

KAROLINSKA HOSPITAL  
DEPARTMENT OF CARDIOLOGY  
SWEDEN

# ANNUAL STATISTICAL REPORT 2021

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**SWEDISH ICD &  
PACEMAKER REGISTRY**

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## Foreword

We are proud to present the annual report for 2021 with expanded data regarding quality and device longevity together with implant rates and usage of device therapy in Sweden.

The report contains data from all implanting hospitals and > 95% of all procedures are reported when crosschecked with the Patient care registry from Socialstyrelsen.

## Pacemaker

### Implant rates

There are 48297 active pacemaker patients in Sweden and 6657 ICD patients and the implant rate was 697 impl/million. There are regional differences with the highest implant rates in the northern regions despite the sparse population density in that region. The overall implant rate has increased somewhat from 2011 (4-9)

The manufacturers shares of the market show slight redistribution and all regions are bound by tenders for 1-3 years (10-11)

## Patients

The average age for females receiving pacemaker treatment is 77 y and males 75 y and four patients over 100 years of age received primary implants. There is a male predominance with 58% of the new implants going to male patients but generator changes are more common in females due to the higher average survival of females in the country (12-14).

Pacemaker leads are now predominantly bipolar with only very few unipolar leads implanted. Active fixation are used to 98% in the atrium but only to 70% in the ventricle where passive leads are used more commonly than in the US for example. Only a small number of epicardial systems are implanted in small children patients without venous access and in some CRT patients. Venous access is almost equal between cephalic cutdown technique, 54%, and direct subclavian puncture 42% (14-16).

## Pacemakers

All pacemakers implanted have RR capability and DDD-R is the most common subtype, 75%. CRT-P are used in small numbers. 4.5%. (17). The most common aetiology for pacemaker treatment is still the "conductive tissue fibrosis" 76% and ischaemic disease is more common in males, 1.1 vs 0.3%. The usage of "conductive tissue fibrosis" is most probably too high and only represents a lack of proper diagnosis when entering registry data. (18)

System upgrade is increasing, especially in brady paced patients with heart failure and 2021 a total of 300 patients were upgraded from normal brady pacing to CRT (19).

The most common symptom is syncope followed closely by dizziness and dyspnea (20-21). ECG indications are 2021 mainly related to sinus node disease with AV conduction disorders second (22-24). Smaller hospitals tend to use VVI-R pacing more often than larger hospitals.

Generators are used to ERI criteria are fulfilled in 76% of the cases and 3% exhibit premature EOL (27-28). Lead failures are uncommon and survival rates are very good (28-30).

The number of procedures for each implanter vary to a large extent between hospitals (31-33).

## ICD

### Implant rates

The number centers implanting ICD's are 22 and represents roughly half of the PM implanting centers. Implant show the same regional differences as in pacemakers with the highest rates in the north and the lowest in the western region, 141 vs 90 per million. The highest differences are in primary prevention between the same regions, 104 vs 53 per million in northern and western region. Clear explanations for this are not at hand. The national average is 136 per million and is only a slight increase over 2011, 128 per million (35-41). About 25% of the procedures are replacements (47)

As with PM the regions are bound by tenders and manufacturers share show only slight variations over previous year. A small number of subcutaneous devices were implanted (42-43).

## Patients

The average age for ICD implant is 63 y in males and 61 y in females for all types of implants. 44 patients in the age group 80-89 and one patient >90 years of age received new implants, mostly as secondary prevention (43-46).

Medication at the start of therapy is displayed in tables (66-69)

### Subtypes and leads

60% of the leads are single coil and to 94% active fixation. Venous access is comparable to PM implants with a equal distribution between cephalic cutdown and direct subclavian puncture. Subtypes are 41% DDR devices, 48% CRT-D and 20% VVI-R devices (47-50)

Indication is most commonly primary prevention and heart failure with ischaemic heart disease as underlying cause (51-58).

Only 60% of the ICD's are used until normal EOL/ERI, 9% are changed due to system upgrade requirements and 15% are changed due to infections. The infection rate as a whole is however 3% (59+130). Technical failure rate is down to 0.6% 2021 from 2.1% 2010. ICD leads display larger failure rates but overall longevity is still good (60-63+135-140).

The number of procedures display the same large variation I volumes as with pacemaker procedures at different hospitals and some are clearly below recommended volumes (64-65).

## CRT

### Implant rates

Implant rates of CRT system is only increasing slowly in Sweden, 55 per million CRT-D's and 42 per million CRT-P's new implants. The number of centers performing CRT implantations are less than the number doing ICD's (70-77). The distribution between CRT-D and CRT-P systems show regional differences with some regions doing almost exclusively CRT-D systems (74). The failure rate at implant is according to the registry 5% but this is most likely an underestimation when compared to the literature(79).

## Patients

The average age of CRT-P patients at first implant is 74 y and CRT-D patients 65 years with a large male predominance (77-78). Medication for patients receiving CRT for the first time is given in tables 81-83.

## ILR

648 ILR's were implanted in Sweden 2021 with the main indication being dizzy spells and syncope. In the cases were a device implant was based on findings; 91% of the cases an indication for pacemaker was found during follow up, in 8% an indicatton for ICD and only in 1% was a new ILR implanted for extended FU. The most common finding during regular FU was however normal sinus rhythm in 81% of the registered FU events (84-89).

## Quality of device treatment

### Pacemakers

#### Pacing modes

In high degree AV block only 5% of the patients receive VVI-R systems on average but to a higher degree, 11%, in small hospitals (91-93).

The use of pacing mode in sinus node disease show the same tendency with 7% VVI-R systems on average but 13% in small hospitals.

#### Lead dislocations

The rate is 1.6% in the right atrium and 1.5% in the right ventricle with fixed screw leads displaying to lowest displacement frequency (97).

#### Lead extractions

The registry does not so far contain detailed data regarding lead extraction procedures but to get an estimate of how common this is in Sweden we have looked at the number of leads with implant duration >1 year that have been entered into the registry as "removed" during 2021. This is a very loose definition of lead extraction but fulfills the criteria that the lead should be older than 1 year to be qualified as an extraction procedure.

#### Procedures

Duration of fluoroscopy and procedure times are given for all types and hospitals in tables (99-106). The procedures that have been performed in less than 10 at different sites are marked as not reliable for comparison.

#### Complications to pacemaker procedures

The total complication rate for pacemaker procedures is 5.3% with lead displacement being the most common (107-110). The complication rate per hospital is given in tables (108-110) and hospitals that have registered <3% in total are excluded and regarded as not having complete registration.

#### Device longevity

Generators generally have very good longevity with an average of 98% after 5 years (111) but there are differences between models and manufacturers (112-113+ 118-120).

Pacemaker lead survival is very good with a survival rate of 98% after 10 years (114-116) with very little difference between models and manufacturers.

#### Patients

The overall pacemaker patient survival is shorter than the average expected survival at the time of implant but not much; 64% after 5 years with an average age at implant of 75 years for pacemaker patients vs 71% for the whole population (117).

#### ICD

#### Procedures

Duration of fluoroscopy and procedure times are given for all types of ICD implants and hospitals in tables. The procedures that have been performed in less than 10 at different sites are marked as not reliable for comparison (121-126).

### Complications

The overall complication rate to ICD treatment is 6.1% and is down slightly from 6.8% in 2019. The most common complication is lead dislodgement 2.2% followed by infection and electrical dysfunction with 0.9%.

The rate between hospitals is also given in tables and as with pacemaker treatment <3% overall complication rate is considered incomplete registration.

### Device longevity

ICD generator survival is shorter than pacemaker generator survival and greater differences between manufacturers and models are present. The average survival of an ICD is 88% after 5 years (134-135+141)

ICD lead survival is also shorter than pacemaker lead survival, 97% vs 99% after 5 years (136)

The Medtronic Sprint Fidelis models were implanted in 727 cases in Sweden and the survival rate is 90% after 10 years vs 91.5% for the overall ICD lead group (135-137)

In the St Jude Riata models only a few failures have occurred so far (138-139)

### Patients

The ICD patient survival is markedly longer than for pacemaker patients, 82% after 5 years for ICD patients vs 64% for pacemaker patients. This being an effect partly of course due to the average implant age 65 vs 75 for patients at the first implant (148).

### CRT

#### Device longevity

The longevity of CRT devices are the lowest both among pacemakers and ICD's due to the higher energy requirements of a three lead system and generally higher thresholds on the LV lead. CRT-P survival is 96% after 5 years in general and CRT-D 87% after 5 years (150-151).

#### Patients

The heart failure patients also have the shortest expected survival rate among the PM and ICD patients. The difference between CRT-P and CRT-D patients are however surprisingly small in an unadjusted comparison (152-153).

The overall 1 year mortality in all device treated patients are given in table (154)

Fredrik Gadler  
Manager Swedish National ICD and Pacemaker Registry

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## STATISTICS – PACEMAKER

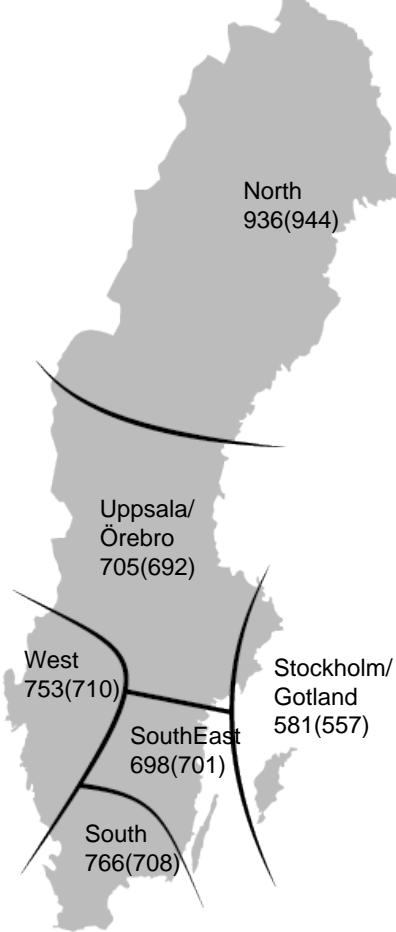
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## STATISTICS – PACEMAKER – IMPLANTS PER REGION

*The regions are based on where the patients live, not where they are treated*

Region	Population	No of first impl	No per million	Active patients
Stockholm/Gotland	2476140	1438	581	12183
Uppsala/Örebro	2141936	1510	705	13245
South-East Sweden	1083943	757	698	6102
Southern Sweden	1906213	1460	766	11288
Western Sweden	1943591	1464	753	11466
Northern Sweden	900503	843	936	6807
Total	10452326	7472	715	61091

Implants per million 2021(2020)



## STATISTICS – PACEMAKER – IMPLANTING HOSPITALS

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*First implants per hospital*

<b>Region</b>	<b>Hospital</b>	<b>2021</b>	<b>2020</b>
Northern Sweden	Norrlands Universitetssjukhus	170	174
	Skellefteå lasarett	32	49
	Sollefteå sjukhus	14	16
	Sunderby sjukhus	266	230
	Sundsvalls sjukhus	197	217
	Örnsköldsviks sjukhus	60	68
	Östersunds sjukhus	118	138
Southern Sweden	Blekingesjukhuset	169	162
	Centrallasarettet Växjö	129	108
	Centralsjukhuset Kristianstad	259	268
	Helsingborgs lasarett	221	181
	Länssjukhuset Halmstad	93	78
	Skånes universitetssjukhus, Lund	430	371
	Skånes universitetssjukhus, Malmö	182	199
South-East Sweden	Varbergs sjukhus	164	164
	Linköpings Universitetssjukhus	356	392
	Länssjukhuset Kalmar	137	120
	Länssjukhuset Ryhov	223	201
Stockholm/Gotland	Västerviks sjukhus	40	43
	Danderyds sjukhus	452	410
	Karolinska Universitetssjukhuset	393	432
	St Görans sjukhus	279	261
	Södersjukhuset	302	249
Uppsala/Örebro	Visby lasarett	25	32
	Akademiska sjukhuset	306	299
	Centralsjukhuset Karlstad	172	158
	Centralsjukhuset Västerås	151	148
	Falu lasarett	251	222
	Gävle sjukhus	190	199
	Hudiksvalls sjukhus	45	54
	Mälarsjukhuset	190	167
	Torsby sjukhus	27	35
	Universitetssjukhuset Örebro	182	190
Western Sweden	Alingsås lasarett	74	73
	Drottning Silvias Bus	1	10
	Kungälvs sjukhus	102	110
	Sahlgrenska Universitetssjukhuset	503	434
	Skaraborgs sjukhus Skövde	193	184
	Södra Älvsborgs sjukhus	192	163
	Trollhättan, NÄL	238	231

