

Predictive power for mortality of the CHA₂DS₂-VASc score, the HAS-BLED score and their combination in anticoagulated patients with atrial fibrillation

Running title: Risk scores and mortality in atrial fibrillation

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SUPPLEMENTARY MATERIALS

(Abbreviations, Highlights, Supplemental Tables, Supplemental references)

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ABBREVIATIONS (in alphabetical order)

AF = Atrial fibrillation

ATRIA = AnTicoagulation and Risk factors In Atrial fibrillation

AUC = area under the curve

CHADS₂ = congestive heart failure, hypertension, age $\geq$ 75 years, diabetes, stroke/transient ischemic attack/thromboembolism [doubled]

CHA₂DS₂-VASc = congestive heart failure, hypertension, age $\geq$ 75 years [doubled], diabetes, stroke/transient ischemic attack/thromboembolism [doubled], vascular disease [prior myocardial infarction, peripheral artery disease, or aortic plaque], age 65-75 years, sex category [female]

CRUSADE = Can Rapid risk stratification of Unstable angina patients Suppress ADverse outcomes with Early implementation of the ACC/AHA guidelines

DACH = Germany (Deutschland), Austria, Switzerland (Confederatio Helvetica)

eCRF = electronic case report form

GOF = Hosmer and Lemeshow goodness of fit test

GRACE = Global Registry of Acute Coronary Events

HAS-BLED = hypertension, abnormal renal/liver function, stroke, bleeding history or predisposition, labile international normalized ratio [INR], elderly [age $\geq$ 65 years], drugs/alcohol concomitantly

IDI = integrated discrimination improvement

ISTH = International Society on Thrombosis and Haemostasis

NRI = net reclassification improvement

NOAC = non-vitamin K antagonist oral anticoagulant

PREFER in AF = Prevention of Thromboembolic Events – European Registry in Atrial Fibrillation” study

SD = standard deviation of the mean

SEE = systemic embolic event

TIA = transient ischemic attack

TIMI = Thrombolysis In Myocardial Infarction

VKA = vitamin K antagonist

HIGHLIGHTS

- Atrial fibrillation (AF) is associated with increased mortality, but predictors of mortality are poorly characterized.
- We here investigated the predictive power of the CHA₂DS₂-VASc and the HAS-BLED score, commonly used to assess the risk of stroke and bleeding, for mortality in patients with AF in a large contemporary registry.
- In the PREFER in AF prospective, real-world registry including AF patients across 7 European countries in 5,209 AF patients, the average 1-year mortality was 3.1%.
- We found strong gradients between all examined outcomes (mortality, stroke and systemic embolic events and major bleeding) for both the CHA₂DS₂-VASc and the HAS-BLED risk scores, with similar c-statistics.
- The predictive power with both scores combined, removing overlapping components, was higher than individual scores separately. Such combination may thus be clinically useful.

Table S1. Logit regression result with CHA₂DS₂-VASc scores as explanatory variables

