS₂-VASc score – treat if ≥ 2%
- Consider HAS-BLED score to evaluate risk of bleeding
- If unstable - treat emergently (hospital)
- If stable:
 - **Rate control** (first line beta blocker or non-DHP CCB vs second line digoxin esp. if heart failure) + **anticoagulation** initially - keep rate < 110 if asymptomatic and normal EF
 - Rhythm control for certain patients: 1. instability 2. younger 3. those w/ shorter duration AF 4. reduced LVEF 5. persistent symptoms despite treating with rate control.
 - Electrical Cardioversion - usually first line
 - Pharmacological
 - Consider cardiac ablation – if unable or unwilling to take rate or rhythm control meds
 - This may improve EF in some patients w/ HFrEF
 - May be preferred in younger patients with fewer comorbidities who have paroxysmal AF
- Cardioversion within 1 year of AF onset may be associated with lower mortality
- Antiarrhythmic medication may reduce CV morbidity and mortality in patients < 65 years compared with rate control

CVA, TIA, A. Fib

CHA ₂ DS ₂ -VASc	Risk Factor	Points
C	Congestive Heart Failure	+1
H	HTN	+1
A	Age 75 yrs+	+2
D	DM	+1
S	Previous Stroke, TIA, or thromboembolism	+2
V	Vascular dx	+1
A	Age 65-74	+1
Sc	Sex Category (female)	+1

Treat if score ≥2 in men / ≥3 in women

HAS-BLED

- HAS-BLED Criteria (Each scored 1 point):**
- Hypertension (SBP >160 mmHg)
 - Abnormal Renal/Liver Function (1 point for each)
 - Renal: Dialysis, transplant, or serum creatinine >2.3 mg/dL
 - Liver: Cirrhosis or bilirubin >2x normal, with AST/ALT >3x normal
 - Stroke (history of stroke)
 - Bleeding History or Predisposition (e.g., prior major bleeding, anemia)
 - Labile INRs (unstable or high INRs if on warfarin)
 - Elderly (age >65 years)
 - Drugs or Alcohol (1 point for each)
 - Drugs: Antiplatelets or NSAIDs
 - Alcohol: ≥8 drinks/week
- Interpretation:**
- **Score ≥3** indicates **high bleeding risk**. Extra caution and closer monitoring are required if anticoagulation is started.
- Management:**
- Address modifiable risk factors (e.g., control BP, avoid NSAIDs/alcohol).
 - Consider alternative strategies if bleeding risk outweighs the benefits of anticoagulation.

TIA Risk Stratification

- The ABCD² Score helps estimate the short-term risk of stroke after a Transient Ischemic Attack (TIA). It assesses factors associated with stroke risk within 2 days after a TIA.
- ABCD² Criteria:
- Age ≥60 years (1 point)
 - Blood Pressure ≥140/90 mmHg (1 point)
 - Clinical Features (max 2 points):
 - Unilateral weakness (2 points)
 - Speech disturbance without weakness (1 point)
 - Duration of TIA symptoms:
 - ≥60 minutes (2 points)
 - 10-59 minutes (1 point)
 - Diabetes (1 point)
- Interpretation:**
- **Score 0-3:** Low risk (1% stroke risk in 2 days)
 - **Score 4-5:** Moderate risk (4.1% stroke risk in 2 days)
 - **Score 6-7:** High risk (8.1% stroke risk in 2 days)
- Management:**
- **High-risk patients** (ABCD2 ≥4): Send to ER
 - Prompt initiation of secondary stroke prevention (e.g., antiplatelets, statins) is critical for all patients.
 - **Aspirin and Clopidogrel:** Dual antiplatelet therapy (DAPT) for 21 days then switch to single antiplatelet after 21 days

