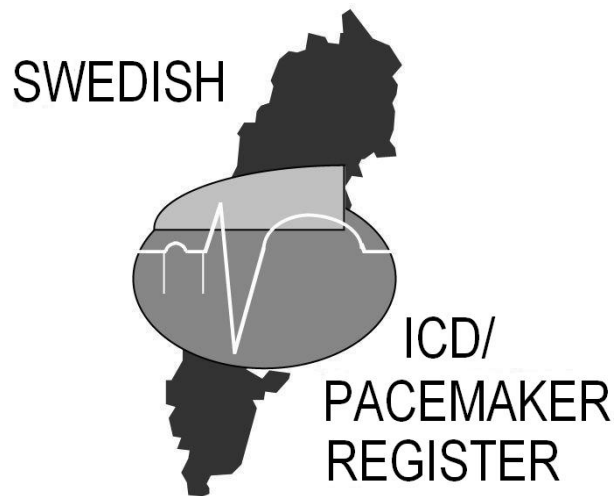


KAROLINSKA HOSPITAL
DEPARTMENT OF CARDIOLOGY
SWEDEN

ANNUAL STATISTICAL REPORT 2006

SWEDISH ICD REGISTER



STATISTICAL REPORT SWEDISH ICD REGISTRY 2006

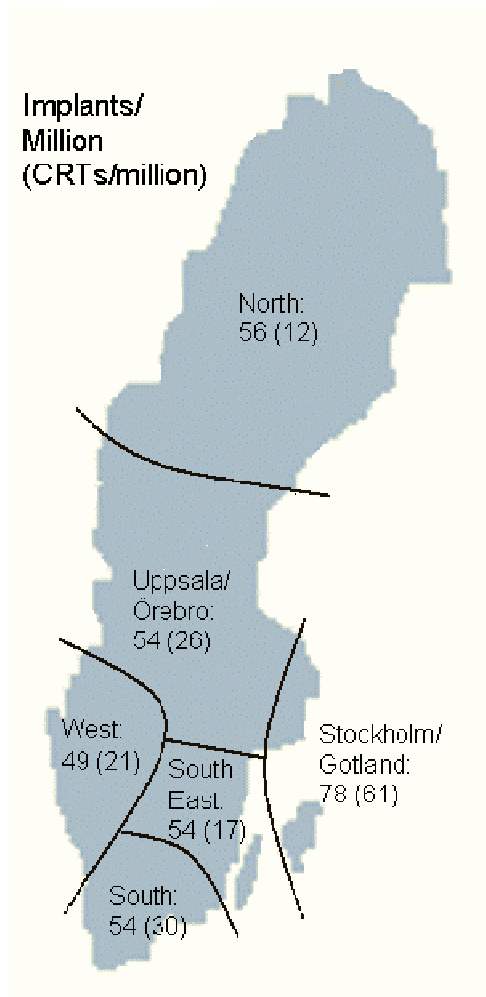
ICD IMPLANTING HOSPITALS / REGION 2006

Region	Hospital	No of first implants
Stockholm/Gotland	Danderyds sjukhus	0
	Karolinska Universitetssjukhuset Huddinge	25
	Karolinska Universitetssjukhuset Solna	115
	Södersjukhuset	15
Western Sweden	Sahlgrenska sjukhuset	71
	Varbergs sjukhus	13
Northern Sweden	Sunderby sjukhus	2
	Universitetssjukhuset Umeå	47
	Östersunds sjukhus	1
Southern Sweden	Blekinge sjukhuset	23
	Universitetssjukhuset Lund	67
UppsalaÖrebro	Bollnäs sjukhus	4
	Uppsala Akademiska sjukhuset	74
	Universitetssjukhuset Örebro	27
South-East Sweden	Länssjukhuset kalmar	17
	Universitetssjukhuset Linköping	37

ANNUAL IMPLANTATION RATE

NUMBER OF IMPLANTS LISTED PER REGION

Region	Population	No of first implants	No /million	% CRT	No active patients
Stockholm/Gotland	1 975 401	155	78	39.4	629
Western Sweden	1 704 661	84	49	23.8	492
Northern Sweden	880 465	50	56	24.5	202
Southern Sweden	1 638 053	90	54	33.3	410
Uppsala/Örebro	1 931 396	105	54	24.8	326
Southeast Sweden	983 281	54	54	31.5	241
Total	9 113 257	538	59	30.9	2300

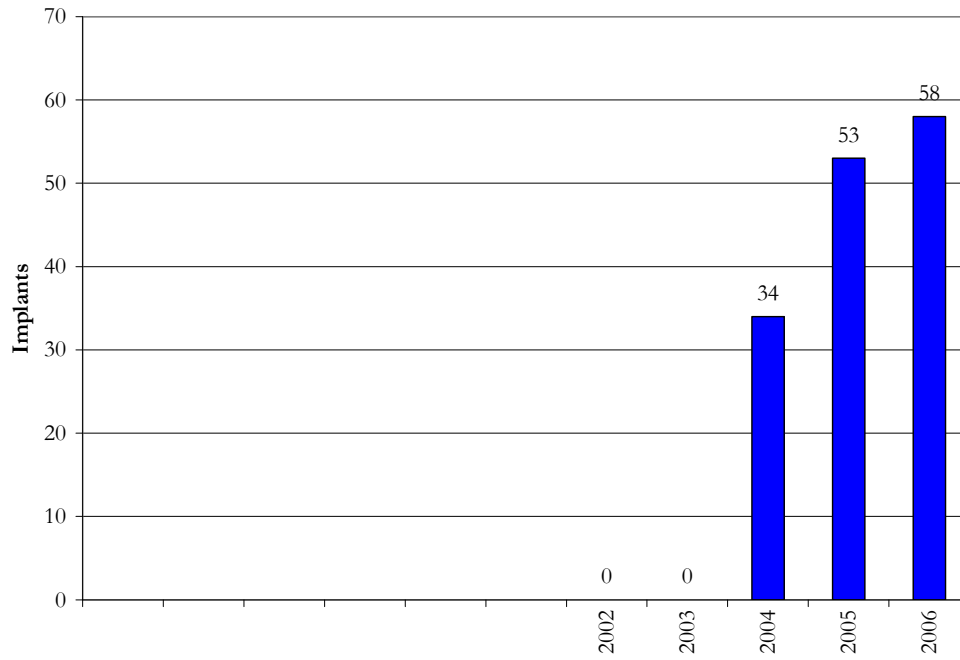
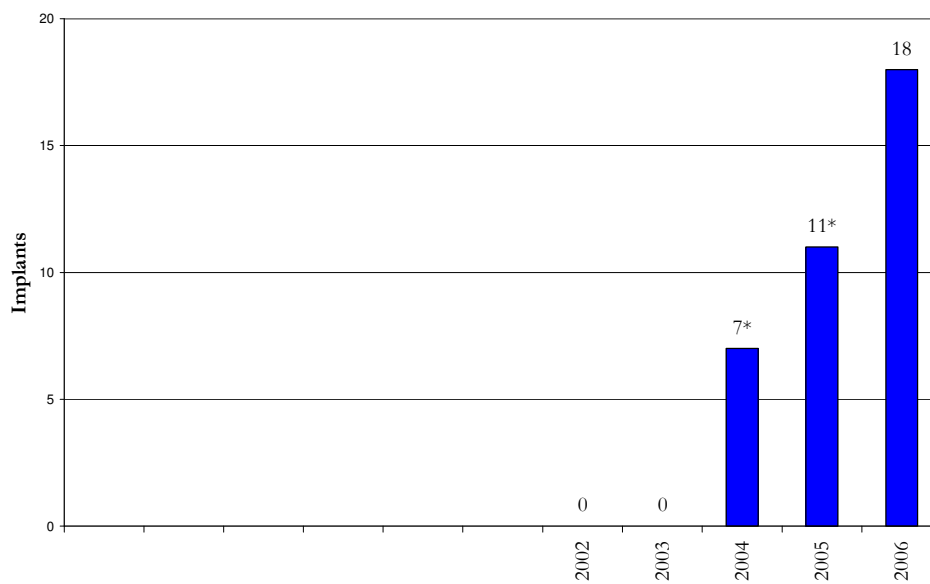


