

Supplementary Table 1. Train, test and validation cohorts in two tertiary hospitals

	SNUBH		AMC
	Train	Test	External Validation
Sample size (met inclusion criteria)	34670	11555	396424
MACCE (n, %)	1692(4.9%)	564(4.9%)	24853(6.3%)

Supplementary Table 2. Internal and external validations of extra-combination prediction models

	Demographic	Measurement	Underlying history	Type of surgery	Medication
Prediction model	O	O	O	O	O
Recombination (1)	O	O	O	O	X
Recombination (2)	O	O	O	X	O
Recombination (3)	O	O	X	O	X

Recombination (1)	SNUBH		AMC
AUROC (95% CI)	Train	Test	External Validation
MACCE			
Random forest	0.975 (0.971-0.979)	0.896 (0.883-0.910)	0.814 (0.812-0.817)
Gradient boosting machine	0.917 (0.910-0.925)	0.896 (0.882-0.910)	0.821 (0.818-0.823)
Lasso Logistic Regression	0.905 (0.897-0.912)	0.894 (0.880-0.907)	0.792 (0.789-0.795)
AdaBoost	0.906 (0.899-0.912)	0.881 (0.866-0.897)	0.756 (0.752-0.759)
DecisionTree	0.894 (0.885-0.903)	0.820 (0.797-0.843)	0.708 (0.705-0.712)

Recombination (2)	SNUBH		AMC
AUROC (95% CI)	Train	Test	External Validation
MACCE			
Random forest	0.974 (0.970-0.979)	0.894 (0.880-0.908)	0.797 (0.764-0.800)
Gradient boosting machine	0.923 (0.917-0.930)	0.895 (0.881-0.909)	0.815 (0.812-0.817)
Lasso Logistic Regression	0.899 (0.891-0.906)	0.889 (0.874-0.903)	0.782 (0.779-0.785)
AdaBoost	0.900 (0.893-0.907)	0.878 (0.862-0.893)	0.761 (0.758-0.765)
DecisionTree	0.896 (0.887-0.905)	0.809 (0.785-0.832)	0.617 (0.613-0.622)

Combination (3)	SNUBH		AMC
AUROC (95% CI)	Train	Test	External Validation
MACCE			
Random forest	0.991 (0.989-0.993)	0.837 (0.820-0.854)	0.670 (0.666-0.674)
Gradient boosting machine	0.873 (0.865-0.882)	0.831 (0.814-0.848)	0.694 (0.690-0.697)
Lasso Logistic Regression	0.832 (0.822-0.841)	0.824 (0.806-0.841)	0.710 (0.707-0.713)
AdaBoost	0.839 (0.830-0.848)	0.813 (0.795-0.831)	0.687 (0.683-0.690)
DecisionTree	0.861 (0.851-0.871)	0.707 (0.681-0.733)	0.613 (0.609-0.616)

Supplementary Table 3. MACCE standardized concept ID

MACCE	CONCEPT_ID	CONCEPT_NAME	DOMAIN_ID	VOCABULARY_ID	CONCEPT_CODE
Stroke	4110189	Cerebral infarct due to thrombosis of precerebral arteries	Condition	SNOMED	195185009
Stroke	4110190	Cerebral infarction due to embolism of precerebral arteries	Condition	SNOMED	195186005
Stroke	4111714	Cerebral infarction due to cerebral venous thrombosis, non-pyogenic	Condition	SNOMED	195230003
Stroke	4110192	Cerebral infarction due to thrombosis of cerebral arteries	Condition	SNOMED	195189003
Stroke	43531609	Sequela of ischemic cerebral infarction	Condition	SNOMED	23671000119107
Stroke	4108356	Cerebral infarction due to embolism of cerebral arteries	Condition	SNOMED	195190007
Stroke	4112026	Sequelae of cerebral infarction	Condition	SNOMED	195243003
Stroke	4045738	Pure sensory lacunar infarction	Condition	SNOMED	230700009
Stroke	4043731	Infarction - precerebral	Condition	SNOMED	230692004
Stroke	4045735	Anterior cerebral circulation infarction	Condition	SNOMED	230693009
Stroke	4046358	Total anterior cerebral circulation infarction	Condition	SNOMED	230694003
Stroke	4046359	Partial anterior cerebral circulation infarction	Condition	SNOMED	230695002
Stroke	4046360	Lacunar infarction	Condition	SNOMED	230698000
Stroke	4045737	Pure motor lacunar infarction	Condition	SNOMED	230699008
Stroke	4046361	Pure sensorimotor lacunar infarction	Condition	SNOMED	230701008

Stroke	4045740	Lacunar ataxic hemiparesis	Condition	SNOMED	230702001
Stroke	4046362	Hemorrhagic cerebral infarction	Condition	SNOMED	230706003
Stroke	4048784	Anterior cerebral circulation hemorrhagic infarction	Condition	SNOMED	230707007
Stroke	4043732	Posterior cerebral circulation hemorrhagic infarction	Condition	SNOMED	230708002
Stroke	43531592	Sequela of thrombotic stroke	Condition	SNOMED	91601000119109
Stroke	4194375	Septic infarct	Observation	SNOMED	79770005
Stroke	4319331	Cerebellar infarction	Condition	SNOMED	95460007
Stroke	4096252	Impending infarction	Condition	SNOMED	25106000
Stroke	4151368	Edematous infarct	Observation	SNOMED	28208008
Stroke	4141405	Left sided cerebral infarction	Condition	SNOMED	307766002
Stroke	4145897	Multiple lacunar infarcts	Condition	SNOMED	307363008
Stroke	4146185	Right sided cerebral infarction	Condition	SNOMED	307767006
Stroke	4077086	Occipital cerebral infarction	Condition	SNOMED	276219001
Stroke	46270381	Cerebral infarction due to stenosis of precerebral artery	Condition	SNOMED	293831000119105
Stroke	46270380	Cerebral infarction due to vertebral artery stenosis	Condition	SNOMED	293811000119100
Stroke	42535466	Lacunar ataxic hemiparesis of left dominant side	Condition	SNOMED	292861000119106
Stroke	42535465	Lacunar ataxic hemiparesis of right dominant side	Condition	SNOMED	292851000119109
Stroke	43530732	Sequela of lacunar stroke	Condition	SNOMED	33331000119103

Stroke	42535524	Lacunar ataxic hemiparesis of right nondominant side	Condition	SNOMED	330421000119102
Stroke	42535523	Lacunar ataxic hemiparesis of left nondominant side	Condition	SNOMED	330411000119109
Stroke	4267511	Cystic infarct	Observation	SNOMED	36560003
Stroke	46273649	Cerebral infarction due to occlusion of basilar artery	Condition	SNOMED	34181000119102
Stroke	44782773	Cerebral infarction due to vertebral artery occlusion	Condition	SNOMED	34191000119104
Stroke	765515	Cerebral infarction due to basilar artery stenosis	Condition	SNOMED	434991000124105
Stroke	762951	Cerebral infarction due to anterior cerebral artery occlusion	Condition	SNOMED	434151000124101
Stroke	4184344	Focal infarct	Observation	SNOMED	43618000
Stroke	763015	Cerebral infarction due to middle cerebral artery occlusion	Condition	SNOMED	434961000124102
Stroke	443454	Cerebral infarction	Condition	SNOMED	432504007
Stroke	762937	Cerebral infarction due to cerebral venous thrombosis	Condition	SNOMED	433961000124100
Stroke	4138327	Acute lacunar infarction	Condition	SNOMED	426107000
Stroke	762933	Cerebral infarction due to cerebral artery occlusion	Condition	SNOMED	433891000124100
Stroke	4142739	Thalamic infarction	Condition	SNOMED	427296003
Stroke	43530749	Behavior disorder as sequela of cerebral infarction	Condition	SNOMED	46421000119102
Stroke	762935	Cerebral infarction due to internal	Condition	SNOMED	433931000124109

		carotid artery occlusion			
Stroke	762934	Cerebral infarction due to posterior cerebral artery occlusion	Condition	SNOMED	433911000124103
Stroke	4165538	Watershed infarct	Observation	SNOMED	47559000
Stroke	764363	Cerebellar infarction due to occlusion of superior cerebellar artery	Condition	SNOMED	454041000124101
Stroke	315296	Preinfarction syndrome	Condition	SNOMED	4557003
Stroke	4200827	Evolving infarct	Observation	SNOMED	52481007
Stroke	44782781	Hemiplegia and/or hemiparesis following stroke	Condition	SNOMED	48601000119107
Stroke	46270031	Cerebral infarction due to occlusion of precerebral artery	Condition	SNOMED	125081000119106
Stroke	43530683	Cerebral infarction due to carotid artery occlusion	Condition	SNOMED	149821000119103
Stroke	761110	Bilateral cerebral infarction due to precerebral arterial occlusion	Condition	SNOMED	151161000119102
Stroke	4031045	Anterior choroidal artery syndrome	Condition	SNOMED	14309005
Stroke	4216520	Lacunar infarct	Observation	SNOMED	81037000
Stroke	4251763	Hemorrhagic infarct	Observation	SNOMED	74310003
Stroke	765694	Apraxia due to and following hemorrhagic cerebrovascular accident	Condition	SNOMED	674351000119101
Stroke	42535689	Speech and language deficit as sequela of hemorrhagic cerebrovascular accident	Condition	SNOMED	674391000119106

