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CHADS2 score

From Wikipedia, the free encyclopedia

	Condition	Points
C	Congestive heart failure	1
H	Hypertension: blood pressure consistently above 140/90 mmHg (or treated hypertension on medication)	1
A	Age ≥75 years	1
D	Diabetes mellitus	1
S_2	Prior Stroke or TIA or Thromboembolism	2

The **CHADS$_2$ score** is a clinical prediction rule for estimating the risk of stroke in patients with non-rheumatic atrial fibrillation (AF), a common and serious heart arrhythmia associated with thromboembolic stroke. It is used to determine whether or not treatment is required with anticoagulation therapy or antiplatelet therapy,[1] since AF can cause stasis of blood in the upper heart chambers, leading to the formation of a mural thrombus that can dislodge into the blood flow, reach the brain, cut off supply to the brain, and cause a stroke. A high CHADS$_2$ score corresponds to a greater risk of stroke, while a low CHADS$_2$ score corresponds to a lower risk of stroke. The CHADS$_2$ score is simple and has been validated by many studies.[2]

The CHADS$_2$ scoring table is shown above:[3] adding together the points that correspond to the conditions that are present results in the CHADS$_2$ score, that is used to estimate stroke risk.

In clinical use, the CHADS$_2$ score has been superseded by the CHA$_2$DS$_2$-VASc score that gives a better stratification of low-risk patients.

Stroke risk assessment, and antithrombotic therapy

According to the findings of the initial validation study, the risk of stroke as a percentage per year for the CHADS$_2$ score is shown in the table.

The CHADS$_2$ score does not include some common stroke risk factors and its various pros/cons have been carefully discussed.[4] Nonetheless, this score is simple and thus it has become widely used.

To complement the CHADS$_2$ score, by the inclusion of additional 'stroke risk modifier' risk factors, the CHA$_2$DS$_2$-VASc-score has been proposed.[5] These

Annual Stroke Risk[2]		
CHADS$_2$ Score	Stroke Risk %	95% CI
0	1.9	1.2–3.0
1	2.8	2.0–3.8
2	4.0	3.1–5.1
3	5.9	4.6–7.3
4	8.5	6.3–11.1
5	12.5	8.2–17.5
6	18.2	10.5–27.4

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additional non-major stroke risk factors include age 65-74, female gender and vascular disease. In the CHA_2DS_2-VASc score, 'age 75 and above' also has extra weight, with 2 points.

The CHA_2DS_2-VASc score has been used in the new European Society of Cardiology guidelines for the management of atrial fibrillation.[6][7]

The European Society of Cardiology (ESC) guidelines recommend that if the patient has a $CHADS_2$ score of 2 and above, oral anticoagulation therapy (OAC) such as warfarin (target INR of 2-3) or one of the new OAC drugs (such as rivaroxaban or dabigatran) should be prescribed.

If the $CHADS_2$ score is 0-1, other stroke risk modifiers could be considered: (i) If there are 2 or more risk factors (essentially a CHA_2DS_2-VASc score of 2 or more), OAC is recommended; and (ii) If there is 1 risk factor (essentially a CHA_2DS_2-VASc score=1), antithrombotic therapy with OAC or aspirin (OAC preferred) is recommended, and patient values and preferences should be considered.

A CHA_2DS_2-VASc score=0 corresponds to a 'truly low risk,'[8][9] and thus the recommendation is to prescribe either aspirin or no antithrombotic therapy, but 'no antithrombotic therapy' is preferred.[10]

Stroke risk assessment should always include an assessment of bleeding risk. This can be done using validated bleeding risk scores, such as the $HEMORR_2HAGES$ or HAS-BLED scores. The latter is recommended in the ESC and Canadian guidelines.[11] If the patient is taking warfarin, then knowledge of INR control is needed to assess the 'labile INR' criterion in HAS-BLED; otherwise for a non-warfarin patient, this scores zero.

