A modified version of

Cardiology Audit and Registration Data Standards for Clinical Electrophysiology (pacemakers, implantable cardioverter defibrillators (ICDs) and ablation)

A Report of the CARDS Expert Committee on Electrophysiology

Dr. Francisco G. Cosío Chair Dr. Conor Barrett Dr Cecilia Linde Prof. Gunther Breithardt Prof. Philippe Mabo Prof. John Camm Dr. Rafael Peinado Ms. Rachel Flynn Dr. Antonio Raviele Dr. Joseph Galvin Dr. Emer Shelley Prof. Luc Jordaens Prof. Panos E. Vardas

The CARDS Co-ordination Committee: Maarten L. Simoons (Chair), Prof. Francisco F. Avilés, Dr. Eric Boersma, Dr. Roger Boyle, Ms. Christine Brennan, Dr. Francisco G. Cosío, Ms. Rachel Flynn, Prof. Kim Fox, Dr. Anselm K. Gitt, Dr. José María Hernández, Dr. Peter Kearney, Dr. Aldo Maggioni, Dr. Emer Shelley, Prof. Lars Wallentin.

CARDS EP Expert Committee EP Data Standards

Adapted by the Working group on Arrhythmia, Danish Society of Cardiology, November 2005
(Jens Brock Johansen, Peter Thomas Mortensen, Regitze Videbæk, Per Arnsbo, Mogens Møller)

Skipped data standards ***Added data standards***

Implantable Cardioverter Defibrillators Data Standards

ICD Data Standards

ICD Data Standards

1,26	4,10	1.0	3,33	5,31	7,2	1,75
ID No	Field	Short Code	Field content	Definition of Field	Field content	Data Format
1. Demographics						
ICD 1.01	Hospital identification number			Indicate the hospital identification number		Id an100
ICD 1.02	Patient identification number			Indicate the patient identification number		Id an100
ICD 1.03	Date of birth			The date the patient was born as recorded on their birth certificate		Date
ICD 1.04	Sex	1	Male	The sex of the patient		Code n2
		2	Female			
		99	Unknown		Information missing	
ICD 1.05	Height			Height in cms		n3
ICD 1.06	Weight			Weight in kgs		n3.1
ICD 1.07	Patient last name			Name of the patient (Last)		An 100
ICD 1.08	Patient first name			Name of the patient (First-Middle)		An 100
ICD 1.09	Patients adress (street)			Name of adress (street + number)		An100
ICD 1.10	Patients adress (ZIP code)			Adress (ZIP code)		An100
ICD 1.11	Patients adress (city)			Adress (city)		An100

2. Past History Previous history may be documented in the patient's medical notes, GP letter or other referral letters or the patient or the patient's family may have positive information from medical professionals that confirm history.						
ID No	Field	Short Code	Field content	Definition of Field	Field content	Data Format
ICD 2.01	History of cerebrovascular embolic disease	1	No	Indicate if the patient has a history of cerebrovascular embolic disease. [See definitions]		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.02	Other arterial embolic episodes	1	No	Indicate if the patient has had any other arterial embolic episodes, apart from cerebroembolic		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.03	Diabetes mellitus	1	Non-diabetic	Indicate if the patient has a history of diabetes mellitus diagnosed prior to the current admission	Patient does not have diabetes	Code n2
		2	Diabetic (dietary control)		The patient has received dietary advice appropriate to their condition but is not receiving medication	
		3	Diabetic (oral medication)		The patient uses oral medication to control their condition	
		4	Diabetic (insulin)		The patient uses insulin treatment, with or without oral therapy, to control their condition	
		5	Newly diagnosed diabetic		If a patient is admitted with new (not previously diagnosed) diabetes use option "newly diagnosed diabetes" as final treatment modality will not be known	
		99	Unknown		Information missing	
ICD 2.04	Hypertension	1	No	Indicate if the patient has a history of hypertension diagnosed and/or treated by a physician		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.05	Previous implantable cardioverter defibrillator (ICD) implanted	1	No	Indicate if the patient had a previous ICD implanted		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.06	Previous pacemaker implanted	1	No	Indicate if the patient had a previous permanent pacemaker implanted		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.07	Previous electrophysiology study (diagnostic)	1	No	Indicate if the patient had a previous EP diagnostic study		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.08	Previous catheter ablation for supraventricular tachycardia	1	No	Indicate if the patient had a previous catheter ablation for supraventricular tachycardia		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.09	Previous catheter ablation for ventricular tachycardia	1	No	Indicate if the patient had a previous catheter ablation for ventricular tachycardia		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.10	Previous percutaneous intervention - coronary	1	No	Indicate if the patient had a previous percutaneous intervention for coronary artery disease		Code n2
		2	Yes			

		99	Unknown		Information missing	
ICD 2.11	Previous percutaneous intervention- valvular	1	No	Indicate if the patient had a previous percutaneous intervention for valvular heart disease		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.12	Previous percutaneous intervention- congenital	1	No	Indicate if the patient had a previous percutaneous intervention for congenital heart disease		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.13	Previous percutaneous intervention - chemical septal ablation	1	No	Indicate if the patient had a previous percutaneous intervention in the form of chemical septal ablation		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.14	Previous coronary artery bypass graft (CABG)	1	No	Indicate if the patient had a previous CABG		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.15	Previous valvular heart surgery	1	No	Indicate if the patient had previous valvular heart surgery		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.16	Previous cardiac surgery for congenital disease	1	No	Indicate if the patient had previous cardiac surgery for congenital disease		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.17	Previous heart transplant	1	No	Indicate if the patient had a previous cardiac transplant irrespective of aetiology of underlying cardiomyopathy.		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.18	Other previous surgical or percutaneous procedures	1	No	Indicate if the patient had any other previous cardiac surgical or percutaneous procedures (including implantation of loop recorder)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 2.19	Optimal coronary revascularization	1	No	Indicate if the patient is optimal coronary revascularized i.e. recent coronary angiography without clinical significant stenosis		Code n2
		2	Yes			
		99	Unknown		Information missing	