ANNUAL IMPLANTATION RATE

NUMBER OF IMPLANTS PERFORMED PER COUNTY

County	Population	No of first implants	No / million	%CRT
implants				
Stockholm	1 918 104	155	80	39,4
Uppsala	319 925	74	231	24,3
Södermanland	263 099	0	0	0
Östergötland	417 966	37	88	45,9
Jönköping	331 539	0	0	0
Kronoberg	179 635	0	0	0
Kalmar	233 776	17	72	0
Gotland	57 297	0	0	0
Blekinge	151 436	23	151	21,7
Skåne	1 184 500	67	56	37,3
Halland	288 859	13	45	30,8
Västra Götaland	1 538 284	71	46	23,9
Värmland	273 489	0	0	0
Örebro	275 030	27	98	29,6
Västmanland	248 489	0	0	0
Dalarna	275 711	0	0	0
Gävleborg	275 653	4	14	0
Västernorrland	243 978	0	0	0
Jämtland	127 020	1	7	0
Västerbotten	257 581	47	182	25,5
Norrbottn	251 886	2	8	0

ANNUAL IMPLANTATION RATE

NUMBER OF IMPLANTS / MILLION INHABITANTS 1970-2006**NUMBER OF CRT IMPLANTS / MILLION INHABITANTS 1970-2006**

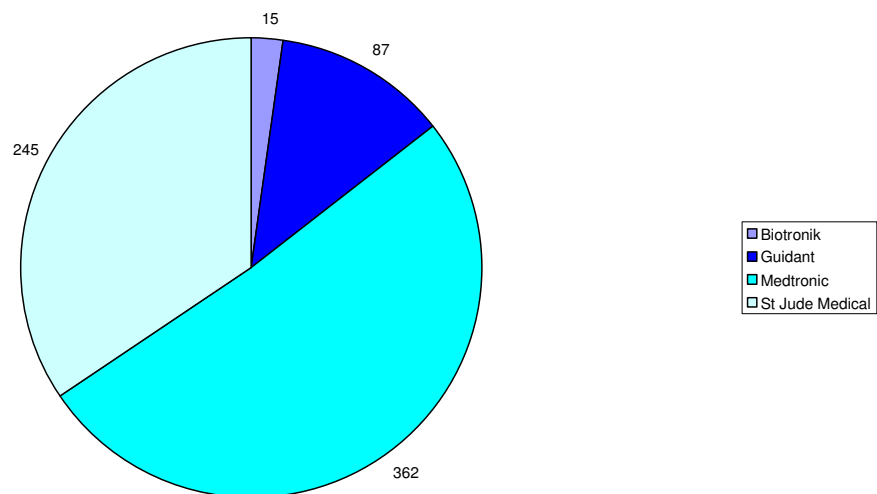
* = Excluding Uppsala

DISTRIBUTION OF MANUFACTURERS

ICD GENERATORS (% OF TOTAL)

Total number of implants: 709

	No	%
Biotronik	15	2,1
Guidant	87	12,3
Medtronic	362	51,1
St Jude Medical	245	34,6

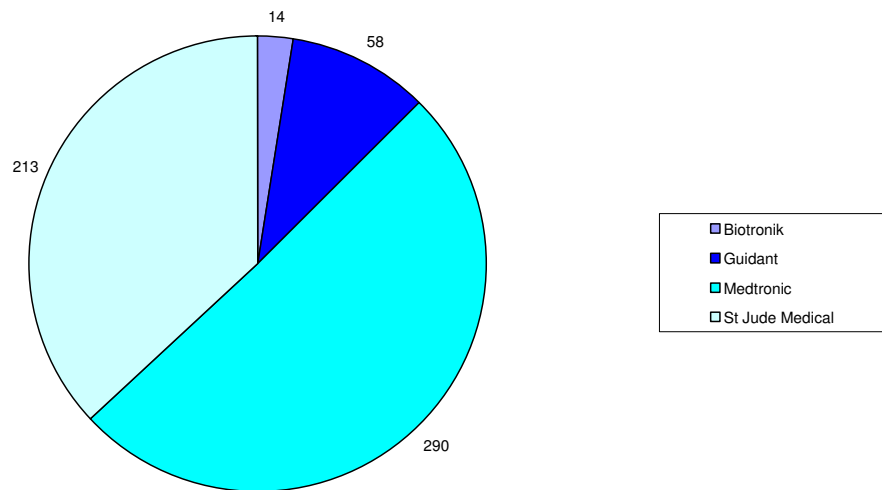
ICD Generators

DISTRIBUTION OF MANUFACTURERS

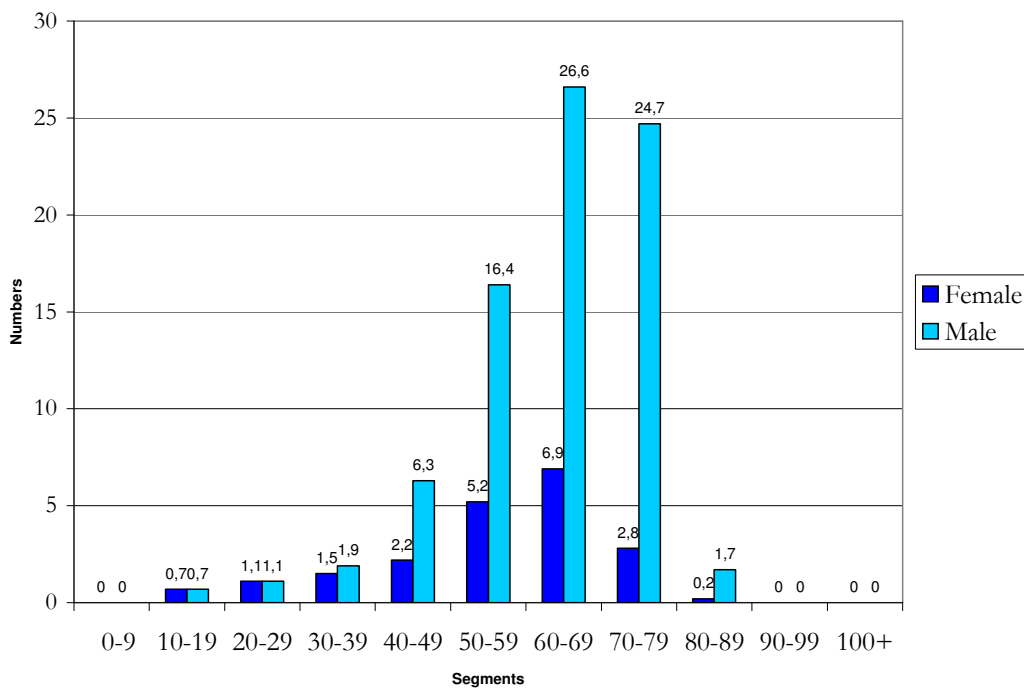
ICD LEADS (% OF TOTAL)

Total number of implants: 575

	No	%
Biotronik	14	2.4
Guidant	58	10.1
Medtronic	290	50.4
St Jude Medical	213	37.0

ICD Leads

AGE DISTRIBUTION - FIRST IMPLANT

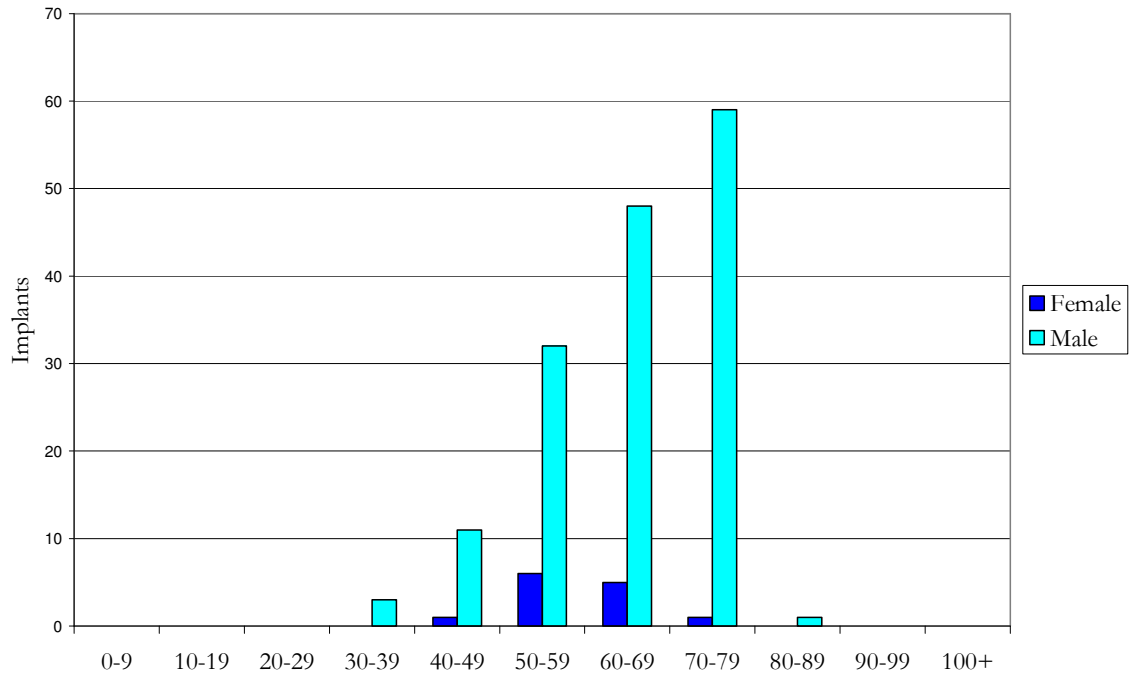
AGE DISTRIBUTION FOR MALES, FEMALES 2006


