
Report for European Heart Rhythm Association

Country United Kingdom
Year 2007
Population 60.92 million



Commissioned by the Healthcare Quality Improvement Partnership
and carried out by CCAD, part of NCASP/NHS Information Centre.

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Summary of Device Usage: Total Implants

Year	PM	ICD	CRT-P	CRT-D
1980	4,759	15		
1981	5,470	14		
1982	6,960	18		
1983	7,668	4		
1984	8,360	9		
1985	9,193	9		
1986	9,789	6		1
1987	10,637	5		
1988	10,441	19		
1989	11,736	38		
1990	13,193	74		
1991	14,325	143	1	1
1992	15,951	176		
1993	17,082	184		
1994	18,771	235		
1995	20,408	360	1	
1996	22,574	588		
1997	23,385	627	1	
1998	23,851	936	9	
1999	24,781	1,114	60	10
2000	26,722	1,393	120	65
2001	29,108	1,838	308	152
2002	29,172	2,413	405	318
2003	30,454	2,868	552	587
2004	32,522	3,167	881	945
2005	32,707	3,472	1,156	1,357
2006	34,397	3,577	1,336	1,882
2007	36,297	3,762	1,696	2,231

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*report compiled by Dr A D Cunningham, Senior Manager, Central Cardiac Audit Database
www.ccad.org.uk*

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PM Total Implants 36,297 595.8 per million population

registered: 36,297

PM New Implants: 25,210 413.8 per million population

registered: 25,210

PM Replacements: 11,087 182.0 per million population

registered: 11,087

Implanting centres 203

DB established: 1977

Estimated completeness 100.0%

PM in DB at end of year 552,534

Patients in follow up 308,325

	All	Male	Female
New implants:	25,210	14,643	10,567
Mean age new implants	75.5 years	75.0 years	76.2 years

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Primary Sympton at Initial Implant

		%
A1	UNSPECIFIED	6.9%
B1	SYNCOPE	41.5%
B2	DIZZY SPELLS	27.9%
B3	BRADYCARDIA	11.7%
C1	TACHYCARDIA	1.7%
D1	NONE/PROPHYLACTIC	3.8%
D2	HEART FAILURE/DYSPNOEA	5.6%
D3	CEREBRAL DYSFUNCTION	0.2%
D4	CHEST PAIN	0.7%
D5	ABORTED SUDDEN DEATH	0.1%

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Pre-pacing ECG: New Implants

	%
A1-2 unspec uncoded	2.1%
B1 norm sinus rhythm	5.7%
B2 NSR + abnormal EPS	0.5%
C1-C4 I-II degree AVB	15.9%
C5-C8 III degree AVB	26.9%
D1-D12 BBB	4.7%
E1-E5 SSS	26.6%
E6 Chronic AF/AFL + bradycardia	16.1%
E7 Interatrial block	0.1%
E8 Chronotropic incompetence	0.3%
F1-3 Supraventricular tachycardia	0.6%
G1 Ventricular extrasystoles	0.0%
G2-3 Ventricular extrasystoles	0.4%
G4 Torsades de pointes	0.1%

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Pacing Mode: New Implants

	%
AAI Atrial Demand	0.68%
AAIR Atrial Demand Rate Responsive	0.72%
DDD Dual chamber	24.80%
DDDR Dual chamber rate responsive	31.50%
DDI Dual chamber Non-Triggered	0.59%
DDIR Dual chamber Non-Triggered rate responsive	0.26%
DVI AV sequential	0.01%
VAT P-wave synchronous	0.01%
VDD P-wave synchronous ventricular inhibited	0.50%
VOO Ventricular Asynchronous	0.03%
VVI Ventricular Demand	13.61%
VVIR Ventricular Demand Rate Responsive	22.66%
CRT-P Biventricular	4.65%

Average Pacemaker Price

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Mode vs pre-Pacing ECG: New Implants

ECGGroup	VVI	AAI	DDD	VDD	CRTP
A1-2 unspec uncoded	33.8%	3.5%	56.2%	2.0%	4.5%
B1 norm sinus rhythm	24.8%	3.2%	66.9%	0.2%	4.9%
B2 NSR + abnormal EPS	36.7%		61.7%		1.7%
C1-C4 I-II degree AVB	19.1%	0.9%	77.5%	1.7%	0.9%
C5-C8 III degree AVB	39.6%	0.1%	58.6%	1.1%	0.5%
D1-D12 BBB	19.2%	0.7%	57.2%	0.2%	22.7%
E1-E5 SSS	20.8%	4.5%	74.3%	0.2%	0.3%
E6 Chronic AF/AFL + bradycardia	90.0%	0.2%	8.3%		1.5%
E7 Interatrial block	50.0%		50.0%		
E8 Chronotropic incompetence	23.1%		76.9%		
F1-3 Supraventricular tachycardia	27.0%		71.4%		1.6%
G1 Ventricular extrasystoles	25.0%		75.0%		
G2-3 Ventricular extrasystoles	35.3%		64.7%		
G4 Torsades de pointes	40.0%		60.0%		

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Rate responsive sensors

	%
Activity	77.27%
Activity or Respiration	18.41%
Activity/impedance blend	0.62%
Activity/QT blend	0.28%
Activity/Respiration blend	3.42%