3. Medication: pre procedure This refers to medications taken by the patient before the procedure, including prior to this hospital admission. Medication administered as a single (*stat*) or occasional dose should not be included.						
ID No	Field	Short Code	Field content	Definition of Field	Field content	Data Format
ICD 3.01	Class I AAD	1	No	Indicate if the patient has in the past or prior to this procedure taken class I anti arrhythmic drug(s)	The patient has never taken class I AAD	Code n2
		2	Current		The patient was taking class I AAD regularly prior to this procedure	
		3	Former		The patient had taken class I AAD previously, but not regularly prior to this procedure	
		99	Unknown		Information missing	
ICD 3.02	Class III AAD (excluding Amiodarone)	1	No	Indicate if the patient has in the past or prior to this procedure taken class III anti arrhythmic drug(s), excluding amiodarone	The patient has never taken class III AAD (excluding amiodarone)	Code n2
		2	Current		The patient was taking class III AAD (excluding amiodarone) regularly prior to this procedure	
		3	Former		The patient had taken class III AAD (excluding amiodarone) previously, but not regularly prior to this procedure	
		99	Unknown		Information missing	
ICD 3.03	Amiodarone	1	No	Indicate if the patient has in the past or prior to this procedure taken amiodarone	The patient has never taken amiodarone	Code n2
		2	Current		The patient was taking amiodarone regularly prior to this procedure	
		3	Former		The patient had taken amiodarone previously, but not regularly prior to this procedure	
		99	Unknown		Information missing	
ICD 3.04	Beta-blockers	1	No	Indicate if the patient has in the past or prior to this procedure taken beta-blocker(s)	The patient has never taken beta-blocker(s)	Code n2
		2	Current		The patient was taking beta-blocker(s) regularly prior to this procedure	
		3	Former		The patient had taken beta-blocker(s) previously, but not regularly prior to this procedure	
		99	Unknown		Information missing	
ICD 3.05	Calcium antagonists	1	No	Indicate if the patient has in the past or prior to this procedure taken non-dihydropyridine calcium antagonist(s).	The patient has never taken non-dihydropyridine calcium antagonist(s)	Code n2
		2	Current		The patient was taking non-dihydropyridine calcium antagonist(s) regularly prior to this procedure	
		3	Former		The patient had taken non-dihydropyridine calcium antagonist(s) previously, but not regularly prior to this procedure	
		99	Unknown		Information missing	
ICD 3.06	Digoxin	1	No	Indicate if the patient has in the past or prior to this procedure taken digoxin	The patient has never taken digoxin	Code n2
		2	Current		The patient was taking digoxin regularly prior to this procedure	
		3	Former		The patient had taken digoxin previously, but not regularly prior to this procedure	
		99	Unknown		Information missing	
ICD 3.07	Diuretics	1	No	Indicate if the patient has in the past or prior to this procedure been taking diuretic(s)	The patient has never taken diuretic(s)	Code n2
		2	Current		The patient was taking diuretic(s) regularly prior to this hospital procedure	
		3	Former		The patient had taken diuretic(s) previously, but not regularly prior to this procedure	
		99	Unknown		Information missing	
ICD 3.08	ACE inhibitors/ angiotensin II blockers	1	No	Indicate if the patient had been taking ACE	The patient has never taken ACE Inhibitor(s), angiotensin II receptor	Code n2

	/ aldosterone antagonists			inhibitor(s) or angiotensin II receptor blocker(s) or aldosterone antagonist(s) prior to this procedure	blocker(s) or aldosterone antagonists(s)	
		2	Current		The patient was taking ACE Inhibitor(s), angiotensin II receptor blocker(s) or aldosterone antagonists(s) regularly prior to this hospital procedure	
		3	Former		The patient had taken ACE Inhibitor(s), angiotensin II receptor blocker(s) or aldosterone antagonists(s) previously, but not regularly prior to this procedure	
		99	Unknown		Information missing	
ICD 3.09	Antiplatelet - aspirin	1	No	Indicate if the patient has been taking acetylsalicylic acid (ASA / aspirin) regularly prior to this procedure		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 3.08	Antiplatelet -clopidogrel/ diclopidine	1	No	Indicate if the patient has been taking ticlopidine or clopidogrel regularly prior to this procedure		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 3.10	Antiplatelet - other	1	No	Indicate if the patient has been taking any other antiplatelet agent regularly prior to this procedure		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 3.11	Heparin / LMWH	1	No	Indicate if the patient had been taking heparin or low molecular weight heparin (either intravenous or subcutaneous) agent(s) prior to this procedure		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 3.12	Direct thrombin inhibitors	1	No	Indicate if the patient had been taken direct antithrombin agent(s) regularly prior to this procedure		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 3.13	Coumarin anticoagulants	1	No	Indicate (specifically) if the patient had been taking anticoagulant medication regularly prior to this procedure	The patient was not taking warfarin or any other coumarin derivative regularly prior to this procedure	Code n2
		2	Warfarin		The patient was taking warfarin regularly prior to this procedure	
		3	Other coumarin derivatives		The patient was taking any other coumarin derivative (not warfarin) regularly prior to this procedure	
		99	Unknown		Information missing	

4. Underlying Disease and Clinical Presentation						
ID No	Field	Short Code	Field content	Definition of Field	Field content	Data Format
ICD 4.01	Predominant presenting symptom	1	Asymptomatic	Indicate the predominant symptom / reason why the patient presented for medical attention (see definitions)		Code n2
		2	Fatigue			
		3	Palpitations			
		4	Dyspnoea			
		5	Chest pain			
		6	Near / pre-syncope			
		7				
		8	Chronic heart failure			
		9	Systemic embolic event			
		10	Cardiac arrest / aborted sudden death			
		88	Other symptoms			
		99	Unknown		Information missing	
ICD 4.02	Functional class	1	NYHA I	Record the New York Heart Association (NYHA) functional status of the patient	No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, dyspnoea or palpitations.	Code n2
		2	NYHA II		Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, palpitations or dyspnoea.	
		3	NYHA III		Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity results in symptoms.	
		4	NYHA IV		Unable to carry on any physical activity without discomfort. Symptoms are present even at rest with increased discomfort with any physicial activity.	
		99	Unknown		Information missing	
ICD 4.03	Left ventricular (LV) function		Ejection fraction (percent)	Indicate the patients estimated or calculated ejection fraction. This categorises the percentage of the blood emptied from the left ventricle at the end of the contraction. Data may have been derived from angiography, echocardiography, nuclear imaging, magnetic resonance imaging etc. (1-80)		nn2
		1	Normal (>50%)			Code n2
		2	Slightly reduced (41-50%)			
		3	Moderately reduced (3140%)			
		4	Severely reduced (<30%)			
		5	LV function not assessed			
		99	Unknown		Information missing	

5. Relevant cardiac diagnoses						
ID No	Field	Short Code	Field content	Definition of Field	Field content	Data Format
ICD 5.01	Apparently normal heart	1	No	Indicate if the patient has an apparently normal heart		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 5.02	Ischaemic heart disease	1	No	Indicate if the patient has underlying ischaemic heart disease	The patient has no history of ischaemic heart disease (angina)	Code n2
		2	Yes, without Q wave MI		The patient has a history of ischaemic heart disease, without evidence or history of Q wave myocardial infarction	
		3	Yes, with Q wave MI		The patient has a history of ischaemic heart disease, with evidence or history of Q wave myocardial infarction	
		99	Unknown		Information missing	
ICD 5.03	Cardiomyopathy -hypertrophic	1	No	Indicate if the patient has hypertrophic cardiomyopathy (see definitions)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 5.04	Cardiomyopathy - dilated	1	No	Indicate if the patient has dilated cardiomyopathy (see definitions)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 5.05	Cardiomyopathy -(arrhythmogenic) right ventricular	1	No	Indicate if the patient has right ventricular cardiomyopathy (see definitions)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 5.06	Cardiomyopathy - other	1	No	Indicate if the patient has any other cardiomyopathy. This includes cardiomyopathy secondary to subacute / acute myocarditis, restrictive cardiomyopathy or unclassified cardiomyopathy. [See definitions]		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 5.07	Congenital heart disease	1	No	Indicate if the patient has congenital heart disease (see definitions)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 5.08	Valvular heart disease	1	No	Indicate if the patient has valvular heart disease		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 5.09	Primary electrical disease - idiopathic ventricular fibrillation (normal heart)	1	No	Indicate if the patient has had idiopathic ventricular fibrillation (see definitions)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 5.10	Primary electrical disease - congenital long QT	1	No	Indicate if the patient has a congenital long QT syndrome (see definitions)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 5.11	Primary electrical disease - Brugada syndrome	1	No	Indicate if the patient has Brugada syndrome (see definitions)		Code n2
		2	Yes			
		99	Unknown		Information missing	