Total number of implants 538

Age (Years)	Total no	%	Female	Male
0-9	0	0,0	0	0
10-19	8	1,5	0,7	0,7
20-29	12	2,2	1,1	1,1
30-39	18	3,4	1,5	1,9
40-49	46	8,6	2,2	6,3
50-59	116	21,6	5,2	16,4
60-69	180	33,4	6,9	26,6
70-79	148	27,5	2,8	24,7
80-89	10	1,9	0,2	1,7
90-99	0	0,0	0	0
100+	0	0,0	0	0
average	61,6		55,9	63,2

AGE DISTRIBUTION - FIRST IMPLANT

AGE DISTRIBUTION FOR CRT 2006

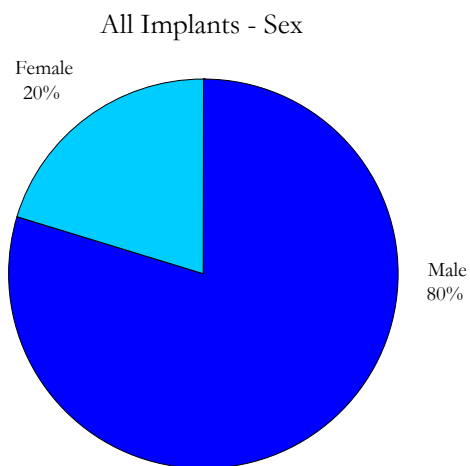
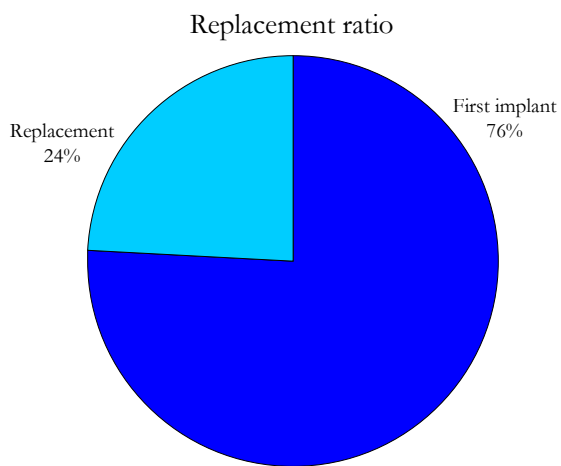
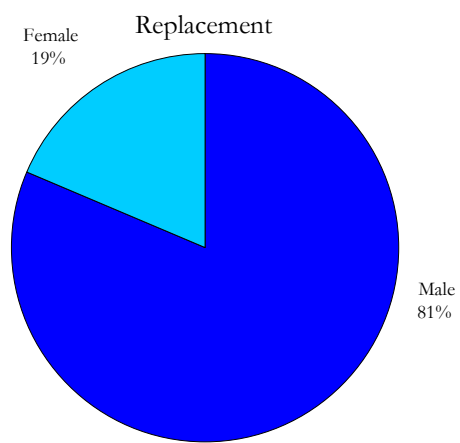
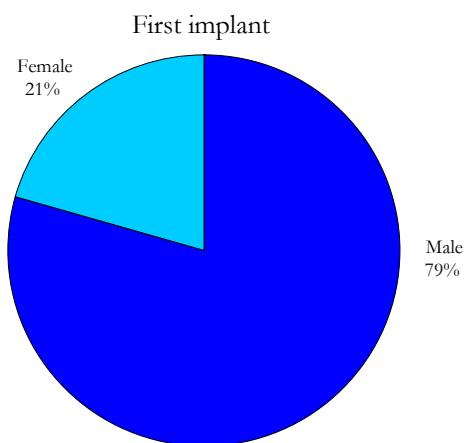


Total number of implants 167 CRT

Age (Years)	Total no	%	Female	Male
0-9	0	0,0	0	0
10-19	0	0,0	0	0
20-29	0	0,0	0	0
30-39	3	1,8	0	3
40-49	12	7,2	1	11
50-59	38	22,8	6	32
60-69	53	31,7	5	48
70-79	60	35,9	1	59
80-89	1	0,6	0	1
90-99	0	0,0	0	0
100+	0	0,0	0	0
average	64,5		59,6	64,9

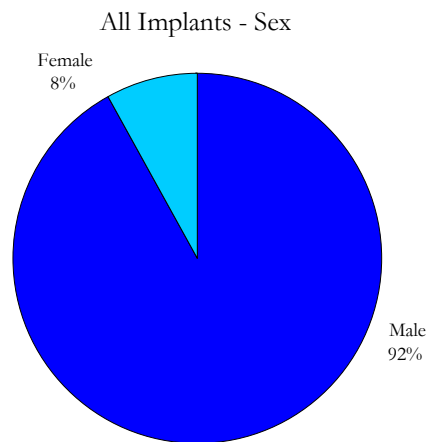
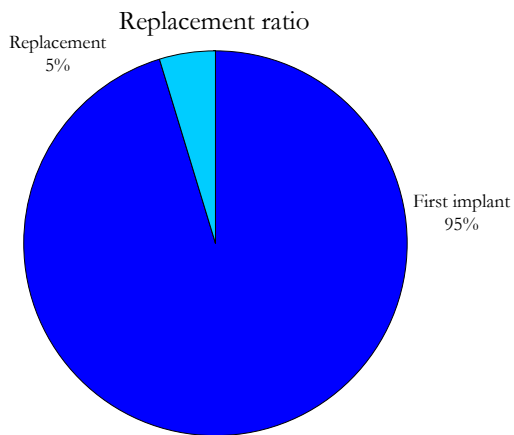
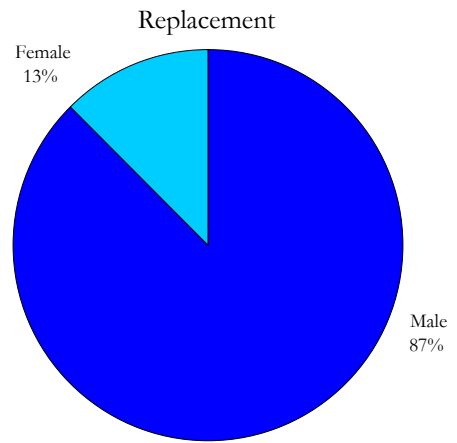
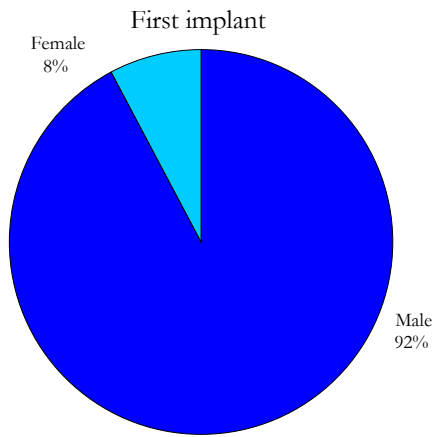
NUMBER OF IMPLANTS

	Total no	Male	Female
First implant	538	427	111
	75,9%	79,4%	20,6%
Replacement	171	139	32
	24,1%	81,3%	18,7%



NUMBER OF IMPLANTS CRT

	Total no	Male	Female
First implant	167	154	13
	95,4%	92,2%	7,8%
Replacement	8	7	1
	4,6%	87,5%	12,5%

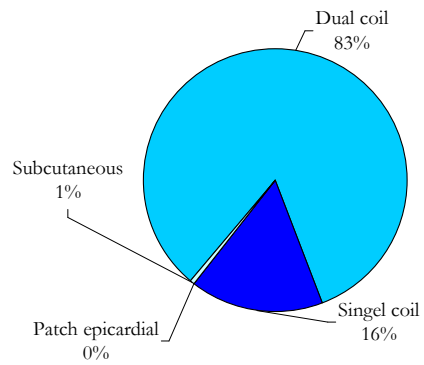


ACTIVE/INACTIVE CRT

	Total no of implants 200	Total no of implants 51
	First implant (generator)	Replacement (generator)
SC-lead first implant	141	26
SC-lead plugged	59	6
CRT system change	-	19