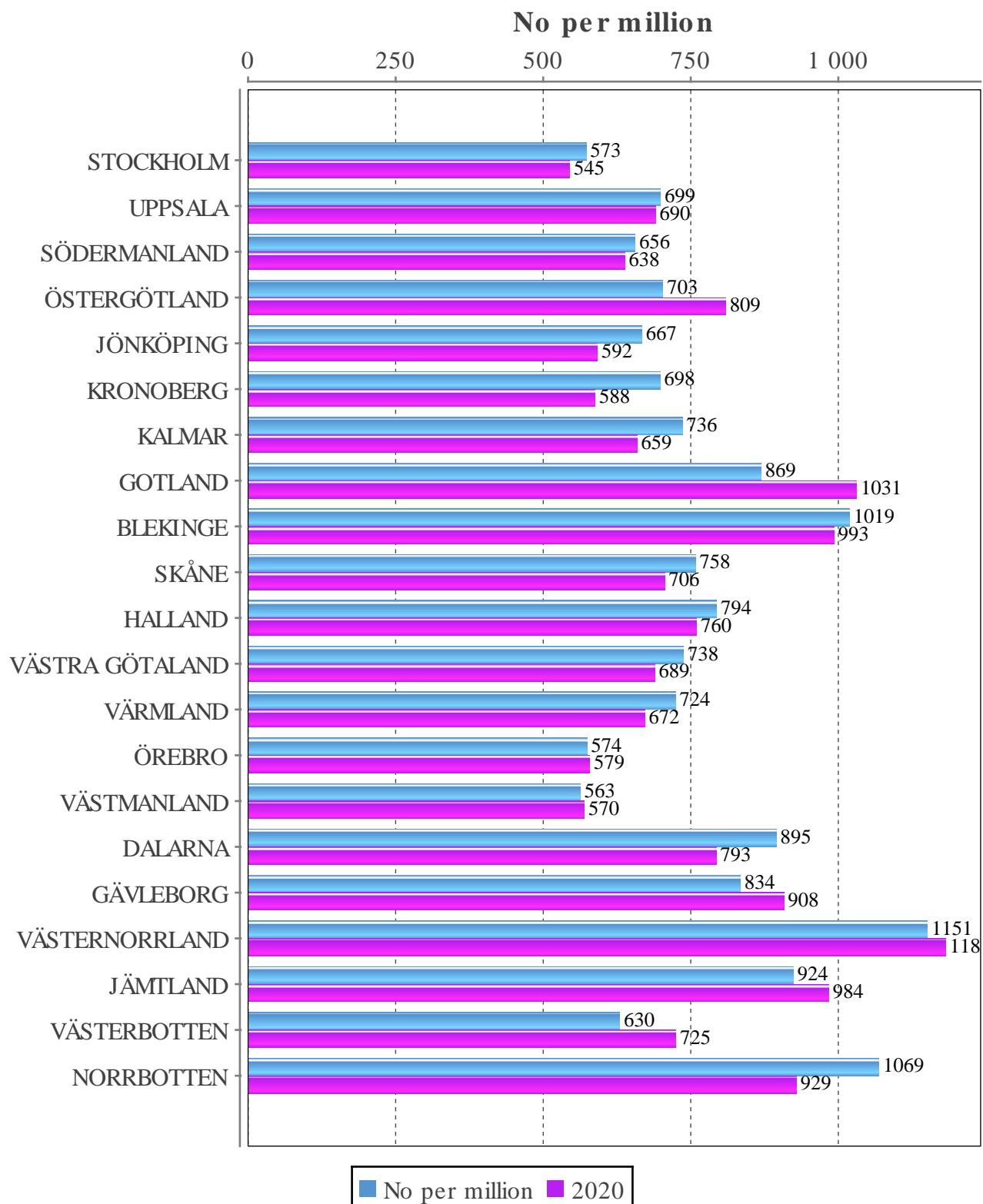
## STATISTICS – PACEMAKER – IMPLANTS PER COUNTY

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*The regions are based on where the patients live, not where they are treated*

County	Population	No of first	No per million	Active patients
STOCKHOLM	2415139	1385	573	11699
UPPSALA	395026	276	699	2295
SÖDERMANLAND	301801	198	656	1787
ÖSTERGÖTLAND	469704	330	703	2814
JÖNKÖPING	367064	245	667	1959
KRONOBERG	203340	142	698	1039
KALMAR	247175	182	736	1329
GOTLAND	61001	53	869	484
BLEKINGE	158937	162	1019	1189
SKÅNE	1402425	1063	758	8332
HALLAND	340243	270	794	1968
VÄSTRA GÖTALAND	1744859	1287	738	10226
VÄRMLAND	283196	205	724	1715
ÖREBRO	306792	176	574	1580
VÄSTMANLAND	278967	157	563	1462
DALARNA	288387	258	895	2005
GÄVLEBORG	287767	240	834	2401
VÄSTERNORRLAND	244193	281	1151	2114
JÄMTLAND	132054	122	924	1066
VÄSTERBOTTEN	274563	173	630	1717
NORRBOTTEN	249693	267	1069	1910
Total	10452326	7472	715	61091

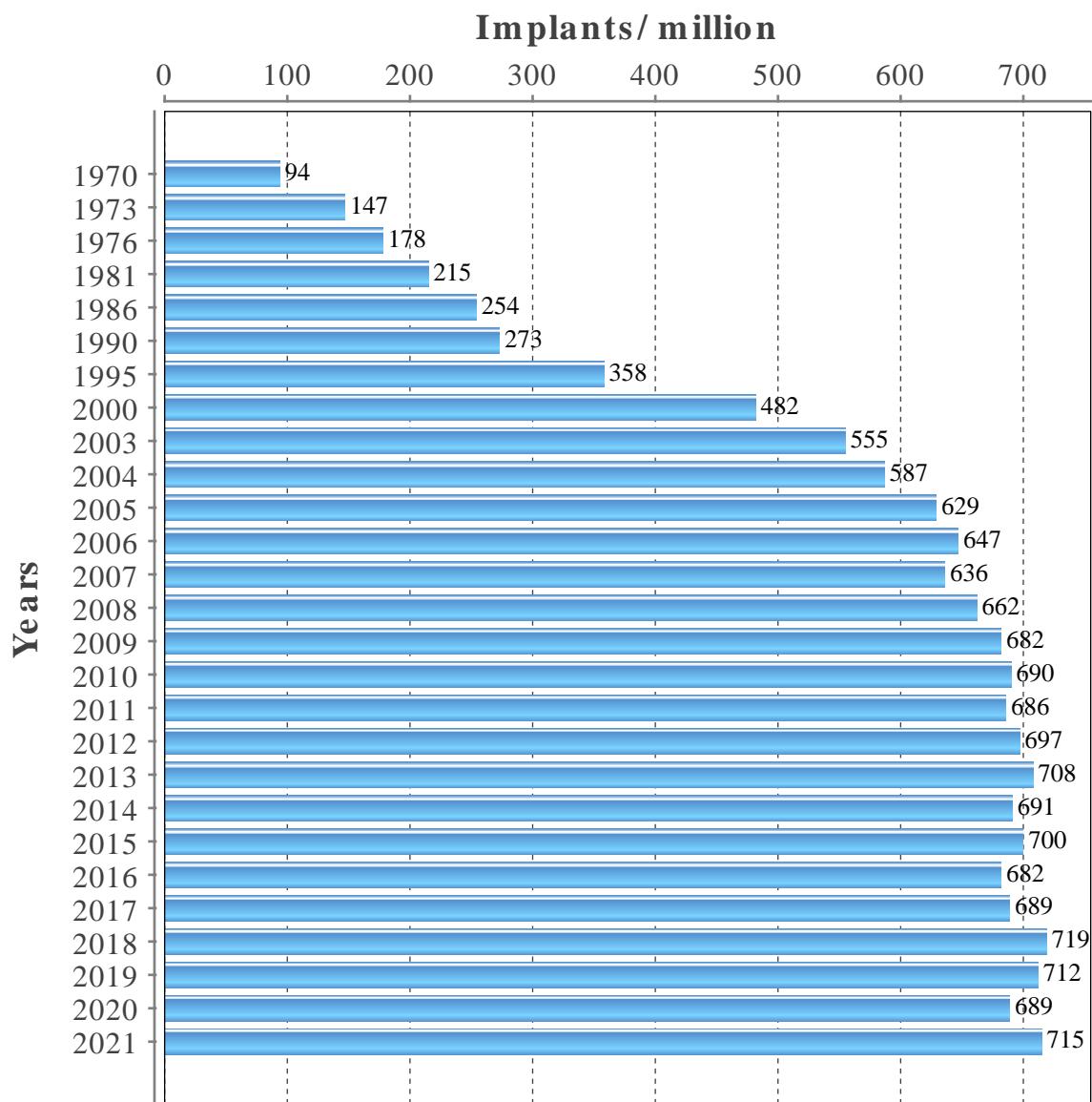
## STATISTICS – PACEMAKER – IMPLANTS PER COUNTY



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## STATISTICS – PACEMAKER – HISTORICAL IMPLANTATION RATES

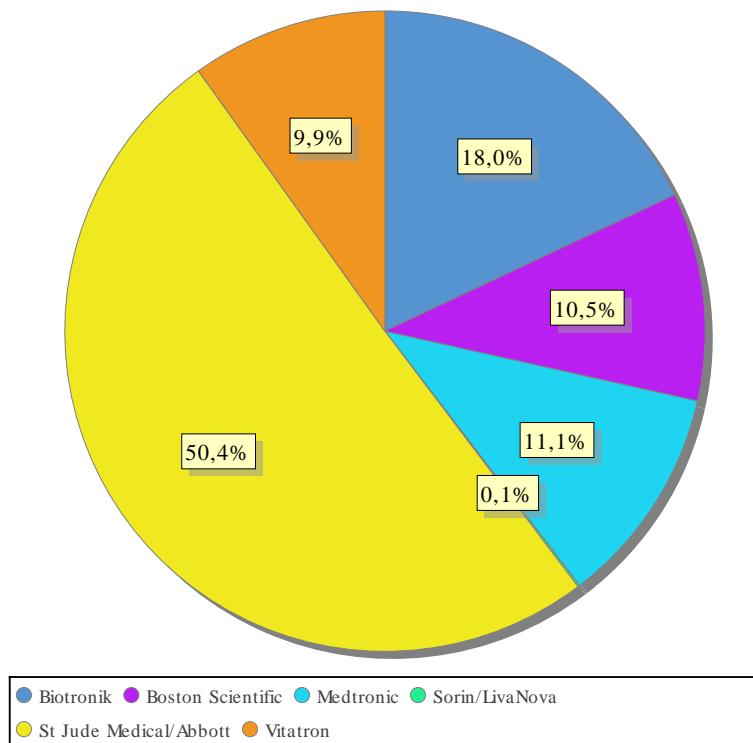
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## STATISTICS – PACEMAKER – PACEMAKERS PER MANUFACTURER

Market share per manufacturer in Sweden. Medtronic and Vitatron regarded as separate companies

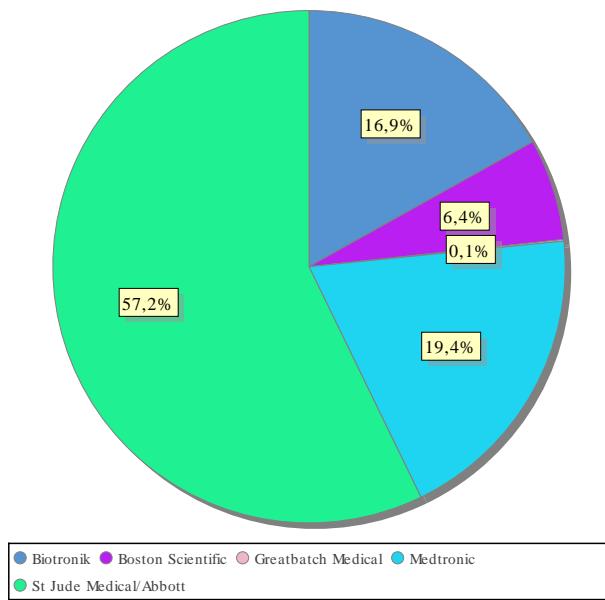
Manufacturer	2018 %	2019 %	2020 %	2021 %
Biotronik	18.9	18.2	19.1	18.0
Boston Scientific	10.2	11.5	11.8	10.5
Medtronic	11.5	11.3	10.4	11.1
Sorin/LivaNova	0.5	0.1	-	0.1
St. Jude Medical	48.7	48.1	48.4	50.4
Vitatron	10.2	4.9	10.3	9.9
Impulse Dynamics	-	-	-	-



## STATISTICS – PACEMAKER – LEADS PER MANUFACTURER

*Market share per manufacturer in Sweden. Medtronic and Viatron regarded as separate companies. From 2011 even including leads implanted in ICD systems.*

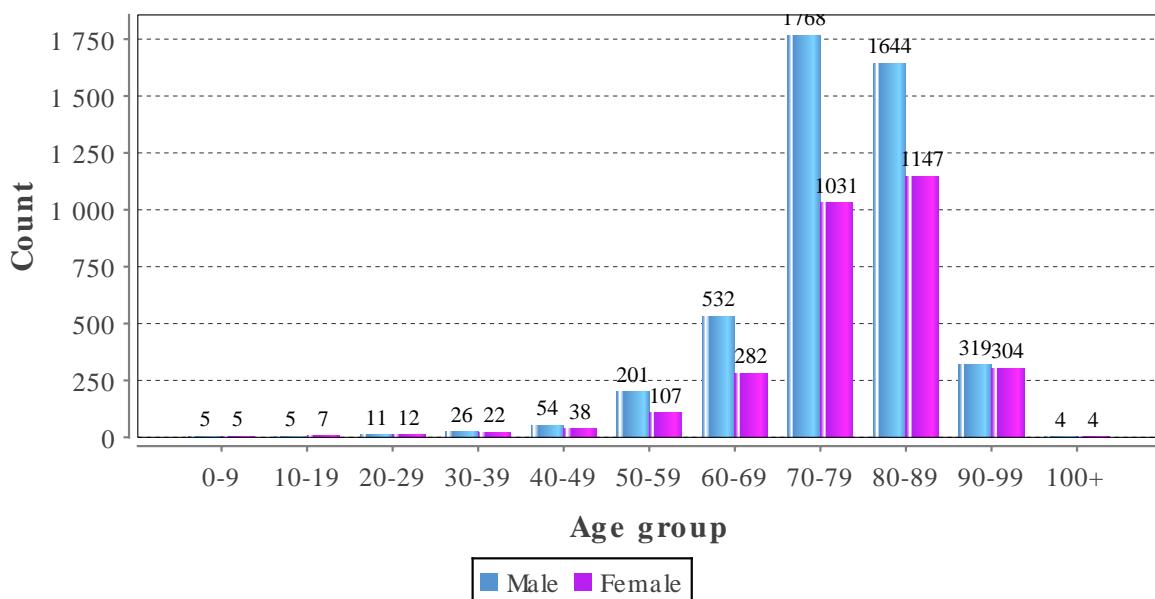
Manufacturer	2018 %	2019 %	2020 %	2021 %
Biotronik	13.7	15.3	17.6	16.9
Boston Scientific	9.1	8.7	8.7	6.4
Medtronic	22.2	23.2	20.1	19.4
St. Jude Medical	54.8	52.7	53.4	57.2
Sorin/LivaNova	0.1	-	-	-
Greatbatch Medical	-	-	0.1	0.1
Viatron	-	-	-	-