Stroke	764819	Vertigo due to and following hemorrhagic cerebrovascular accident	Condition	SNOMED	674101000119103
Stroke	42535685	Ataxia as sequela of hemorrhagic cerebrovascular accident	Condition	SNOMED	674121000119107
Stroke	44783179	Multiple lacunar infarcts	Observation	SNOMED	698970007
Stroke	35621734	Aphasia due to and following hemorrhagic cerebrovascular accident	Condition	SNOMED	672551000119100
Stroke	764818	Fluency disorder due to and following hemorrhagic cerebrovascular accident	Condition	SNOMED	672491000119106
Stroke	42535678	Dysarthria due to and following hemorrhagic cerebrovascular accident	Condition	SNOMED	672511000119101
Stroke	42535680	Dysphasia due to and following hemorrhagic cerebrovascular accident	Condition	SNOMED	672531000119106
Stroke	45772786	Cerebral infarction due to embolism of middle cerebral artery	Condition	SNOMED	705128004
Stroke	45767658	Cerebral infarction due to thrombosis of middle cerebral artery	Condition	SNOMED	705130002
Stroke	42535682	Cognitive deficit due to and following hemorrhagic cerebrovascular accident	Condition	SNOMED	672571000119109
Stroke	3179950	Right subthalamic lacunar stroke	Condition	Nebraska Lexicon	2.16300010000041e+16

Stroke	3191217	Chronic lacunar infarct	Observation	Nebraska Lexicon	891011000004101
Stroke	3196370	Acute and/or recent lacunar infarct	Observation	Nebraska Lexicon	952381000004100
Stroke	35610084	Cerebral infarction due to occlusion of cerebral artery	Condition	SNOMED	1089411000000100
Stroke	1340441	Exacerbation of preinfarction syndrome	Condition	OMOP Extension	OMOP5166096
Stroke	35610085	Cerebral infarction due to stenosis of cerebral artery	Condition	SNOMED	1089421000000100
Stroke	36716999	Cerebellar stroke	Condition	SNOMED	1.63717810001191e+16
Stroke	4111710	Brainstem stroke syndrome	Condition	SNOMED	195212005
Stroke	4111711	Cerebellar stroke syndrome	Condition	SNOMED	195213000
Stroke	381316	Cerebrovascular accident	Condition	SNOMED	230690007
Stroke	43531607	Cerebral infarction due to stenosis of carotid artery	Condition	SNOMED	99451000119105
Stroke	443790	Multi-infarct dementia with delusions	Condition	SNOMED	25772007
Stroke	762339	Right anterior cerebral artery embolism with stroke	Condition	SNOMED	329391000119100
Stroke	762340	Left anterior cerebral artery embolism with stroke	Condition	SNOMED	329401000119103
Stroke	762345	Left vertebral artery thrombosis with stroke	Condition	SNOMED	329631000119108
Stroke	4298750	Periventricular hemorrhagic venous infarct	Condition	SNOMED	384993003
Stroke	4159140	Thrombotic stroke	Condition	SNOMED	371040005
Stroke	4153352	Embolic stroke	Condition	SNOMED	371041009

Stroke	4310996	Ischemic stroke	Condition	SNOMED	422504002
Stroke	4211509	Cardioembolic stroke	Condition	SNOMED	413758000
Stroke	36684840	Acute stroke	Condition	SNOMED	457551000124104
Stroke	43531605	Occlusion of cerebral artery with stroke	Condition	SNOMED	9901000119100
Stroke	379778	Multi-infarct dementia	Condition	SNOMED	56267009
Stroke	761790	Nonpyogenic cerebral venous thrombosis with stroke	Condition	SNOMED	1.60021510001191e+16
Stroke	761791	Left cerebellar artery thrombosis with stroke	Condition	SNOMED	1.60021910001191e+16
Stroke	761793	Left posterior cerebral artery thrombosis with stroke	Condition	SNOMED	1.60022710001191e+16
Stroke	761794	Right vertebral artery embolism with stroke	Condition	SNOMED	1.60023510001191e+16
Stroke	761795	Left vertebral artery embolism with stroke	Condition	SNOMED	1.60023910001191e+16
Stroke	761796	Right carotid artery embolism with stroke	Condition	SNOMED	1.60024310001191e+16
Stroke	761797	Left carotid artery embolism with stroke	Condition	SNOMED	1.60024710001191e+16
Stroke	761798	Basilar artery embolism with stroke	Condition	SNOMED	1.60025110001191e+16
Stroke	443864	Multi-infarct dementia with depression	Condition	SNOMED	14070001
Stroke	43530670	Ischemic stroke without coma	Condition	SNOMED	140921000119102
Stroke	43530669	Ischemic stroke with coma	Condition	SNOMED	140911000119109

Stroke	37110237	Cerebral ischemic stroke due to small artery occlusion	Condition	SNOMED	724424009
Stroke	37110238	Cerebral ischemic stroke due to intracranial large artery atherosclerosis	Condition	SNOMED	724425005
Stroke	37110239	Cerebral ischemic stroke due to extracranial large artery atherosclerosis	Condition	SNOMED	724426006
Stroke	377254	Multi-infarct dementia, uncomplicated	Condition	SNOMED	70936005
Stroke	37110765	Ischemic stroke without residual deficits	Condition	SNOMED	725132001
Stroke	37110678	Cerebral ischemic stroke due to occlusion of extracranial large artery	Condition	SNOMED	724993002
Stroke	37110679	Cerebral ischemic stroke due to stenosis of extracranial large artery	Condition	SNOMED	724994008
Stroke	37395562	Multi-infarct dementia due to atherosclerosis	Condition	SNOMED	106021000119105
Stroke	444091	Multi-infarct dementia with delirium	Condition	SNOMED	10349009
Myocardial infraction	4108670	Acute coronary insufficiency	Condition	SNOMED	194823009
Myocardial infraction	321318	Angina pectoris	Condition	SNOMED	194828000
Myocardial infraction	4108679	Rupture of cardiac wall without hemopericardium as current complication following acute myocardial infarction	Condition	SNOMED	194865003

Myocardial infraction	4108219	Rupture of chordae tendinae due to and following acute myocardial infarction	Condition	SNOMED	194866002
Myocardial infraction	4108220	Rupture of papillary muscle as current complication following acute myocardial infarction	Condition	SNOMED	194867006
Myocardial infraction	4108680	Thrombosis of atrium, auricular appendage, and ventricle due to and following acute myocardial infarction	Condition	SNOMED	194868001
Myocardial infraction	4078531	Status anginosus	Condition	SNOMED	19057007
Myocardial infraction	4068938	Syncope anginosa	Condition	SNOMED	21470009
Myocardial infraction	4119942	Stable angina	Condition	SNOMED	233819005
Myocardial infraction	4119455	New onset angina	Condition	SNOMED	233821000
Myocardial infraction	4124683	Silent myocardial ischemia	Condition	SNOMED	233823002
Myocardial infraction	4124687	Cardiac rupture due to and following acute myocardial infarction	Condition	SNOMED	233847009
Myocardial infraction	4310270	Angina, class III	Condition	SNOMED	85284003
Myocardial infraction	42537536	Mural thrombus of right ventricle following acute myocardial infarction	Condition	SNOMED	736978009
Myocardial infraction	315830	Prinzmetal angina	Condition	SNOMED	87343002
Myocardial infraction	43020461	Acute ST segment elevation myocardial infarction involving left main coronary artery	Condition	SNOMED	285991000119100