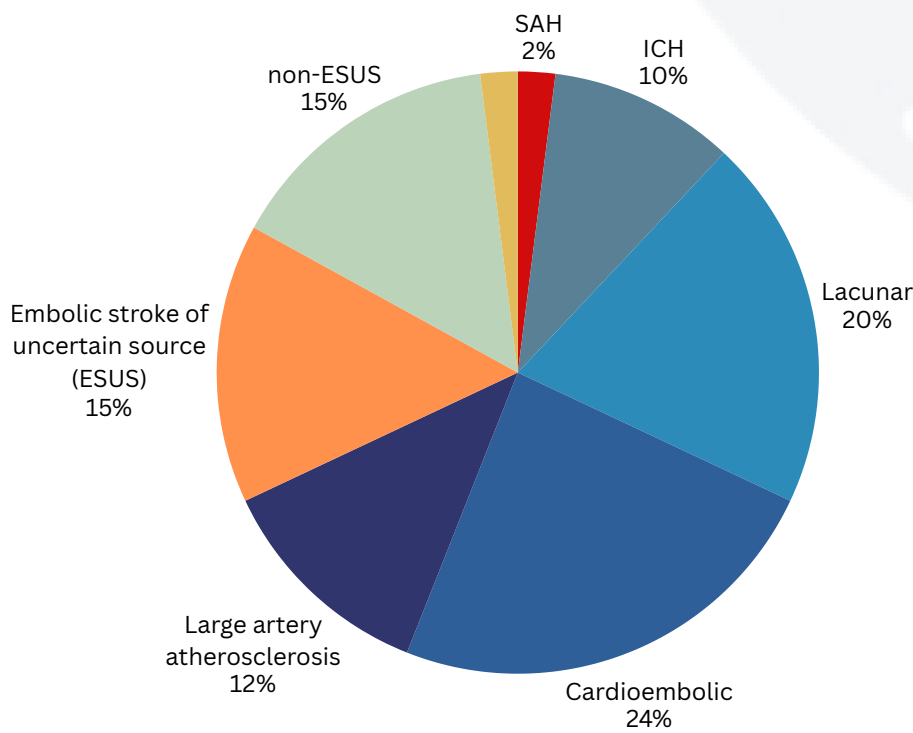
Atrial Fib: Anticoagulant & other Options

- DOACs are usually preferred to Warfarin
 - Lower risk of bleeding
 - Warfarin still preferred in patients w/ valvular a. fib (those w/ moderate to severe mitral stenosis or with a mechanical heart valve).
 - Direct Factor Xa Inhibitors: apixaban, rivaroxaban, and edoxaban
 - Direct Thrombin Inhibitor: dabigatran
- Aspirin is not recommended for reducing risk of stroke (in patients with AF)
 - Left atrial appendage occlusion (e.g., Watchman device) is an alternative for patients with increased risk of stroke w/ contraindications to anticoagulation.

Transient Ischemic Attack

- Definition is now based on imaging rather than time.
 - A TIA occurs when there are transient neurological symptoms without evidence of infarction on brain imaging
 - Symptoms typically resolve within minutes to 1 hour, but if they persist for longer, imaging is essential to rule out infarction (i.e., stroke).
- 60-Minute Threshold: Symptoms lasting > 1 hour are more likely to show infarction on imaging and may indicate a minor stroke rather than a TIA.
 - Use MRI with DWI to distinguish TIA from stroke and guide further management.

Stroke Types



Vascular Imaging

- Carotid Ultrasound (Carotid Doppler):
 - To assess for carotid artery stenosis, which is a common cause of ischemic stroke.
- Computed Tomography Angiography (CTA) or Magnetic Resonance Angiography (MRA):
 - Evaluate intracranial and extracranial arteries for stenosis, occlusion, dissection, or aneurysm.
 - Useful for identifying large vessel occlusion in ischemic strokes.
 - Especially useful when considering endovascular intervention

Tests to Identify Cause of TIA/CVA

- Imaging Studies:**
- Non-Contrast CT Scan of the Head
 - MRI of the Brain (if CT is negative and clinically indicated)
 - CT Angiography (CTA) or MRI Angiography (MRA) (to assess vascular status)
- Laboratory Tests:**
- Complete Blood Count (CBC)
 - Basic Metabolic Panel (BMP)
 - Coagulation Profile (PT/INR and aPTT)
 - Lipid Panel
 - Thyroid Function Tests
 - Blood Glucose Level
 - Serum Ethanol Level (if intoxication is suspected)
- Additional Tests:**
- EKG & Echocardiogram (transthoracic or transesophageal) to evaluate for cardiac sources of emboli
 - Autoimmune and Hypercoagulability Panels (if secondary causes are suspected)

Neuroimaging

- Non-contrast CT of the Brain:
 - Initial imaging to rule out hemorrhage, particularly if anticoagulation or thrombolysis is considered.
 - May show early signs of ischemia.
- Magnetic Resonance Imaging (MRI):
 - Diffusion-weighted imaging (DWI): More sensitive for identifying acute ischemia, particularly small infarcts.

