

Review of the CHA₂DS₂-VASc Score

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Abstract

The CHA₂DS₂-VASc score is a validated clinical tool for estimating the annual risk of thromboembolic and ischemic stroke in patients with non-valvular atrial fibrillation. It was developed among patients not taking anticoagulation. It refines the earlier CHADS₂ score by incorporating additional risk factors to identify low-risk patients who may not require anticoagulation. The score guides shared decision-making regarding oral anticoagulation.

I. HOW TO USE

When to Use

The CHA₂DS₂-VASc score is one of several risk stratification tools used to estimate the one-year risk of a thromboembolic event in a non-anticoagulated patient with non-valvular atrial fibrillation (AF) and no history of valvular surgery. It can be used in discussions with patients to facilitate shared decision-making regarding risk for thromboembolic events.

Pearls / Pitfalls

CHA₂DS₂-VASc identifies both low-risk and high-risk patients for thromboembolic events, though debate remains about whether anticoagulation should be considered even in certain low-risk individuals. Because the score's overall discrimination is modest, it should always be interpreted in the context of clinical judgment. For patients with hypertrophic cardiomyopathy or cardiac amyloidosis, the 2024 European Society of Cardiology guidelines do not recommend basing stroke prevention strategies on the CHA₂DS₂-VASc score. The presence of other thrombotic risk factors (e.g., impaired renal function) may also negatively impact the score's performance. Interpretation in these populations should be made with caution and with consideration of the individual clinical context.

Why Use

The CHA₂DS₂-VASc score helps stratify the risk of thromboembolic and ischemic stroke in patients with non-valvular atrial fibrillation who are being considered for anticoagulation.

II. NEXT STEPS

Advice

Recent guidelines emphasize the strong evidence supporting anticoagulation and the lack of benefit from antiplatelet treatment. Studies also suggest that sex may warrant removal from the CHA₂DS₂-VASc score, which forms the basis for the CHA₂DS₂-VA score.

Management

Most guidelines suggest that men with a score of 0 and women with a score of 1 do not require anticoagulation; all other patients should receive anticoagulation, preferably with a direct oral anticoagulant (unless contraindicated).

- Anticoagulation is not recommended in patients with non-valvular AF and a CHA₂DS₂-VASc score of 0 if male or 1 if female.
- Depending on a patient's preferences and individual risk factors, anticoagulation can be considered for a score of 1 in men and 2 in women.
- Anticoagulation should be started in patients with a score ≥ 2 in men or ≥ 3 in women.

- For patients in whom anticoagulation is considered, bleeding risk scores (e.g., ATRIA bleeding risk score, DOAC score, HAS-BLED score) can help estimate the risk for warfarin-associated or anticoagulant-associated bleeding. However, these tools should primarily serve as reminders to address reversible bleeding risk factors, as the overall risk-benefit profile of anticoagulation usually remains favorable.
- In patients with a CHA₂DS₂-VASc score ≥ 2 who have contraindications to oral anticoagulation due to irreversible causes, percutaneous or standalone endoscopic surgical left atrial appendage (LAA) occlusion may be considered. If such patients are undergoing cardiac surgery or endoscopic or hybrid AF ablation, surgical LAA closure may be considered.
- Clinicians should carefully consider all risks and benefits prior to initiating anticoagulation in patients with non-valvular AF.
- Certain risk factors, such as hypertrophic cardiomyopathy, warrant anticoagulation regardless of the score.
- Aspirin monotherapy is not supported by current evidence.

Critical Actions

Before initiating anticoagulation, assess the patient's bleeding risk using validated tools (e.g., HAS-BLED) and consider any additional risk factors for bleeding. The risks and benefits should be weighed carefully and discussed thoroughly with the patient to support shared decision-making.

III. EVIDENCE

Evidence Appraisal

The CHA₂DS₂-VASc score was constructed as an update to the older CHADS₂ score and was intended as a simple clinical tool for predicting and stratifying the 1-year thromboembolic risk in patients with non-valvular AF ([Lip GYH et al., 2010](#)). Although the derivation study had some methodological shortcomings (e.g., significant proportion of patients excluded due to missing outcome data, no consideration given to death as a competing event), the CHA₂DS₂-VASc score has since been validated in a large number of cohort studies across a wide range of populations. Its overall discrimination is consistently modest, with a c-statistic of around 0.6-0.7 in most studies, which is only marginally higher than that achieved by the CHADS₂ score. However, its low-risk classification has demonstrated reasonable negative predictive value, meaning that patients categorized as low risk truly had exceedingly low thromboembolic risk at

one year. This was a significant improvement over the CHADS₂ score and had substantial clinical relevance, as it enabled clinicians to reliably identify patients with non-valvular AF who do not require anticoagulation. As a result, the CHA₂DS₂-VASc score has become one of the most extensively validated thromboembolic risk scores for non-valvular AF and has been consistently incorporated into major international guidelines for AF management. The score has also been explored as a prognostic marker in other patient groups (e.g., [patients without AF who present with acute ischemic stroke](#)). However, these applications are uncommon and not recommended by societal guidelines; its primary use remains unchanged from its original intention.