Anticoagulation

Score	Risk	Anticoagulation Therapy	Considerations
0	Low	None or Aspirin	Aspirin daily
1	Moderate	Aspirin, Warfarin, or other oral anti-coagulant	Aspirin daily or raise INR to 2.0-3.0, depending on patient preference
2 or greater	Moderate or High	Warfarin or other oral anti-coagulant	Raise INR to 2.0-3.0, unless contraindicated

Treatment strategies recommended based on the $CHADS_2$ score are shown in the table.[1][2]

How the treatment recommendations based on the $CHADS_2$ score are modified by considering additional 'stroke risk modifier' risk factors using the CHA2DS2-VASc (http://www.wikidoc.org/index.php/CHA2DS2-VASc_score) score, see ESC guideline (http://www.escardio.org/guidelines-surveys/esc-guidelines/Pages/atrial-fibrillation.aspx) recommendations, which recommend the management as shown in the following table:(table is outdated and using this table may result in patient harm)

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CHA$_2$DS$_2$-VASc

	Condition	Points
C	Congestive heart failure (or Left ventricular systolic dysfunction)	1
H	Hypertension: blood pressure consistently above 140/90 mmHg (or treated hypertension on medication)	1
A$_2$	Age ≥75 years	2
D	Diabetes Mellitus	1
S$_2$	Prior Stroke or TIA or thromboembolism	2
V	Vascular disease (e.g. peripheral artery disease, myocardial infarction, aortic plaque)	1
A	Age 65–74 years	1
Sc	Sex category (i.e. female sex)	1

The CHA$_2$DS$_2$-VASc[12][13][14] score is a refinement of CHADS$_2$[15][16] score and extends the latter by including additional common stroke risk factors, as discussed below.

The maximum CHADS$_2$ score is 6, whilst the maximum CHA$_2$DS$_2$-VASc score is 9 (for age, either the patient is ≥75 years and gets two points, is between 65-74 and gets one point, or is under 65 and does not get points). Note that female gender only scores one point if the patient has at least one other risk factor, and does not score any points in isolation.

Stroke risk assessment

Annual Stroke Risk[17]

CHA$_2$DS$_2$-VASc Score	Stroke Risk %	95% CI
0	0	-
1	1.3	-
2	2.2	-
3	3.2	-
4	4.0	-
5	6.7	-
6	9.8	-
7	9.6	-
8	??	-
9	15.2	-

Anticoagulation

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Score	Risk	Anticoagulation Therapy	Considerations
0	Low	No antithrombotic therapy (or Aspirin)	No antithrombotic therapy (or Aspirin 75–325 mg daily)
1	Moderate	Oral anticoagulant (or Aspirin)	Oral anticoagulant, either new oral anticoagulant drug e.g. rivaroxaban or dabigatran or well controlled warfarin at INR 2.0-3.0 (or Aspirin 75–325 mg daily, depending on factors such as patient preference)
2 or greater	High	Oral anticoagulant	Oral anticoagulant, using either a new oral anticoagulant drug (apixaban, rivaroxaban or dabigatran) or well controlled warfarin at INR 2.0-3.0

Based on the ESC guidelines on Atrial Fibrillation, oral anticoagulation is recommended or preferred for patients with one or more stroke risk factors (i.e. a CHA_2DS_2-VASc score of 1 and above). This is consistent with a recent decision analysis model showing how the 'tipping point' on the decision to anticoagulate has changed with the availability of new 'safer' OAC drugs.[7][18]

Limitations of stroke risk prediction tools

Current stroke risk prediction tools including the CHADS2 and CHA2DS2VASc models are helpful in clinical practice. However, these are limited within the context of complex cardiogeriatric syndromes. Expanding such models to consider frailty, cognitive and functional decline, or nonadherence to anticoagulant therapy is warranted. Although avoiding stroke is an important consideration, the potential adverse effects of treatment needs to be balanced within the context of best available evidence, clinical expertise, and the individual patient's circumstances. Developing metrics that consider the combination of these factors are likely to shed light on the issues of adherence in this population.[19][20]