## STATISTICS – PACEMAKER – AGE DISTRIBUTION MALES/FEMALES

*Age and gender distribution for new implants, total numbers*

<b>Age (years)</b>	<b>Total no</b>	<b>%</b>	<b>Male</b>	<b>Female</b>
0-9	10	0.1	5	5
10-19	12	0.2	5	7
20-29	23	0.3	11	12
30-39	48	0.6	26	22
40-49	92	1.2	54	38
50-59	308	4.1	201	107
60-69	814	10.8	532	282
70-79	2799	37.2	1768	1031
80-89	2791	37.1	1644	1147
90-99	623	8.3	319	304
100+	8	0.1	4	4
Average age	77	0.0	77	78
Total number of implants: 7528				

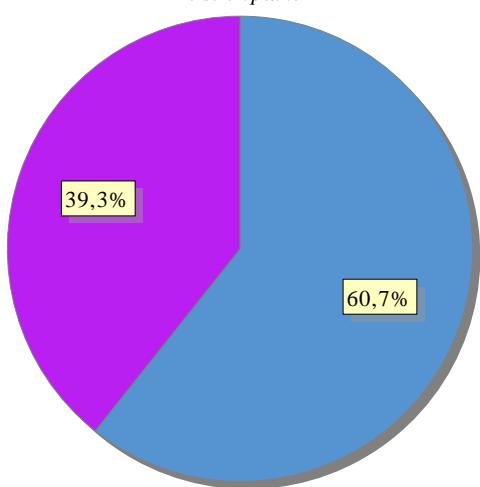


## STATISTICS – PACEMAKER – TYPE OF IMPLANTS

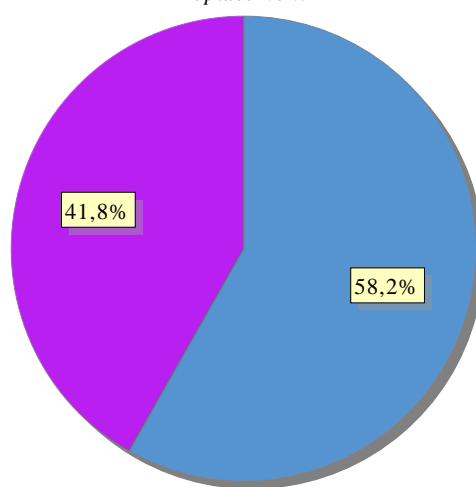
*Ratio of new implants versus generator changes*

	Total		Male		Female	
	no	%	no	%	no	%
First implant	7528	68.8	4569	60.7	2959	39.3
Replacement	3421	31.2	1990	58.2	1431	41.8
Total	10949	100.0	6559	59.9	4390	40.1

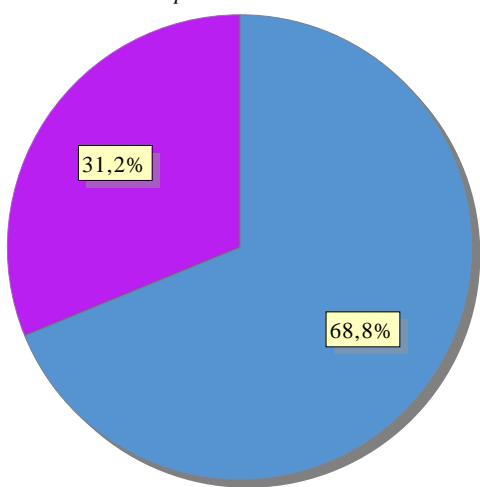
*First implant*



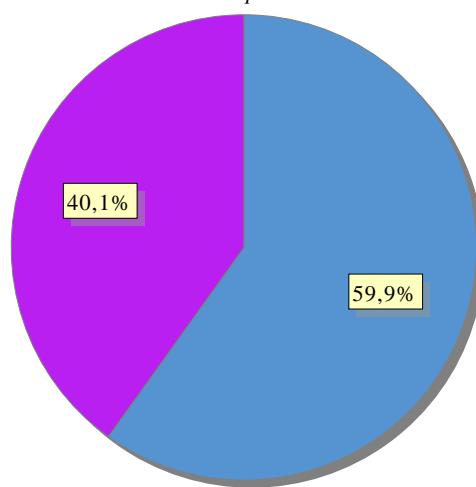
*Replacement*



*Replacement ratio*



*All implant*



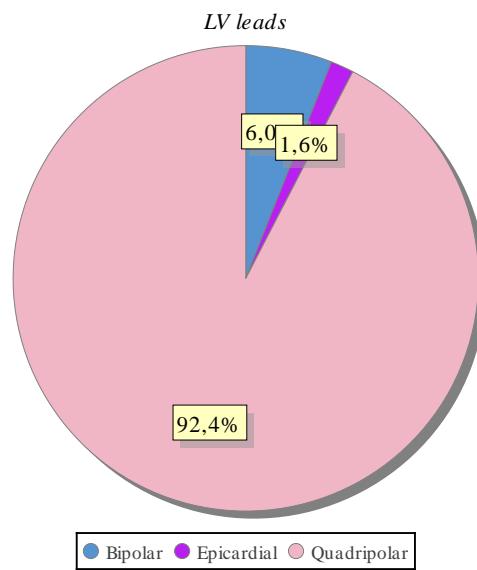
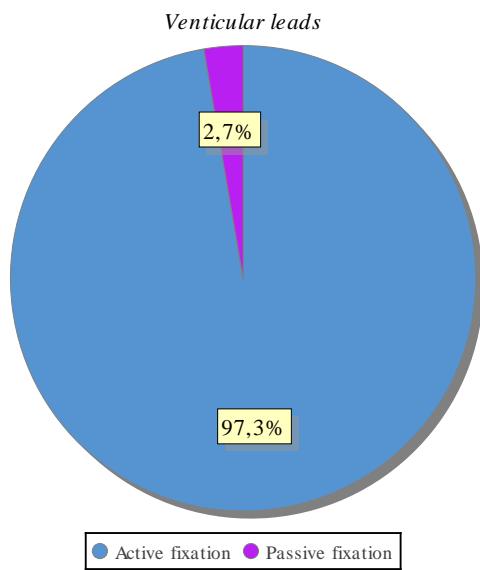
## STATISTICS – PACEMAKER – LEAD TYPES

*Lead type distribution for atrial and ventricular use for first implants and replacements including all pace leads, pace and ICD systems*

	Atrial		Ventricular		LV-lead	
	no	%	no	%	no	%
Bipolar	7440	99.7	7866	99.5	79	6.0
Epicardial	19	0.3	37	0.5	21	1.6
Quadripolar	-	-	3	-	1210	92.4

	Atrial		Ventricular		LV-lead	
	no	%	no	%	no	%
Active fixation	7450	99.9	7692	97.3	362	27.6
Passive fixation	10	0.1	215	2.7	948	72.4

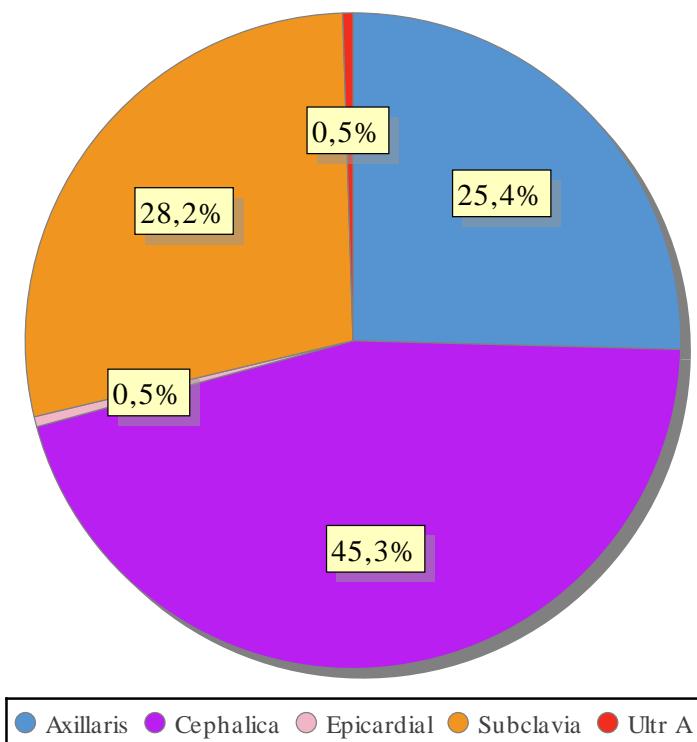
Total number of leads: 16677



## STATISTICS – PACEMAKER – LEAD ACCESS

*Venous access for first implants and replacements, all types of pace leads.*

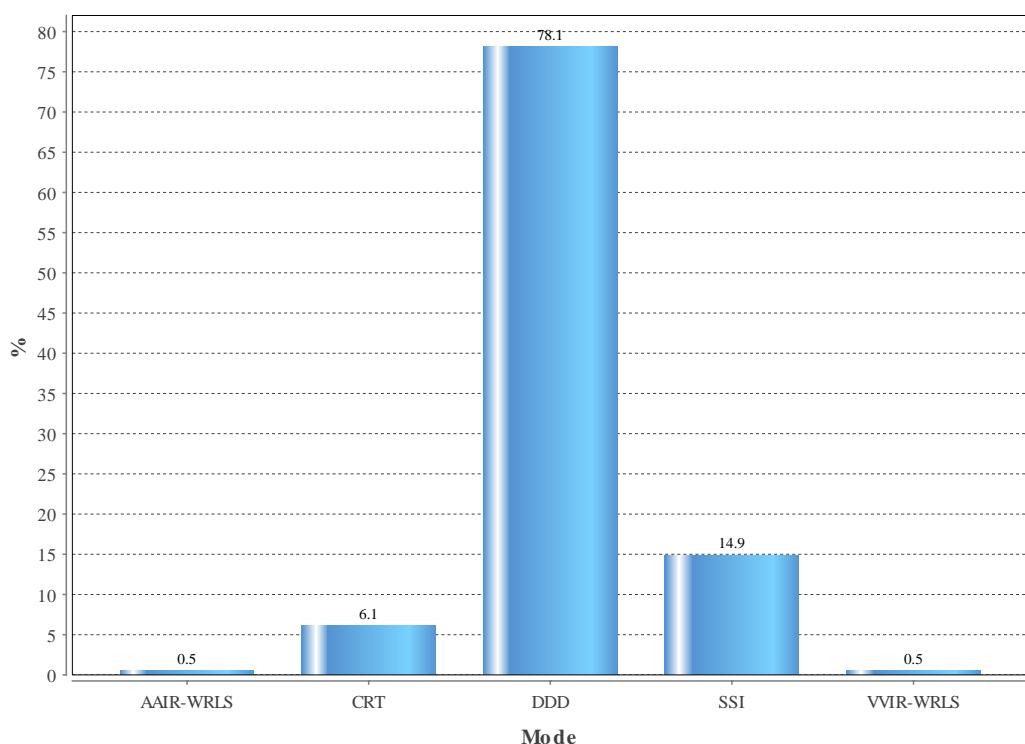
Lead access	No	%
Axillaris	4243	25.4
Cephalica	7552	45.3
Epicardial	80	0.5
Jugular	5	0.0
N/A	1	0.0
Other	2	0.0
Subclavia	4702	28.2
Ultr A	90	0.5
Ultr J	2	0.0



