

The background features a dark blue gradient with faint, light blue medical diagrams. On the left, there is a large circular scale with numerical markings from 40 to 260 in increments of 10. Several dashed and solid circles with arrows are scattered across the background, suggesting a technical or scientific theme.

# ROLE OF ANTICOAGULANTS IN STROKE

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FELLOWSHIP OF HEART FAILURE AND TRANSPLANT

# PRIMARY PREVENTION OF STROKE IN PATIENTS WITH ATRIAL FIBRILLATION

- **Q: Which patients with AF should receive long-term oral anticoagulation (OAC)?**
- **A: Assess the individual patient's risks of thromboembolism and bleeding.**

# CHA<sub>2</sub>DS<sub>2</sub>-VASC SCORE

Congestive HF	1
Hypertension	1
Age ≥75 years	2
Diabetes mellitus	1
Stroke/TIA/TE	2

Vascular disease (prior MI, PAD, or aortic plaque)	1
Age 65 to 74 years	1
Sex category (ie, female sex)	1

# CHA<sub>2</sub>DS<sub>2</sub>-VASC SCORE

**CHA<sub>2</sub>DS<sub>2</sub>-VASC score  $\geq 2$  in males or  $\geq 3$  in females (two or more nonsex risk factors):**

**Benefit from OAC**

**For CHA<sub>2</sub>DS<sub>2</sub>-VASC score of 1 in males or 2 in females (one nonsex risk factor with a value of 1):**

**The risk of thromboembolism varies depending upon the nonsex risk factor.**

**For CHA<sub>2</sub>DS<sub>2</sub>-VASC score of 0 in males or 1 in females (zero nonsex risk factors):**

**No OAC is suggested**



# HAS-BLED BLEEDING RISK SCORE

Letter	Clinical characteristic*	Points
H	Hypertension (ie, uncontrolled blood pressure)	1
A	Abnormal renal and liver function (1 point each)	1 or 2
S	Stroke	1
B	Bleeding tendency or predisposition	1
L	Labile INRs (for patients taking warfarin)	1
E	Elderly (age greater than 65 years)	1
D	Drugs (concomitant aspirin or NSAIDs) or excess alcohol use (1 point each)	1 or 2

# DOSE OF ANTICOAGULANTS IN AF

- **Warfarin**: INR between 2.0 and 3.0
- **Apixaban** : 5 mg twice daily unless the patient has two or more of the following:
  - age  $\geq 80$  years,
  - body weight  $\leq 60$  kg,
  - serum creatinine level  $\geq 1.5$  mg/dL.
- Then the dose of apixaban is 2.5 mg twice daily.
- **Rivaroxaban**
  - If the CrCl is  $>50$  mL/min, the rivaroxaban dose is 20 mg once daily.
  - If the CrCl is 15 to 50 mL/min, the rivaroxaban dose is 15 mg once daily.
  - If the CrCl  $<15$  mL/min, avoid use of rivaroxaban.

# DOAC OR WARFARIN?

- **AF + Moderate to Severe MS or Mechanical heart valve ⇒ Warfarin**
- **AF + Other valvular heart disease ⇒ NOAC**

# SECONDARY PREVENTION FOR CARDIOEMBOLISM

## CAUSES OF ISCHEMIC STROKE

1. Atrial Fibrillation
2. Valvular Disease
3. LV Thrombus
4. Cardiomyopathy
5. Patent Foramen Ovale



# ATRIAL FIBRILLATION

<b>1</b>	<b>A</b>	1. In patients with nonvalvular AF and stroke or TIA, oral anticoagulation (eg, apixaban, dabigatran, edoxaban, rivaroxaban, or warfarin) is recommended to reduce the risk of recurrent stroke. <sup>419–426</sup>
<b>1</b>	<b>B-R</b>	2. In patients with AF and stroke or TIA, oral anticoagulation is indicated to reduce the risk of recurrent stroke regardless of whether the AF pattern is paroxysmal, persistent, or permanent. <sup>427</sup>

# ATRIAL FIBRILLATION

1	B-R	3. In patients with stroke or TIA and AF who do not have moderate to severe mitral stenosis or a mechanical heart valve, apixaban, dabigatran, edoxaban, or rivaroxaban is recommended in preference to warfarin to reduce the risk of recurrent stroke. <sup>419–426</sup>
1	B-NR	4. In patients with atrial flutter and stroke or TIA, anticoagulant therapy similar to that in AF is indicated to reduce the risk of recurrent stroke. <sup>427</sup>

# ATRIAL FIBRILLATION

**1**

**C-EO**

5. In patients with AF and stroke or TIA, without moderate to severe mitral stenosis or a mechanical heart valve, who are unable to maintain a therapeutic INR level with warfarin, use of dabigatran, rivaroxaban, apixaban, or edoxaban is recommended to reduce the risk of recurrent stroke.