LEADS

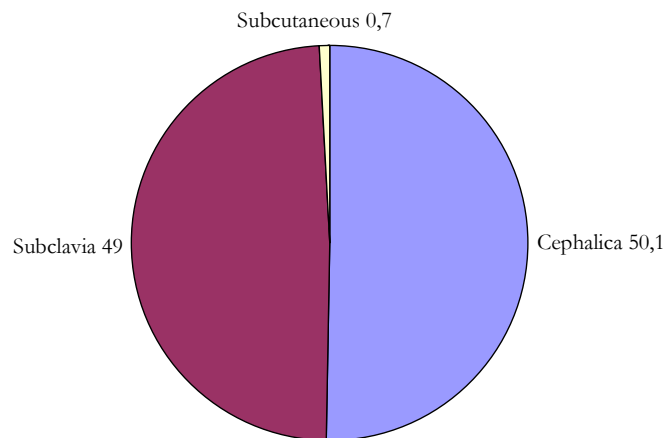
Total number of implants 577		
	No	%
Dual coil	479	83
Singel coil	94	16,3
Patch epicardial	0	0
Subcutaneous	4	0,7
Passive fixation	232	40,2
Active fixation	345	59,8



LEAD ACCESS

Lead access	No	%
Cephalica	290	50,1
Subclavia	283	49
Subcutaneous	4	0,7

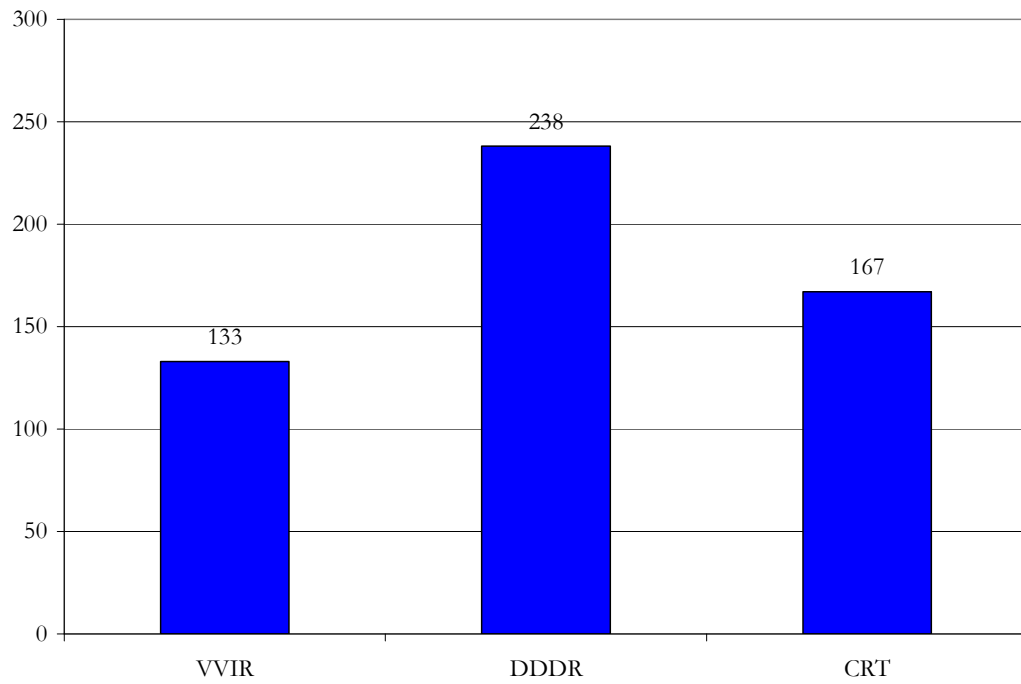
%



PACING MODE FIRST IMPLANT

Total number of implants 538

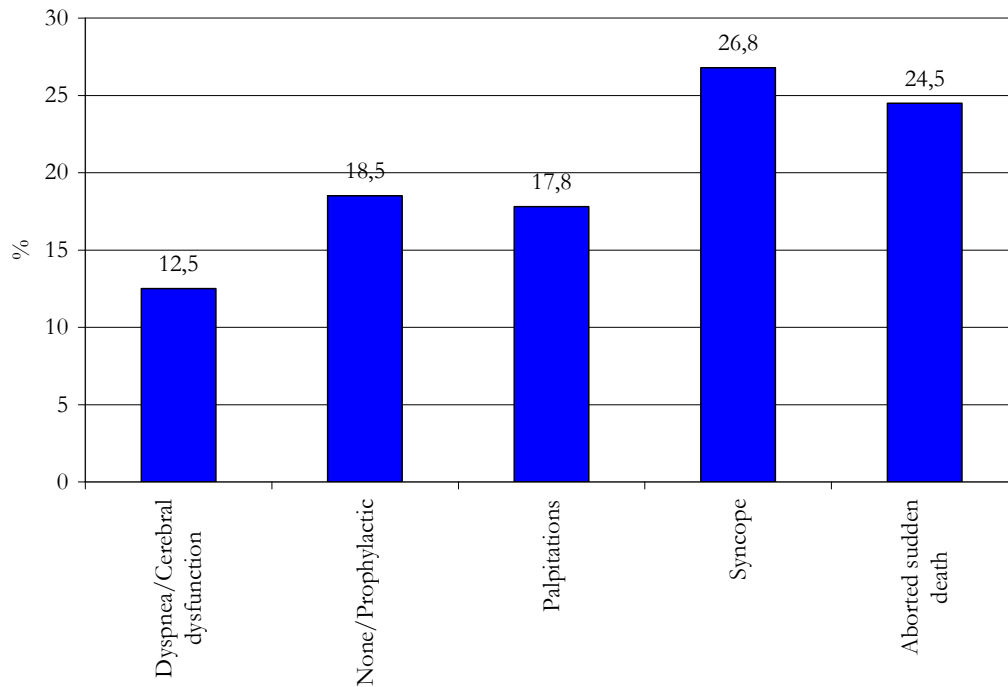
Mode	%	No
VVIR	24.7	133
DDDR	44.2	238
CRT	31.0	167



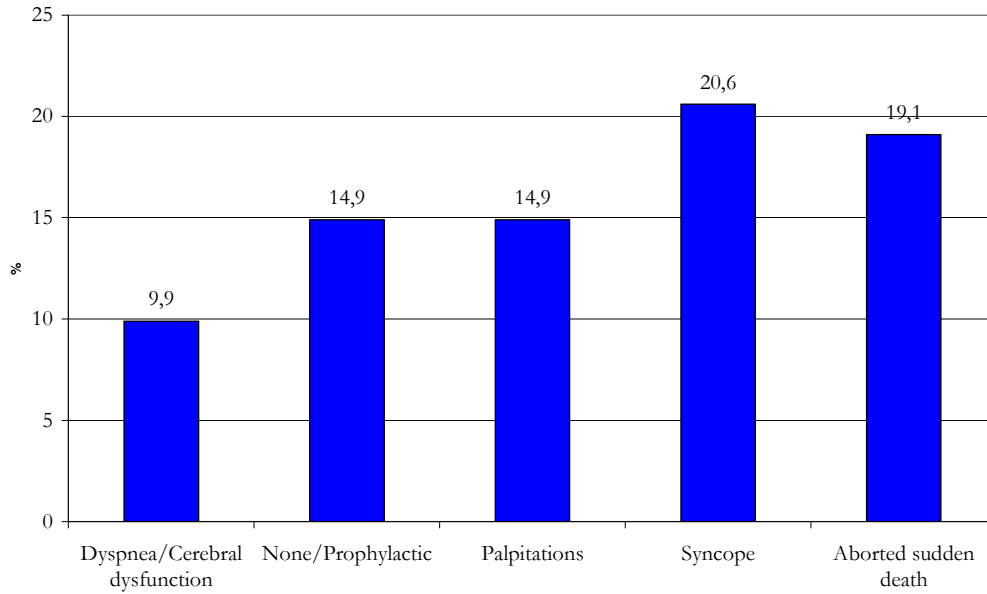
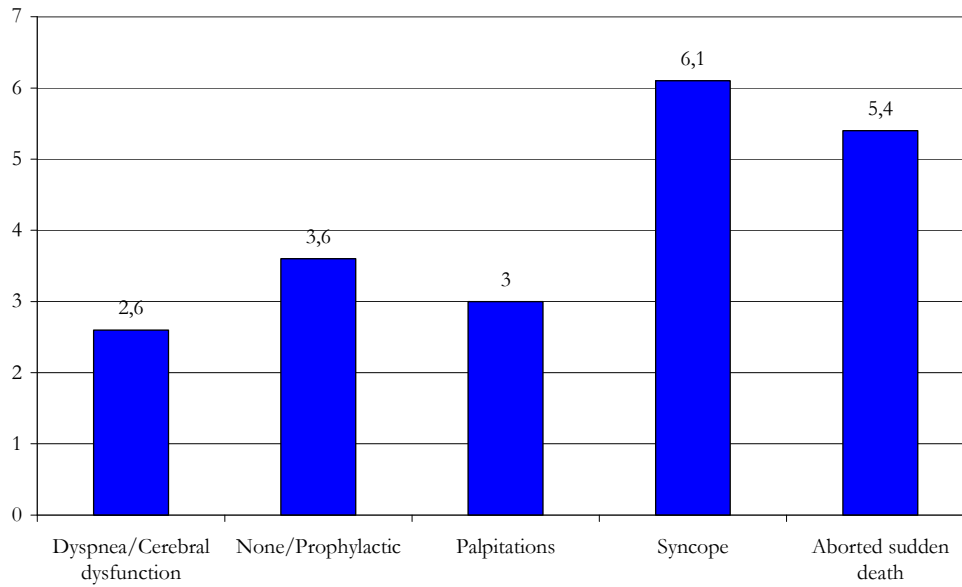
CLINICAL INDICATIONS - FIRST IMPLANT