## STATISTICS – PACEMAKER – SUB TYPE

*Implants by subtype (WRLS: wireless)*

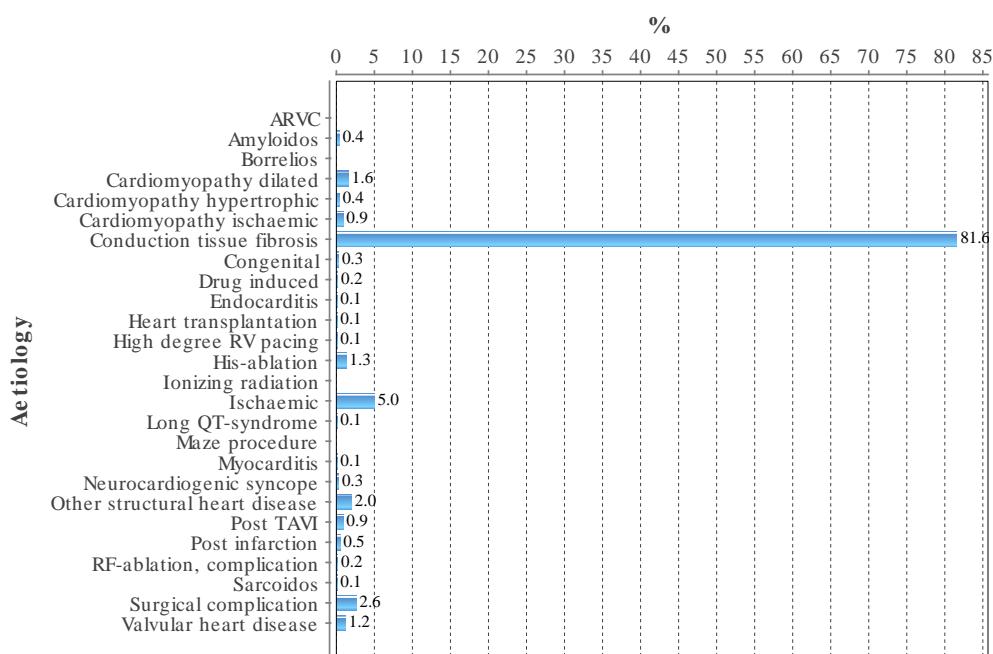
Mode	%	No
AAIR-WRLS	0.5	36
CRT	6.1	462
DDD	78.1	5878
SSI	14.9	1118
VVIR-WRLS	0.5	34
Total number of first implants 7528		



## STATISTICS – PACEMAKER - AETIOLOGY FIRST IMPLANT

*Main aetiology for implanting pacemakers*

<b>Aetiology</b>	<b>Total %</b>	<b>Male %</b>	<b>Female %</b>
ARVC	0.0	0.0	0.0
Amyloidos	0.4	0.5	0.2
Borrelios	0.0	0.0	0.0
Cardiomyopathy dilated	1.6	1.8	1.4
Cardiomyopathy hypertrophic	0.4	0.3	0.5
Cardiomyopathy ischaemic	0.9	1.2	0.3
Conduction tissue fibrosis	81.6	80.0	84.1
Congenital	0.3	0.3	0.4
Drug induced	0.2	0.1	0.3
Endocarditis	0.1	0.1	0.1
Heart transplantation	0.1	0.1	0.1
High degree RV pacing	0.1	0.1	0.0
His-ablation	1.3	0.9	2.0
Ionizing radiation	0.0	0.0	0.1
Ischaemic	5.0	6.5	2.8
Long QT-syndrome	0.1	0.0	0.1
Maze procedure	0.0	0.0	0.1
Myocarditis	0.1	0.1	0.1
Neurocardiogenic syncope	0.3	0.2	0.4
Other structural heart disease	2.0	2.0	2.1
Post TAVI	0.9	1.0	0.9
Post infarction	0.5	0.6	0.4
RF-ablation, complication	0.2	0.2	0.2
Sarcoidos	0.1	0.2	0.0
Surgical complication	2.6	2.8	2.2
Valvular heart disease	1.2	1.2	1.1



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## STATISTICS – PACEMAKER – SYSTEM UPGRADE

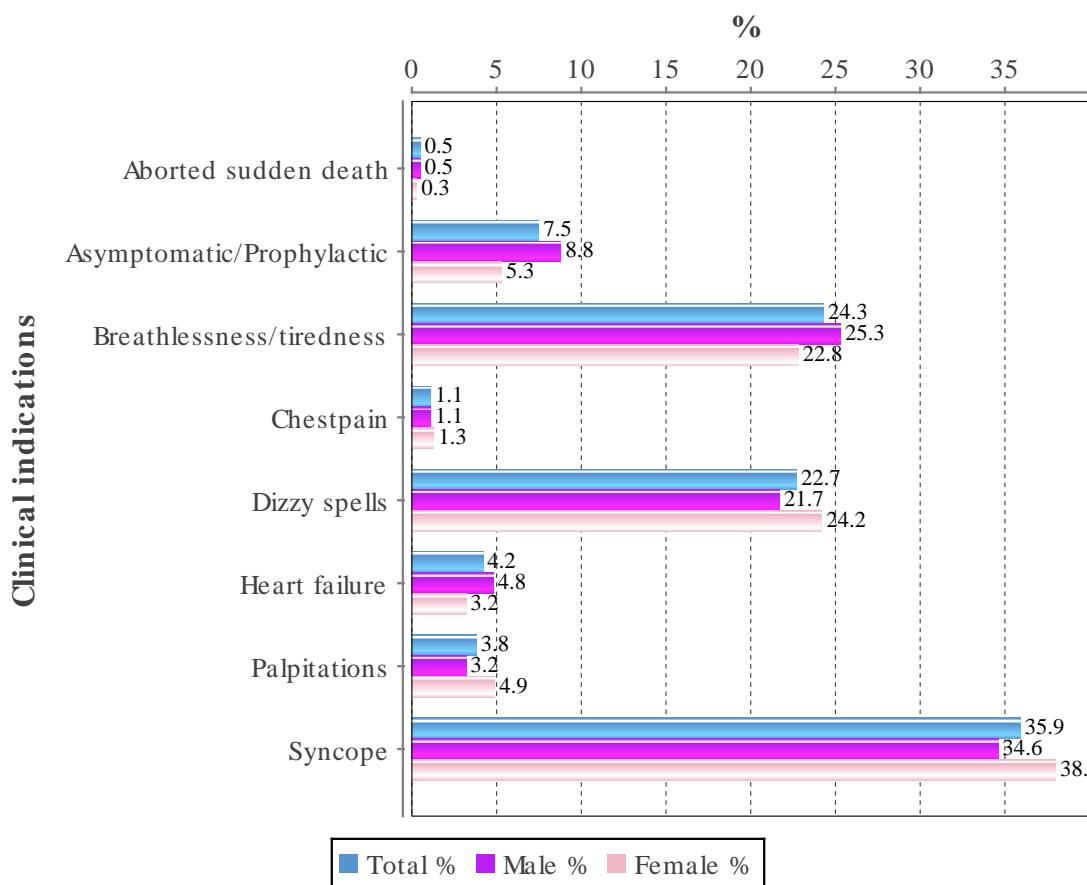
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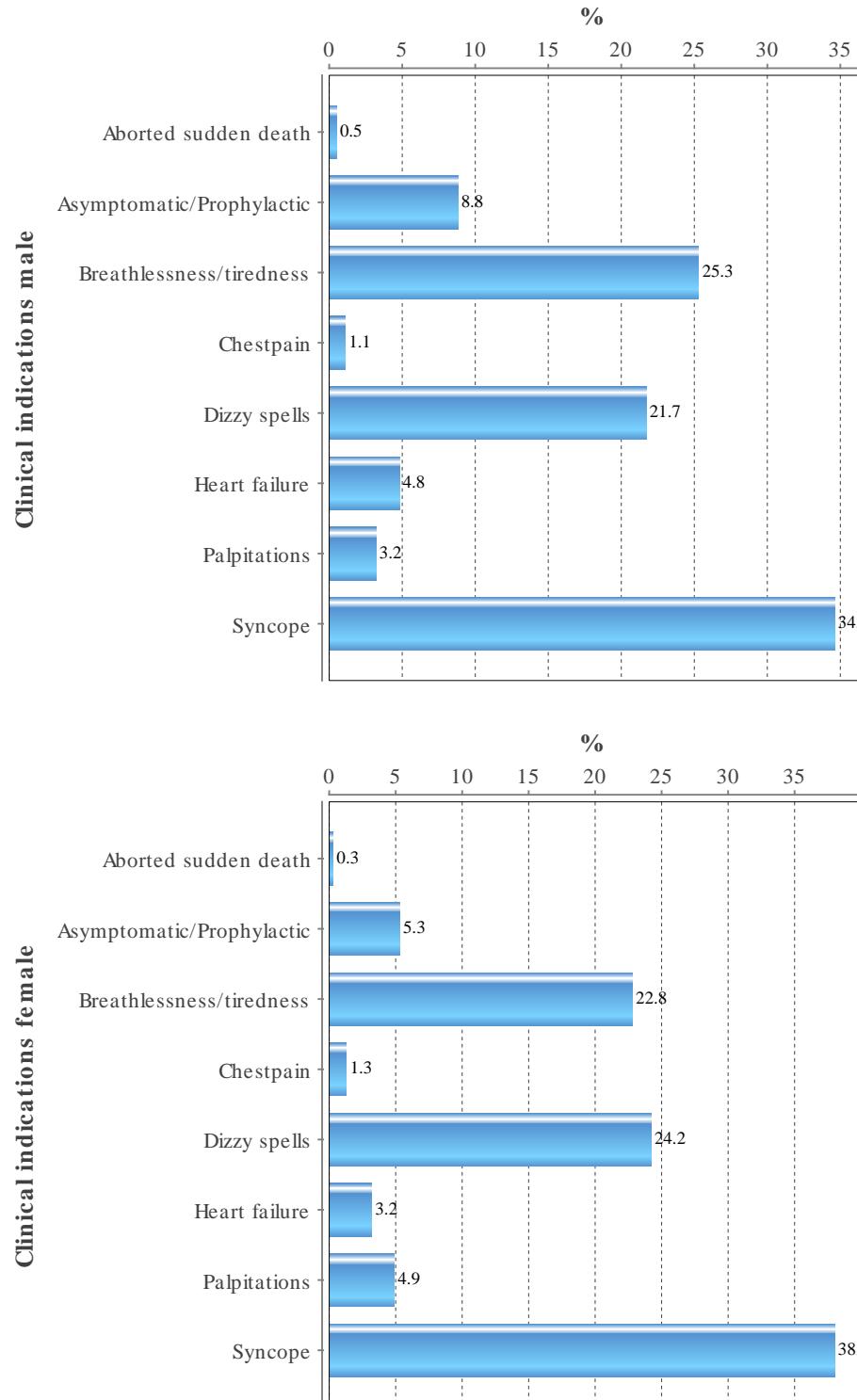
	2021	2020	2019	2018	2017	2016
VVI to VVIR	4	3	3	4	3	5
AAI/AAIR to DDD/DDDR	17	21	21	21	21	21
VVI/VVIR to DDD/DDDR	13	28	35	23	24	22
VVI/VVIR/DDD/DDDR to CRT	267	255	260	274	221	239

## STATISTICS – PACEMAKER – CLINICAL INDICATIONS FIRST IMPLANT

*Main symptom for implanting pacemakers*

Indication	Total %	Male %	Female %
Aborted sudden death	0.5	0.5	0.3
Asymptomatic/Prophylactic	7.5	8.8	5.3
Breathlessness/tiredness	24.3	25.3	22.8
Chestpain	1.1	1.1	1.3
Dizzy spells	22.7	21.7	24.2
Heart failure	4.2	4.8	3.2
Palpitations	3.8	3.2	4.9
Syncope	35.9	34.6	38.0



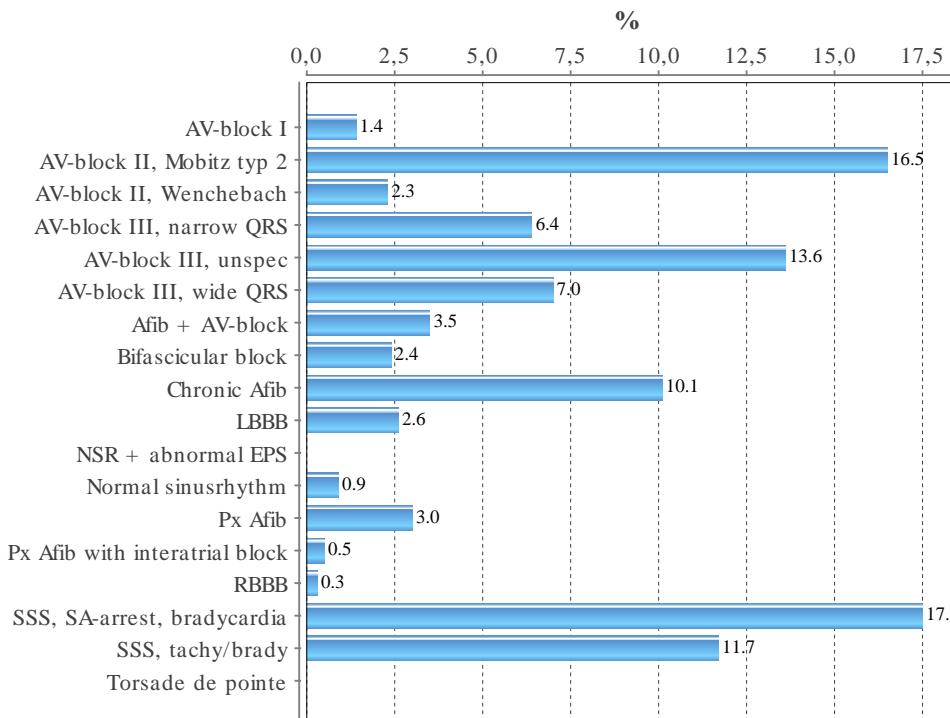


## STATISTICS – PACEMAKER – ECG INDICATION FIRST IMPLANT

*Main ECG indication, total*

Indication	%
AV-block I	1.4
AV-block II, Mobitz typ 2	16.5
AV-block II, Wenchebach	2.3
AV-block III, narrow QRS	6.4
AV-block III, unspec	13.6
AV-block III, wide QRS	7.0
Afib + AV-block	3.5
Bifascicular block	2.4
Chronic Afib	10.1
LBBB	2.6
NSR + abnormal EPS	0.0
Normal sinusrhythm	0.9
Px Afib	3.0
Px Afib with interatrial block	0.5
RBBB	0.3
SSS, SA-arrest, bradycardia	17.5
SSS, tachy;brady	11.7
Torsade de pointe	0.0