		Coefficient	P-value	Bias	95% CI (Bias-corrected)		Log-likelihood	Homes-Leweshow	C-statistic	95% CI (Bias-corrected)	
Stroke/SSE							-560.76	0.014	0.584	0.536	0.637
	Total score	0.307	0.00	0.00	0.23	0.46					
	Constant	-4.918	0.00	-0.01	-5.51	-4.52					
Stroke/SSE							-551.266	0.691	0.687*	0.638	0.730
	Congestive heart failure	0.775	0.00	-0.02	0.51	1.18					
	Hypertension	-0.100	0.66	0.02	-0.50	0.37					
	Age >75 years	0.458	0.14	0.00	-0.06	1.14					
	Diabetes mellitus	0.079	0.73	-0.02	-0.33	0.53					
	Stroke/TIA	1.026	0.00	0.00	0.52	1.38					
	Vascular disease	-0.120	0.61	0.04	-0.69	0.27					
	Age 65 to 74 years	0.043	0.89	-0.01	-0.53	0.88					
	Sex category	0.276	0.16	0.03	-0.16	0.65					
	Constant	-4.571	0.00	-0.06	-5.27	-4.09					
Major bleeding							-668.392	0.269	0.520	0.478	0.567
	Total score	0.188	0.000	-0.002	0.119	0.271					
	Constant	-4.219	0.000	-0.015	-4.651	-3.882					
Major bleeding							-656.538	0.446	0.626*	0.579	0.672
	Congestive heart failure	0.050	0.776	0.003	-0.353	0.342					
	Hypertension	0.072	0.718	-0.020	-0.212	0.621					
	Age >75 years	0.685	0.012	0.019	0.199	1.114					
	Diabetes mellitus	-0.013	0.946	0.007	-0.351	0.301					
	Stroke/TIA	-0.028	0.902	-0.041	-0.457	0.488					
	Vascular disease	0.726	0.000	0.020	0.316	1.088					
	Age 65 to 74 years	-0.081	0.791	0.010	-0.611	0.454					
	Sex category	-0.024	0.901	0.013	-0.397	0.341					
	Constant	-4.148	0.000	-0.041	-4.567	-3.594					
Mortality							-695.570	0.039	0.559	0.513	0.604
	Total score	0.280	0.000	0.003	0.208	0.372					
	Constant	-4.523	0.000	-0.036	-4.867	-4.227					
Mortality							-668.911	0.005	0.707*	0.666	0.744
	Congestive heart failure	0.962	0.000	0.020	0.581	1.226					
	Hypertension	-0.416	0.020	0.028	-0.826	-0.130					
	Age >75 years	1.180	0.000	0.085	0.722	1.693					
	Diabetes mellitus	0.368	0.034	-0.030	0.103	0.872					
	Stroke/TIA	0.090	0.670	0.008	-0.294	0.491					
	Vascular disease	0.209	0.236	-0.019	-0.115	0.562					
	Age 65 to 74 years	0.270	0.426	0.084	-0.364	0.951					
	Sex category	-0.018	0.929	0.013	-0.454	0.332					
	Constant	-4.481	0.000	-0.134	-4.999	-4.044					

Abbreviations: SSE: Systemic Embolic Events; TIA: Transient Ischemic Attack; CHA₂DS₂-VASc=congestive heart failure, hypertension, age ≥ 75 years [doubled], diabetes,

* Significant improvement

Table S2. Logit regression result with HAS-BLED scores as explanatory variables

		Coefficient	P-value	Bias	95% CI (Bias-corrected)		Log-likelihood	Homes-Leweshow	C-statistic	95% CI (Bias-corrected)	
Stroke/SEE							-548.924	0.432	0.571	0.512	0.631
	Total score	0.582	0.000	-0.005	0.453	0.738					
	Constant	-5.140	0.000	0.013	-5.534	-4.806					
Stroke/SEE							-536.495	0.576	0.670*	0.613	0.719
	Hypertension	0.042	0.823	-0.016	-0.314	0.432					
	Renal function	-0.007	0.977	-0.077	-0.448	0.436					
	Liver function	1.119	0.003	0.055	0.316	1.750					
	Stroke	0.962	0.000	-0.013	0.504	1.370					
	Bleeding	0.356	0.379	-0.040	-0.561	0.888					
	Labile INR	1.006	0.000	-0.018	0.704	1.490					
	Age> 65 years	0.514	0.049	-0.003	0.085	1.042					
	Drug	0.809	0.000	0.011	0.505	1.169					
	Alcohol	0.626	0.174	-0.061	-0.201	1.566					
	Constant	-4.902	0.000	-0.002	-5.474	-4.437					
Major bleeding							-653.214	0.594	0.534	0.486	0.584
	Total score	0.472	0.000	-0.006	0.301	0.586					
	Constant	-4.631	0.000	0.000	-5.024	-4.202					
Major bleeding							-640.898	0.156	0.650*	0.600	0.698
	Hypertension	0.081	0.620	-0.007	-0.230	0.405					
	Renal function	0.662	0.002	-0.025	0.266	1.051					
	Liver function	0.864	0.039	-0.089	0.019	1.681					
	Stroke	0.054	0.858	-0.004	-0.567	0.490					
	Bleeding	1.374	0.000	-0.001	1.005	1.791					
	Labile INR	0.401	0.052	-0.033	0.027	0.786					
	Age> 65 years	0.531	0.023	0.015	0.068	1.024					
	Drug	0.335	0.098	0.016	-0.097	0.718					
	Alcohol	0.791	0.029	-0.031	-0.164	1.289					
	Constant	-4.491	0.000	-0.019	-4.948	-3.942					
Mortality							-697.432	0.250	0.504	0.454	0.554
	Total score	0.397	0.000	-0.007	0.322	0.520					
	Constant	-4.361	0.000	-0.007	-4.784	-4.114					
Mortality							-671.598	0.772	0.646*	0.598	0.691
	Hypertension	▼ -0.337	0.039	-0.008	-0.681	-0.070					
	Renal function	▼ 1.246	0.000	-0.020	1.019	1.568					
	Liver function	▼ 1.154	0.002	-0.048	0.475	1.850					
	Stroke	▼ 0.029	0.926	-0.033	-0.493	0.791					
	Bleeding	▼ 0.423	0.166	-0.031	-0.170	0.995					
	Labile INR	▼ 0.262	0.196	-0.025	-0.168	0.569					
	Age> 65 years	▼ 0.825	0.003	0.119	0.293	1.297					
	Drug	▼ 0.317	0.027	0.001	0.066	0.586					
	Alcohol	▼ 0.128	0.814	-0.142	-1.345	0.998					
	Constant	▼ -4.447	0.000	-0.090	-4.899	-4.066					