Since its original publication ([Lip GYH et al., 2010](#)), there have been substantial changes in the epidemiology of risk factors and the management of non-valvular AF. One of the more controversial and better-explored areas concerns the role of sex in the CHA₂DS₂-VASc score. Multiple studies have demonstrated that removing sex from the score may result in non-inferior, or even superior, discrimination. This was formally acknowledged in the [2024 European Society of Cardiology guidelines](#), which advocate using the CHA₂DS₂-VA score (i.e., with removal of the 'sex category' variable) in place of CHA₂DS₂-VASc. This approach unifies anticoagulation thresholds across sexes (i.e., no anticoagulation for a score of 0, consider anticoagulation for a score of 1, and initiate anticoagulation for scores ≥ 2) and may also offer advantages in terms of inclusivity for non-binary individuals. [A 2024 study by Teppo and colleagues](#) found that the CHA₂DS₂-VA score performs similarly to CHA₂DS₂-VASc, especially in more recent cohorts. A subsequent [British study by Champai et al.](#) reported that CHA₂DS₂-VA is statistically superior to CHA₂DS₂-VASc in overall discrimination, although the absolute difference was small. Additionally, data from the GLORI-AF registry ([Lam et al., 2025](#)) demonstrated similar performance between the two scores but noted a potential interaction between female sex and age.

Overall, while the CHA₂DS₂-VASc score remains one of the core thromboembolic risk prediction tools for patients with non-valvular AF, ongoing changes in the epidemiology, management, and scientific understanding of AF suggest that updates and modifications to the score will likely become increasingly common and relevant.

Formula

Criteria	Value	Points
Age	<65 years old	0
	65-74 years old	+1
	≥ 75 years old	+2

Sex	Male	0
	Female	+1
Congestive heart failure history	Y/N	+1
Hypertension history	Y/N	+1
Stroke / TIA / thromboembolism history	Y/N	+2
Vascular disease history	Y/N	+1
Diabetes mellitus history	Y/N	+1

Literature

Original/Primary

<http://www.ncbi.nlm.nih.gov/pubmed/19762550>

Lip GYH, Nieuwlaet R, Pisters R, Lane DA, Crijns HJGM. Refining clinical risk stratification for predicting stroke and thromboembolism in atrial fibrillation using a novel risk factor-based approach: the Euro Heart Survey on Atrial Fibrillation. *Chest*. 2010;137(2):263-272. doi:10.1378/chest.09-1584. PMID: 19762550

Validation

<http://www.ncbi.nlm.nih.gov/pubmed/22246443>

Friberg L, Rosenqvist M, Lip GYH. Evaluation of risk stratification schemes for ischaemic stroke and bleeding in 182,678 patients with atrial fibrillation: the Swedish Atrial Fibrillation cohort study. *Eur Heart J*. 2012;33(12):1500-1510. doi:10.1093/eurheartj/ehae488. PMID: 22246443

<http://www.ncbi.nlm.nih.gov/pubmed/24759791>

Okumura K, Inoue H, Atarashi H, Yamashita T, Tomita H, Origasa H; J-RHYTHM Registry Investigators. Validation of CHA₂DS₂-VASc and HAS-BLED scores in Japanese patients with nonvalvular atrial fibrillation: an analysis of the J-RHYTHM Registry. *Circ J*. 2014;78(7):1593-1599. doi:10.1253/circj.CJ-14-0202. PMID: 24759791

<https://pubmed.ncbi.nlm.nih.gov/25323252/>

Chao TF, Liu CJ, Wang KL, Lin YJ, Chang SL, Lo LW, *et al.* Using the CHA₂DS₂-VASc score for refining stroke risk stratification in "low-risk" Asian patients with atrial fibrillation. *J Am Coll Cardiol*. 2014;64(16):1658-1665. doi:10.1016/j.jacc.2014.06.1203. PMID: 25323252

<https://pubmed.ncbi.nlm.nih.gov/21282258/>

Olesen JB, Lip GYH, Hansen ML, Hansen PR, Tolstrup JS, Lindhardsen J, *et al.* Validation of risk stratification schemes for predicting stroke and thromboembolism in patients with atrial fibrillation: nationwide cohort study. *BMJ*. 2011;342:d124. doi:10.1136/bmj.d124. PMID: 21282258; PMCID: PMC3031123