ICD 5.12	Primary electrical disease -other	1	No	Indicate if the patient has any other primary electrical disease. This would also include a diagnosis of WPW [see definitions]		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 5.13	Neurally mediated syncope	1	No	Indicate if the patient has neurally mediated syncope (see definitions)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 5.01	Relevant cardiac diagnosis	1	Primary electrical disease - idiopathic ventricular fibrillation (normal heart)*	Indicate (specifically) the relevant cardiac diagnosis. The most significant diagnosis to be chosen (one choice only) (see definitions)*		Code n2
		2	Ischaemic heart disease			
		3	Cardiomyopathy – hypertrophic*			
		4	Cardiomyopathy – dilated*			
		5	Cardiomyopathy - (arrhythmogenic) right ventricular*			
		6	Cardiomyopathy – other*			
		7	Congenital heart disease*			
		8	Valvular heart disease			
		9	Primary electrical disease - congenital long QT*			
		10	Primary electrical disease - Brugada syndrome*			
		88	Primary electrical disease – other*			
		99	Unknown		Information missing	

6. Arrhythmia indication						
ID No	Field	Short Code	Field content	Definition of Field	Field content	Data Format
ICD 6.01	Arrhythmia indication for ICD implant	1	Ventricular Fibrillation	Indicate (specifically) the indication arrhythmia. The most significant indication to be chosen (one choice only) (see definitions)		Code n2
		2	VT – monomorphic Sustained			
		3	VT - monomorphic Non-sustained			
		4	VT - polymorphic (with normal QT interval)			
		5	VT - Polymorhic with long QT interval (Torsades des pointes)			
		6	Wide complex tachycardia unspecified			
		7	Syncope with inducible VT or VF			
		8	Prophylactic (none documented / induced)			
		99	Unknown		Information missing	
ICD 6.02	AV conduction status	1	Normal AV conduction	Indicate (specifically) the highest degree of AV block [one choice only]	Normal AV conduction There is no degree of heart block	Code n2
		2	First degree		First degree During first-degree AV block, every atrial impulse conducts to the ventricles and a regular ventricular rate is produced, but the PR interval exceeds 0.20 second in adults less than 75 years or exceeds 0.24 second in persons 75 years or older.	
		3	Second degree type I		Second degree type I (Wenckebach) block is characterised (Wenckebach) by progressive prolongation of the PR interval until an atrial impulse is not conducted to the ventricles.	
		4	Second degree type II		Second degree type II (Mobitz) denotes occasional or (Mobitz) repetitive sudden block of conduction of an impulse without prior significant lengthening of conduction time (<80 ms).	
		5	2:1 AV block		2:1 AV block is when AV conduction occurs in a 2:1 pattern, every other P wave not being conducted to the ventricles. Block cannot be unequivocally classified as type I or type II.	
		6	Third degree		Third degree AV block is defined as absence of AV conduction	
		7	Impaired AV conduction status unknown		Impaired AV conduction but the nature of this cannot be discerned on the basis on the ECG. For example atrial fibrillation with slow ventricular response and not complete heart block	
		99	Unknown		Information missing	
ICD 6.03	QRS duration			Indicate the duration of the QRS complex in mSec		n3

7. Procedure						
ID No	Field	Short Code	Field content	Definition of Field	Field content	Data Format
ICD 7.01	Date of procedure			Indicate the procedure date		Date
ICD 7.02	Sedation / anaesthesia	1	No	Indicate if the patient received intravenous sedation or received an anaesthetic (other than local) during this procedure		Code n2
		2	Sedation IV			
		3	General anaesthetic			
		99	Unknown		Information missing	
ICD 7.03	Antibiotics IV - perioperative	1	No	Indicate if the patient received intravenous antibiotics for the procedure (either prior to or during the procedure)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 7.04	Antibiotics topical	1	No	Indicate if the patient received topical antibiotics (including antibiotic solution irrigation of the pocket) during the procedure		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 7.05	Antibiotics postoperative	1	No	Indicate if the patient received intravenous antibiotics post the procedure		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 7.06	Generator pacing mode	1	None	Indicate (specifically) the programmed pacing mode	No pacing mode programmed	Code n2
		2	Single chamber (VVI / VVIR)		Single chamber (VVI / VVIR) Ventricular pacing / sensing +/- rate responsiveness	
		3	Dual chamber (DDD / DDDR)		Dual chamber (DDD / DDDR) Atrial & Ventricular pacing & sensing +/- rate responsiveness	
		4	Biventricular (resynchronisation)		Biventricular (resynchronisation) Cardiac resynchronisation / Biventricular pacing	
		88	Other		Other	
		99	Unknown		Information missing	
ICD 7.07	Generator therapy mode	1	None	Indicate (specifically) the therapy mode of the generator	None	Code n2
		2	Atrial therapy		Atrial therapy only	
		3	Ventricular therapy		Ventricular therapy only	
		4	Ventricular and atrial therapy		Ventricular and atrial therapy	
		99	Unknown		Information missing	
ICD 7.08	Generator manufacturer			Indicate (specifically) the generator manufacturer		an100
ICD 7.09	Generator model			Indicate the generator model		an50
ICD 7.10	Generator serial number			Indicate the generator serial number		an50
ICD 7.11	Generator site of implantation	1	None	Indicate (specifically) the generator site of implantation		Code n2
		2	Pectoral - Subcutaneous / subfascial			
		3	Pectoral - Submuscular			
		4	Abdominal - Subcutaneous / subfascial			
		5	Abdominal - Submuscular			