Abbreviations: HAS-BLED=hypertension, abnormal renal/liver function, stroke, bleeding history or predisposition, labile international normalized ratio [INR], elderly [age ≥65 years], drugs/alcohol concomitantly.

* Significant improvement

Table S3. Comparison C-statistic in subjects treated with NOACs vs total population**CHA₂DS₂-VASc scores as explanatory variables**

			C-statistic	95% CI (Bias-corrected)	
Stroke/SEE	Total score	NOAC subgroup	0.466	0.349	0.590
		Total population	0.584	0.536	0.637
	Individual components	NOAC subgroup	0.662	0.525	0.778
		Total population	0.687	0.638	0.730
Major bleeding	Total score	NOAC subgroup	0.491	0.393	0.585
		Total population	0.520	0.478	0.567
	Individual components	NOAC subgroup	0.674	0.586	0.760
		Total population	0.626	0.579	0.672
Mortality	Total score	NOAC subgroup	0.596	0.419	0.752
		Total population	0.559	0.513	0.604
	Individual components	NOAC subgroup	0.829	0.695	0.940
		Total population	0.707	0.666	0.744

HAS-BLED scores as explanatory variables

			C-statistic	95% CI (Bias-corrected)	
Stroke/SEE	Total score	NOAC subgroup	0.411	0.280	0.553
		Total population	0.571	0.512	0.631
	Individual components	NOAC subgroup	0.609	0.445	0.747
		Total population	0.670	0.613	0.719
Major bleeding	Total score	NOAC subgroup	0.536	0.420	0.663
		Total population	0.534	0.486	0.584
	Individual components	NOAC subgroup	0.617	0.511	0.730
		Total population	0.650	0.600	0.698
Mortality	Total score	NOAC subgroup	0.544	0.318	0.781
		Total population	0.504	0.454	0.554
	Individual components	NOAC subgroup	0.635	0.369	0.852
		Total population	0.646	0.598	0.691

CHA₂DS₂-VASc and HAS-BLED combined as explanatory variables

			C-statistic	95% CI (Bias-corrected)	
Stroke/SEE	Individual components	NOAC subgroup	0.689	0.569	0.803
		Total population	0.731	0.681	0.778
Major bleeding	Individual components	NOAC subgroup	0.725	0.630	0.822
		Total population	0.702	0.659	0.747
Mortality	Individual components	NOAC subgroup	0.863	0.737	0.967
		Total population	0.740	0.699	0.780

Abbreviations: NOAC: non-vitamin K antagonist oral anticoagulant; SSE: Systemic Embolic Events; CHA₂DS₂-VASc=congestive heart failure, hypertension, age >75 years [doubled], diabetes, stroke/transient ischemic attack/thromboembolism [doubled], vascular disease [prior myocardial infarction, peripheral artery disease, or aortic plaque], age 65-75 years, sex category [female]; HAS-BLED=hypertension, abnormal renal/liver function, stroke, bleeding history or predisposition, labile international normalized ratio [INR], elderly [age ≥65 years], drugs/alcohol concomitantly.