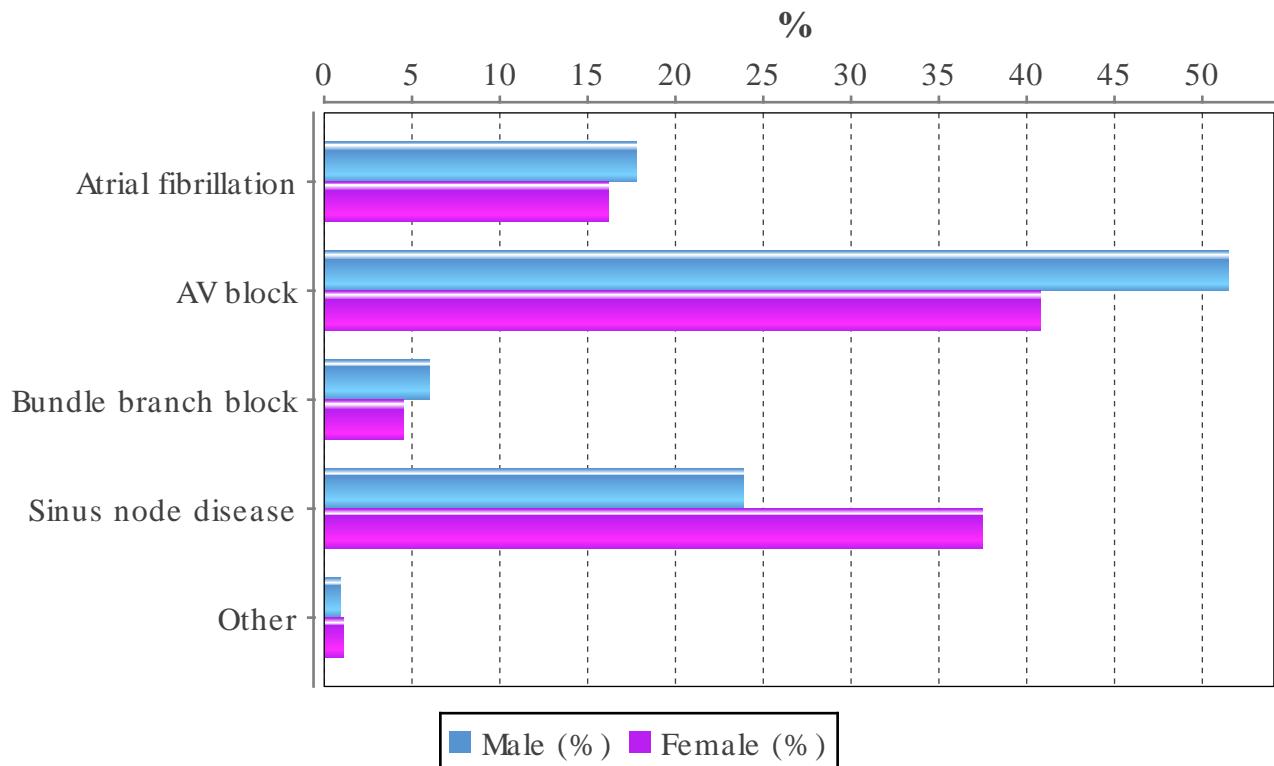
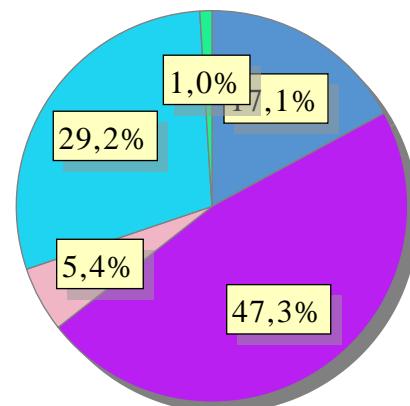
Clinical indications



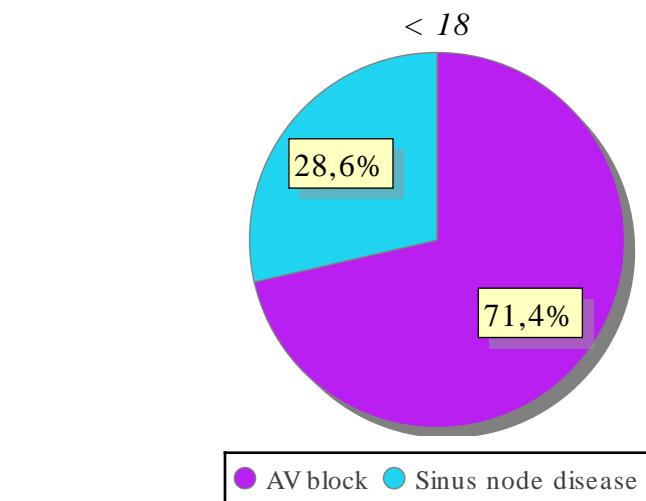
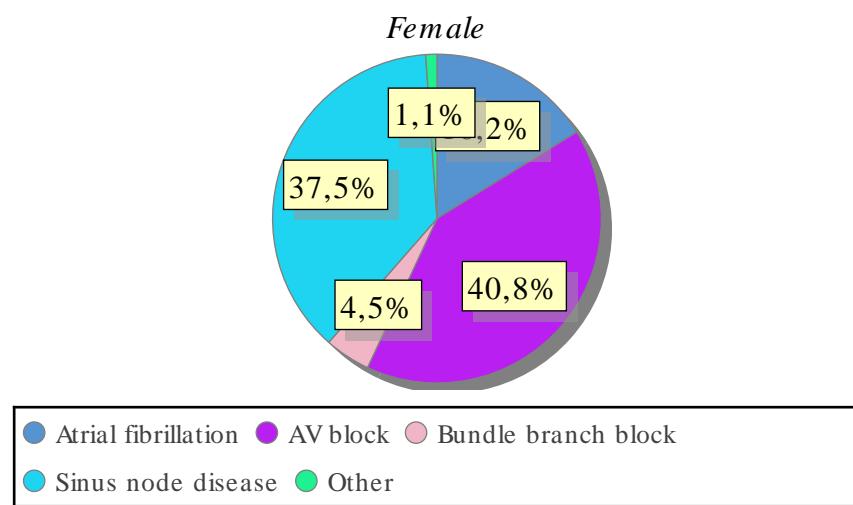
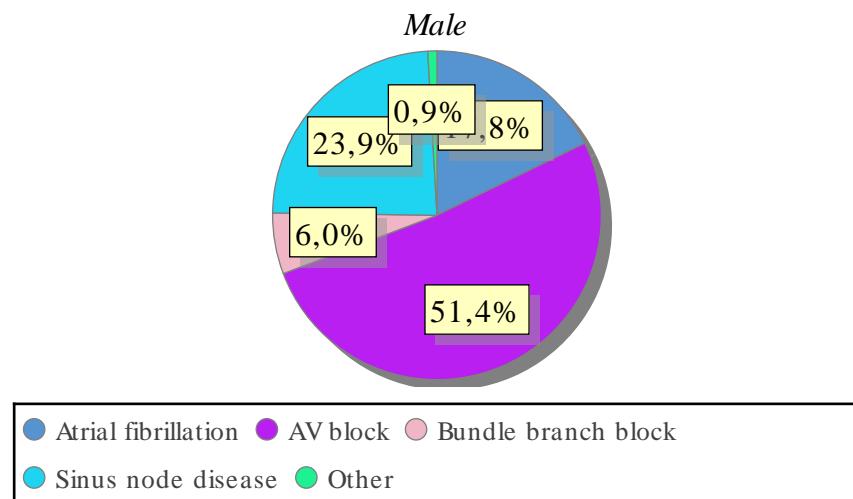
## STATISTICS – PACEMAKER - PREPACING ECG FIRST IMPLANT

*Main ECG indication by gender and for patients < 18 years of age*

<b>Indication</b>	<b>No</b>	<b>%</b>	<b>Male (%)</b>	<b>Female (%)</b>	<b>Younger than 18 (%)</b>
Atrial fibrillation	1290	17.1	17.8	16.2	0.0
AV block	3559	47.3	51.5	40.8	71.4
Bundle branch block	405	5.4	6.0	4.5	0.0
Sinus node disease	2200	29.2	23.9	37.5	28.6
Other	74	1.0	0.9	1.1	0.0
Total number of implants 7528					



## STATISTICS – PACEMAKER - PREPACING ECG FIRST IMPLANT

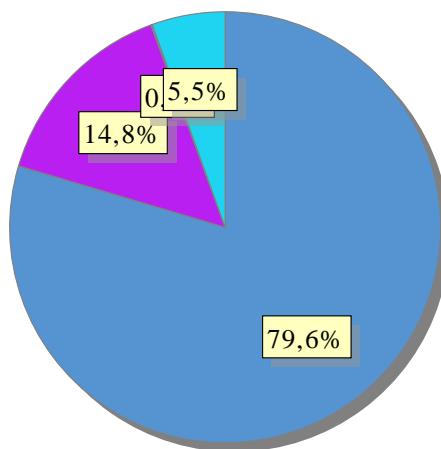


## STATISTICS – PACEMAKER – USE OF PACING MODES FIRST IMPLANT

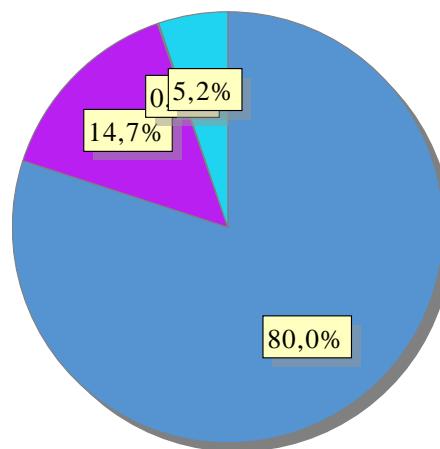
*Use of pacemaker subtype for all indications per hospital size (number of new implants/year and hospital)*

Size	Hospitals	DDD %	VVI %	AAI %	CRT %
Large	14	79.3	14.5	0.1	6.1
Medium	18	80.0	14.7	0.1	5.2
Small	8	78.9	20.5	0.6	0.0
Total	40	79.6	14.8	0.1	5.5

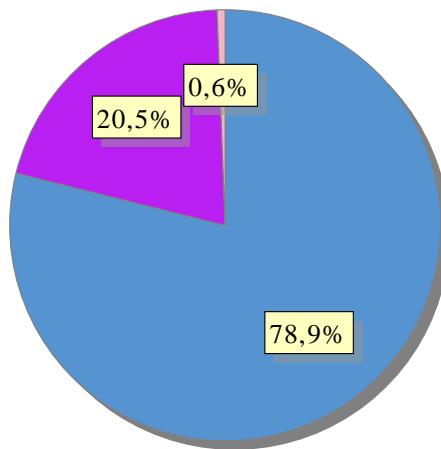
*All hospitals*



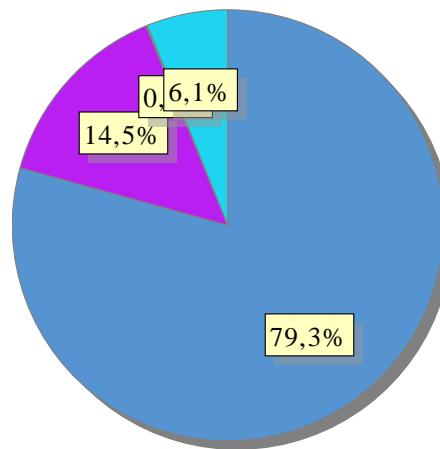
*Medium hospitals*



*Small hospitals*



*Large hospitals*



**STATISTICS – PACEMAKER – USE OF PACING  
MODES FIRST IMPLANT PER HOSPITAL**

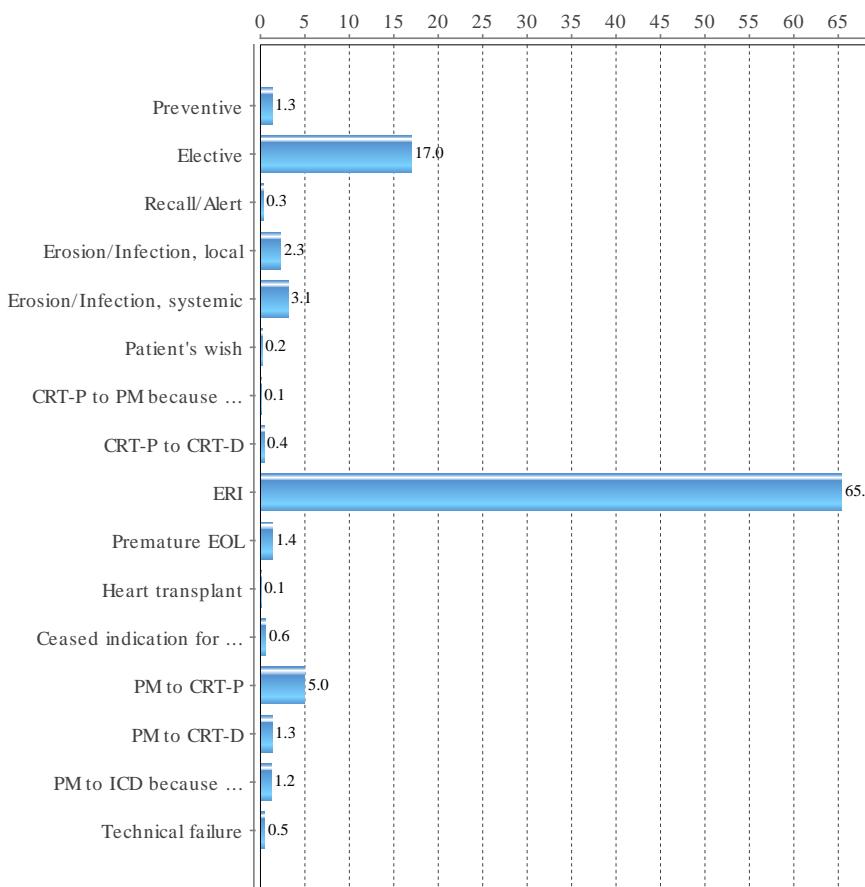
*Use of pacemaker sub type for all indications per hospital (number of new implants / year and hospital))*