# ATRIAL FIBRILLATION

**2a**

**B-NR**

6. In patients with stroke at high risk of hemorrhagic conversion in the setting of AF, it is reasonable to delay initiation of oral anticoagulation beyond 14 days to reduce the risk of ICH.<sup>428-431</sup>

**2b**

**B-NR**

9. In patients with stroke at low risk for hemorrhagic conversion in the setting of AF, it may be reasonable to initiate anticoagulation 2 to 14 days after the index event to reduce the risk of recurrent stroke.<sup>428,429,437</sup>



# ATRIAL FIBRILLATION

**2a**

**C-EO**

7. In patients with TIA in the setting of nonvalvular AF, it is reasonable to initiate anticoagulation immediately after the index event to reduce the risk of recurrent stroke.

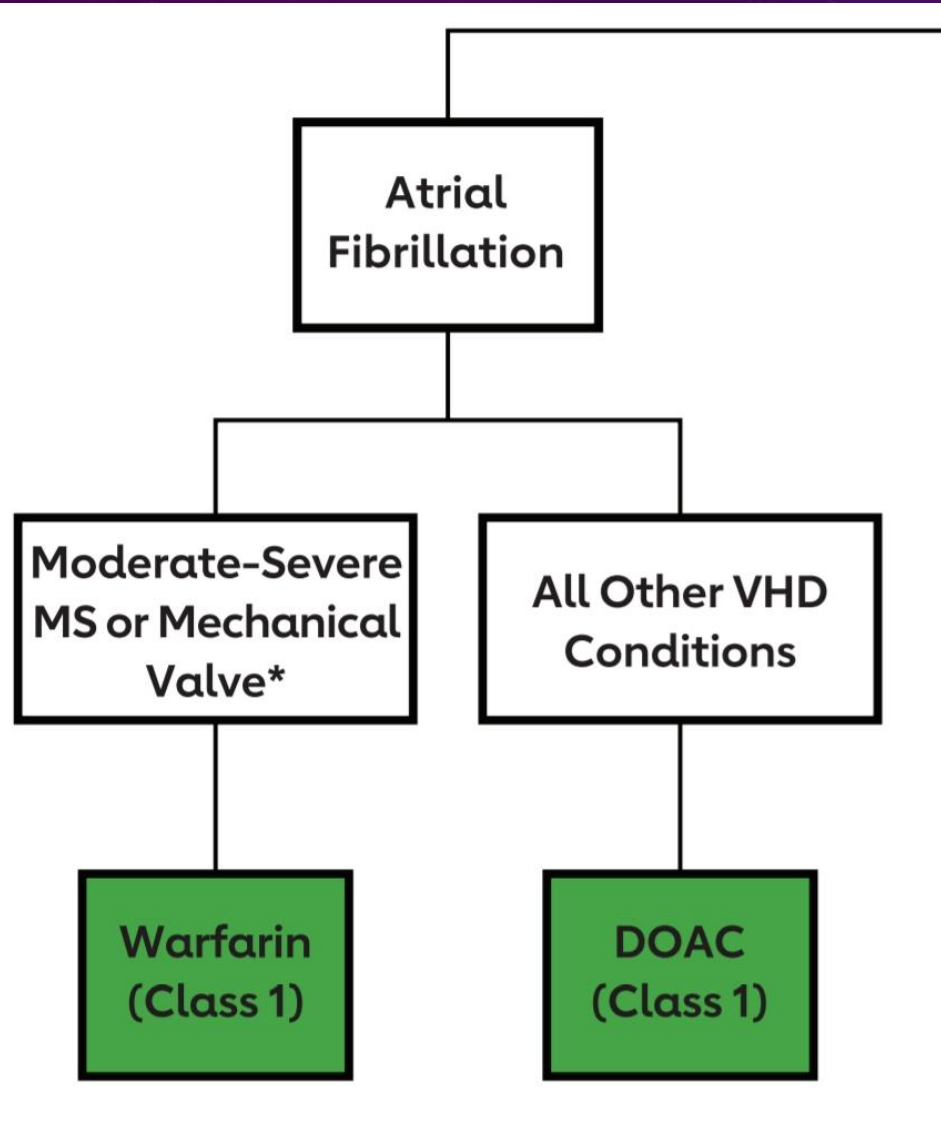
# ATRIAL FIBRILLATION

**2b**

**B-NR**

10. In patients with AF and stroke or TIA who have end-stage renal disease or are on dialysis, it may be reasonable to use warfarin or apixaban (dose adjusted if indicated) for anticoagulation to reduce the chance of recurrent stroke.<sup>438</sup>

# VALVULAR DISEASE + ISCHEMIC STROKE OR TIA



1. In patients with ischemic stroke or TIA and valvular AF (moderate to severe mitral stenosis or any mechanical heart valve), warfarin is recommended to reduce the risk of recurrent stroke or TIA.<sup>452-457</sup>



# VALVULAR DISEASE + ISCHEMIC STROKE OR TIA

- Routine addition of aspirin to warfarin therapy in patients with mechanical valves is not recommended.