Total number of implants 538

Indication	Total %	Male %	Female %
Dyspnea/Cerebral dysfunction	12,5	9,9	2,6
None/Prophylactic	18,5	14,9	3,6
Palpitations	17,8	14,9	3
Syncope	26,8	20,6	6,1
Aborted sudden death	24,5	19,1	5,4

CLINICAL INDICATIONS TOTAL 2006


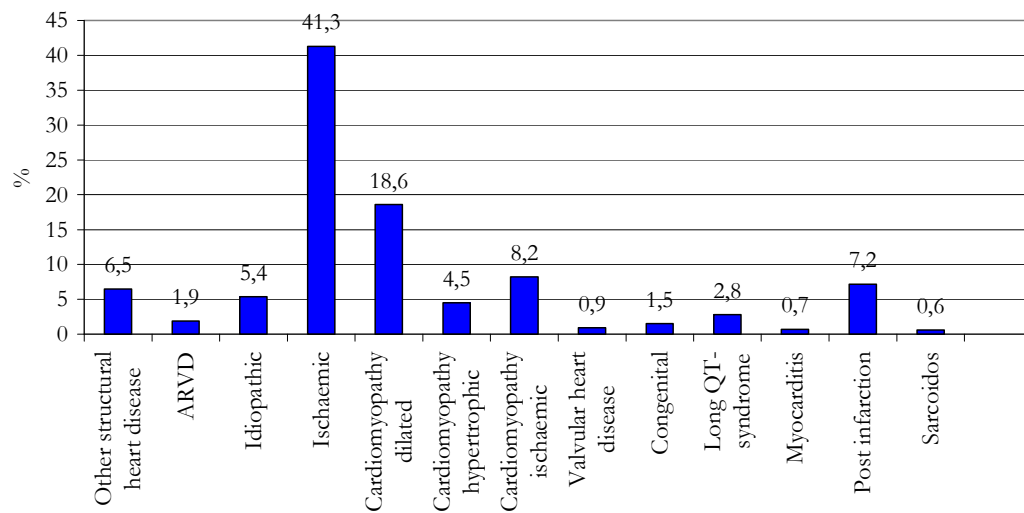
CLINICAL INDICATIONS - FIRST IMPLANT

CLINICAL INDICATIONS MALE 2006**CLINICAL INDICATIONS FEMALE 2006**

AETIOLOGY - FIRST IMPLANT

Total number of implants 538

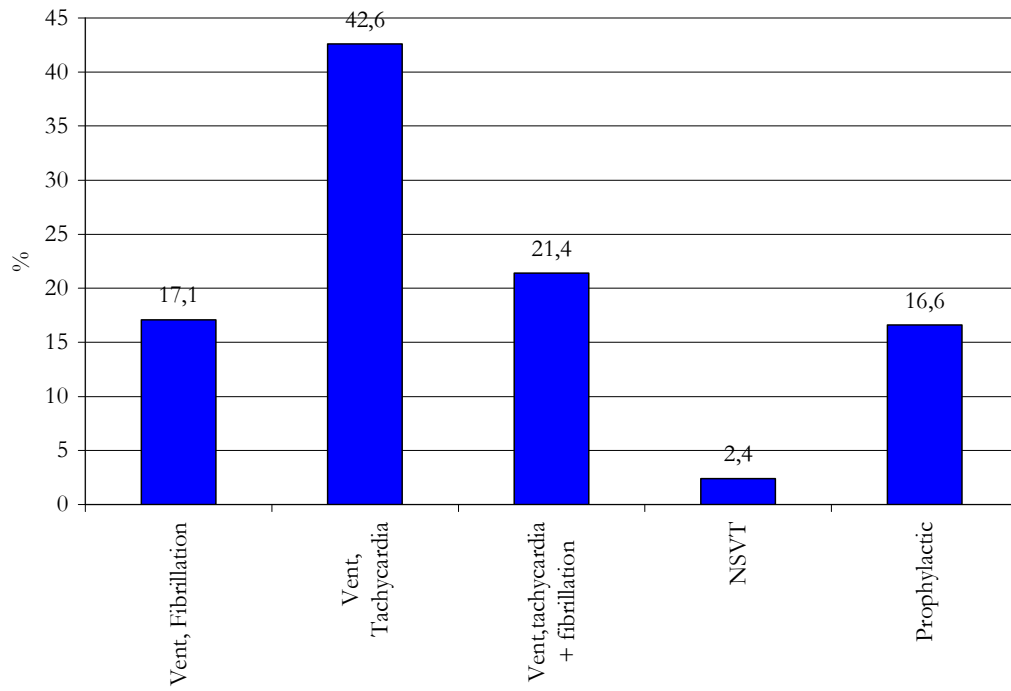
Aetiology	%	Male %	Female %
Other structural heart disease	6,5	4,8	1,7
ARVD	1,9	1,1	0,7
Idiopathic	5,4	2,9	2,4
Ischaemic	41,3	35,3	5,9
Cardiomyopathy dilated	18,6	14,9	3,7
Cardiomyopathy hypertrophic	4,5	3	1,5
Cardiomyopathy ischaemic	8,2	7,8	0,4
Valvular heart disease	0,9	0,9	0
Congenital	1,5	0,6	0,9
Long QT-syndrome	2,8	1,1	1,7
Myocarditis	0,7	0,4	0,4
Post infarction	7,2	6,1	1,1
Sarcoidos	0,6	0,4	0,2



ECG INDICATIONS (TACHY) - FIRST IMPLANT

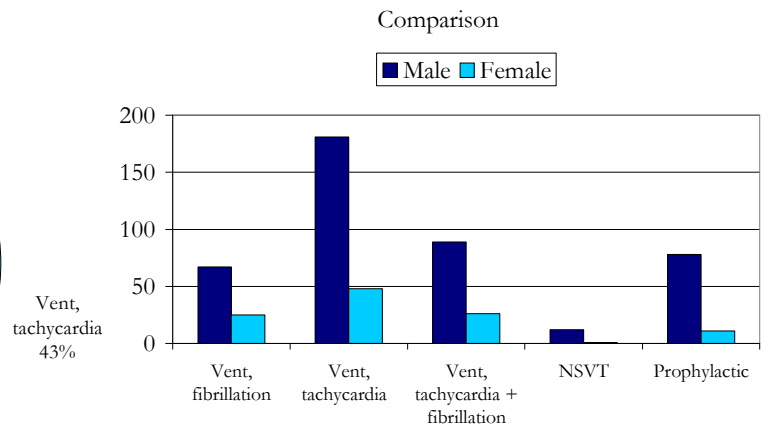
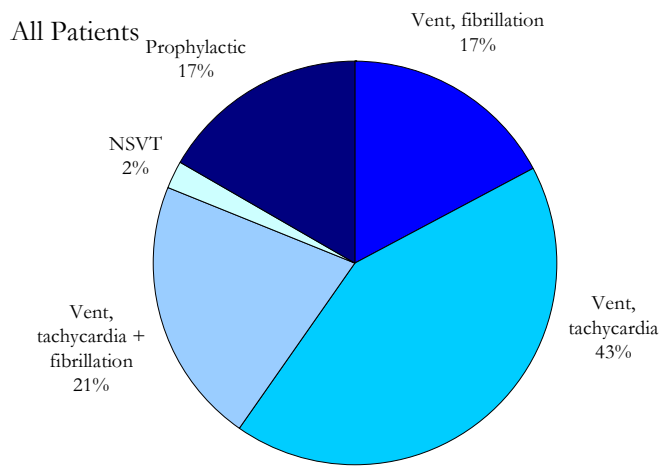
Total number of implants 538