Market share

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Primary Aetiology at Initial Implant

		%
A1	UNSPECIFIED	15.2%
B1	UNKNOWN	46.4%
B2	CONDUCTION TISSUE FIBROSIS	26.4%
C1	ISCHAEMIC	3.3%
C2	POST INFARCTION	0.6%
D1	CONGENITAL UNSPECIFIED	0.5%
E1	SURGICAL COMPLICATION	1.6%
E2	SURGICAL THERAPEUTIC (ABLATION)	0.4%
E3	CATHETER ABLATION UNSPECIFIED	0.7%
E4	DRUG INDUCED	0.3%
F1	CAROTID SINUS SYNDROME	1.9%
F2	VASOVAGAL SYNDROME	0.7%
F3	ORTHOSTATIC HYPOTENSION	0.0%
G1	CARDIOMYOPATHY UNSPECIFIED	0.6%
G1A	HYPERTROPHIC CARDIOMYOPATHY	0.0%
G1B	DILATED CARDIOMYOPATHY	0.5%
G2	MYOCARDITIS	0.0%
G3	VALVULAR HEART DISEASE	0.9%
G6	ENDOCARDITIS	0.0%
G7	HEART TRANSPLANT	0.0%
G8	IONISING RADIATION	0.0%

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Pacemaker File Closures

	%
A1 UNSPECIFIED	2.89%
B1 DEATH UNRELATED TO PACEMAKER	30.70%
B2 DEATH RELATED TO PACEMAKER	0.49%
B3 DEATH - SUDDEN	2.07%
B4 DEATH - CAUSE UNKNOWN	46.45%
B5 DEATH - LEAD RELATED	0.06%
C1 LOST TO FOLLOW-UP	1.24%
C2 HOSPITAL TRANSFER	13.25%
C3 PACEMAKER REMOVED	2.85%

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Generator Explants

	%
A1 UNSPECIFIED	2.86%
B1 ELECTIVE	63.02%
B2 RECALL	0.16%
B3 SYSTEM CHANGE - HEMODYNAMIC	1.24%
B4 SYSTEM CHANGE - PACER SYNDROME	0.24%
B5 SYSTEM CHANGE - PALPITATIONS	0.14%
B6 SYSTEM CHANGE - ELECTRODE PROBLEM	0.54%
B7 EMG INHIBITION	0.02%
C1 MECHANICAL PROTRUSION	0.06%
C2 EROSION	0.30%
C3 INFECTION	0.78%
C4 WOUND PAIN	0.04%
D1 MINOR FAILURE - UNSPECIFIED	0.14%
D2 MINOR FAILURE - UNDERSENSING	0.08%
E1 MAJOR FAILURE - UNSPECIFIED	0.02%
E2 MAJOR FAILURE - NO OUTPUT	0.12%
E6 MAJOR FAILURE - CONNECTOR	0.06%
E7 MAJOR FAILURE - ENCAPSULATION	0.30%
F1 BATTERY FAILURE - NORMAL EOL	29.19%
F2 BATTERY FAILURE - PREMATURE EOL	0.68%

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Lead Explants

	Atrial	Ventricular
A1 UNSPECIFIED	13.46%	8.33%
B1 ELECTIVE	27.56%	25.00%
B2 DISPLACEMENT	23.72%	22.06%
B3 EXIT BLOCK		3.43%
B4 EMG INHIBITION		
B5 EXTRACARDIAC STIMULATION		1.47%
B6 PERFORATION		0.49%
B7 UNDERSENSING	1.92%	0.98%
B8 RECALL		
C1 INFECTION - ULCERATION	25.00%	19.61%
D1 CONNECTOR FAILURE	0.64%	0.98%
D2 INSULATION BREAK	5.77%	11.76%
D3 CONDUCTOR BREAK	1.92%	5.88%

Lead Extractions

No information is currently available on the success rate or complication rate of lead extraction in the United Kingdom.

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Lead polarity: ventricular

BIPOLAR	99.77%
UNIPOLAR	0.23%

Lead polarity: atrial

BIPOLAR	99.2%
Unipolar	0.8%

Lead polarity: coronary sinus

Bipolar	96.2%
UNIPOLAR	3.8%

Lead fixation: ventricular

Active	7.30%
Passive	92.70%

Lead fixation: atrial

Active	8.5%
Passive	91.5%

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Patient Age - New Implants

Age group at time of new implant	%
0-4	0.27%
5-9	0.12%
10-14	0.13%
15-19	0.26%
20-24	0.43%
25-29	0.35%
30-34	0.48%
35-39	0.70%
40-44	0.95%
45-49	1.36%
50-54	2.00%
55-59	3.34%
60-64	5.76%
65-69	8.23%
70-74	13.48%
75-79	19.13%
80-84	20.37%
85-89	15.40%
90-94	5.86%
95-99	1.27%
100-104	0.10%
105-109	0.01%

Patients aged 100 or over at implant (first or replacement): 47

Pacemaker Re-Use

Pacemakers are not allowed to be re-used in the United Kingdom.

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ICD Total Implants: **3,762** **61.8** per million population

ICD New Implants: **2,522** **41.4** per million population

ICD Replacements: **1,240** **20.4** per million population

ICD Implant centres **80**

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RF Ablations:

Ablation centres:	54
Total # ablations:	9,067