Hospital	Number	DDD %	VVI %	AAI %	CRT %
Akademiska sjukhuset	306	81.0	14.7	0.0	4.2
Alingsås lasarett	74	78.4	18.9	2.7	0.0
Blekingesjukhuset	169	86.4	9.5	0.0	4.1
Centrallasarettet Växjö	129	88.4	7.8	0.0	3.9
Centralsjukhuset Karlstad	172	82.0	8.7	0.0	9.3
Centralsjukhuset Kristianstad	258	82.2	17.8	0.0	0.0
Centralsjukhuset Västerås	151	81.5	17.2	0.0	1.3
Danderyds sjukhus	452	80.8	13.7	0.0	5.5
Falu lasarett	251	75.7	17.5	0.0	6.8
Gävle sjukhus	190	74.2	20.0	0.0	5.8
Helsingborgs lasarett	221	77.8	19.9	0.0	2.3
Hudiksvalls sjukhus	45	73.3	26.7	0.0	0.0
Karolinska Universitetssjukhuset	391	77.0	13.6	0.5	9.0
Kungälvs sjukhus	102	79.4	20.6	0.0	0.0
Linköpings Universitetssjukhus	356	77.5	11.0	0.0	11.5
Länssjukhuset Halmstad	93	82.8	17.2	0.0	0.0
Länssjukhuset Kalmar	118	66.1	28.0	0.0	5.9
Länssjukhuset Ryhov	223	81.2	18.8	0.0	0.0
Mälarsjukhuset	190	83.2	9.5	0.0	7.4
Norrlands Universitetssjukhus	168	80.4	12.5	0.6	6.5
Sahlgrenska Universitetssjukhuset	466	79.0	13.7	0.4	6.9
Skaraborgs sjukhus Skövde	193	70.5	10.4	0.0	19.2
Skellefteå lasarett	32	81.3	18.8	0.0	0.0
Skånes universitetssjukhus, Lund	419	78.5	8.6	0.5	12.4
Skånes universitetssjukhus, Malmö	181	82.9	17.1	0.0	0.0
Söllefteå sjukhus	14	78.6	21.4	0.0	0.0
St Görans sjukhus	279	85.3	12.5	0.0	2.2
Sunderby sjukhus	266	76.7	18.8	0.0	4.5
Sundsvalls sjukhus	197	85.3	12.2	0.0	2.5
Södersjukhuset	302	79.5	16.2	0.3	4.0
Södra Älvborgs sjukhus	192	77.6	15.1	0.5	6.8
Torsby sjukhus	27	70.4	29.6	0.0	0.0
Trollhättan, NÄL	238	73.9	22.7	0.0	3.4
Universitetssjukhuset Örebro	182	83.0	16.5	0.0	0.5
Varbergs sjukhus	164	81.7	9.8	0.0	8.5
Visby lasarett	25	84.0	16.0	0.0	0.0
Västerviks sjukhus	40	80.0	20.0	0.0	0.0
Örnsköldsviks sjukhus	60	83.3	16.7	0.0	0.0
Östersunds sjukhus	118	83.9	10.2	0.0	5.9

## STATISTICS – PACEMAKER – REASON FOR GENERATOR EXPLANT

*Reason for generator explant. Elective used for changes performed before reached ERI/EOL.*

Reason	All hospitals %	(large) %	(medium) %	(small) %
Preventive	1.3	0.9	2.0	1.1
Elective	17.0	11.9	25.9	8.4
Recall/Alert	0.3	0.4	0.1	0.0
Erosion/Infection, local	2.3	3.0	1.2	1.6
Erosion/Infection, systemic	3.1	4.4	1.5	1.6
Patient's wish	0.2	0.2	0.1	0.5
CRT-P to PM because discontinued	0.1	0.0	0.1	0.0
CRT-indication				
CRT-P to CRT-D	0.4	0.4	0.4	0.0
ERI	65.4	67.2	60.3	83.2
Premature EOL	1.4	1.7	1.0	1.1
Heart transplant	0.1	0.1	0.0	0.0
Ceased indication for PM therapy	0.6	0.8	0.3	1.1
PM to CRT-P	5.0	5.9	4.2	0.0
PM to CRT-D	1.3	1.4	1.1	1.1
PM to ICD because of arrhythmia	1.2	1.3	1.1	0.5
Technical failure	0.5	0.5	0.6	0.0



## STATISTICS – PACEMAKER – REASON FOR GENERATOR CHANGE HISTORICAL

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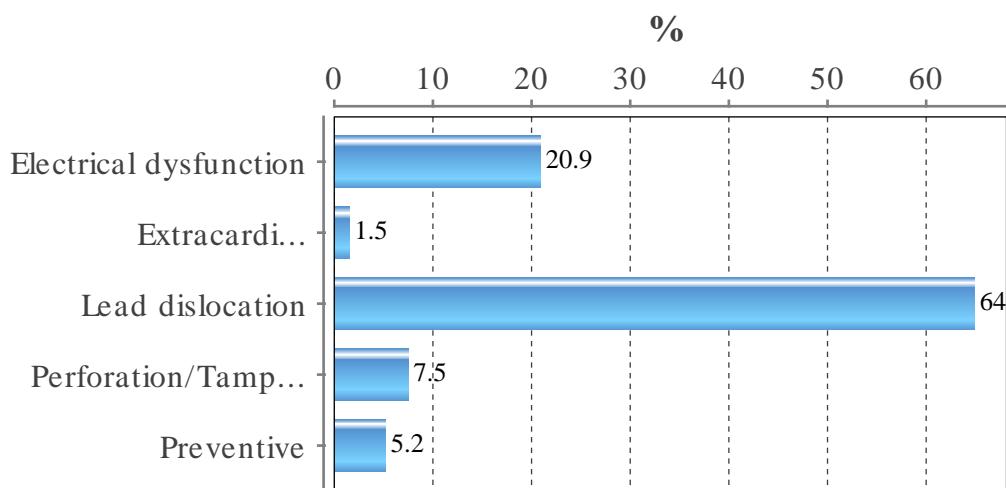
### *Historical explant indications*

Reason	2017 %	2018 %	2019 %	2020 %	2021 %
Preventive	3.7	2.1	2.7	1.7	1.3
Elective	12.6	13.7	15.9	18.1	17.0
System change hemodynamic	0.7	0.9	0.2	0.0	0.0
Recall/Alert	0.0	0.1	0.2	0.2	0.3
Erosion/Infection, local	2.8	2.7	2.0	2.1	2.3
Erosion/Infection, systemic	3.5	3.8	3.3	3.0	3.1
Patient's wish	0.4	0.1	0.1	0.1	0.2
CRT-P to CRT-D	0.6	0.5	0.8	0.3	0.4
ERI	66.4	66.2	65.9	64.5	65.4
Premature EOL	0.8	0.6	0.7	1.6	1.4
Ceased indication for PM therapy	0.3	0.5	0.2	0.3	0.6
PM to CRT-P	4.9	5.6	5.1	4.5	5.0
PM to CRT-D	1.9	2.0	1.5	1.9	1.3
PM to ICD because of arrhythmia	1.2	0.9	0.9	1.1	1.2
Technical failure	0.1	0.2	0.4	0.4	0.5
CRT-P to PM because of discontinued CRT-indication	0.0	0.1	0.0	0.1	0.1
Heart transplant	0.0	0.1	0.1	0.1	0.1

## STATISTICS – PACEMAKER – REASON FOR LEAD CORRECTION

*Reason for lead correction/reoperation by hospital size (number of new implants/year and hospital) Electrical dysfunction including undersense and threshold increase.*

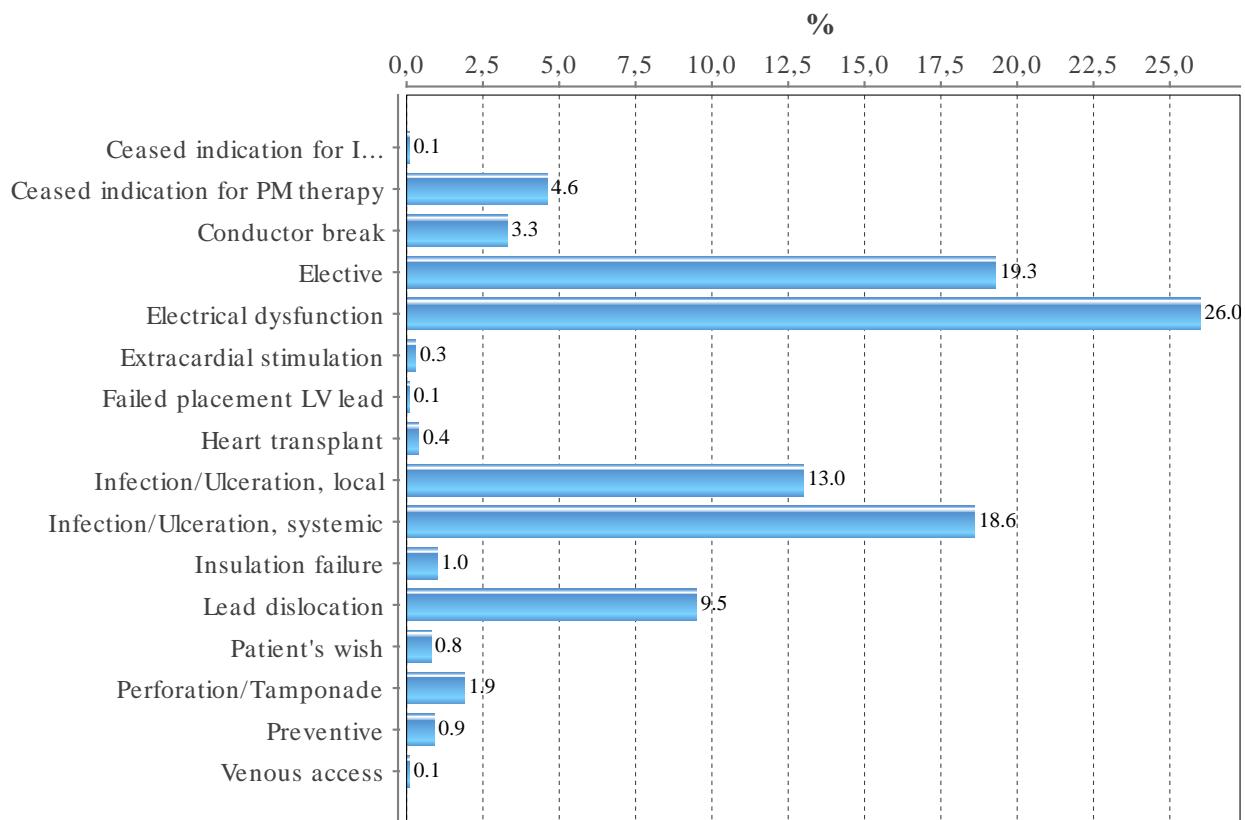
Reason	All hospital (%)	Small (%)	Medium (%)	Large (%)
Electrical dysfunction	20.9	18.2	18.0	23.3
Extracardial stimulation	1.5	0.0	2.0	1.4
Lead dislocation	64.9	63.6	66.0	64.4
Perforation/Tamponade	7.5	0.0	4.0	11.0
Preventive	5.2	18.2	10.0	0.0
				Total no 134



## STATISTICS – PACEMAKER – REASON FOR LEAD EXPLANT

*Reason for lead explants by hospital size. (number of new implants/year and hospital)*

Reason	All hospitals (%)	Small (%)	Medium (%)	Large (%)
Ceased indication for ICD therapy	0.1	-	-	0.1
Ceased indication for PM therapy	4.6	4.5	6.3	3.9
Conductor break	3.3	18.2	3.5	2.4
Elective	19.3	22.7	24.1	17.2
Electrical dysfunction	26.0	22.7	29.5	24.8
Extracardial stimulation	0.3	-	0.3	0.4
Failed placement LV lead	0.1	-	-	0.1
Heart transplant	0.4	-	-	0.6
Infection/Ulceration, local	13.0	9.1	4.8	16.5
Infection/Ulceration, systemic	18.6	13.6	13.3	21.0
Insulation failure	1.0	-	1.3	1.0
Lead dislocation	9.5	6.8	12.4	8.5
Patient's wish	0.8	-	1.0	0.8
Perforation/Tamponade	1.9	-	2.2	1.9
Preventive	0.9	2.3	1.3	0.6
Venous access	0.1	-	-	0.1
<b>Total no 1149</b>				