Table S4. Comparison C-statistic of the CHA₂DS₂-VASc score, the HAS-BLED score and their combination for Stroke/Systemic Embolic Events (SEE), Major Bleeding and Mortality, broken down according to the type of atrial fibrillation - paroxysmal, persistent, long-term persistent and permanent.

Paroxysmal atrial fibrillation

Outcome	C-statistic	95% CI (Bias-corrected)	
Stroke/SEE	CHA ₂ DS ₂ -VASc	0.619	0.520
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.614	0.510
	HAS-BLED	0.543	0.438
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.614	0.510
Major bleeding	CHA ₂ DS ₂ -VASc	0.547	0.461
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.600	0.502
	HAS-BLED	0.577	0.483
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.600	0.502
Mortality	CHA ₂ DS ₂ -VASc	0.739	0.632
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.732	0.620
	HAS-BLED	0.631*	0.498
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.732	0.620

Persistent atrial fibrillation

Outcome	C-statistic	95% CI (Bias-corrected)	
Stroke/SEE	CHA ₂ DS ₂ -VASc	0.775	0.693
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.825	0.747
	HAS-BLED	0.776	0.681
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.825	0.747
Major bleeding	CHA ₂ DS ₂ -VASc	0.739	0.651
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.750	0.661
	HAS-BLED	0.692*	0.578
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.750	0.661
Mortality	CHA ₂ DS ₂ -VASc	0.727	0.639
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.776	0.688
	HAS-BLED	0.739	0.642
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.776	0.688

Long-standing persistent atrial fibrillation

Outcome	C-statistic	95% CI (Bias-corrected)	
Stroke/SEE	CHA ₂ DS ₂ -VASc	0.654	0.344
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.701	0.447
	HAS-BLED	0.609	0.316
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.701	0.447
Major bleeding	CHA ₂ DS ₂ -VASc	0.554*	0.360
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.765	0.533
	HAS-BLED	0.848	0.706
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.765	0.533
Mortality	CHA ₂ DS ₂ -VASc	0.620	0.472
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.740	0.638
	HAS-BLED	0.667	0.519
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.740	0.638

Permanent atrial fibrillation

Outcome	C-statistic	95% CI (Bias-corrected)	
Stroke/SEE	CHA ₂ DS ₂ -VASc	0.686*	0.617
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.760	0.688
	HAS-BLED	0.691*	0.604
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.760	0.688
Major bleeding	CHA ₂ DS ₂ -VASc	0.633*	0.565
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.731	0.668
	HAS-BLED	0.655*	0.580
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.731	0.668
Mortality	CHA ₂ DS ₂ -VASc	0.665	0.609
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.698	0.641
	HAS-BLED	0.584*	0.512
	CHA ₂ DS ₂ -VASc + HAS-BLED	0.698	0.641

* denotes statistically different values compared with the following value in the column.

Table S5: Previous studies of CHA₂DS₂-VASc and HAS-BLED scores to predict mortality