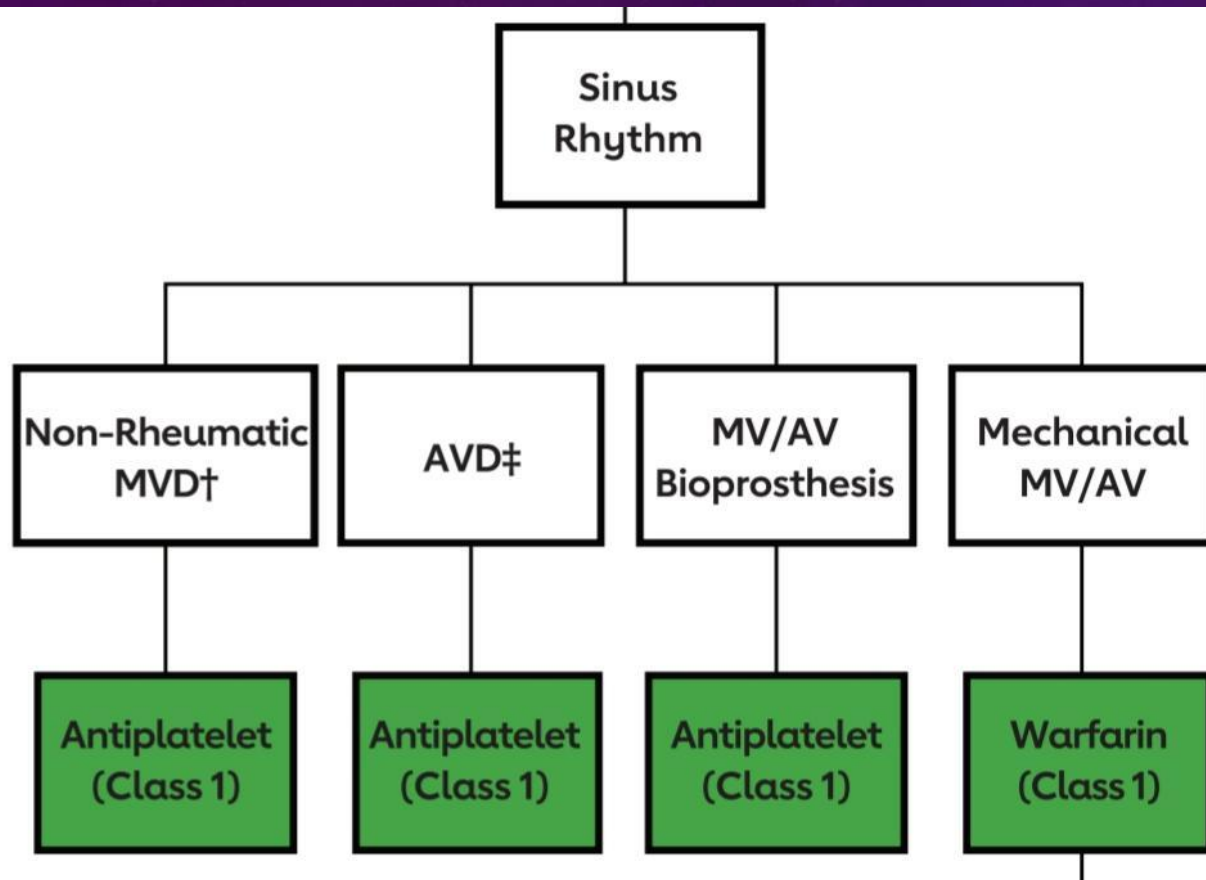
**1**

**C-LD**

2. In patients with a mechanical mitral valve and a history of ischemic stroke or TIA before valve replacement, aspirin (75–100 mg/d) is recommended in addition to warfarin with an INR target of 3.0 (range, 2.5–3.5) to reduce the risk of thrombosis and recurrent stroke or TIA.<sup>458,459</sup>



# VALVULAR DISEASE + ISCHEMIC STROKE OR TIA



3. In patients with ischemic stroke or TIA and native aortic or nonrheumatic mitral valve disease (eg, mitral annular calcification or mitral valve prolapse) who do not have AF or another indication for anticoagulation, antiplatelet therapy is recommended to reduce the risk of recurrent stroke or TIA.

# LV THROMBUS

- Incidence of LV thrombus increase after acute MI
- ( especially Anterior MI and without reperfusion )
- Risk of stroke among patients with defined LV thrombus has been reported to be as high as 9% to 11%
- Warfarin for at least 3 months (  $2 < \text{INR} < 3$  )
- **COR = 1**

# LV THROMBUS

**2a**

**C-EO**

2. In patients with stroke or TIA in the setting of acute MI, it is reasonable to perform advanced cardiac imaging (eg, contrasted echocardiogram or cardiac MRI) to assess for the presence of LV thrombus.

- **Contrasted Echocardiography and Cardiac MRI is more sensitive than TTE without contrast**



# LV THROMBUS

2b

C-LD