Myocardial infraction	4101262	Multiple infarcts	Observation	SNOMED	27876002
Myocardial infraction	4147223	Rupture of ventricle due to acute myocardial infarction	Condition	SNOMED	30277009
Myocardial infraction	4116486	Exercise-induced angina	Condition	SNOMED	300995000
Myocardial infraction	4201629	Refractory angina	Condition	SNOMED	315025001
Myocardial infraction	4198141	Post infarct angina	Condition	SNOMED	314116003
Myocardial infraction	4262446	Nocturnal angina	Condition	SNOMED	35928006
Myocardial infraction	4261964	Ruptured infarct	Observation	SNOMED	35696001
Myocardial infraction	4215140	Acute coronary syndrome	Condition	SNOMED	394659003
Myocardial infraction	4154704	Myocardial infarction with complication	Condition	SNOMED	371068009
Myocardial infraction	4161973	Progressive angina	Condition	SNOMED	371806006
Myocardial infraction	4161974	Recurrent angina after percutaneous transluminal coronary angioplasty	Condition	SNOMED	371808007
Myocardial infraction	4161456	Recurrent angina after coronary stent placement	Condition	SNOMED	371809004
Myocardial infraction	4161457	Recurrent angina after coronary artery bypass graft	Condition	SNOMED	371810009
Myocardial infraction	4155008	Recurrent angina post rotational atherectomy	Condition	SNOMED	371811008
Myocardial infraction	4155009	Recurrent angina after directional coronary atherectomy	Condition	SNOMED	371812001
Myocardial infraction	4324893	Typical angina	Condition	SNOMED	429559004

Myocardial infraction	4186397	Myocardial ischemia	Condition	SNOMED	414795007
Myocardial infraction	319844	Acute ischemic heart disease	Condition	SNOMED	413439005
Myocardial infraction	4189939	Acute myocardial ischemia	Condition	SNOMED	413444003
Myocardial infraction	4184827	Angina, class II	Condition	SNOMED	41334000
Myocardial infraction	315286	Chronic ischemic heart disease	Condition	SNOMED	413838009
Myocardial infraction	4185302	Chronic myocardial ischemia	Condition	SNOMED	413844008
Myocardial infraction	4185932	Ischemic heart disease	Condition	SNOMED	414545008
Myocardial infraction	4263712	Subendocardial ischemia	Condition	SNOMED	46109009
Myocardial infraction	4207965	Acute infarct	Observation	SNOMED	55470003
Myocardial infraction	315832	Angina decubitus	Condition	SNOMED	59021001
Myocardial infraction	4264145	Angina, class I	Condition	SNOMED	61490001
Myocardial infraction	4206471	Infarct	Observation	SNOMED	55641003
Myocardial infraction	4209296	Diffuse infarct	Observation	SNOMED	56229006
Myocardial infraction	37108686	Myocardial ischemia during surgery	Condition	SNOMED	10971000087107
Myocardial infraction	36712983	Angina co-occurrent and due to coronary arteriosclerosis	Condition	SNOMED	1.59601410001191e+16
Myocardial infraction	36712984	Angina co-occurrent and due to arteriosclerosis of coronary artery bypass graft	Condition	SNOMED	1.59603810001191e+16
Myocardial infraction	37309713	Unstable angina due to arteriosclerosis of autologous vein coronary artery bypass graft	Condition	SNOMED	1.59605410001191e+16

Myocardial infraction	35615052	Arteriosclerosis of autologous vein coronary artery bypass graft with angina	Condition	SNOMED	1.59605810001191e+16
Myocardial infraction	35615053	Unstable angina co-occurrent and due to arteriosclerosis of coronary artery bypass graft	Condition	SNOMED	1.59606610001191e+16
Myocardial infraction	36712982	Unstable angina co-occurrent and due to coronary arteriosclerosis	Condition	SNOMED	1.59600610001191e+16
Myocardial infraction	761735	Arteriosclerosis of autologous arterial coronary artery bypass graft with angina	Condition	SNOMED	1.59607810001191e+16
Myocardial infraction	36712985	Mural thrombus of left ventricle following acute myocardial infarction	Condition	SNOMED	1.59609810001191e+16
Myocardial infraction	37209632	Stable angina due to coronary arteriosclerosis	Condition	SNOMED	1.67543910001191e+16
Myocardial infraction	4310118	Transmural infarct	Observation	SNOMED	85844000
Myocardial infraction	4231426	Angina, class IV	Condition	SNOMED	89323001
Myocardial infraction	43531588	Angina associated with type 2 diabetes mellitus	Condition	SNOMED	791000119109
Myocardial infraction	4248026	Massive infarct	Observation	SNOMED	72647007
Myocardial infraction	4215649	Healed infarct	Observation	SNOMED	71911007
Myocardial infraction	319038	Postmyocardial infarction syndrome	Condition	SNOMED	66189004
Myocardial infraction	4322145	Pericarditis secondary to acute myocardial infarction	Condition	SNOMED	71023004

Myocardial infraction	45766212	Mitral valve regurgitation due to and following acute myocardial infarction	Condition	SNOMED	703326006
Myocardial infraction	37017177	Subacute ischemic heart disease	Condition	SNOMED	713405002
Myocardial infraction	45766214	Mitral valve regurgitation due to acute myocardial infarction without papillary muscle and chordal rupture	Condition	SNOMED	703328007
Myocardial infraction	45771327	Mitral valve regurgitation due to acute myocardial infarction with papillary muscle and chordal rupture	Condition	SNOMED	703330009
Myocardial infraction	45766117	Silent coronary vasospastic disease	Condition	SNOMED	703214003
Myocardial infraction	4325279	Old and recent infarct	Observation	SNOMED	71292007
Myocardial infraction	37109910	Ventricular aneurysm due to and following acute myocardial infarction	Condition	SNOMED	723858002
Myocardial infraction	44783791	Coronary microvascular dysfunction	Condition	SNOMED	697976003
Myocardial infraction	37016755	Resting ischemia	Condition	SNOMED	712866001
Myocardial infraction	3195310	Acute and/or recent infarct	Observation	Nebraska Lexicon	952361000004106
Myocardial infraction	1340247	Exacerbation of angina pectoris	Condition	OMOP Extension	OMOP5165902
Myocardial infraction	4011131	Acute infarction of papillary muscle	Condition	SNOMED	10273003
Myocardial infraction	37309626	Myocardial infarction due to demand ischemia	Condition	SNOMED	1.68376810001191e+16
Myocardial infraction	4329847	Myocardial infarction	Condition	SNOMED	22298006

Myocardial infraction	439693	True posterior myocardial infarction	Condition	SNOMED	194802003
Myocardial infraction	4108217	Subsequent myocardial infarction	Condition	SNOMED	194856005
Myocardial infraction	4108677	Subsequent myocardial infarction of anterior wall	Condition	SNOMED	194857001
Myocardial infraction	4108218	Subsequent myocardial infarction of inferior wall	Condition	SNOMED	194858006
Myocardial infraction	4108669	Acute myocardial infarction of atrium	Condition	SNOMED	194809007
Myocardial infraction	44782712	Acute myocardial infarction due to right coronary artery occlusion	Condition	SNOMED	23311000119105
Myocardial infraction	4124685	Acute non-Q wave infarction - widespread	Condition	SNOMED	233837006
Myocardial infraction	319039	Acute posterior myocardial infarction	Condition	SNOMED	233838001
Myocardial infraction	4119949	Old anterior myocardial infarction	Condition	SNOMED	233839009
Myocardial infraction	4121467	Old inferior myocardial infarction	Condition	SNOMED	233840006
Myocardial infraction	4119950	Old lateral myocardial infarction	Condition	SNOMED	233841005
Myocardial infraction	4119943	Acute Q wave infarction - anteroseptal	Condition	SNOMED	233825009
Myocardial infraction	4119456	Acute non-Q wave infarction - anteroseptal	Condition	SNOMED	233826005
Myocardial infraction	4119457	Acute Q wave infarction - anterolateral	Condition	SNOMED	233827001
Myocardial infraction	4119944	Acute non-Q wave infarction - anterolateral	Condition	SNOMED	233828006
Myocardial infraction	4121464	Acute Q wave infarction - inferior	Condition	SNOMED	233829003

Myocardial infraction	4119945	Acute non-Q wave infarction - inferior	Condition	SNOMED	233830008
Myocardial infraction	4121465	Acute Q wave infarction - inferolateral	Condition	SNOMED	233831007
Myocardial infraction	4119946	Acute non-Q wave infarction - inferolateral	Condition	SNOMED	233832000
Myocardial infraction	4121468	Old posterior myocardial infarction	Condition	SNOMED	233842003
Myocardial infraction	4124686	Silent myocardial infarction	Condition	SNOMED	233843008
Myocardial infraction	4124684	Acute Q wave infarction - lateral	Condition	SNOMED	233833005
Myocardial infraction	4121466	Acute non-Q wave infarction - lateral	Condition	SNOMED	233834004
Myocardial infraction	4119947	Acute widespread myocardial infarction	Condition	SNOMED	233835003
Myocardial infraction	4119948	Acute Q wave infarction - widespread	Condition	SNOMED	233836002
Myocardial infraction	312327	Acute myocardial infarction	Condition	SNOMED	57054005
Myocardial infraction	3661641	Acute ST segment elevation myocardial infarction due to occlusion of proximal portion of right coronary artery	Condition	SNOMED	868214006
Myocardial infraction	3661503	Acute ST segment elevation myocardial infarction due to mid left anterior descending coronary artery occlusion	Condition	SNOMED	840312002
Myocardial infraction	43020460	Acute ST segment elevation myocardial infarction involving left anterior descending coronary artery	Condition	SNOMED	285981000119103