		6	Axillary			
		88	Other			
		99	Unknown		Information missing	
ICD 7.12	Right ventricular defibrillation lead implant	1	No	Only one choice (if No / Unknown go to ICD 7.19)		Code n2
		2	Yes			
		99	Unknown			
ICD 7.13	Right ventricular defibrillation lead manufacturer			Indicate (specifically) the right ventricular defibrillation lead manufacturer		an100
ICD 7.14	Right ventricular defibrillation lead model			Indicate the right ventricular defibrillation lead model		an50
ICD 7.15	Right ventricular defibrillation lead serial number			Indicate the right ventricular defibrillation lead serial number		an50
ICD 7.16	Right ventricular defibrillation lead Coil	1	Single coil	Indicate (specifically) the right ventricular defibrillation lead type		Code n2
		2	Double coil			
		3	Other			
		99	Unknown		Information missing	
ICD 7.17	Right ventricular defibrillation lead access	1	Cephalic vein	Indicate (specifically) the right ventricular defibrillation lead implant approach		Code n2
		2	Subclavian vein			
		3	External jugular vein			
		4	Internal jugular vein			
		5	Femoral vein			
		6	Transvenous, other			
		7	Thoracotomy			
		8	Thoracoscopy			
		9	Subcutaneous			
		88	Other			
		99	Unknown		Information missing	
ICD 7.18	Right ventricular defibrillation lead Placement	1	RV Apex	Indicate (specifically) the right ventricular defibrillation lead position. Epicardial placement includes placement via the coronary sinus.		Code n2
		2	Epicardial			
		3	Septal			
		88	Other			
		99	Unknown		Information missing	
ICD 7.19	Supplementary defibrillation lead implant	1	No	Only one choice (if No / Unknown go to ICD 7.25)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 7.20	Supplementary defibrillation lead Manufacturer			Indicate (specifically) the supplementary defibrillation lead manufacturer		an100
ICD 7.21	Supplementary defibrillation lead Model			Indicate the supplementary defibrillation lead model		an50
ICD 7.22	Supplementary defibrillation lead serial number			Indicate the supplementary defibrillation lead serial number		an50

ICD 7.23	Supplementary defibrillation lead access	1	Cephalic vein	Indicate (specifically) the supplementary defibrillation lead implant approach		Code n2
		2	Subclavian vein			
		3	External jugular vein			
		4	Internal jugular vein			
		5	Femoral vein			
		6	Transvenous, other			
		7	Thoracotomy			
		8	Thoracoscopy			
		9	Subcutaneous			
		88	Other			
		99	Unknown		Information missing	
ICD 7.24	Supplementary defibrillation lead placement	1	Right atrium / superior vena cava	Indicate (specifically) the supplementary defibrillation lead position. Epicardial placement includes placement via the coronary sinus.		Code n2
		2	Subcutaneous			
		3	Epicardial			
		88	Other			
		99	Unknown		Information missing	
ICD 7.25	Atrial lead implant	1	No	Only one choice (if No / Unknown go to ICD 7.31)		Code n2
		2	Yes			
		99	Unknown			
ICD 7.26	Atrial lead manufacturer			Indicate (specifically) the atrial lead manufacturer		an100
ICD 7.27	Atrial lead model			Indicate the atrial lead model		an50
ICD 7.28	Atrial lead serial number			Indicate the atrial lead implant serial number		an50
ICD 7.29	Atrial lead access	1	Cephalic vein	Indicate (specifically) the atrial lead implant Approach		Code n2
		2	Subclavian vein			
		3	External jugular vein			
		4	Internal jugular vein			
		5	Femoral vein			
		6	Transvenous, other			
		7	Thoracotomy			
		8	Thoracoscopy			
		9	Subcutaneous			
		88	Other			
		99	Unknown		Information missing	
ICD 7.30	Atrial lead placement	1	RA Appendage	Indicate (specifically) the atrial lead position. Epicardial placement includes placement via the coronary sinus.		Code n2
		2	Epicardial			
		88	Other			
		99	Unknown		Information missing	

ICD 7.31	Left ventricular lead implant	1	No	Only one choice (if No / Unknown go to ICD 8.01)		Code n2
		2	Yes			
		99	Unknown			
ICD 7.32	Left ventricular lead manufacturer			Indicate (specifically) the left ventricular lead manufacturer		an100
ICD 7.33	Left ventricular lead model			Indicate the left ventricular lead model		an50
ICD 7.34	Left ventricular lead serial number			Indicate the left ventricular lead serial number		an50
ICD 7.35	Left ventricular lead access	1	Cephalic vein	Indicate (specifically) the left ventricular lead implant approach		Code n2
		2	Subclavian vein			
		3	External jugular vein			
		4	Internal jugular vein			
		5	Femoral vein			
		6	Transvenous, other			
		7	Thoracotomy			
		8	Thoracoscopy			
		9	Subcutaneous			
		88	Other			
		99	Unknown		Information missing	
ICD 7.36	Left ventricular lead placement	1	Coronary vein	Indicate (specifically) the left ventricular lead position (if 1/Coronary vein go to ICD 7.37)		Code n2
		2	Intrapericardial			
		3	Endocardial			
		88	Other			
		99	Unknown		Information missing	
ICD 7.37	Left ventricular lead (coronary vein) placement			Indicate the position of the coronary vein left ventricular lead position. (Clock (1-12) position in LAO projection)		n2
ICD 7.38	Left ventricular lead (coronary vein) placement	1	Basal	Indicate the position of the coronary vein left ventricular lead position relative to the base of the left ventricle. (in RAO projection)		Code n2
		2	Mid			
		3	Apical			
		99	Unknown		Information missing	
ICD 7.39	Supplementary right ventricular pace/sense lead implant	1	No			Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 7.40	Supplementary right ventricular pace/sense lead manufacturer			Indicate (specifically) the left ventricular lead manufacturer		an100
ICD 7.41	Supplementary right ventricular pace/sense lead model			Indicate the left ventricular lead model		an50
ICD 7.42	Supplementary right ventricular pace/sense lead serial number			Indicate the left ventricular lead serial number		an50
ICD 7.43	Supplementary right ventricular pace/sense lead access	1	Cephalic vein	Indicate (specifically) the supplementary right ventricular pace/sense lead implant approach		Code n2
		2	Subclavian vein			

		3	External jugular vein			
		4	Internal jugular vein			
		5	Femoral vein			
		6	Transvenous, other			
		7	Thoracotomy			
		8	Thoracoscopy			
		9	Subcutaneous			
		88	Other			
		99	Unknown		Information missing	
ICD 7.44	Supplementary right ventricular pace/sense lead placement	1	RV Apex	Indicate (specifically) the supplementary right ventricular pace/sense lead position. Epicardial placement includes placement via the coronary sinus.		Code n2
		2	Epicardial			
		3	Septal			
		88	Other			
		99	Unknown		Information missing	
ICD 7.45	Implant procedure time			Indicate the duration of the implant procedure (skin-to-skin) [min].		n3
ICD 7.46	Duration of X-ray			Indicate the duration of the X-ray used during the implant procedure [min].		n3.1
ICD 7.47	Amount of X-ray			Indicate the dosage of X-ray used during the procedure [GYMC^{2}]		n3.1
ICD 7.48	Contrast media			Indicate the amount of contrast media used during the implant procedure [ml]		n3
ICD 7.49	Phrenic nerve stimulation thresshold			Indicate the minimum output [volt] from the LV lead which lead to stimulation of the phrenic nerve	00.0 if stimulation of the phrenic is not possible	n3.1
ICD 7.50	Surgeon			Indicate the surgeon (initials) responsible for the implant procedure		an50