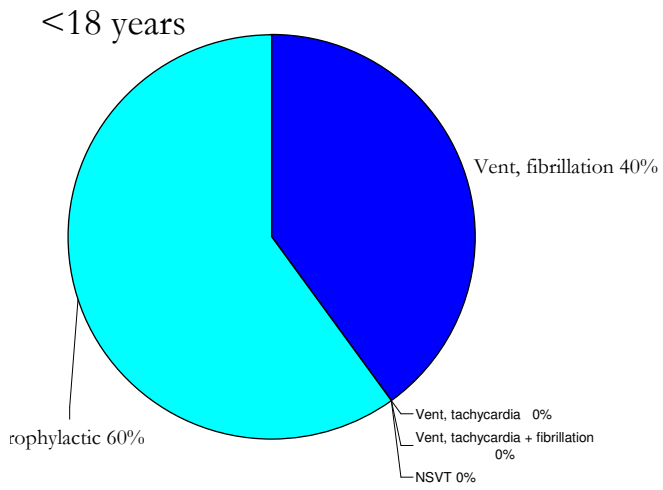
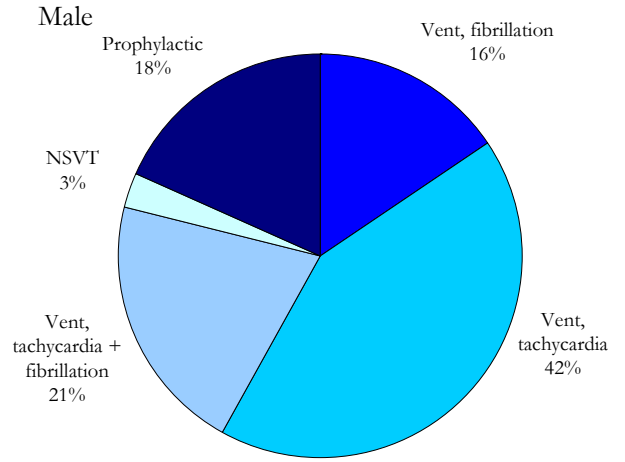
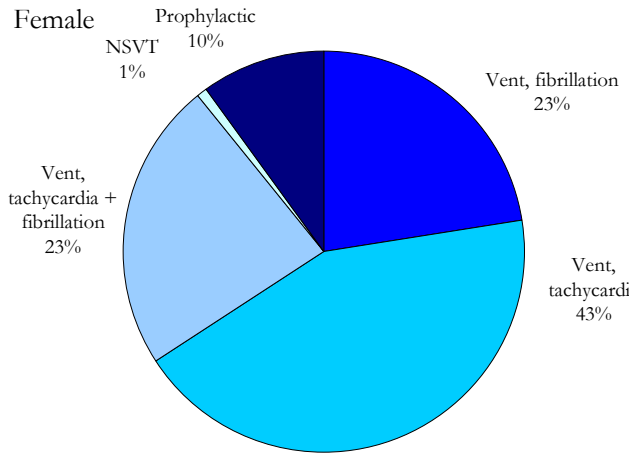
indication	%
Vent, Fibrillation	17,1
Vent, Tachycardia	42,6
Vent,tachycardia + fibrillation	21,4
NSVT	2,4
Prophylactic	16,6



PREPACING ECG (TACHY) – FIRST IMPLANT – SEX

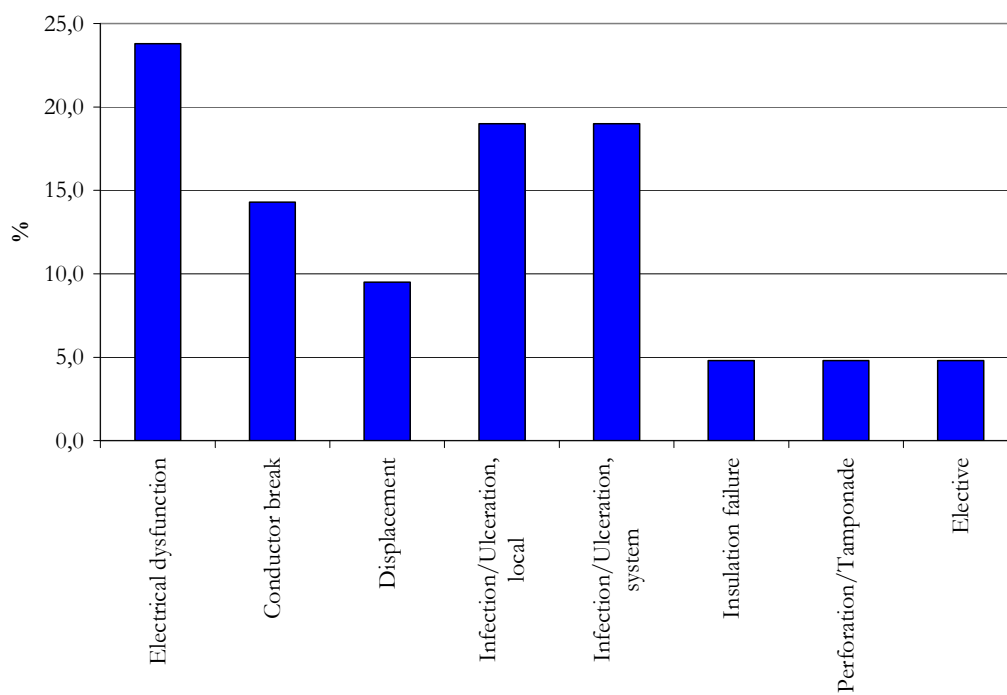
Prepacing ECG	No	%	Male	Female	<18 years
Vent, fibrillation	92	17,1	67	25	2
Vent, tachycardia	229	42,6	181	48	-
Vent, tachycardia + fibrillation	115	21,4	89	26	-
NSVT	13	2,4	12	1	-
Prophylactic	89	16,6	78	11	3





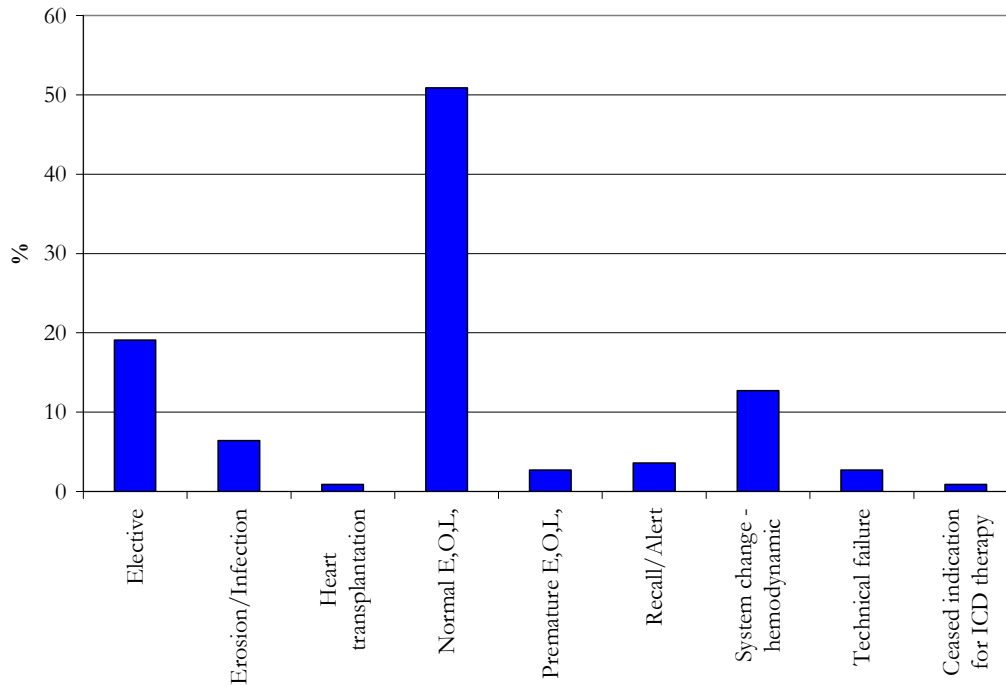
REASON FOR LEAD REPLACEMENT

Reason	%
Electrical dysfunction	23,8
Conductor break	14,3
Displacement	9,5
Infection/Ulceration, local	19,0
Infection/Ulceration, system	19,0
Insulation failure	4,8
Perforation/Tamponade	4,8
Elective	4,8

REASONS FOR LEAD REPLACEMENT - ALL HOSPITALS


REASON FOR GENERATOR REPLACEMENT

Reason	%
Elective	19,1
Erosion/Infection	6,4
Heart transplantation	0,9
Normal E,O,L,	50,9
Premature E,O,L,	2,7
Recall/Alert	3,6
System change - hemodynamic	12,7
Technical failure	2,7
Ceased indication for ICD therapy	0,9