3. In patients with stroke or TIA and new LV thrombus (<3 months), the safety of anticoagulation with a direct oral anticoagulant to reduce risk of recurrent stroke is uncertain.<sup>509</sup>

- Warfarin is better than DOAC



# LV THROMBUS

- Patients with reduced LV systolic function (LV EF <50%) in the setting of acute anterior MI are at the greatest risk of developing LV thrombus ( 24% ).
- Risk of stroke among patients with defined LV thrombus has been reported to be as high as 9% to 11%

**2b**

**C-EO**

4. In patients with stroke or TIA in the setting of acute anterior MI with reduced ejection fraction (EF; <50%) but no evidence of LV thrombus, empirical anticoagulation for at least 3 months might be considered to reduce the risk of recurrent cardioembolic stroke.

# CARDIOMYOPATHY

1

C-EO

1. In patients with ischemic stroke or TIA and left atrial or left atrial appendage thrombus in the setting of ischemic, nonischemic, or restrictive cardiomyopathy and LV dysfunction, anticoagulant therapy with warfarin is recommended for at least 3 months to reduce the risk of recurrent stroke or TIA.

# CARDIOMYOPATHY

**2a**

**C-LD**

2. In patients with ischemic stroke or TIA in the setting of a mechanical assist device, treatment with warfarin and aspirin can be beneficial to reduce the risk of recurrent stroke or TIA.<sup>516-523</sup>