8. Reposition / Repair/ Replacement / Explant Procedure						
ID No	Field	Short Code	Field content	Definition of Field	Field content	Data Format
ICD 8.01	Is this a reposition / repair / replacement / explant procedure	1	No	Indicate if this is a reposition / repair / replacement / explant procedure		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 8.02	Date of implant of device requiring reposition, repair, replacement or explant			Indicate the date of implant for which this procedure is a reposition / repair / replacement / explant procedure		Date
ICD 8.03	ICD Generator reposition / repair/ replacement / explant procedure	1	Not applicable	Indicate (specifically) what action was done to the ICD generator		Code n2
		2	Generator reposition			
		3	Generator repair			
		4	Generator replacement			
		5	Generator explant			
		6	System explant			
		7	Wound revision			
		88	Other			
		99	Unknown		Information missing	
ICD 8.04	Reason for reposition / repair/ replacement / explant of ICD generator	1	Not applicable	Indicate (specifically) why the ICD generator was repositioned / repaired / replaced / explanted		Code n2
		2	Normal EOL			
		3	Premature EOL			
		4	Upgrade to dual chamber			
		5	Upgrade to biventricular / CRT			
		6	Upgrade to atrial therapy			
		7	Sensing / pacing failure			
		8	Failure to defibrillate			
		9	Software (algorithm) failure			
		10	Connector failure			
		11	Recall			
		12	Skin erosion / infection			
		13	Systemic infection / endocarditis			
		14	Elective (patient request)			
		88	Other			
		99	Data unknown		Information missing	
ICD 8.05	Right Ventricular defibrillator lead reposition / repair/ replacement / explant	1	Not applicable	Indicate (specifically) what action was done to the ventricular defibrillator lead		Code n2
		2	Lead reposition			
		3	Lead repair			

		4	Lead replacement			
		5	Lead explant			
		6	System explant			
		88	Other			
		99	Unknown		Information missing	
ICD 8.06	Reason for reposition / repair/ replacement / explant of right ventricular defibrillator lead	1	Not applicable	Indicate (specifically) why the right ventricular defibrillation lead was repositioned / repaired / replaced / explanted		Code n2
		2	Displacement			
		3	High defibrillation threshold			
		4	High pacing threshold			
		5	Undersensing			
		6	Myopotential inhibition			
		7	Extracardiac stimulation			
		8	Connector failure			
		9	Insulation failure			
		10	Conductor break			
		11	Recall			
		12	Cardiac perforation			
		13	Skin erosion / infection			
		14	Systemic infection / endocarditis			
		15	Elective (patient request)			
		88	Other			
		99	Unknown		Information missing	
ICD 8.07	Supplementary defibrillation lead reposition / repair/ replacement / explant	1	Not applicable	Indicate (specifically) what action was done to the supplementary defibrillator lead		Code n2
		2	Lead reposition			
		3	Lead repair			
		4	Lead replacement			
		5	Lead explant			
		6	System explant			
		88	Other			
		99	Unknown		Information missing	
ICD 8.08	Reason for reposition / repair/ replacement / explant of supplementary defibrillation lead	1	Not applicable	Indicate (specifically) why the supplementary defibrillation lead was repositioned / repaired / replaced / explanted		Code n2
		2	Displacement			
		3	High defibrillation threshold			
		4	High pacing threshold			
		5	Undersensing			
		6	Myopotential inhibition			

		7	Extracardiac stimulation			
		8	Connector failure			
		9	Insulation failure			
		10	Conductor break			
		11	Recall			
		12	Cardiac perforation			
		13	Skin erosion / infection			
		14	Systemic infection / endocarditis			
		15	Elective (patient request)			
		88	Other			
		99	Unknown		Information missing	
ICD 8.09	Atrial lead reposition / repair/ replacement / explant	1	Not applicable	Indicate (specifically) what action was done to the atrial lead		Code n2
		2	Atrial lead reposition			
		3	Atrial lead repair			
		4	Atrial lead replacement			
		5	Atrial lead explant			
		6	System explant			
		88	Other			
		99	Unknown		Information missing	
ICD 8.10	Reason for reposition / repair/ replacement / explant of atrial lead	1	Not applicable	Indicate (specifically) why the atrial lead was repositioned / repaired / replaced / explanted		Code n2
		2	Displacement			
		3	High pacing threshold			
		4	Undersensing			
		5	Myopotential inhibition			
		6	Extracardiac stimulation			
		7	Connector failure			
		8	Insulation failure			
		9	Conductor break			
		10	Recall			
		11	Cardiac perforation			
		12	Skin erosion / Infection			
		13	Systemic infection / Endocarditis			
		14	Elective (patient request)			
		88	Other			
		99	Unknown		Information missing	
ICD 8.11	Left ventricle lead reposition / repair/	1	Not applicable	Indicate (specifically) what action was done to the		Code n2

	replacement / explant	2	Lead reposition	left ventricular lead		
		3	Lead repair			
		4	Lead replacement			
		5	Lead explant			
		6	System explant			
		88	Other			
		99	Unknown		Information missing	
ICD 8.12	Reason for reposition / repair/ replacement / explant of left ventricle lead	1	Not applicable	Indicate (specifically) why the left ventricular lead was repositioned / repaired / replaced / explanted		Code n2
		2	Displacement			
		3	High pacing threshold			
		4	Undersensing			
		5	Myopotential inhibition			
		6	Extracardiac stimulation			
		7	Connector failure			
		8	Insulation failure			
		9	Conductor break			
		10	Recall			
		11	Cardiac perforation			
		12	Skin erosion / infection			
		13	Systemic infection / endocarditis			
		14	Elective (patient request)			
		88	Other			
		99	Unknown		Information missing	
ICD 8.13	Number of inactive leads abandoned in place	0	None	Indicate (specifically) the number of inactive leads abandoned in place		Code n2
		1	1			
		2	2			
		3	3			
		4	>3			
		99	Unknown		Information missing	
ICD 8.14	Number of lead adaptors	0	0	Indicate (specifically) the number of lead adapters used		Code n2
		1	1			
		2	2			
		3	3			
		4	>3			
		99	Unknown		Information missing	

9. Procedure / Programming						
ID No	Field	Short Code	Field content	Definition of Field	Field content	Data Format
ICD 9.01	Ventricular fibrillation induced	1	No	Indicate if ventricular fibrillation was induced		Code n2
		2	Yes			
		3	Not attempted			
		99	Unknown		Information missing	
ICD 9.02	Lowest successful shock			Indicate the lowest successful shock energy [J]		n3
ICD 9.03	Lowest shock tested			Indicate the lowest shock energy tested [J]		n3
ICD 9.04	Other arrhythmias tested	1	No	Indicate (specifically) if other arrhythmias were tested		Code n2
		2	Yes, atrial			
		3	Yes, ventricular			
		4	Yes, atrial and ventricular			
		99	Unknown		Information missing	

10. Discharge						
ID No	Field	Short Code	Field content	Definition of Field	Field content	Data Format
ICD 10.01	Survival status at discharge	1	Alive	Indicate survival status at discharge		Code n2
		2	Dead			
		99	Unknown		Information missing	
ICD 10.02	Date of discharge / death			Indicate the date the patient was discharged from hospital or if the patient died record the date of death.		Date