<https://pubmed.ncbi.nlm.nih.gov/28375552/>

van Doorn S, Debray TPA, Kaasenbrood F, Hoes AW, Rutten FH, Moons KGM, *et al.* Predictive performance of the CHA₂DS₂-VASc rule in atrial fibrillation: a sys-

tematic review and meta-analysis. *J Thromb Haemost*. 2017;15(6):1065-1077. doi:10.1111/jth.13690. PMID: 28375552

<https://pubmed.ncbi.nlm.nih.gov/27067084/>

Lip GYH, Nielsen PB. Should patients with atrial fibrillation and one stroke risk factor (CHA₂DS₂-VASc score 1 in men, 2 in women) be anticoagulated? Yes: even one stroke risk factor confers a real risk of stroke. *Circulation*. 2016;133(15):1498-1503. doi:10.1161/CIRCULATIONAHA.115.018475.

<https://pubmed.ncbi.nlm.nih.gov/27231269/>

Fauchier L, Clementy N, Ivanov F, Angoulvant D, Babuty D, Lip GYH. Should atrial fibrillation patients with only one nongender-related CHA₂DS₂-VASc risk factor be anticoagulated? *Stroke*. 2016;47(7):1831-1836. doi:10.1161/STROKEAHA.116.013343.

<https://pubmed.ncbi.nlm.nih.gov/40289614/>

Lam SHM, Romiti GF, Corica B, Bucci T, Olshansky B, Chao T-F, Huisman MV, Lip GYH. Stroke risk stratifications according to CHA₂DS₂-VASc vs. CHA₂DS₂-VA in patients with atrial fibrillation: insights from the GLORIA-AF registry. *Eur Heart J Cardiovasc Pharmacol*. 2025;11(5):433-440. doi:10.1093/ehjcvp/pvaf031. PMID:40289614.

Other References

[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(16\)31257-0/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(16)31257-0/fulltext)

Freedman B, Potpara TS, Lip GYH. Stroke prevention in atrial fibrillation. *Lancet*. 2016;388(10046):806-817. doi:10.1016/S0140-6736(16)31257-0.

<https://pubmed.ncbi.nlm.nih.gov/39171253/>

Teppo K, Lip GYH, Airaksinen KEJ, Halminen O, Haukka J, Putaala J, *et al.* Comparing CHA₂DS₂-VA and CHA₂DS₂-VASc scores for stroke risk stratification in patients with atrial fibrillation: a temporal trends analysis from the retrospective Finnish AntiCoagulation in Atrial Fibrillation (FinACAF) cohort. *Lancet Reg Health Eur*. 2024;43:100967. doi:10.1016/j.lanepe.2024.100967. PMID: 39171253.

<https://pubmed.ncbi.nlm.nih.gov/35757148/>

Bungo B, Chaudhury P, Arustamyan M, Rikhi R, Hussain M, Collier P, *et al.* Better prediction of stroke in atrial fibrillation with incorporation of cancer in CHA₂DS₂-VASc score (CCHA₂DS₂-VASc score). *Int J Cardiol Heart Vasc*. 2022;41:101072. doi:10.1016/j.ijcha.2022.101072. PMID: 35757148; PMCID: PMC9218829.

<https://pubmed.ncbi.nlm.nih.gov/39217497/>

Champs A, Mobley AR, Subramanian A, Nirantharakumar K, Wang X, Shukla D, *et al.* Gender and contemporary risk of adverse events in atrial fibrillation. *Eur Heart J*. 2024;45(17):ehae539. doi:10.1093/eurheartj/ehae539. Epub ahead of print. PMID: 39217497.

Guidelines

<https://pubmed.ncbi.nlm.nih.gov/38033089/>

Joglar JA, Chung MK, Armbruster AL, Benjamin EJ, Chyou JY, Cronin EM, *et al.* 2023 ACC/AHA/ACCP/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Circulation*. 2024;149(1):e1-e156. doi:10.1161/CIR.0000000000001193. Epub 2023 Nov 30. Erratum

in: *Circulation*. 2024;149(1):e167. doi:10.1161/CIR.0000000000001207.

<https://pubmed.ncbi.nlm.nih.gov/39210723/>

Van Gelder IC, Rienstra M, Bunting KV, Casado-Arroyo R, Caso V, Crijns HJGM, *et al.* 2024 ESC Guidelines for the Management of Atrial Fibrillation Developed in Collaboration with the European Association for Cardio-Thoracic Surgery (EACTS). *Eur Heart J*. 2024;45(18):ehae176. doi:10.1093/eurheartj/ehae176.