Myocardial infraction	4151046	Acute myocardial infarction of basal-lateral wall	Condition	SNOMED	282006
Myocardial infraction	4207921	Postoperative transmural myocardial infarction of anterior wall	Condition	SNOMED	311792005
Myocardial infraction	4209541	Postoperative transmural myocardial infarction of inferior wall	Condition	SNOMED	311793000
Myocardial infraction	4206867	Postoperative subendocardial myocardial infarction	Condition	SNOMED	311796008
Myocardial infraction	4145721	Acute non-Q wave infarction	Condition	SNOMED	307140009
Myocardial infraction	4126801	Acute Q wave myocardial infarction	Condition	SNOMED	304914007
Myocardial infraction	4200113	Non-Q wave myocardial infarction	Condition	SNOMED	314207007
Myocardial infraction	4138833	Past myocardial infarction diagnosed on ECG AND/OR other special investigation, but currently presenting no symptoms	Condition	SNOMED	32574007
Myocardial infraction	4215259	First myocardial infarction	Condition	SNOMED	394710008
Myocardial infraction	765132	Subendocardial myocardial infarction	Condition	SNOMED	380001000004106
Myocardial infraction	4296653	Acute ST segment elevation myocardial infarction	Condition	SNOMED	401303003
Myocardial infraction	4270024	Acute non-ST segment elevation myocardial infarction	Condition	SNOMED	401314000
Myocardial infraction	4323202	Mixed myocardial ischemia and infarction	Condition	SNOMED	428196007
Myocardial infraction	4173632	Microinfarct of heart	Condition	SNOMED	42531007

Myocardial infraction	4178129	Acute anteroapical myocardial infarction	Condition	SNOMED	52035003
Myocardial infraction	4267568	Acute anteroseptal myocardial infarction	Condition	SNOMED	62695002
Myocardial infraction	436706	Acute myocardial infarction of lateral wall	Condition	SNOMED	58612006
Myocardial infraction	4170094	Myocardial infarction in recovery phase	Condition	SNOMED	418044006
Myocardial infraction	434376	Acute myocardial infarction of anterior wall	Condition	SNOMED	54329005
Myocardial infraction	4243372	Acute myocardial infarction of apical-lateral wall	Condition	SNOMED	59063002
Myocardial infraction	35610091	Acute nontransmural myocardial infarction	Condition	SNOMED	1089451000000100
Myocardial infraction	35610093	Acute transmural myocardial infarction	Condition	SNOMED	1089471000000100
Myocardial infraction	35611570	Acute ST segment elevation myocardial infarction of inferolateral wall	Condition	SNOMED	1.22381110001191e+16
Myocardial infraction	35611571	Acute ST segment elevation myocardial infarction of inferoposterior wall	Condition	SNOMED	1.22381510001191e+16
Myocardial infraction	761737	Acute ST segment elevation myocardial infarction due to occlusion of circumflex coronary artery	Condition	SNOMED	1.59631810001191e+16
Myocardial infraction	4030582	Postoperative myocardial infarction	Condition	SNOMED	129574000
Myocardial infraction	761736	Acute ST segment elevation myocardial infarction of anteroapical wall	Condition	SNOMED	1.59625410001191e+16
Myocardial infraction	4051874	Acute myocardial infarction of posterolateral wall	Condition	SNOMED	15990001

Myocardial infraction	46270158	Acute ST segment elevation myocardial infarction of posterolateral wall	Condition	SNOMED	1.57128410001191e+16
Myocardial infraction	46270163	Acute ST segment elevation myocardial infarction due to right coronary artery occlusion	Condition	SNOMED	1.57131210001191e+16
Myocardial infraction	46270164	Acute ST segment elevation myocardial infarction of septum	Condition	SNOMED	1.57131610001191e+16
Myocardial infraction	46273495	Acute ST segment elevation myocardial infarction of posterobasal wall	Condition	SNOMED	1.57132010001191e+16
Myocardial infraction	46270159	Acute ST segment elevation myocardial infarction of anterolateral wall	Condition	SNOMED	1.57128810001191e+16
Myocardial infraction	46274044	Acute ST segment elevation myocardial infarction of lateral wall	Condition	SNOMED	1.57129210001191e+16
Myocardial infraction	46270160	Acute ST segment elevation myocardial infarction of anteroseptal wall	Condition	SNOMED	1.57129610001191e+16
Myocardial infraction	46270161	Acute ST segment elevation myocardial infarction of posterior wall	Condition	SNOMED	1.57130410001191e+16
Myocardial infraction	46270162	Acute ST segment elevation myocardial infarction due to left coronary artery occlusion	Condition	SNOMED	1.57130810001191e+16
Myocardial infraction	44782769	Acute myocardial infarction due to left coronary artery occlusion	Condition	SNOMED	17531000119105
Myocardial infraction	314666	Old myocardial infarction	Condition	SNOMED	1755008
Myocardial infraction	3661502	Acute ST segment elevation myocardial infarction due to	Condition	SNOMED	840309000

		proximal left anterior descending coronary artery occlusion			
Myocardial infraction	3661504	Acute ST segment elevation myocardial infarction due to distal left anterior descending coronary artery occlusion	Condition	SNOMED	840316004
Myocardial infraction	3661642	Acute ST segment elevation myocardial infarction due to occlusion of distal portion of right coronary artery	Condition	SNOMED	868217004
Myocardial infraction	3661643	Acute ST segment elevation myocardial infarction due to occlusion of mid portion of right coronary artery	Condition	SNOMED	868220007
Myocardial infraction	3661644	Acute ST segment elevation myocardial infarction due to occlusion of marginal branch of right coronary artery	Condition	SNOMED	868224003
Myocardial infraction	3661645	Acute ST segment elevation myocardial infarction due to occlusion of posterior descending branch of right coronary artery	Condition	SNOMED	868225002
Myocardial infraction	3661646	Acute ST segment elevation myocardial infarction due to occlusion of posterior lateral branch of right coronary artery	Condition	SNOMED	868226001
Myocardial infraction	3655133	Acute ST segment elevation myocardial infarction due to occlusion of intermediate artery	Condition	SNOMED	846683001
Myocardial infraction	3661547	Acute ST segment elevation myocardial infarction due to occlusion of diagonal branch of anterior	Condition	SNOMED	846668006

		descending branch of left coronary artery			
Myocardial infraction	3661520	Acute ST segment elevation myocardial infarction due to occlusion of anterior descending branch of left coronary artery	Condition	SNOMED	840609007
Myocardial infraction	441579	Acute myocardial infarction of inferoposterior wall	Condition	SNOMED	76593002
Myocardial infraction	3661524	Acute ST segment elevation myocardial infarction due to occlusion of septal branch of anterior descending branch of left coronary artery	Condition	SNOMED	840680009
Myocardial infraction	438170	Acute myocardial infarction of inferior wall	Condition	SNOMED	73795002
Myocardial infraction	3654465	Acute myocardial infarction of right ventricle	Condition	SNOMED	836293000
Myocardial infraction	4303359	Acute myocardial infarction of septum	Condition	SNOMED	79009004
Myocardial infraction	3654466	Acute myocardial infarction of apex of heart	Condition	SNOMED	836294006
Myocardial infraction	3654467	Acute myocardial infarction of inferolateral wall with posterior extension	Condition	SNOMED	836295007
Myocardial infraction	4324413	Acute myocardial infarction of posterobasal wall	Condition	SNOMED	70998009
Myocardial infraction	45771322	Acute myocardial infarction of inferior wall involving right ventricle	Condition	SNOMED	703251009
Myocardial infraction	45766150	Acute myocardial infarction of anterior wall involving right ventricle	Condition	SNOMED	703252002