Special Considerations: PFO, Vasculitis

- Patent Foramen Ovale (PFO*):
 - Consider echocardiography (TEE) if cryptogenic stroke and patient under 60 years.
- Vasculitis or Other Rare Causes:
 - Further testing may be indicated if autoimmune conditions or other rare causes (e.g., vasculitis, dissection) are suspected.

* It is reasonable to percutaneously close a PFO in patients who meet each of the following criteria: age 18–60 years, nonlacunar stroke, no other identified cause, and high risk PFO features (especially with an atrial septal aneurysm or large right-to-left shunting)

Cardiac Evaluation

- Electrocardiogram (ECG):
 - To detect atrial fibrillation (A. fib), arrhythmias, or ischemic changes.
 - Consider long-term monitoring for paroxysmal A. fib if the initial ECG is normal (e.g., Holter monitor or event monitor).
- Echocardiogram:
 - Transthoracic (TTE): Assess for structural heart disease, valvular disease, left ventricular dysfunction.
 - Transesophageal (TEE): For detailed evaluation of the left atrium, interatrial septum (to detect PFO, atrial septal aneurysm), and aortic arch atheroma.

Special Considerations: Managing Carotid Artery Stenosis

- Medical Management: ASA, statin, BP control, lifestyle
- Carotid Endarterectomy (CEA):
 - Recommended for symptomatic patients with 70-99% stenosis of ipsilateral side.
 - Considered for symptomatic patients with 50-69% stenosis based on individual risk factors.
 - For asymptomatic patients, CEA is considered in those with ≥70% stenosis if the perioperative risk is <3%.
- Carotid Artery Stenting (CAS)
 - Alternative to CEA, particularly for:
 - Patients with high surgical risk (e.g., significant comorbidities, prior neck surgery or radiation).

Acute Ischemic Stroke - tPA and Beyond

- Thrombolysis (tPA): Administered within 4.5 hours based on eligibility.
 - Converts plasminogen to plasmin, facilitating the breakdown of fibrin clots and restoring blood flow.

Mechanical Thrombectomy

- Thrombectomy up to 24 hours in select patients.
- Treatment is beneficial for large-vessel occlusions (LVO), with significant improvement in outcomes compared to medical management alone.

Anticoagulation in Stroke w/ A. fib

Management: Start anticoagulation with apixaban* – Timing depends on severity of Stroke support earlier DOAC initiation than previously but evidence is evolving.
* Apixaban is preferred due to lower renal clearance and reduced bleeding risks compared to other DOACs

Stroke and Rehab, Depression

- Rehabilitation Therapies: Early physical and occupational therapy are key to improving functional recovery after a stroke.
- Constraint-Induced Movement Therapy (CIMT): An effective rehabilitation technique for improving upper limb function in stroke survivors.
- Post-Stroke Depression (PSD): Affects up to one-third of stroke survivors and is associated with worse functional outcomes and increased mortality.
- Treatment: Early screening and management with SSRIs or cognitive behavioral therapy (CBT) are recommended.

Secondary Stroke Prevention

- **Lifestyle interventions:** Mediterranean diet, physical activity, reduce or eliminate alcohol, quit smoking
- **Statins:** High-dose statin therapy - atorvastatin 80mg
 - Target LDL < 70 mg/dL
 - If needed may add ezetimibe or PCSK-9i
- **Dual Antiplatelet Therapy (DAPT):** For select patients with a non-cardioembolic ischemic stroke or TIA:
 - Early arriving (<24hrs from onset) with minor stroke (NIHSS ≤ 3) (for 21 days)
 - High risk TIA, ABCD² ≥4 (21 days)
 - Severe symptomatic intracranial stenosis (up to 90 days)
 - Post carotid stent for 30days
- Transition from DAPT to **single agent antiplatelet therapy**
- May consider adding icosapent ethyl (Vascepa) based on one small study if TGs are 150-499 mg per dL (in patients already on a statin)
- It is unclear whether **patients already taking aspirin** at the time of noncardioembolic stroke or TIA benefit from increasing the dosage or changing to a different antiplatelet therapy.

Secondary Prevention CVA - BP control

- Hypertension Control: Goal < 130/80
- First-Line Agents: ACE-I and thiazide diuretics are preferred

Stroke prevention in Diabetics

- High dose statin
- Goal A1C < 7.0
 - Metformin plus GLP-1 or SGLT2i is recommended

Suspected Stroke