11. Medication at discharge / follow-up						
ID No	Field	Short Code	Field content	Definition of Field	Field content	Data Format
ICD 11.01	Class I AAD	1	No	Indicate if the patient, at the time of discharge, is taking Class I anti-arrhythmic drug(s)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 11.02	Class III AAD (excluding amiodarone)	1	No	Indicate if the patient, at the time of discharge, is taking Class III anti-arrhythmic drug(s) (excluding amiodarone)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 11.03	Amiodarone	1	No	Indicate if the patient, at the time of Discharge follow-up, is taking amiodarone		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 11.04	Beta-blockers	1	No	Indicate if the patient, at the time of Discharge follow-up, is taking beta blocker(s)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 11.05	Calcium antagonists	1	No	Indicate if the patient, at the time of discharge, is taking non-dihydropyridine calcium antagonist(s).		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 11.06	Digoxin	1	No	Indicate if the patient, at the time of discharge, is taking digoxin		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 11.07	Diuretics	1	No	Indicate if the patient, at the time of discharge, is taking diuretic(s)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 11.08	ACE inhibitors/ angiotensin II blockers / aldosterone antagonists	1	No	Indicate if the patient, at the time of discharge, is taking ACE inhibitor(s) or angiotensin receptor blocker(s) or aldosterone antagonist(s)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 11.09	Antiplatelet - aspirin	1	No	Indicate if the patient, at the time of discharge is taking acetylsalicylic acid (ASA/Aspirin)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 11.10	Antiplatelet -clopidogrel/ ticlopidine	1	No	Indicate if the patient, at the time of discharge, is taking ticlopidine or clopidogrel		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 11.11	Antiplatelet - other	1	No	Indicate if the patient, at the time of discharge, is taking any other antiplatelet medication		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 11.12	Coumarin anticoagulants	1	No	Indicate (specifically) if the patient, at the time of discharge is taking anticoagulant medication		Code n2
		2	Warfarin			

		3	Other coumarin derivatives			
		99	Unknown		Information missing	
ICD 11.13	Heparin / LMWH	1	No	Indicate if the patient, at the time of discharge, is taking heparin or low molecular weight heparin (either intravenous or subcutaneous)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 11.14	Direct thrombin inhibitors	1	No	Indicate if the patient, at the time of discharge, is taking direct antithrombin agent(s)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 11.15	Antibiotics	1	No	Indicate (specifically) if the patient, at the time of discharge, is taking antibiotic(s)		Code n2
		2	Oral			
		3	Topical			
		4	Intravenous			
		99	Unknown		Information missing	

12. Post-procedure complications (from date of procedure to date of first follow-up)						
ID No	Field	Short Code	Field content	Definition of Field	Field content	Data Format
ICD 12.13	Date of first medical attention of complication			Indicate the date of first medical attention of the complication		Date
ICD 12.14	Hardware complication	1		Indicate if this complication result in a reposition / repair / replacement / explant procedure (go to section 8)		Code n2
		2				
		99	Unknown		Information missing	
ICD 12.01	Central venous complications	1	No	Indicate if the patient experienced an intrathoracic vein thrombosis or laceration		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 12.02	Deep venous thrombosis	1	No	Indicate if the patient experienced a deep vein thrombosis of the lower limb(s) post procedure		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 12.03	Pulmonary embolism	1	No	Indicate if the patient experienced a pulmonary embolism post procedure		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 12.04	Pneumothorax	1	No	Indicate if the patient experienced a pneumothorax post procedure		Code n2
		2	Yes, not requiring drainage			
		3	Yes, requiring drainage			
		99	Unknown		Information missing	
ICD 12.05	Haemothorax	1	No	Indicate if the patient experienced a haemothorax post procedure		Code n2
		2	Yes, not requiring drainage			
		3	Yes, requiring drainage			
		99	Unknown		Information missing	
ICD 12.06	Pericardial effusion / tamponade	1	No	Indicate if the patient experienced a pericardial effusion / tamponade post procedure		Code n2
		2	Yes, not requiring pericardiocentesis			
		3	Yes, requiring pericardiocentesis			
		4	Yes, requiring thoracotomy			
		99	Unknown		Information missing	
ICD 12.07	Arrhythmic storm	1	No	Indicate if the patient suffered multiple shocks for repetitive / incessant VT or VF after implant		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 12.08	Stroke or RIND or TIA	1	No	Indicate if the patient experienced a stroke or TIA post procedure (see definitions)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 12.09	Myocardial infarction	1	No	Indicate if the patient experienced a myocardial infarction post procedure (see definitions)		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 12.10	Wound complications	1	None	Indicate (specifically) if the patient had any		Code n2

		2	Pocket haematoma	wound complications		
		3	Wound infection			
		4	Wound breakdown / erosion			
		5	Wound pain			
		88	Other			
		99	Unknown		Information missing	
ICD 12.11	Need to remove whole system	1	No	Indicate if the whole system was removed		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 12.12	Other complication	1	No	Indicate if patient experienced any other complication. If yes, please specify.		Code n2
		2	Yes			
		99	Unknown		Information missing	

13. Follow Up						
ID No	Field	Short Code	Field content	Definition of Field	Field content	Data Format
ICD 13.01	Date of follow up / death			Indicate the date that follow up was performed		Date
ICD 13.02	Survival status at follow up	1	Alive	Indicate survival status at follow up		Code n2
		2	Dead			
		99	Unknown		Information missing	
ICD 13.03	ICD therapies (DC/ATP) since last follow up	1	No	Indicate if ICD has been delivered any therapy (DC shock or ATP) since last follow-up either appropiate or inappropiate.		Code n2
		2	Yes			
		99	Unknown		Information missing	
ICD 13.04	Number of episodes with appropiate (VT/VF) therapy			Number of clinical episodes with sustained VT/VF which results in any relevant therapy (DC shock or ATP) since last follow-up.	Only if “2” in ICD 13.03	n2
ICD 13.05	Number of appropiate DC shock			Total number of DC shock for sustained VT/VF (eventually more than one per clinical episode)	Only if “2” in ICD 13.03	n2
ICD 13.06	Number of appropiate ATP sequences			Total number of ATP sequences for sustained VT (eventually more than one per clinical episode)	Only if “2” in ICD 13.03	n2
ICD 13.07	Inappropiate ICD therapies (DC/ATP) since last follow up	1	No	Indicate if ICD has been delivered therapies (DC shock or ATP) without VT/VF since last follow-up.		Code n2
		2	Yes		Only if “2” in ICD 13.03	
		99	Unknown		Information missing	
ICD 13.08	Number of inappropiate DC shock			Total number of inappropiate DC shock (eventually more than one per clinical episode)	Only if “2” in ICD 13.07	n2
ICD 13.09	Number of inappropiate ATP sequences			Total number of inappropiate ATP sequences (eventually more than one per clinical episode)	Only if “2” in ICD 13.07	n2
ICD 13.10	ICD therapies (DC/ATP) programmed off	1	No	Indicate if the ICD therapies has been programmed off, both ATP and DC		n2
		2	Yes			
		99	Unknown		Information missing	
ICD 13.10	Reason for inappropiate therapy	1	Atrial flutter and fibrillation	Indicate the reason for inappropriate therapy at follow up The most significant indication to be chosen (one choice only)		Code n2
		2	Supraventricular arrhythmias		Supraventricular arrhythmias other than atrial flutter and fibrillation	
		3	Lead related problems		Including lead displacement and oversensing	
		4	ICD related problems			
		88	Other			
		99	Unknown		Information missing	Code n2
ICD 13.11	File closure	1	Death - sudden	Indicate (specifically) the reason for file closure		
		2	Death - cause unknown			
		3	Death – cardiac, not sudden			
		4	Death – Non cardiac cause			
		5	Death related to ICD			
		6	Death – related to lead			
		7	Lost to follow-up			
		8	Hospital transfer			
		9	ICD programmed off			
		10	ICD removed			
		88	Other			
		99	Unknown		Information missing	

