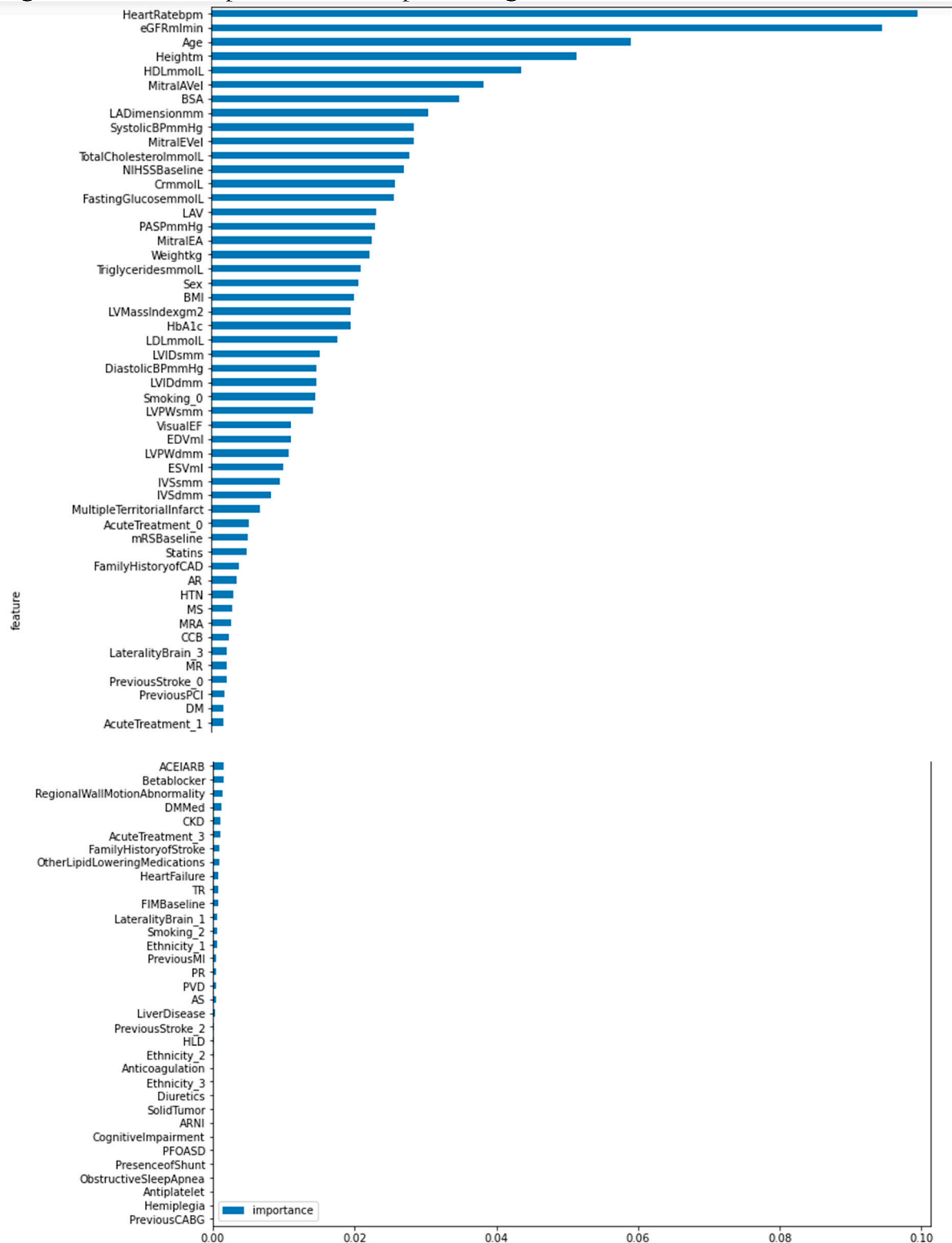


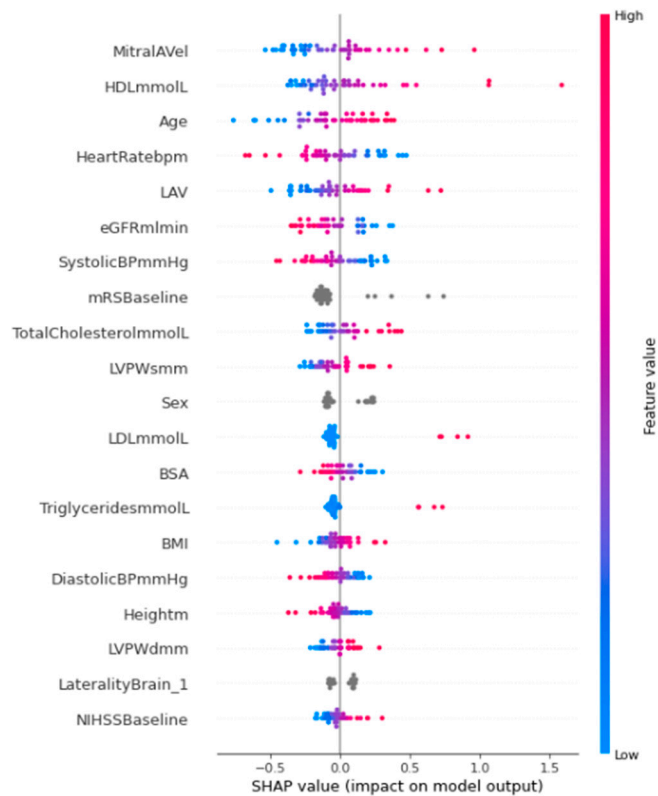
Supplementary Material

Figure S1: Feature Importance of Best-performing Random Forest Model



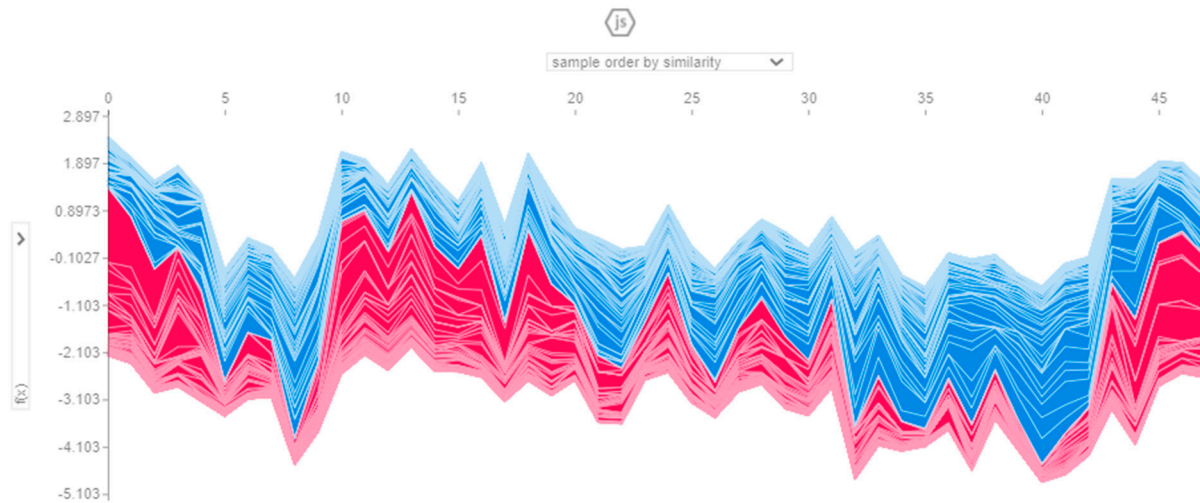
Abbreviations: abbreviations of all features are found in Supplementary Table 5.

Figure S2: Beeswarm Plot of Best-performing SVM Model (top 20 features displayed)



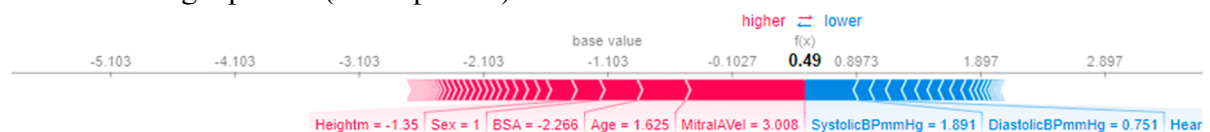
Abbreviations: SVM support vector machine. Abbreviations of all features are found in Supplementary Table 4.

Figure S3: SHAP Global Importance/Explanations: Force Plot with Best-performing SVM Model



Abbreviations: SHapley Additive exPlanations, SVM support vector machine.

Figure S4: SHAP Local Importance/Explanations: Force Plot with Best-performing SVM Model for single patient (index patient)



Abbreviations: SHapley Additive exPlanations, SVM support vector machine. Abbreviations of all features are found in Supplementary Table 4.

Table S1: Set of Hyperparameters Tuned using Grid Search in Machine Learning Models

Model	Hyperparameters Tuned using Grid Search
SVM	misclassification penalty parameter C, gamma, and kernel function.
Random Forest	number of trees in the random forest, maximum depth of a tree, minimum number of samples required for each split, minimum number of samples required for each leaf node, and whether bootstrap samples are used when building trees.
XGBoost	learning rate, L1 regularization parameter, minimum loss reduction required for each leaf node, maximum tree depth for the base classifiers, minimum weight needed to create a new node, and the number of boosting iterations.
MLP	number of neurons in the hidden layer, activation function used for the hidden layer, the L2 regularization parameter, learning rate, and maximum number of iterations.