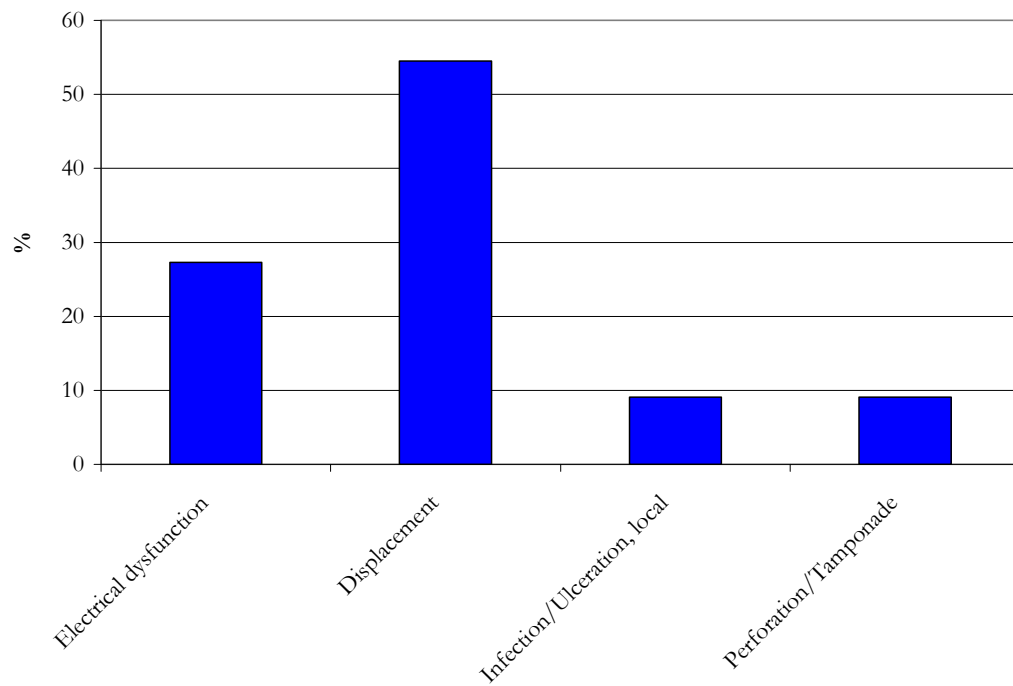
REASON FOR GENERATOR REPLACEMENT- ALL HOSPITALS


REASON FOR GENERATOR REPLACEMENT HISTORICAL DATA %

Reason %	2004	2005	2006
Elective	34,4	26,9	19,1
Erosion/Infection	6,3	1,5	6,4
Heart transplant	1	0,8	0,9
Normal E.O.L.	33,3	33,1	50,9
Premature E.O.L.	9,4	3,8	2,7
Recall/Alert	4,2	16,2	3,6
System change - hemodynamic	6,3	10	12,7
Technical failure	3,1	6,9	2,7
Ceased indication for ICD therapy	2,1	0,8	0,9

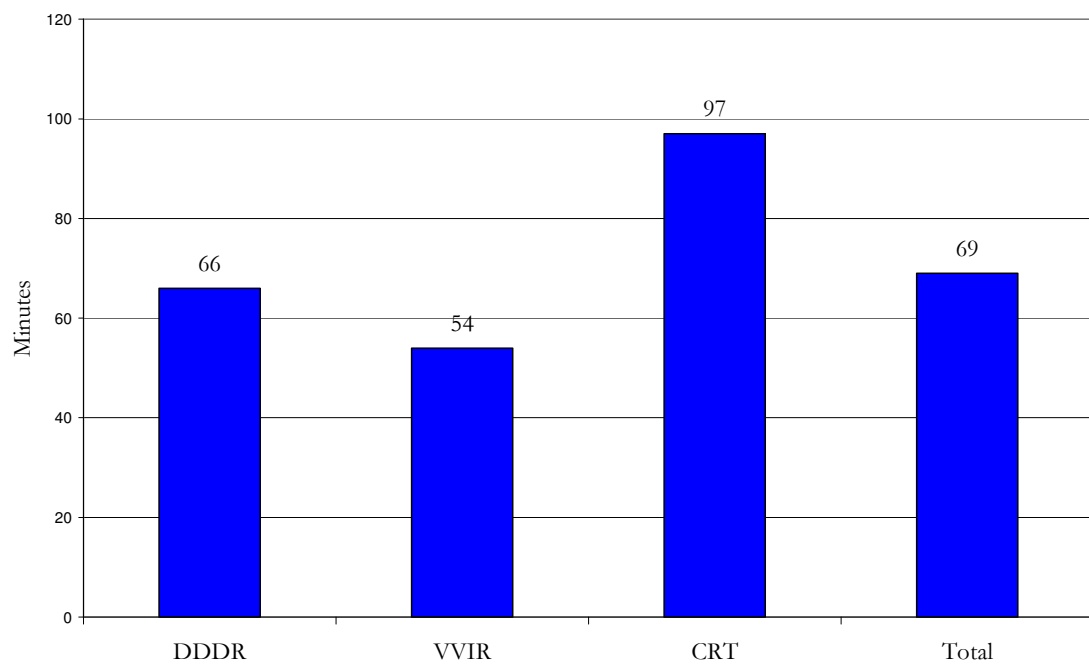
REASON FOR LEAD CORRECTION

REASON	%
Electrical dysfunction	27,3
Displacement	54,5
Infection/Ulceration, local	9,1
Perforation/Tamponade	9,1

REASON FOR LEAD CORRECTION

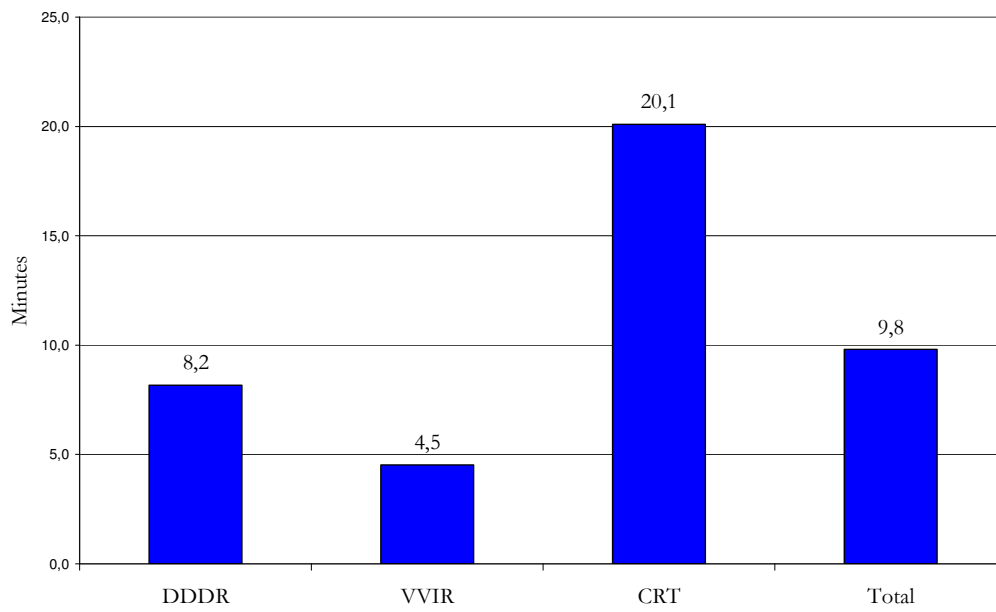
KNIFE TIME

Knife time	Average	Standard deviation
DDDR	66	34,9
VVIR	54	24,4
CRT	97	55,2
Total	69	40,6



FLUOROSCOPY

Fluoro time	Average	Standard deviation
DDDR	8,2	9,8
VVIR	4,5	4,9
CRT	20,1	18,8
Total	9,8	12,8



COMPLICATIONS TO INTERVENTIONS

Based on 733 (all implants) alternatively
562 (first implant + lead replacement) validated events

COMPLICATION	%
Electrical dysfunction	1,5
Local bleeding	1,1
Perforation/Tamponade	0,9
Pneumothorax	0,7
Infection / Perforation	1,6
Electrode displacement	2,9
Other	4,5
Death	0,4
Total (93)	12,7