First Author	Year	Reference	Score(s) studied	No. of Patients	Type of patients studied	Main findings
Gallego, P.	2012	¹	HAS-BLED	965	Atrial fibrillation	The HAS-BLED score shows some predictive value for cardiovascular events and mortality in anticoagulated patients with AF, consistent with the relationship between thrombosis and bleeding.
Padjen, V.	2013	²	CHA2DS2 -VASc, HAS-BLED	787	Atrial fibrillation	HAS-BLED was found to have an independent predictive value on the occurrence of sICH regardless of the treatment (thrombolysis or conservative therapy). The CHA2DS2-VASc score was inversely related to the favourable outcome in the univariate analysis (OR 0.80; 95% CI 0.65-0.99, P = 0.042)
Capodanno, D.	2015	³	CHA2DS2 -VASc, HAS-BLED	1437	Atrial fibrillation	In patients without AF undergoing PCI and discharged on dual antiplatelet therapy, the HAS-BLED score performed better than the CHA2DS2-VASc for the prediction of MACE. Although both scores predict MACE, their discrimination was modest. Conversely, both scores did not significantly predict major bleeding in non-AF patients undergoing PCI.
Sadeghi, R.	2015	⁴	CHA2DS2-VASc	900	Ischemic stroke	Patients with atrial fibrillation hospitalized with ischemic stroke showed an important absolute risk of further stroke and early mortality. Despite substantiated advantages of warfarin prophylaxis, the application of the score is still very limited.
García-Fernández A	2016	⁵	HAS-BLED	406	Atrial fibrillation	In AF patients undergoing electrical cardioversion, major bleeding episodes and mortality were independently associated with poor quality control of anticoagulation and previous bleeding. The HAS-BLED score successfully predicted major bleeding and mortality.
Yoshihisa, A.	2016	⁶	CHA2DS2-VASc	1011	Atrial fibrillation and heart failure	A CHA2DS2-VASc score 7-9 was an independent predictor of all-cause mortality in heart failure (HF): for all HF patients: hazard ratio (HR) 1.822, P = 0.011; or HF patients with AF: HR 1.951, P = 0.031; for HF patients without AF: HR 2.215, P = 0.033).
Fox, KAA	2017	⁷	GARFIELD VS CHA2DS2-VASc	39898	Atrial fibrillation	Performance of the GARFIELD-AF risk tool was superior to CHA2DS2-VASc in predicting stroke and mortality and superior to HAS-BLED for bleeding, overall and in lower risk patients.
Mazzone, C.	2017	⁸	CHA2DS2-VASc	12599	Patients in sinus rhythm	In a community population of Caucasian arterial hypertension patients in sinus rhythm, CHA2DS2-VASc well stratified for adverse clinical events at a mid-term follow-up with accuracy similar as in atrial fibrillation patients.
Chen, Yung-Lung	2017	⁹	CHA2DS2-VASc	1311	Heart failure with reduced ejection fraction	CHADS2, CHA2DS2-VASc, and R2CHADS2 scores can be used to predict 1-year all-cause mortality in patients with heart failure with preserved ejection fraction with or without atrial fibrillation. For predicting all-cause mortality in uch patients, the R2CHADS2 is more accurate than CHADS2 and CHA2DS2-VASc.
Graves G	2018	¹⁰	CHA2DS2-VASc	10077	Atrial fibrillation	Using the Intermountain Mortality Risk Score (IMRS) jointly with CHA2DS2-VASc in patients with atrial fibrillation improved the prediction of stroke and mortality. For example, in patients at the OAC treatment threshold (CHA2DS2-VASc = 2), the IMRS provided ~4-fold separation between low and high risk. The IMRS provides an enhancing marker for risk in patients with AF that reflects the underlying systemic nature of this disease that may be considered in combination with the CHA2DS2-VASc score.
Gazova, A.	2019	¹¹	CHA2DS2 VASc	137	Atrial fibrillation	The CHA2DS2-VASc score correctly predicted the patients at high-risk for 3 to 5 years mortality and confirmed its significant predictive value in the patients with atrial fibrillation.
Cioffi, G.	2019	¹²	CHA2DS2-VASc	414	Inflammatory arthritis	The CHA2DS2 VASc score accurately predicts cardiovascular and non cardiovascular mortality and hospitalization in patients in sinus rhythm with rheumatoid arthritis, ankylosing spondylitis and psoriatic arthritis in the mid term.