Myocardial infraction	45766151	Acute ST segment elevation myocardial infarction of inferior wall involving right ventricle	Condition	SNOMED	703253007
Myocardial infraction	4275436	Acute myocardial infarction of high lateral wall	Condition	SNOMED	64627002
Myocardial infraction	45766241	Subsequent non-ST segment elevation myocardial infarction	Condition	SNOMED	703360004
Myocardial infraction	45766075	Acute anterior ST segment elevation myocardial infarction	Condition	SNOMED	703164000
Myocardial infraction	45766076	Acute ST segment elevation myocardial infarction of anterior wall involving right ventricle	Condition	SNOMED	703165004
Myocardial infraction	45773170	Subsequent ST segment elevation myocardial infarction of inferior wall	Condition	SNOMED	703209002
Myocardial infraction	45766113	Subsequent ST segment elevation myocardial infarction of anterior wall	Condition	SNOMED	703210007
Myocardial infraction	45766114	Subsequent ST segment elevation myocardial infarction	Condition	SNOMED	703211006
Myocardial infraction	45766115	Acute myocardial infarction during procedure	Condition	SNOMED	703212004
Myocardial infraction	45766116	Acute ST segment elevation myocardial infarction of inferior wall	Condition	SNOMED	703213009
Myocardial infraction	438438	Acute myocardial infarction of anterolateral wall	Condition	SNOMED	70211005
Myocardial infraction	444406	Acute subendocardial infarction	Condition	SNOMED	70422006

Myocardial infraction	438447	Acute myocardial infarction of inferolateral wall	Condition	SNOMED	65547006
Myocardial infraction	3189643	Anterior subendocardial myocardial infarction	Condition	Nebraska Lexicon	2.97800010000041e+16
Myocardial infraction	35610087	Postoperative nontransmural myocardial infarction	Condition	SNOMED	1089431000000100
Myocardial infraction	35610089	Postoperative transmural myocardial infarction	Condition	SNOMED	1089441000000100
Heart failure	37309625	Acute on chronic right-sided congestive heart failure	Condition	SNOMED	1.68389510001191e+16
Heart failure	37309625	Acute on chronic right-sided congestive heart failure	Condition	SNOMED	1.68389510001191e+16
Heart failure	4071869	Congenital cardiac failure	Condition	SNOMED	206586007
Heart failure	4071869	Congenital cardiac failure	Condition	SNOMED	206586007
Heart failure	439696	Hypertensive heart and renal disease with (congestive) heart failure	Condition	SNOMED	194779001
Heart failure	439696	Hypertensive heart and renal disease with (congestive) heart failure	Condition	SNOMED	194779001
Heart failure	4111554	Decompensated cardiac failure	Condition	SNOMED	195111005
Heart failure	4108245	Acute left ventricular failure	Condition	SNOMED	195114002
Heart failure	4108245	Acute left ventricular failure	Condition	SNOMED	195114002
Heart failure	4111554	Decompensated cardiac failure	Condition	SNOMED	195111005
Heart failure	4108244	Compensated cardiac failure	Condition	SNOMED	195112003

Heart failure	4108244	Compensated cardiac failure	Condition	SNOMED	195112003
Heart failure	439698	Benign hypertensive heart disease with congestive cardiac failure	Condition	SNOMED	194767001
Heart failure	439694	Hypertensive heart and renal disease with both (congestive) heart failure and renal failure	Condition	SNOMED	194781004
Heart failure	439694	Hypertensive heart and renal disease with both (congestive) heart failure and renal failure	Condition	SNOMED	194781004
Heart failure	439698	Benign hypertensive heart disease with congestive cardiac failure	Condition	SNOMED	194767001
Heart failure	44782713	Congestive heart failure with right heart failure	Condition	SNOMED	23341000119109
Heart failure	44782713	Congestive heart failure with right heart failure	Condition	SNOMED	23341000119109
Heart failure	4124705	Heart failure as a complication of care	Condition	SNOMED	233924009
Heart failure	4124705	Heart failure as a complication of care	Condition	SNOMED	233924009
Heart failure	43020657	Heart failure due to end stage congenital heart disease	Condition	SNOMED	471880001
Heart failure	42598803	Spontaneous cardiomyopathy	Condition	SNOMED Veterinary	339881000009101
Heart failure	42598803	Spontaneous cardiomyopathy	Condition	SNOMED Veterinary	339881000009101
Heart failure	3656094	Low output heart failure due to and following Fontan operation	Condition	SNOMED	871617000

Heart failure	4242669	Biventricular congestive heart failure	Condition	SNOMED	92506005
Heart failure	4242669	Biventricular congestive heart failure	Condition	SNOMED	92506005
Heart failure	3656094	Low output heart failure due to and following Fontan operation	Condition	SNOMED	871617000
Heart failure	439846	Left heart failure	Condition	SNOMED	85232009
Heart failure	439846	Left heart failure	Condition	SNOMED	85232009
Heart failure	764877	Acute heart failure co-occurrent with normal ejection fraction	Condition	SNOMED	7421000175106
Heart failure	764877	Acute heart failure co-occurrent with normal ejection fraction	Condition	SNOMED	7421000175106
Heart failure	4229440	Chronic congestive heart failure	Condition	SNOMED	88805009
Heart failure	4229440	Chronic congestive heart failure	Condition	SNOMED	88805009
Heart failure	764871	Reduced ejection fraction co-occurrent and due to acute on chronic heart failure	Condition	SNOMED	7371000175103
Heart failure	764871	Reduced ejection fraction co-occurrent and due to acute on chronic heart failure	Condition	SNOMED	7371000175103
Heart failure	43022068	Exacerbation of congestive heart failure	Condition	SNOMED	96311000119109
Heart failure	43022068	Exacerbation of congestive heart failure	Condition	SNOMED	96311000119109
Heart failure	762002	Congestive heart failure as post-operative complication of cardiac surgery	Condition	SNOMED	285211000119102

Heart failure	762002	Congestive heart failure as post-operative complication of cardiac surgery	Condition	SNOMED	285211000119102
Heart failure	762003	Congestive heart failure as post-operative complication of non-cardiac surgery	Condition	SNOMED	285221000119109
Heart failure	762003	Congestive heart failure as post-operative complication of non-cardiac surgery	Condition	SNOMED	285221000119109
Heart failure	4103448	Low output heart failure	Condition	SNOMED	25544003
Heart failure	4103448	Low output heart failure	Condition	SNOMED	25544003
Heart failure	4079695	Sepsis-associated left ventricular failure	Condition	SNOMED	277638005
Heart failure	4079695	Sepsis-associated left ventricular failure	Condition	SNOMED	277638005
Heart failure	4079296	Sepsis-associated right ventricular failure	Condition	SNOMED	277639002
Heart failure	4079296	Sepsis-associated right ventricular failure	Condition	SNOMED	277639002
Heart failure	4199500	Refractory heart failure	Condition	SNOMED	314206003
Heart failure	4199500	Refractory heart failure	Condition	SNOMED	314206003
Heart failure	4273632	Right ventricular failure	Condition	SNOMED	367363000
Heart failure	4273632	Right ventricular failure	Condition	SNOMED	367363000
Heart failure	314369	Malignant hypertensive heart disease without congestive heart failure	Condition	SNOMED	36315003

Heart failure	4267800	Acute left-sided heart failure	Condition	SNOMED	364006
Heart failure	4267800	Acute left-sided heart failure	Condition	SNOMED	364006
Heart failure	4233424	Acute right-sided heart failure	Condition	SNOMED	359617009
Heart failure	4233424	Acute right-sided heart failure	Condition	SNOMED	359617009
Heart failure	4185565	Low cardiac output syndrome	Condition	SNOMED	44088000
Heart failure	4185565	Low cardiac output syndrome	Condition	SNOMED	44088000
Heart failure	40482857	Cardiorenal syndrome	Condition	SNOMED	445236007
Heart failure	40479192	Chronic systolic heart failure	Condition	SNOMED	441481004
Heart failure	40479192	Chronic systolic heart failure	Condition	SNOMED	441481004
Heart failure	40481042	Acute diastolic heart failure	Condition	SNOMED	443343001
Heart failure	40481042	Acute diastolic heart failure	Condition	SNOMED	443343001
Heart failure	40481043	Acute on chronic diastolic heart failure	Condition	SNOMED	443344007
Heart failure	40481043	Acute on chronic diastolic heart failure	Condition	SNOMED	443344007
Heart failure	40479576	Chronic diastolic heart failure	Condition	SNOMED	441530006
Heart failure	40479576	Chronic diastolic heart failure	Condition	SNOMED	441530006
Heart failure	4195785	Right heart failure secondary to left heart failure	Condition	SNOMED	44313006
Heart failure	4195785	Right heart failure secondary to left heart failure	Condition	SNOMED	44313006
Heart failure	40480602	Acute on chronic systolic heart failure	Condition	SNOMED	443253003