## STATISTICS – PACEMAKER – OPERATORCODE FOR IMPLANTS

*Procedures per operator (exclusive CRT)*

Hospital	Operator	No
Akademiska sjukhuset	Arvanitis	75
	Falasca Zamponi	143
	Grinnemo	1
	Lindblom	1
	Schiller	3
	Sciaraffia	115
	Teder	89
	Zemgulis	3
Alingsås lasarett	Anders Holmdahl	43
	Westerberg	63
Arvika sjukhus	Annan	1
Ålands centralsjukhus	Ove Carlström	1
	Slotte	35
Blekingesjukhuset	Anders Ericsson	24
	Genadi Kaninski	28
	Jan-Olov Borg	40
	Martin Stefanik	59
	Michael Ringborn	64
	Nicoleta Sora	17
	Per Landelius	9
Centrallasarettet Växjö	Annan	41
	Carin Pålman	27
	Johansson P	13
	Jonasson	20
	Rosén Helena	22
	Strandberg	29
Centralsjukhuset Karlstad	Khalili	78
	Niklas Aldergård	75
	Saidi	92
Centralsjukhuset Kristianstad	Babiak	78
	Bakos	136
	Östenson	19
	Tudor	93
Centralsjukhuset Västerås	Amra Kåregren	24
	Johanna Sandström	24
	SkoglundAndersson	86
	Wiberg	80
Danderyds sjukhus	1	149
	2	155
	3	122
	4	183
Drottning Silvias Bus	Hallhagen	1
	Hans Lidén	6
	Oskar Väärt	3
	Synnergren	2
Falu lasarett	Monheim	119

Hospital	Operator	No
	Svedberg	3
	Berglund	82
	Forsgren	120
	Niclas Svedberg	40
Gävle sjukhus	Falck	4
	Kastberg	91
	Kris Lutter	32
	Magnusson Peter	62
	Mati Jalakas	77
Helsingborgs lasarett	Bläckberg	110
	Hammarlund	1
	Jacobsson	45
	Rorsman	69
	Utter	86
Hudiksvalls sjukhus	Roussinne	69
Karolinska Universitetssjukhus	Annan	5
	Gadler	171
	Hörnsten	149
	Reistam	120
	Reistam/Hörnsten	1
	Ståhlberg/Gadler	3
	Ståhlberg/Hörnsten	16
	Ståhlberg/Reistam	10
Kungälvs sjukhus	Annan	3
	Ansari	11
	Liakatsidas	19
	Schultz	108
Länssjukhuset Halmstad	Martin Löfgren	82
	Rikard Berggren	61
Länssjukhuset Kalmar	David Olsson	76
	Hendrik Schreyer	78
	Jörg Carlsson	19
Länssjukhuset Ryhov	Lagerberg	136
	Stefanik	1
	Stumpf	118
	Walid El-Saadi	61
Linköpings universitetssjukhus	Pinna C	96
	Säfström K	94
	Sonesson L	129
	Svenson A	65
	Szymanowski A	43
Mälarsjukhuset	Carl Westholm	51
	Georgios Matthaiou	57
	Kave Keshavarz	78
	Linda Årlehag	78

## STATISTICS – PACEMAKER – OPERATORCODE FOR IMPLANTS

Hospital	Operator	No
Norrlands Universitetssjukhus	Andersson	58
	Annan	8
	Erik Benedik	6
	Höglund	11
	Ioannis Katsoularis	26
	Jensen	20
	Kesek	25
	Landström	22
	Lauri Salonen	18
	Rönn	24
Örnsköldsviks sjukhus	Ehlin	27
	Meidell	52
Östersunds sjukhus	Björklund	28
	Björklund Friberg	2
	Christian Gjessing	33
	Friberg	85
	Friberg/Gjessing	1
	Payam Khalili	2
Sahlgrenska universitetssjukhuset	Alice David	79
	Amar Taha	134
	Annan	4
	Gäbel/ Szamlewski	2
	Jakob Gäbel	3
	Konstantinos Liakatsidas	58
	Nicola Heinze	96
	Piotr Szamlewski	136
	Shabbar Jamaly	89
	Stefan Jakobsson	90
Skaraborgs sjukhus Skövde	Anna Widunder	56
	Annan	13
	Falmer	4
	Joel Wallén	2
	Lorentzen	83
	Paulsson	44
	Winterfeldt	70
Skånes universitetssjukhus, Lund	Annan	6
	David Mörtsell	40
	Erik Ljungström	1
	Johan Brandt	128
	LingWei Wang	99
	Maiwand Farouq	32

Hospital	Operator	No
	Patrycja Näsgaard	5
	Pyotr Platonov	22
	Rasmus Borgquist	47
	Steen Jensen	15
	Uzma Chaudhry	131
Skånes universitetssjukhus, Malmö	Annan	92
	Johan Brandt	2
	Maiwand Farouq	38
	Torbjörn Persson	92
Skellefteå lasarett	E Bygdén	19
	G Lindqvist	6
	K Lindqvist	12
	L Hedlund	23
Söllefteå sjukhus	Åström	4
	Regberg	1
	Rudenstam	24
Södersjukhuset	Jonsson J-E	97
	Kjellman B	122
	Olson J	95
	Rydlund K	85
	Scorza R	4
Södra Älvborgs sjukhus	Heinze	35
	Lodin	61
	Riemer	67
	Widfeldt	51
St Görans sjukhus	1	153
	1+2	2
	2	128
	3	127
Sunderby sjukhus	Agneta Johansson	128
	Annica Wennberg	65
	Marcus Baas	65
	Peter Johansson	2
	Peter Rangson	91
Sundsvalls sjukhus	Benedik Erik	74
	Haupt Jan	14
	Hayder Kadhim	136
	Sundelin Torbjörn	7
	Teder Priit	26
Torsby sjukhus	Bentjerodt	42
Trollhättan, NÄL	Enander	56
	Jabbar	42
	Javid	83
	Orsolya Bene	102

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## STATISTICS – PACEMAKER – OPERATORCODE FOR IMPLANTS

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Hospital	Operator	No
Universitetssjukhuset Örebro	Per-Ola Enander	2
	Söderbergh	23
	Wetterling	47
Varbergs sjukhus	Anna Björkenheim	129
	Annan	1
	Emanuel Frimodig	22
	Lindell	153
Västerviks sjukhus	Andersson	1
	Emma Sandgren	49
	Rorsman	139
	Verstraaten	9
Visby lasarett	Emil Tomov	39
	Joachim Starck	17
	Petter Hollertz	1
Visby lasarett	Gadler	15
	Jacobsson L	28

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## STATISTICS – ICD

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## STATISTICS – ICD – IMPLANTING HOSPITALS

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*First implants per hospital (inclusive CRT)*

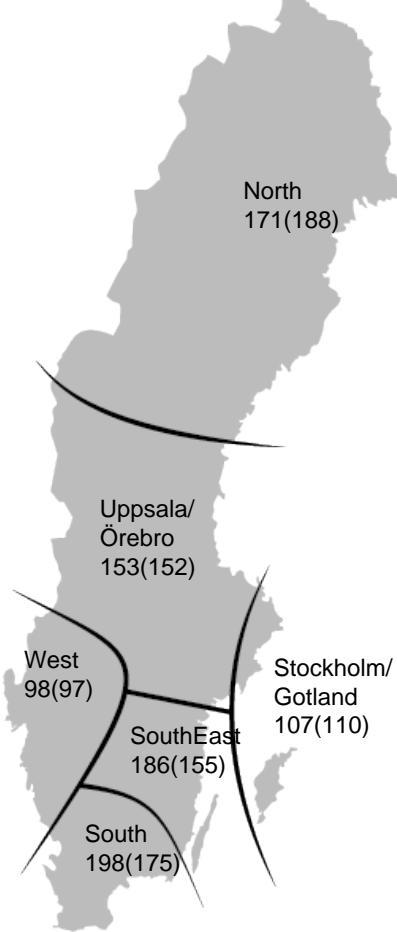
<b>Region</b>	<b>Hospital</b>	<b>2021</b>	<b>2020</b>
Northern Sweden	Norrlands Universitetssjukhus	33	42
	Skellefteå lasarett	2	2
	Sunderby sjukhus	42	59
	Sundsvalls sjukhus	46	41
	Örnsköldsviks sjukhus	17	5
	Östersunds sjukhus	17	25
Southern Sweden	Blekingesjukuset	50	48
	Centrallasarettet Växjö	17	15
	Centralsjukhuset Kristianstad	31	0
	Helsingborgs lasarett	27	22
	Skånes universitetssjukhus, Lund	181	185
	Skånes universitetssjukhus, Malmö	36	40
South-East Sweden	Varbergs sjukhus	69	47
	Linköpings Universitetssjukhus	109	83
	Länssjukhuset Kalmar	48	54
Stockholm/Gotland	Länssjukhuset Ryhov	46	31
	Danderyds sjukhus	70	61
	Karolinska Universitetssjukhuset	122	141
	St Görans sjukhus	34	41
Uppsala/Örebro	Södersjukhuset	45	36
	Akademiska sjukhuset	54	46
	Centralsjukhuset Karlstad	37	40
	Centralsjukhuset Västerås	43	25
	Falu lasarett	52	66
	Gävle sjukhus	50	57
Western Sweden	Hudiksvalls sjukhus	8	9
	Mälarsjukhuset	42	34
	Universitetssjukhuset Örebro	40	40
	Sahlgrenska Universitetssjukhuset	67	68
	Skaraborgs sjukhus Skövde	30	29
	Södra Älvsborgs sjukhus	28	33
	Trollhättan, NÄL	39	31

## STATISTICS – ICD – IMPLANTS PER REGION

*The regions are based on where the patients live, not where they are treated*

Region	Population	No of first impl	No per million	Active patients
Stockholm/Gotland	2476140	265	107	2887
Uppsala/Örebro	2141936	327	153	3220
South-East Sweden	1083943	202	186	1558
Southern Sweden	1906213	377	198	2833
Western Sweden	1943591	191	98	1962
Northern Sweden	900503	154	171	1601
Total	10452326	1516	145	14061

Implants per million 2021(2020)



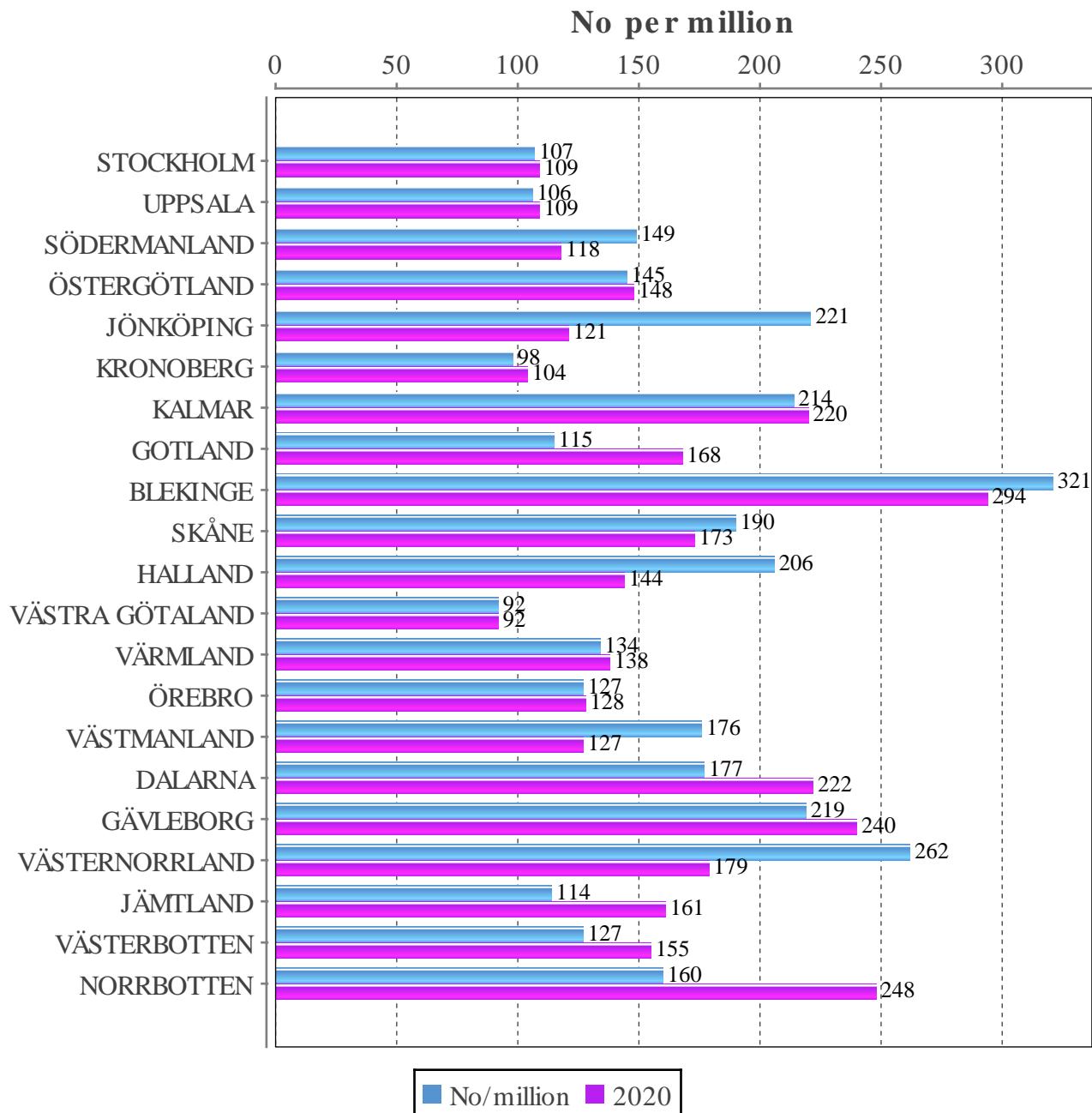
## STATISTICS – ICD – IMPLANTS PER COUNTY