Nof, E.	2020	¹³	CHA2DS2 VASc	1804	Patients with an implanted cardioverter-defibrillator (MADIT Study)	A high CHA2DS2 VASc score can be used to identify patients with mild heart failure who have low risk of ventricular tachyarrhythmias and high morbidity risk or mortality, and may derive a pronounced clinical benefit from cardiac resynchronization therapy without a defibrillator. The authors suggest a possible role for the CHA2DS2 VASc score in device selection among candidates to biventricular pacing.
Karamchandani, k	2020	¹⁴	CHA2DS2-VASc	640	New-onset atrial fibrillation	New-onset atrial fibrillation is common in critically ill patients and is associated with high in-hospital mortality. The CHA2DS2-VASc score is not a reliable prognostic marker of in-hospital mortality in such patients. However, the presence of vascular disease in such patients is associated with increased mortality.
Hsieh, MJ	2017	¹⁵	HAS-BLED	617	Non-ST elevation myocardial infarction without atrial fibrillation	The HAS-BLED scoring system is similar to the GRACE and CRUSADE scores but better than the TIMI risk score to predict long-term survival outcomes in patients with non-ST elevation myocardial infarction without atrial fibrillation.
Ipek, G.	2016	¹⁶	CHA2DS2-VASc	2375	ST-elevation myocardial infarction	The CHA2DS2-VASc score is associated with a higher risk of no-reflow and in-hospital mortality in patients who undergoing primary percutaneous coronary intervention.
Melgaard, L.	2015	¹⁷	CHA2DS2-VASc	42987	Heart failure with and without atrial fibrillation	Among patients with incident heart failure, with or without atrial fibrillation, the CHA2DS2-VASc score was predicted ischemic stroke, thromboembolism, and death. The absolute risk of thromboembolic complications was higher among patients without atrial fibrillation compared with patients with concomitant atrial fibrillation at high CHA2DS2-VASc scores. However, the predictive accuracy was modest, and the clinical utility of the CHA2DS2-VASc score in patients with heart failure remains to be determined.
Mitchell, L.B.	2014	¹⁸	CHA2DS2-VASc	20970	Acute coronary syndrome without atrial fibrillation (Alberta Provincial Project for Outcomes Assessment in Coronary Heart disease (APPROACH) prospective registry)	In patients with acute coronary syndrome but no atrial fibrillation, the CHADS2 and CHA2DS2-VASc scores predict ischaemic stroke and transient ischemic attack with similar accuracy as in historical populations with non-valvular AF, but with lower absolute event rates.
Oldgren, J.	2011	¹⁹	CHADS2	18112	Atrial fibrillation	Higher CHADS2 scores were associated with increased risks for stroke or systemic embolism, bleeding, and death in patients with atrial fibrillation receiving oral anticoagulants.
Onuk, T.	2017	²⁰	CHA2DS2-VASc	277	Acute pulmonary embolism without atrial fibrillation	A CHA2DS2-VASc score ≥4 predicts a 16.8 times higher risk of eath compared to patients with CHA2DS2-VASc score = 0.
Paoletti Perini, A.	2014	²¹	CHA2DS2-VASc	559	Patients candidates to cardiac resynchronization therapy	In CRT-D patients with cardiac resynchronization therapy and implanted defibrillator (CRT-D), a pre-implant CHA2DS2-VASc score is an independent predictor of major clinical events at a 30-month follow-up.
Patti, G.	2019	²²	CHA2DS2-VASc	610	Atrial fibrillation	In a population-based study on diabetic patients without atrial fibrillation, the CHA2 DS2 -VASc score was an independent predictor of ischemic stroke, coronary events, and overall mortality.
Peacock, W.F.	2017	²³	CHA2DS2-VASc	44793	Atrial fibrillation	Patients with higher scores had higher mortality.
Renda, G.	2019	²⁴	CHA2DS2-VASc	22179	Patients with or without new-onset atrial fibrillation	The CHA2DS2VASc score is a sensitive tool for predicting new-onset atrial fibrillation and adverse outcomes in subjects both with and without atrial fibrillation.
Temizer, O.	2017	²⁵	CHA2DS2-VASc	106	Heart failure with reduced ejection fraction	The CHA2DS2-VASc score and functional capacity were the only predictors of 1-year mortality in patients with heart failure with reduced ejection fraction.

Abbreviations: CHADS2=Congestive heart failure , Hypertension,; Age ≥75 years, Diabetes mellitus; Prior Stroke or TIA or Thromboembolism (doubled); CHA2DS2-VASc=congestive heart failure, hypertension, age ≥75 years [doubled], diabetes, stroke/transient ischemic attack/thromboembolism [doubled], vascular disease [prior myocardial infarction,

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