ICD Definitions

ICD Data Standards (definitions)

ID No	Field	Definitions
ICD 2.01	History of cerebrovascular embolic disease	History of cerebrovascular embolic event as defined by one or more of : a) Cerebrovascular Accident (CVA): patient has a history of stroke i.e. loss of neurological function caused by an ischaemic event with residual symptoms at least 72 hours after onset. b) Reversible ischaemic neurological deficit (RIND): patient has a history of loss of neurological function caused by ischaemia with symptoms at least 24 hours after onset but complete return of function within 72 hours. c) Transient Ischaemic Attack (TIA): Patient has a history of loss of neurological function caused by ischaemia that was abrupt in onset but with complete return of function within 24 hours [ACC]
ICD 4.01	Predominant presenting symptom	Asymptomatic means having no symptoms of illness or disease
		Fatigue (loss of energy, lassitude, listlessness, languor) refers to a weariness and loss of that sense of well-being typically found in patients healthy of body and mind
		Palpitations may be defined as an awareness of the beating of the heart, either fast or slow, an awareness most commonly brought about by a change in the heart's rhythm or an augmentation of its contractility. [Harrison's Principles of Internal Medicine (altered)]
		Dyspnoea is defined as abnormal or uncomfortable breathing in the context of what is normal for a person according to his or her level of fitness and exertional threshold for breathlessness. [Silvestri GA, Mahler DA. Evaluation of dyspnoea in the elderly patient. Clin Chest Med 1993;14:393-404]
		Chest pain may be defined as a sensation of chest discomfort, heaviness or pressure.
		Near / pre-syncope is a descriptive term for all sensations directly preceding syncope whether or not they are followed by complete loss of consciousness. [ESC Guidelines on management (diagnosis and treatment) of syncope (2001) (altered)]
		Syncope is a symptom, defined as a transient, self-limited loss of consciousness, usually leading to falling. The onset of syncope is relatively rapid, and the subsequent recovery is spontaneous, complete, and usually prompt. The underlying mechanism is a transient global cerebral hypoperfusion. [ESC Guidelines on management (diagnosis and treatment) of syncope (2001)]
		Chronic heart failure. Criteria 1 and 2 should be fulfilled in all cases 1. Symptoms of heart failure (at rest or during exercise) and 2. Objective evidence of cardiac dysfunction (at rest) and (in cases where the diagnosis is in doubt) 3. Response to treatment directed towards heart failure One commonly used definition is: heart failure is a pathophysiological state in which an abnormality of cardiac function is responsible for the failure of the heart to pump blood at a rate commensurate with the requirements of the metabolising tissues. [Task Force for the Diagnosis and Treatment of Chronic Heart Failure, European Society of Cardiology]
		Cardiac arrest / aborted sudden death. Sudden cardiac death - ‘Natural death due to cardiac causes, heralded by abrupt loss of consciousness within one hour of the onset of acute symptoms; preexisting heart disease may have been known to be present, but the time and mode of death are unexpected. [Task Force on Sudden Cardiac Death of the European Society of Cardiology (2001)]
		Any other symptom causing the patient to seek medical attention, not listed above.
		Unknown

ICD 5.02	Ischaemic heart disease	Q-wave MI: Development of any Q wave in leads V1 through V3, or the development of a Q wave greater than or equal to 30 ms (0.03 s) in leads I, II, aVL, aVF, V4, V5, or V6. (Q-wave changes must be present in any 2 contiguous leads and be greater than or equal to 1 mm in depth.) [European Society of Cardiology / American College of Cardiology Definition of Myocardial Infarction Reference: Myocardial infarction redefined- a consensus document of the Joint European Society of Cardiology / American College of Cardiology Committee for the redefinition of myocardial infarction. Euro Heart Journal. 2000; 21:1502-1513.]
ICD 5.03	Cardiomyopathy hypertrophic	Hypertrophic cardiomyopathy (HCM) is an inherited heart muscle disorder caused by mutations in genes encoding cardiac sarcomeric proteins. HCM has a highly characteristic pathology (myocardial hypertrophy, myocyte disarray and fibrosis) which contributes to a broad spectrum of functional abnormalities that includes myocardial ischaemia, diastolic dysfunction and left ventricular outflow obstruction, resulting in congestive heart failure, clinically important arrhythmias (such as atrial fibrillation) and SCD in some patients. [Task Force on Sudden Cardiac Death of the European Society of Cardiology (2001)]
ICD 5.04	Cardiomyopathy -dilated	Idiopathic dilated cardiomyopathy (DCM) is a chronic heart muscle disease characterised by left ventricular dilatation and impairment of systolic function. [Task Force on Sudden Cardiac Death of the European Society of Cardiology (2001)]
ICD 5.05	Cardiomyopathy -(arrhythmogenic) right ventricular	Right ventricular cardiomyopathy (RVC), originally termed arrhythmogenic right ventricular dysplasia, is a disease of the myocardium, characterised by regional or global fibro-fatty replacement of the right ventricular myocardium, with or without left ventricular involvement and with relative sparing of the septum. [Task Force on Sudden Cardiac Death of the European Society of Cardiology (2001)]
ICD 5.06	Cardiomyopathy -other	According to the definition of the World Health Organization ‘ myocarditis is an inflammatory heart muscle disease associated with cardiac dysfunction’. Myocarditis may occur as the consequence of a systemic infective disease or may be the consequence of a silent infection. Clinical diagnoses of myocarditis may be difficult as the clinical manifestations are frequently non-specific ranging from chest pain to arrhythmias and from heart failure to SCD. [Task Force on Sudden Cardiac Death of the European Society of Cardiology (2001)] Restrictive cardiomyopathy is characterised by restrictive filling and reduced diastolic volume of either or both ventricles with normal or near-normal systolic function and wall thickness. Increased interstitial fibrosis may be present. It may be idiopathic or associated with other disease (eg, amyloidosis; endomyocardial disease with or without hypereosinophilia). [Report of the 1995 World Health Organization/International Society and Federation of Cardiology Task Force on the Definition and Classification of Cardiomyopathies (Circulation. 1996;93:841-842.)] Unclassified Cardiomyopathies include a few cases that do not fit readily into any group (eg, fibroelastosis, noncompacted myocardium, systolic dysfunction with minimal dilatation, mitochondrial involvement). [Report of the 1995 World Health Organization/International Society and Federation of Cardiology Task Force on the Definition and Classification of Cardiomyopathies (Circulation. 1996;93:841-842.)]
ICD 5.07	Congenital heart disease	Congenital heart disease is defined as an abnormality in cardiac structure or function that is present at birth, even if it is discovered much later. [Heart Disease 6th Ed. Braunwald Zipes Libby (altered)]
ICD 5.09	Primary electrical disease - idiopathic ventricular fibrillation (normal heart)	Ventricular fibrillation in the absence of structural heart disease, well characterised cardiac electrophysiologic abnormalities, cardiotoxicity, electrolyte abnormalities, known heritable arrhythmogenic conditions and other transient conditions. [Task Force on Sudden Cardiac Death of the European Society of Cardiology European Heart Journal (2001) 22, 1374–1450 (altered)]
ICD 5.10	Primary electrical disease - congenital long QT	The long QT syndrome (LQTS) is a familial disease characterised by an abnormally prolonged QT interval and, usually, by stress-mediated life threatening ventricular arrhythmias. This is a primary electrical disorder, usually without evidence of structural heart disease or LV dysfunction. [Task Force on Sudden Cardiac Death of the European Society of Cardiology (2001) (altered)]
ICD 5.11	Primary electrical disease - Brugada syndrome	Brugada syndrome -Individuals with syncope, resuscitated cardiac arrest, and/or family history of unexplained sudden cardiac death who have variants of right bundle branch block QRS morphology and ST-segment elevation in leads V1 and V3 [Task Force on Sudden Cardiac Death of the European Society of Cardiology (2001) (altered)]