Heart failure	40480602	Acute on chronic systolic heart failure	Condition	SNOMED	443253003
Heart failure	40480603	Acute systolic heart failure	Condition	SNOMED	443254009
Heart failure	40480603	Acute systolic heart failure	Condition	SNOMED	443254009
Heart failure	40482857	Cardiorenal syndrome	Condition	SNOMED	445236007
Heart failure	40486933	Heart failure with normal ejection fraction	Condition	SNOMED	446221000
Heart failure	40486933	Heart failure with normal ejection fraction	Condition	SNOMED	446221000
Heart failure	4184497	Rheumatic left ventricular failure	Condition	SNOMED	43736008
Heart failure	4184497	Rheumatic left ventricular failure	Condition	SNOMED	43736008
Heart failure	4259490	Cardiorespiratory failure	Condition	SNOMED	410431009
Heart failure	4259490	Cardiorespiratory failure	Condition	SNOMED	410431009
Heart failure	4142561	Congestive heart failure due to valvular disease	Condition	SNOMED	426611007
Heart failure	4142561	Congestive heart failure due to valvular disease	Condition	SNOMED	426611007
Heart failure	4139864	Congestive heart failure due to left ventricular systolic dysfunction	Condition	SNOMED	426263006
Heart failure	4139864	Congestive heart failure due to left ventricular systolic dysfunction	Condition	SNOMED	426263006
Heart failure	4311437	Decompensated chronic heart failure	Condition	SNOMED	424404003
Heart failure	4311437	Decompensated chronic heart failure	Condition	SNOMED	424404003

Heart failure	4138307	Right heart failure due to pulmonary hypertension	Condition	SNOMED	426012001
Heart failure	4138307	Right heart failure due to pulmonary hypertension	Condition	SNOMED	426012001
Heart failure	444031	Chronic heart failure	Condition	SNOMED	48447003
Heart failure	444031	Chronic heart failure	Condition	SNOMED	48447003
Heart failure	4205558	Cardiac failure after obstetrical surgery AND/OR other procedure including delivery	Condition	SNOMED	55565007
Heart failure	4205558	Cardiac failure after obstetrical surgery AND/OR other procedure including delivery	Condition	SNOMED	55565007
Heart failure	443580	Systolic heart failure	Condition	SNOMED	417996009
Heart failure	443580	Systolic heart failure	Condition	SNOMED	417996009
Heart failure	443587	Diastolic heart failure	Condition	SNOMED	418304008
Heart failure	443587	Diastolic heart failure	Condition	SNOMED	418304008
Heart failure	444101	Hypertensive heart failure	Condition	SNOMED	46113002
Heart failure	43021735	Fetal heart failure	Condition	SNOMED	462172006
Heart failure	43021735	Fetal heart failure	Condition	SNOMED	462172006
Heart failure	43022054	Fetal heart failure with myocardial hypertrophy	Condition	SNOMED	462174007
Heart failure	43022054	Fetal heart failure with myocardial hypertrophy	Condition	SNOMED	462174007
Heart failure	43021736	Fetal heart failure with redistribution of cardiac output	Condition	SNOMED	462175008
Heart failure	43021736	Fetal heart failure with redistribution of cardiac output	Condition	SNOMED	462175008
Heart failure	444101	Hypertensive heart failure	Condition	SNOMED	46113002

Heart failure	319835	Congestive heart failure	Condition	SNOMED	42343007
Heart failure	319835	Congestive heart failure	Condition	SNOMED	42343007
Heart failure	43530961	Induced termination of pregnancy complicated by cardiac failure	Condition	SNOMED	609507007
Heart failure	442310	Acute heart failure	Condition	SNOMED	56675007
Heart failure	442310	Acute heart failure	Condition	SNOMED	56675007
Heart failure	43530961	Induced termination of pregnancy complicated by cardiac failure	Condition	SNOMED	609507007
Heart failure	319034	Hypertensive heart disease without congestive heart failure	Condition	SNOMED	60899001
Heart failure	4206009	Chronic left-sided congestive heart failure	Condition	SNOMED	5375005
Heart failure	4206009	Chronic left-sided congestive heart failure	Condition	SNOMED	5375005
Heart failure	314378	Hypertensive heart disease with congestive heart failure	Condition	SNOMED	5148006
Heart failure	314378	Hypertensive heart disease with congestive heart failure	Condition	SNOMED	5148006
Heart failure	43020657	Heart failure due to end stage congenital heart disease	Condition	SNOMED	471880001
Heart failure	4009047	Chronic left-sided heart failure	Condition	SNOMED	111283005
Heart failure	4009047	Chronic left-sided heart failure	Condition	SNOMED	111283005
Heart failure	43021840	Systolic heart failure stage D	Condition	SNOMED	120851000119104

Heart failure	43530642	Systolic heart failure stage B	Condition	SNOMED	120871000119108
Heart failure	43530642	Systolic heart failure stage B	Condition	SNOMED	120871000119108
Heart failure	43021840	Systolic heart failure stage D	Condition	SNOMED	120851000119104
Heart failure	43020421	Systolic heart failure stage C	Condition	SNOMED	120861000119102
Heart failure	43020421	Systolic heart failure stage C	Condition	SNOMED	120861000119102
Heart failure	43021842	Diastolic heart failure stage C	Condition	SNOMED	120891000119109
Heart failure	43021841	Diastolic heart failure stage D	Condition	SNOMED	120881000119106
Heart failure	43021841	Diastolic heart failure stage D	Condition	SNOMED	120881000119106
Heart failure	43021842	Diastolic heart failure stage C	Condition	SNOMED	120891000119109
Heart failure	43530643	Diastolic heart failure stage B	Condition	SNOMED	120901000119108
Heart failure	43530643	Diastolic heart failure stage B	Condition	SNOMED	120901000119108
Heart failure	44782728	Hypertensive heart AND chronic kidney disease with congestive heart failure	Condition	SNOMED	15781000119107
Heart failure	44782728	Hypertensive heart AND chronic kidney disease with congestive heart failure	Condition	SNOMED	15781000119107
Heart failure	44782719	Chronic combined systolic and diastolic heart failure	Condition	SNOMED	153941000119100
Heart failure	44782718	Acute combined systolic and diastolic heart failure	Condition	SNOMED	153931000119109
Heart failure	44782718	Acute combined systolic and diastolic heart failure	Condition	SNOMED	153931000119109

Heart failure	44782719	Chronic combined systolic and diastolic heart failure	Condition	SNOMED	153941000119100
Heart failure	44782733	Acute on chronic combined systolic and diastolic heart failure	Condition	SNOMED	153951000119103
Heart failure	44782733	Acute on chronic combined systolic and diastolic heart failure	Condition	SNOMED	153951000119103
Heart failure	36717359	Systolic heart failure stage B due to ischemic cardiomyopathy	Condition	SNOMED	1.56296410001191e+16
Heart failure	36717359	Systolic heart failure stage B due to ischemic cardiomyopathy	Condition	SNOMED	1.56296410001191e+16
Heart failure	36712929	Systolic heart failure stage C due to ischemic cardiomyopathy	Condition	SNOMED	1.56297410001191e+16
Heart failure	36712929	Systolic heart failure stage C due to ischemic cardiomyopathy	Condition	SNOMED	1.56297410001191e+16
Heart failure	36712927	Congestive heart failure stage C due to ischemic cardiomyopathy	Condition	SNOMED	1.56295410001191e+16
Heart failure	36712927	Congestive heart failure stage C due to ischemic cardiomyopathy	Condition	SNOMED	1.56295410001191e+16
Heart failure	36712928	Congestive heart failure stage B due to ischemic cardiomyopathy	Condition	SNOMED	1.56295910001191e+16
Heart failure	36712928	Congestive heart failure stage B due to ischemic cardiomyopathy	Condition	SNOMED	1.56295910001191e+16
Heart failure	764873	Reduced ejection fraction co-occurrent	Condition	SNOMED	7391000175102