# CARDIOMYOPATHY

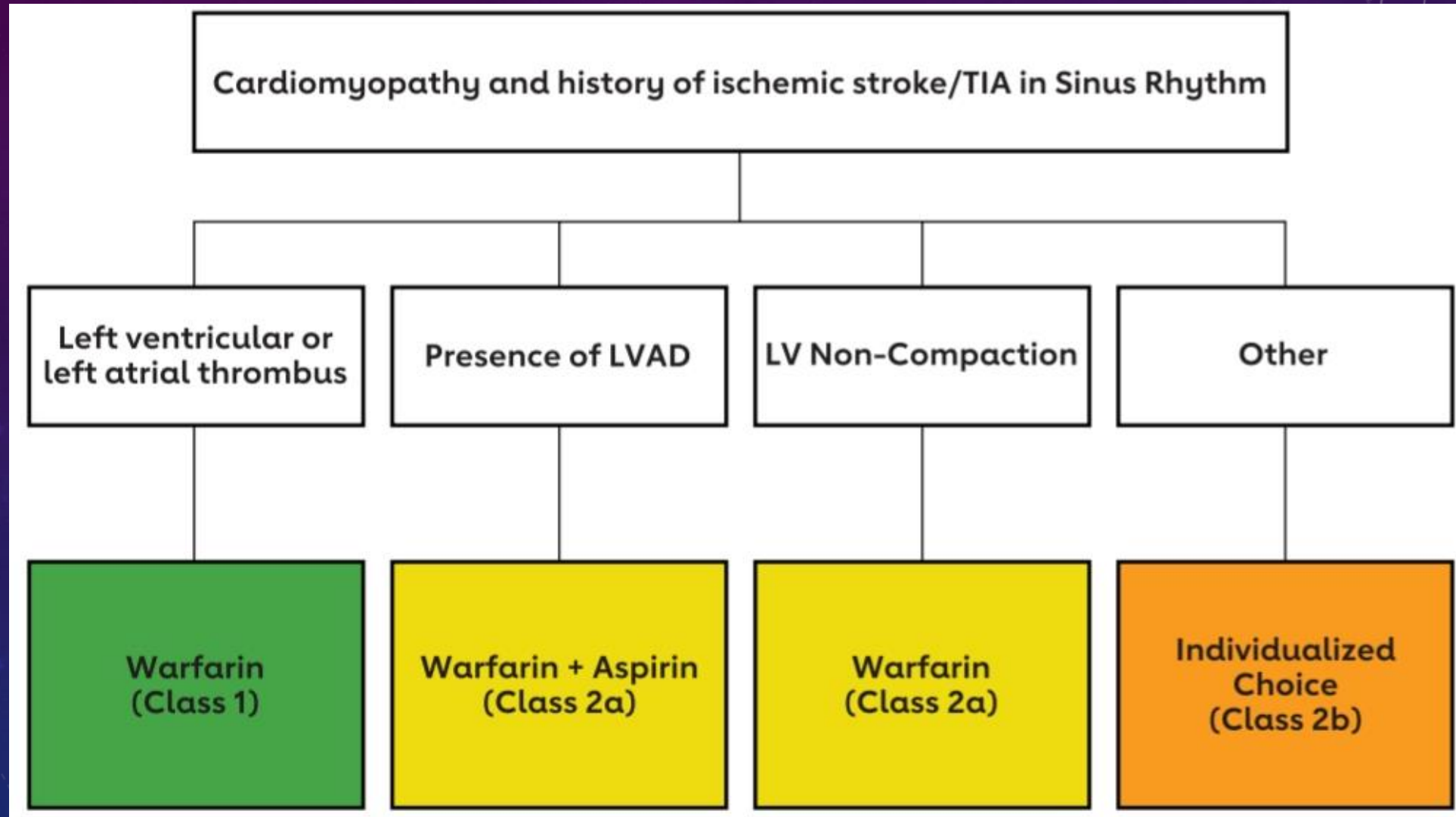
**2b**

**B-R**

4. In patients with ischemic stroke or TIA in sinus rhythm with ischemic or nonischemic cardiomyopathy and reduced EF without evidence of left atrial or LV thrombus, the effectiveness of anticoagulation compared with antiplatelet therapy is uncertain, and the choice should be individualized.<sup>524-528</sup>



# CARDIOMYOPATHY



# PATENT FORAMEN OVALE

**2a**

**B-R**

2. In patients 18 to 60 years of age with a nonlacunar ischemic stroke of undetermined cause despite a thorough evaluation and a PFO with high-risk anatomic features,\* it is reasonable to choose closure with a transcatheter device and long-term antiplatelet therapy over antiplatelet therapy alone for preventing recurrent stroke.<sup>552-557</sup>

- **High risk PFO = Atrial septal aneurysm Or Large right to left shunt**

# PATENT FORAMEN OVALE

**2b**

**C-LD**

3. In patients 18 to 60 years of age with a nonlacunar ischemic stroke of undetermined cause despite a thorough evaluation and a PFO without high-risk anatomic features,\* the benefit of closure with a transcatheter device and long-term antiplatelet therapy over antiplatelet therapy alone for preventing recurrent stroke is not well established,<sup>552–557</sup>



# PATENT FORAMEN OVALE

**2b**

**C-LD**

4. In patients 18 to 60 years of age with a nonlacunar ischemic stroke of undetermined cause despite a thorough evaluation and a PFO, the comparative benefit of closure with a transcatheter device versus warfarin is unknown.<sup>554</sup>