ICD 5.12	Primary electrical disease - other	Three basic features typify the ECG abnormalities of patients with the usual form of WPW conduction caused by an anomalous AV connection: (1) PR interval less than 120 milliseconds during sinus rhythm; (2) QRS complex duration exceeding 120 milliseconds with a slurred, slowly rising onset of the QRS in some leads (delta wave) and usually a normal terminal QRS portion; and (3) secondary ST-T wave changes that are generally directed in an opposite direction to the major delta and QRS vectors. [Heart Disease 6th Ed. Braunwald Zipes Libby (altered)] *Primary electrical disease would also include a diagnosis of WPW
ICD 5.13	Neurally mediated syncope	'Neurally-mediated reflex syncopal syndrome' refers to a reflex that, when triggered, gives rise to vasodilatation and bradycardia, although the contribution of both to systemic hypotension and cerebral hypoperfusion may differ considerably. [Task Force Report Guidelines on management (diagnosis and treatment) of syncope (European Heart Journal (2001) 22, 1256–1306)]
ICD 6.01	Arrhythmia indication for ICD implant	1 Ventricular Fibrillation Ineffective, rapid, disorganised ventricular arrhythmia, resulting in no uniform ventricular contraction and no appreciable cardiac output VT --Ventricular tachycardia is defined as tachycardia (three or more consecutive complexes), originating from the ventricle(s), with or without 1:1 relation between atrial and ventricular rates. Generally there is a broad complex (QRS greater than 120mSec in duration) but QRS width can be less if septal origin allows early penetration of the conduction system. [ACC/AHA/ESC Guidelines for the Management of Patients with Supraventricular Arrhythmias (2003) (altered)]
		2 VT – monomorphic sustained. Monomorhic implies QRS contours during the VT (which are unchanging (uniform). Sustained VT refers to consecutive ventricular ectopic beats (at a rate > 100 beats/min) that last longer than 30 seconds or cause hemodynamic compromise that requires intervention [Heart Disease 6th Ed (Braunwald Zipes Libby)]
		3 VT - monomorphic non-sustained Monomorhic implies QRS contours during the VT which are unchanging (uniform). Nonsustained ventricular tachycardia (VT) is usually defined as three or more consecutive ventricular ectopic beats (at a rate > 100 beats/min) and lasting < 30 seconds. [Heart Disease 6th Ed (Braunwald Zipes Libby)]
		4 VT - polymorphic (with normal QT interval) Polymorphic implies QRS contours during the VT varying randomly (multiform or pleomorphic)
		5 VT - Polymorhic with long QT interval (Torsades des pointes) The term torsades des pointes refers to a VT characterised by QRS complexes of changing amplitude that appear to twist around the isoelectric line and occur at rates of 200 to 250/min.The term is usually used to connote a syndrome, not simply an ECG description of the QRS complex of the tachycardia, characterised by prolonged ventricular repolarization with QT intervals generally exceeding 500 milliseconds. The abnormal repolarisation need not be present or at least prominent on all beats but may be apparent only on the beat prior to the onset of torsades de pointes (i.e., following a premature ventricular contraction). [Heart Disease 6th Ed (Braunwald Zipes Libby)]
		6 Wide complex tachycardia unspecified Wide-QRS tachycardia can be divided into three groups: SVT with bundle-branch block (BBB) or aberration, SVT with AV conduction over an accessory pathway, and VT. Wide complex implies a QRS duration greater then 120 mSec. Unspecified implies undetermined or uncertain mechanism of the wide complex tachycardia [ACC/AHA/ESC Guidelines for the management of patients with Supraventricular Arrhythmias (2003)]

		7 Syncope with inducible VT or VF Patients with syncope of undetermined aetiology in whom clinically relevant VT / VF is induced at electrophysiological study. Syncope is a symptom, defined as a transient, self-limited loss of consciousness, usually leading to falling. The onset of syncope is relatively rapid, and the subsequent recovery is spontaneous, complete, and usually prompt. The underlying mechanism is a transient global cerebral hypoperfusion. [ESC Guidelines on management (diagnosis and treatment) of syncope (2001)] and [ACC/AHA/NASPE 2002 Guideline Update for Implantation of Cardiac Pacemakers and Antiarrhythmia Devices]
ICD 12.08	Stroke or RIND or TIA	History of cerebrovascular embolic event as defined by one or more of : a) Cerebrovascular Accident (CVA): patient has a history of stroke i.e. loss of neurological function caused by an ischaemic event with residual symptoms at least 24 hours after onset. b) Reversible ischaemic neurological deficit (RIND): patient has a history of loss of neurological function caused by ischaemia with symptoms at least 24 hours after onset but complete return of function within 72 hours. c) Transient ischaemic Attack (TIA): Patient has a history of loss of neurological function caused by ischaemia that was abrupt in onset but with complete return of function within 24 hours [ACC]
ICD 12.09	Myocardial Infarction	New myocardial infarction after the ablation procedure, as characterised by clinical symptoms (chest pain) and/or changes in ECG, biochemical markers, or pathological findings. [European Society of Cardiology / American College of Cardiology Definition of Myocardial Infarction Reference: Myocardial infarction redefined- a consensus document of the Joint European Society of Cardiology / American College of Cardiology Committee for the redefinition of myocardial infarction. Euro Heart Journal. 2000; 21:1502-1513.(altered)]