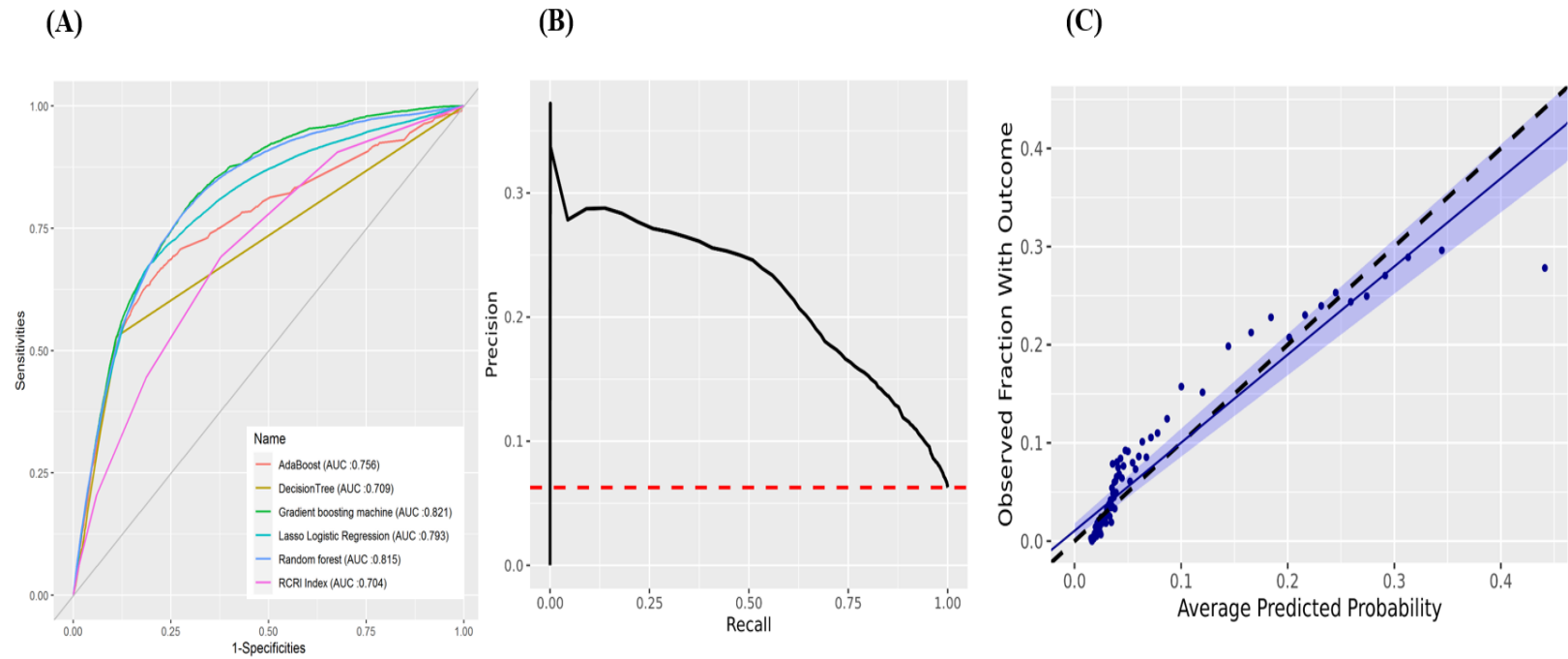
		and due to acute heart failure			
Heart failure	4327205	Acute left-sided congestive heart failure	Condition	SNOMED	74960003
Heart failure	4327205	Acute left-sided congestive heart failure	Condition	SNOMED	74960003
Heart failure	764873	Reduced ejection fraction co-occurrent and due to acute heart failure	Condition	SNOMED	7391000175102
Heart failure	313502	Benign hypertensive heart disease without congestive heart failure	Condition	SNOMED	77970009
Heart failure	316139	Heart failure	Condition	SNOMED	84114007
Heart failure	316139	Heart failure	Condition	SNOMED	84114007
Heart failure	764876	Chronic heart failure co-occurrent with normal ejection fraction	Condition	SNOMED	7411000175102
Heart failure	764872	Reduced ejection fraction co-occurrent and due to chronic heart failure	Condition	SNOMED	7381000175100
Heart failure	764872	Reduced ejection fraction co-occurrent and due to chronic heart failure	Condition	SNOMED	7381000175100
Heart failure	764876	Chronic heart failure co-occurrent with normal ejection fraction	Condition	SNOMED	7411000175102
Heart failure	4219755	Ischemic contracture of left ventricle syndrome	Condition	SNOMED	82522008
Heart failure	315295	Congestive rheumatic heart failure	Condition	SNOMED	82523003
Heart failure	315295	Congestive rheumatic heart failure	Condition	SNOMED	82523003
Heart failure	316994	Malignant hypertensive heart	Condition	SNOMED	83105008

		disease with congestive heart failure			
Heart failure	316994	Malignant hypertensive heart disease with congestive heart failure	Condition	SNOMED	83105008
Heart failure	37311948	Heart failure with mid range ejection fraction	Condition	SNOMED	788950000
Heart failure	37311948	Heart failure with mid range ejection fraction	Condition	SNOMED	788950000
Heart failure	45766164	Heart failure with reduced ejection fraction	Condition	SNOMED	703272007
Heart failure	45766164	Heart failure with reduced ejection fraction	Condition	SNOMED	703272007
Heart failure	45766165	Heart failure with reduced ejection fraction due to coronary artery disease	Condition	SNOMED	703273002
Heart failure	45766165	Heart failure with reduced ejection fraction due to coronary artery disease	Condition	SNOMED	703273002
Heart failure	45766166	Heart failure with reduced ejection fraction due to myocarditis	Condition	SNOMED	703274008
Heart failure	45766166	Heart failure with reduced ejection fraction due to myocarditis	Condition	SNOMED	703274008
Heart failure	45766167	Heart failure with reduced ejection fraction due to cardiomyopathy	Condition	SNOMED	703275009
Heart failure	45766167	Heart failure with reduced ejection	Condition	SNOMED	703275009

		fraction due to cardiomyopathy			
Heart failure	45773075	Heart failure with reduced ejection fraction due to heart valve disease	Condition	SNOMED	703276005
Heart failure	45773075	Heart failure with reduced ejection fraction due to heart valve disease	Condition	SNOMED	703276005
Heart failure	44784442	Symptomatic congestive heart failure	Condition	SNOMED	698594003
Heart failure	44784442	Symptomatic congestive heart failure	Condition	SNOMED	698594003
Heart failure	44782655	Acute exacerbation of chronic congestive heart failure	Condition	SNOMED	698296002
Heart failure	44782655	Acute exacerbation of chronic congestive heart failure	Condition	SNOMED	698296002
Heart failure	764874	Acute on chronic heart failure co- occurent with normal ejection fraction	Condition	SNOMED	7401000175100
Heart failure	764874	Acute on chronic heart failure co- occurent with normal ejection fraction	Condition	SNOMED	7401000175100
Heart failure	4215446	Acute right-sided congestive heart failure	Condition	SNOMED	80479009
Heart failure	4215446	Acute right-sided congestive heart failure	Condition	SNOMED	80479009
Heart failure	4215802	Cardiac asthma	Condition	SNOMED	71892000
Heart failure	4215802	Cardiac asthma	Condition	SNOMED	71892000
Heart failure	36713488	Congestive heart failure stage B	Condition	SNOMED	717840005

Heart failure	36713488	Congestive heart failure stage B	Condition	SNOMED	717840005
Heart failure	43021826	Congestive heart failure stage C	Condition	SNOMED	67441000119101
Heart failure	43021826	Congestive heart failure stage C	Condition	SNOMED	67441000119101
Heart failure	43021825	Congestive heart failure stage D	Condition	SNOMED	67431000119105
Heart failure	43021825	Congestive heart failure stage D	Condition	SNOMED	67431000119105
Heart failure	45766964	Fetal heart failure due to extracardiac disease	Condition	SNOMED	704242009
Heart failure	4284562	Chronic right-sided congestive heart failure	Condition	SNOMED	66989003
Heart failure	4284562	Chronic right-sided congestive heart failure	Condition	SNOMED	66989003
Heart failure	36716182	Acute kidney injury due to circulatory failure	Condition	SNOMED	722095005
Heart failure	36716182	Acute kidney injury due to circulatory failure	Condition	SNOMED	722095005
Heart failure	44784345	Congestive heart failure as early postoperative complication	Condition	SNOMED	72481000119103
Heart failure	44784345	Congestive heart failure as early postoperative complication	Condition	SNOMED	72481000119103
Heart failure	3184320	Heart failure exacerbated by Sotalol	Condition	Nebraska Lexicon	1.26100010000041e+16
Heart failure	3184320	Heart failure exacerbated by Sotalol	Condition	Nebraska Lexicon	1.26100010000041e+16
Heart failure	1340348	Exacerbation of heart failure	Condition	OMOP Extension	OMOP5166003