Abbreviations: SVM support vector machine, XGBoost eXtreme Gradient Boosting, MLP multilayer perceptron

Table S2: List of Features included in ML Models and their Abbreviations:

Clinical parameters and biomarkers		Echocardiography parameters	
Feature	Abbreviation used	Feature	Abbreviation used
Age	Age	Cardiac shunt	PresenceofShunt
Sex	Sex	Peak mitral E-wave velocity	MitralEVel
Body surface area	BSA	Peak mitral A-wave velocity	MitralAVel
Ethnicity	Ethnicity	Mitral E/A ratio	MitralEA
Height	Heightm	PASP	PASPmmHg
Weight	Weightkg	LVID at end diastole	LVIDdmm
Systolic blood pressure	SystolicBPmmHg	LVID at end systole	LVIDsmm
Diastolic blood pressure	DiastolicBPmmHg	End-diastolic volume	EDVml
Admitting heart rate	HeartRatebpm	End-systolic volume	ESVml
Family history of coronary artery disease	FamilyHistoryofCAD	Ejection fraction	VisualEF
Family history of stroke	FamilyHistoryofStroke	Interventricular septal thickness in diastole	IVSdmm
Smoking	Smoking	Interventricular septal thickness in systole	IVSsmm
Hypertension	HTN	LVPWd	LVPWdmm
Hyperlipidemia	HLD	LVPWs	LVPWsmm
Diabetes mellitus status	DM	Left atrial diameter	LADimensionmm
Previous myocardial infarction	PreviousMI	Left atrial volume	LAV
Previous percutaneous coronary intervention	PreviousPCI	Left ventricular mass index	LVMassIndexgm2
Previous coronary artery bypass graft surgery	PreviousCABG	PFO or ASD	PFOASD
Previous stroke	PreviousStroke	Mitral regurgitation	MR
Heart failure	HeartFailure	Mitral stenosis	MS
Peripheral vascular disease	PVD	Aortic regurgitation	AR
Cognitive impairment	CognitiveImpairment	Aortic stenosis	AS
Presence of liver disease	LiverDisease	Tricuspid regurgitation	TR
Hemiplegia	Hemiplegia	Pulmonary regurgitation	PR
Obstructive sleep apnea	ObstructiveSleepApnea	Regional wall motion abnormality	RegionalWallMotion-Abnormality
Chronic kidney disease	CKD		

Solid tumor present	SolidTumor		
Medications			
Beta blocker use	Betablocker		
ACEI or ARB use	ACEIARB		
Angiotensin Receptor Neprilysin inhibitor	ARNI		
Mineralocorticoid receptor antagonist	MRA		
Diabetic medication use	DMMed		
Diuretics	Diuretics		
Calcium channel blocker	CCB		
Statin use	Statins		
On non-statin lipid- lowering medications	OtherLipidLoweringMed ications		
Antiplatelet	Antiplatelet		
Anticoagulation	Anticoagulation		
Stroke parameters			
Laterality of stroke	LateralityBrain		
Multiple territorial infarct	MultipleTerritorialInfarct		
Acute treatment for stroke	AcuteTreatment		
Functional Independent Measure at baseline	FIMBaseline		
Modified Rankin Scale at baseline	mRSBaseline		
NIHSS at baseline	NIHSSBaseline		
ASPECTS at baseline	ASPECTSBaseline		
Total cholesterol	TotalCholesterolmmolL		
LDL-C	LDLmmolL		
HDL-C	HDLmmolL		
Triglycerides	TriglyceridesmmolL		
HbA1c	HbA1c		
Fasting glucose	FastingGlucosemmolL		
Creatinine	CrmmolL		
eGFR	eGFRmlmin		

Abbreviations: ACEI angiotensin-converting enzyme inhibitor, ARB angiotensin receptor blocker, ASPECTS Alberta Stroke Program Early CT Score, NIHSS National Institutes of Health Stroke Scale, LDL-C low-density lipoprotein cholesterol, HDL-C high-density lipoprotein cholesterol, HbA1c hemoglobin A1c, eGFR estimated glomerular filtration rate, PASP pulmonary arterial systolic pressure, LVID left ventricular internal diameter, LVPWd left ventricular posterior wall thickness end-diastole, LVPWs left ventricular posterior wall thickness end-systole, PFO patent foramen ovale, ASD atrial septal defect