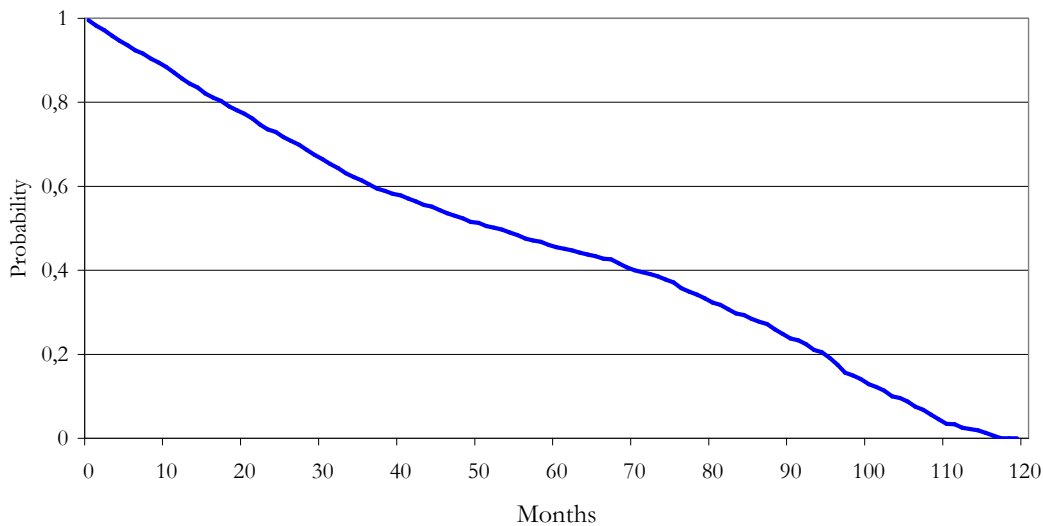
COMPLICATIONS TO INTERVENTIONS PER HOSPITAL

Hospital	Other	Local bleeding	Electrical dysfunction	Electrode displacement
Akademiska sjukhuset	22,1	-	-	1,1
Blekinge sjukhuset	-	2,6	-	-
Bollnäs sjukhus	-	-	-	-
Danderyds sjukhus	-	-	-	-
KS Huddinge	-	-	-	5,1
KS Solna	-	1,9	1,3	1,9
Linköpings Universitetssjukhus	1,1	1,1	1,1	2,3
Länssjukhuset Kalmar	4,3	4,3	2,1	-
Sahlgrenska sjukhuset	3,2	-	-	0,8
Sunderby sjukhus	-	-	-	-
Södersjukhuset	-	-	4,8	-
Universitetssjukhuset Örebro	1	-	1	3,9
Universitetssjukhuset Lund	1,5	0,7	1,5	2,2
Universitetssjukhuset Umeå	-	-	-	7,5
Varbergs sjukhus	13,3	-	-	-
Östersunds sjukhus	-	-	-	-

Hospital	Infection/ Perforation	Perforation/ Tamponade	Pneumothorax	Death
Akademiska sjukhuset	-	-	-	-
Blekinge sjukhuset	5,3	-	-	-
Bollnäs sjukhus	-	-	-	-
Danderyds sjukhus	-	-	-	-
KS Huddinge	5,1	2,6	-	-
KS Solna	1,3	0,6	-	-
Linköpings Universitetssjukhus	2,3	-	-	-
Länssjukhuset Kalmar	-	-	-	-
Sahlgrenska sjukhuset	0,8	2,4	3,2	1,6
Sunderby sjukhus	-	-	-	-
Södersjukhuset	-	-	-	-
Universitetssjukhuset Örebro	1	-	-	-
Universitetssjukhuset Lund	1,5	-	-	-
Universitetssjukhuset Umeå	-	-	-	-
Varbergs sjukhus	-	-	-	-
Östersunds sjukhus	-	-	-	-

SURVIVAL

Generator survival

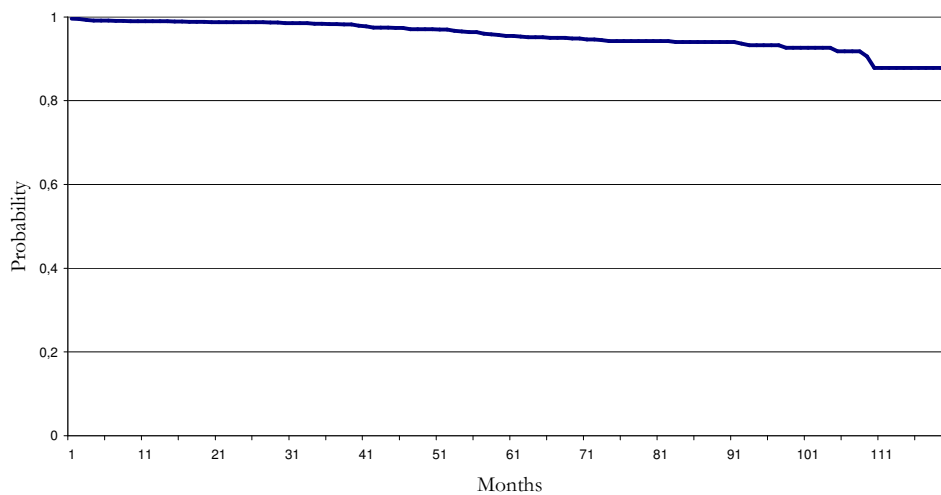


Years	Survival probability
1	85,7%
2	72,9%
3	60,4%
4	52,4%
5	45,5%
6	39,1%
7	29,4%
8	19,2%
9	5,6%
10	0,0%

Tillverkare	Modell	2år	4år	6år	8år
St Jude Medical	V-186HV3	91,90%	11,10%	5,60%	-
Medtronic	7227Cx	99,40%	97,90%	85,40%	-
Medtronic	7273	89,20%	77,20%	19,90%	-
Medtronic	7271	92,60%	86,00%	46,90%	-
Medtronic	7223Cx	93,30%	57,40%	24,50%	-
St Jude Medical	V-145AC	100,00%	92,00%	4,20%	-
Guidant	1720	95,70%	52,60%	-	-
Guidant	1625	96,00%	31,20%	5,20%	-
Guidant	1715	100,00%	25,00%	-	-
Guidant	1763	100,00%	94,10%	75,30%	-
St Jude Medical	V-175AC	100,00%	83,80%	7,50%	-

SURVIVAL

Lead survival

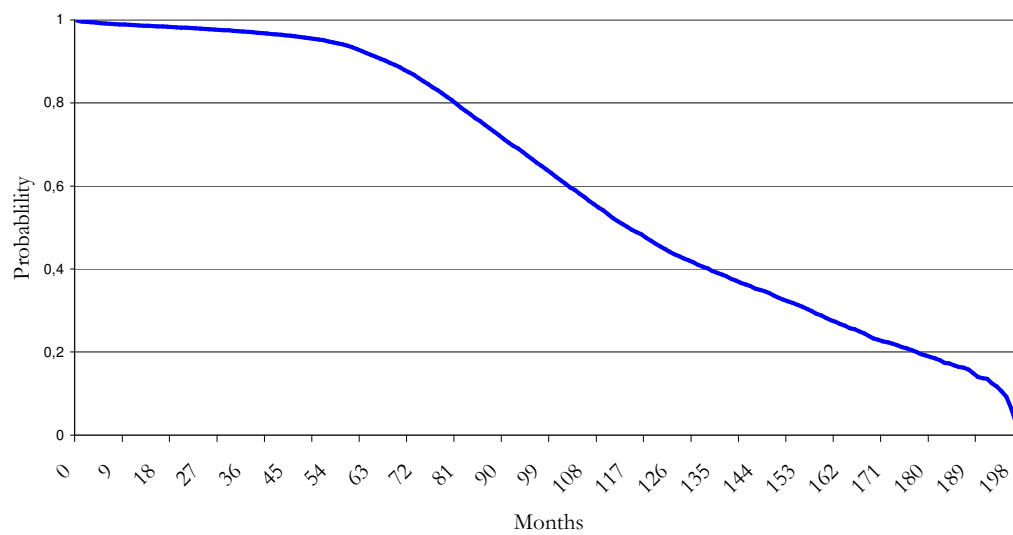


Years	Survival probability
1	99,0%
2	98,8%
3	98,4%
4	97,2%
5	95,6%
6	94,8%
7	94,2%
8	93,4%
9	92,2%
10	88,7%

Tillverkare	Modell	2år	4år	6år	8år
Guidant	147	98,9%	98,9%	98,9%	-
Medtronic	6932	98,2%	96,3%	94,9%	94,9%
Medtronic	6943	100,0%	95,9%	94,0%	86,8%
Medtronic	9944	99,5%	98,4%	96,7%	-
Medtronic	6947	98,9%	98,9%	-	-
Medtronic	6948	98,8%	-	-	-
Medtronic	6949	98,5%	-	-	-
St Jude Medical	1571	99,0%	99,0%	-	-
St Jude Medical	1581	96,1%	-	-	-
St Jude Medical	SP02	99,0%	96,6%	95,1%	95,1%

SURVIVAL

Patient survival



Years	Survival probability
1	98,8%
2	98,0%
3	97,1%
4	95,7%
5	92,5%
6	86,0%
7	76,4%
8	67,3%
9	56,4%
10	48,4%