Heart failure	1340281	Exacerbation of chronic heart failure	Condition	OMOP Extension	OMOP5165936
Heart failure	1340281	Exacerbation of chronic heart failure	Condition	OMOP Extension	OMOP5165936
Heart failure	1340289	Exacerbation of congestive heart failure	Condition	OMOP Extension	OMOP5165944
Heart failure	1340289	Exacerbation of congestive heart failure	Condition	OMOP Extension	OMOP5165944
Heart failure	1340348	Exacerbation of heart failure	Condition	OMOP Extension	OMOP5166003
Heart failure	4014159	Chronic right-sided heart failure	Condition	SNOMED	10335000
Heart failure	4014159	Chronic right-sided heart failure	Condition	SNOMED	10335000
Heart failure	44782428	Congestive heart failure due to cardiomyopathy	Condition	SNOMED	101281000119107
Heart failure	44782428	Congestive heart failure due to cardiomyopathy	Condition	SNOMED	101281000119107
Heart failure	4004279	High output heart failure	Condition	SNOMED	10091002
Heart failure	4004279	High output heart failure	Condition	SNOMED	10091002
Heart failure	4023479	Acute congestive heart failure	Condition	SNOMED	10633002
Heart failure	4023479	Acute congestive heart failure	Condition	SNOMED	10633002
Death	4317150	cardiac death	Condition	SNOMED	95281009
Cardiac arrest/shock	321042	Cardiac arrest	Condition	SNOMED	410429000

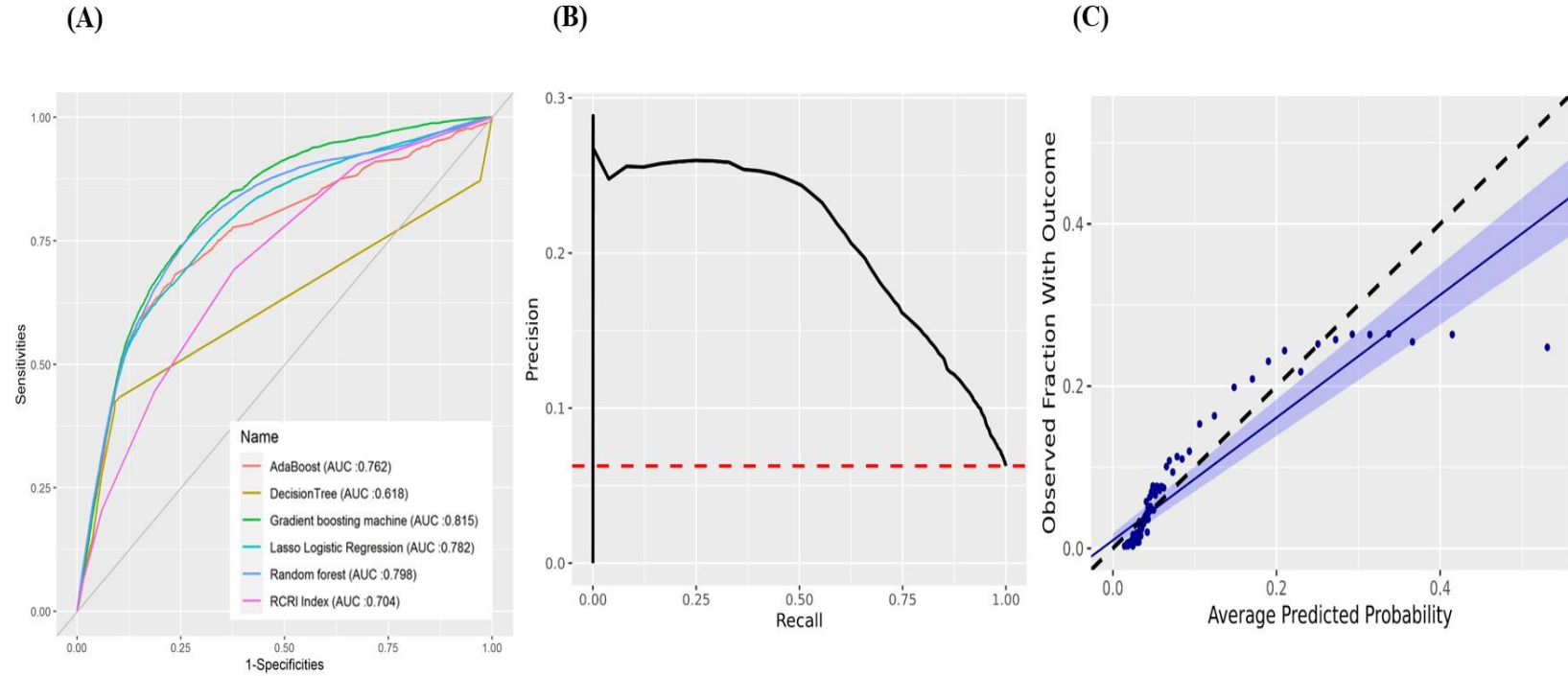


Supplementary Figure 1. Recombination prediction model (1) based on validation data

(A) AUROC for predicting MACCE, demonstrating the model's ability to distinguish between patients with and without MACCE

(B) AUPRC for predicting MACCE, illustrating the precision-recall trade-off of the model.

(C) Calibration plot for MACCE, assessing the agreement between predicted probabilities and observed outcomes

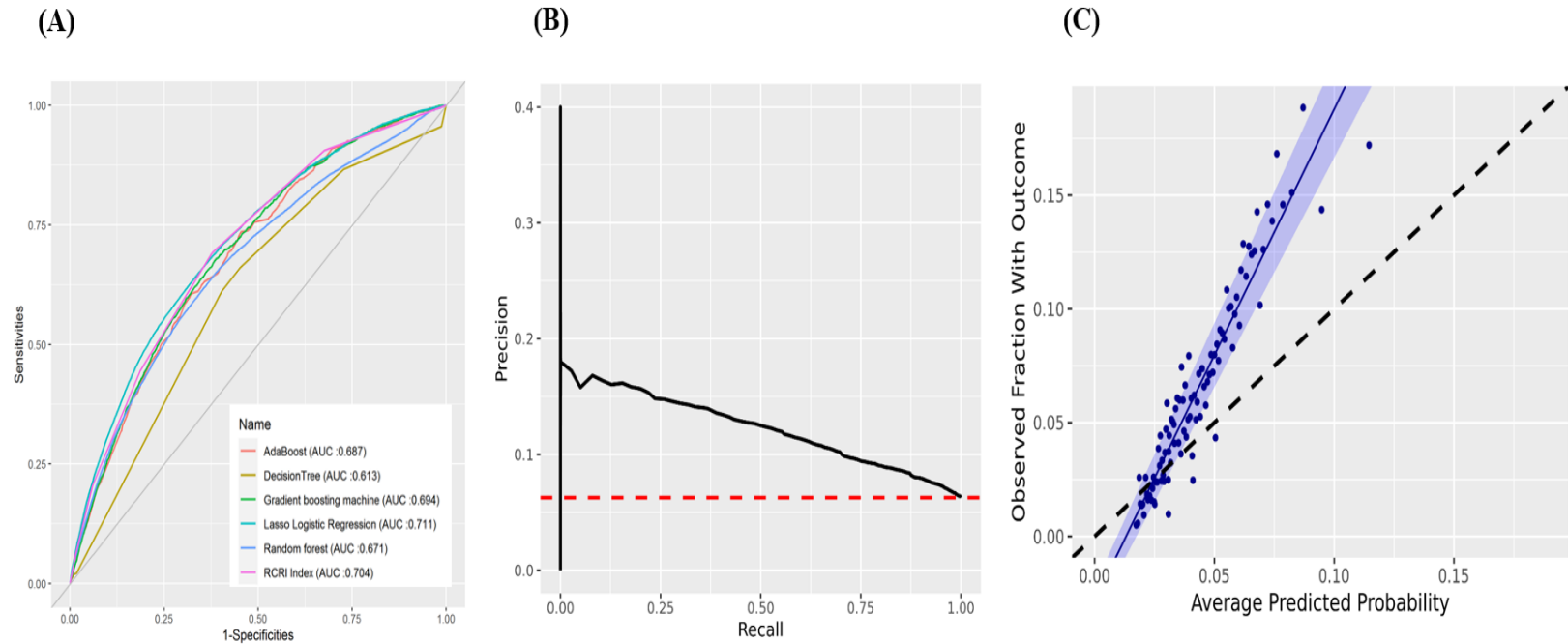


Supplementary Figure 2. Recombination prediction model (2) based on validation data

(A) AUROC for predicting MACCE, demonstrating the model's ability to distinguish between patients with and without MACCE

(B) AUPRC for predicting MACCE, illustrating the precision-recall trade-off of the model.

(C) Calibration plot for MACCE, assessing the agreement between predicted probabilities and observed outcomes



Supplementary Figure 3. Recombination prediction model (3) based on validation data

(A) AUROC for predicting MACCE, demonstrating the model's ability to distinguish between patients with and without MACCE

(B) AUPRC for predicting MACCE, illustrating the precision-recall trade-off of the model.

(C) Calibration plot for MACCE, assessing the agreement between predicted probabilities and observed outcomes