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*The regions are based on where the patients live, not where they are treated*

County	Population	No of first	No/million	Active patients
STOCKHOLM	2415139	258	107	2767
UPPSALA	395026	42	106	557
SÖDERMANLAND	301801	45	149	390
ÖSTERGÖTLAND	469704	68	145	611
JÖNKÖPING	367064	81	221	519
KRONOBERG	203340	20	98	294
KALMAR	247175	53	214	428
GOTLAND	61001	7	115	120
BLEKINGE	158937	51	321	333
SKÅNE	1402425	267	190	1964
HALLAND	340243	70	206	510
VÄSTRA GÖTALAND	1744859	160	92	1694
VÄRMLAND	283196	38	134	371
ÖREBRO	306792	39	127	436
VÄSTMANLAND	278967	49	176	382
DALARNA	288387	51	177	496
GÄVLEBORG	287767	63	219	588
VÄSTERNORRLAND	244193	64	262	463
JÄMTLAND	132054	15	114	227
VÄSTERBOTTEN	274563	35	127	416
NORRBOTTEN	249693	40	160	495
Total	10452326	1516	145	14061

## STATISTICS – ICD – IMPLANTS PER COUNTY

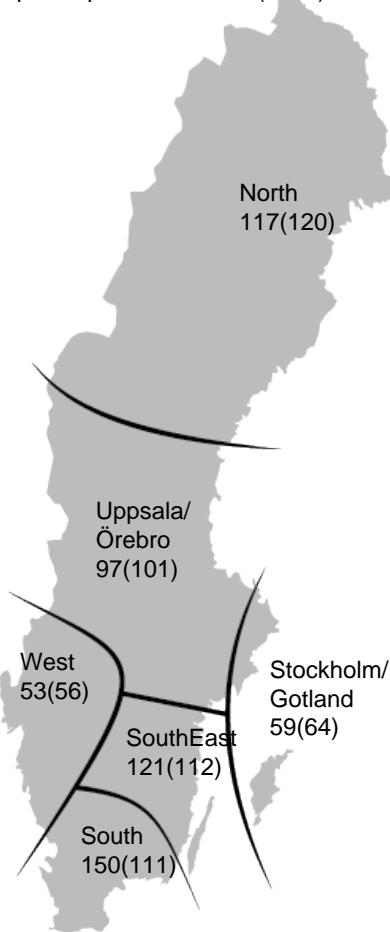


## STATISTICS – ICD – PRIMARY PREVENTION PER REGION

*The regions are based on where the patients live, not where they are treated*

Region	Population	No of first impl	No per million	Active patients
Stockholm/Gotland	2476140	147	59	1668
Uppsala/Örebro	2141936	207	97	1930
South-East Sweden	1083943	131	121	969
Southern Sweden	1906213	285	150	1715
Western Sweden	1943591	103	53	981
Northern Sweden	900503	105	117	918
Total	10452326	978	94	8181

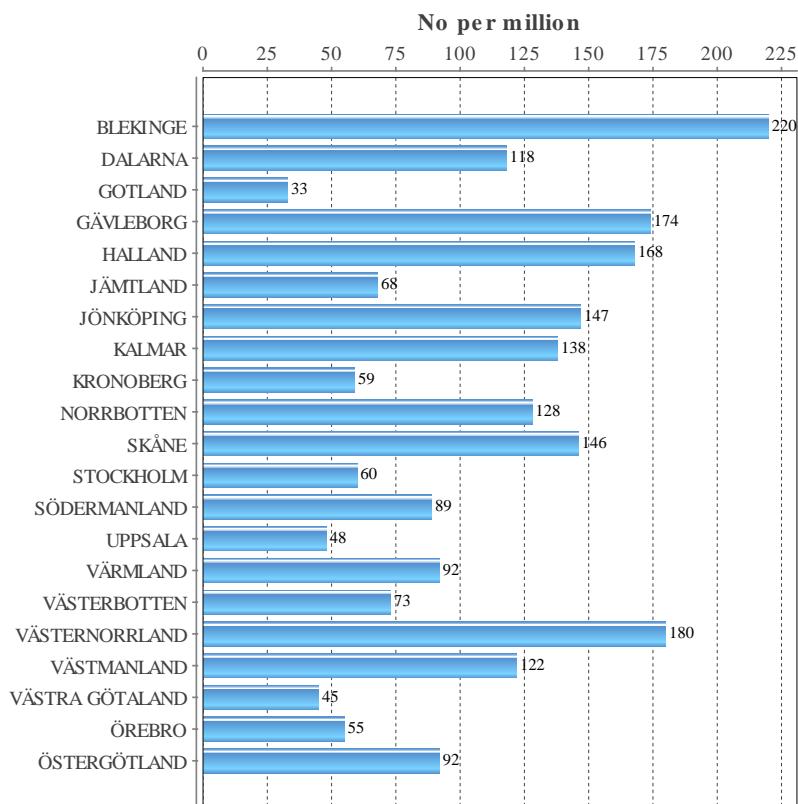
Implants per million 2021(2020)



## STATISTICS – ICD – PRIMARY PREVENTION PER COUNTY

*The regions are based on where the patients live, not where they are treated*

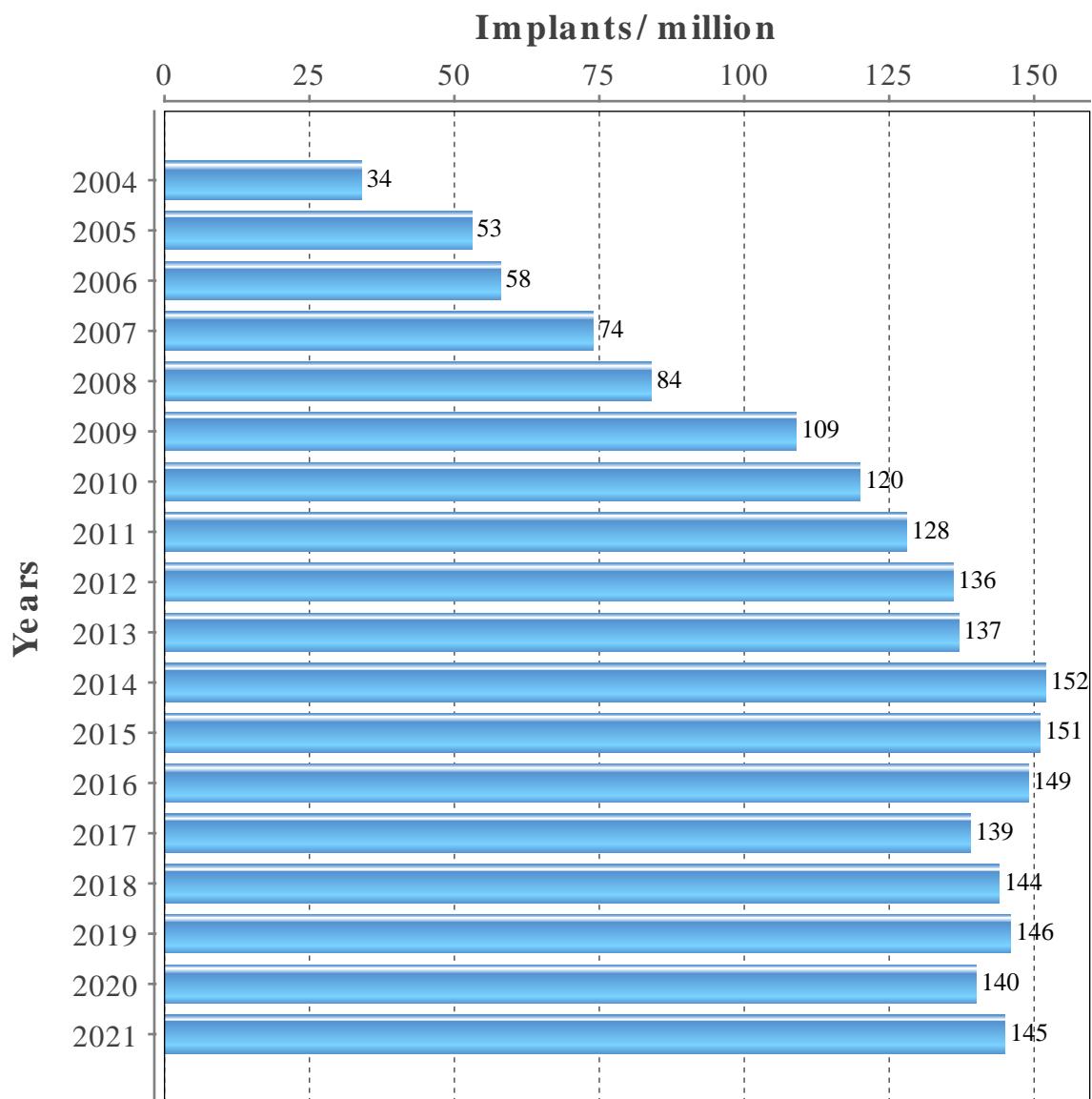
County	Population	No of first	No/million
BLEKINGE	158937	35	220
DALARNA	288387	34	118
GOTLAND	61001	2	33
GÄVLEBORG	287767	50	174
HALLAND	340243	57	168
JÄMTLAND	132054	9	68
JÖNKÖPING	367064	54	147
KALMAR	247175	34	138
KRONOBERG	203340	12	59
NORRBOTTEN	249693	32	128
SKÅNE	1402425	205	146
STOCKHOLM	2415139	145	60
SÖDERMANLAND	301801	27	89
UPPSALA	395026	19	48
VÄRMLAND	283196	26	92
VÄSTERBOTTEN	274563	20	73
VÄSTERNORRLAND	244193	44	180
VÄSTMANLAND	278967	34	122
VÄSTRA GÖTALAND	1744859	79	45
ÖREBRO	306792	17	55
ÖSTERGÖTLAND	469704	43	92
Total	10452326	978	94



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## STATISTICS – ICD – HISTORICAL IMPLANTATION RATES

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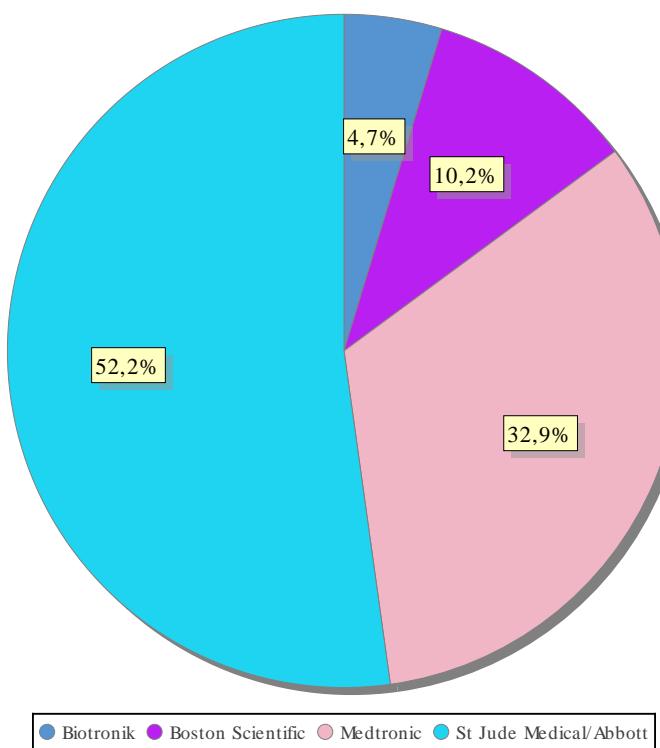


## STATISTICS – ICD – ICDS PER MANUFACTURER

*Market share per manufacturer in Sweden*

Manufacturer	2018 %	2019 %	2020 %	2021 %
Biotronik	3.9	5.3	5.5	4.7
Boston Scientific	14.6	14.4	14.9	10.2
Medtronic	39.6	41.0	36.0	32.9
St. Jude Medical	41.8	39.2	43.5	52.2

Boston Scientific includes Cameron Health from 2015

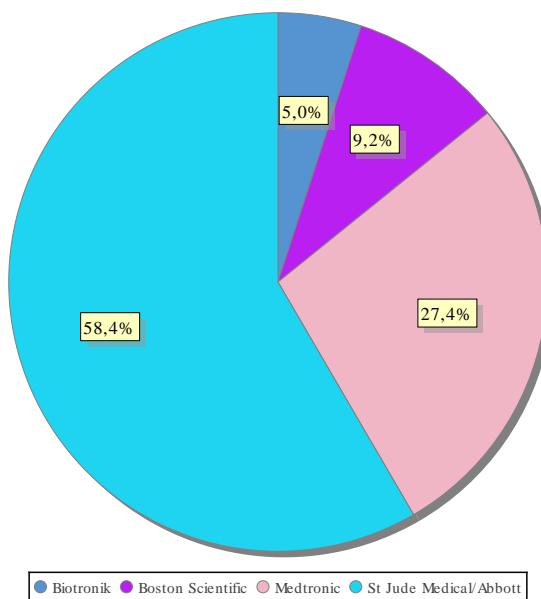


## STATISTICS – ICD – LEADS PER MANUFACTURER

*Market share per manufacturer in Sweden*

Manufacturer	2018 %	2019 %	2020 %	2021 %
Biotronik	3.8	5.5	6.1	5.0
Boston Scientific	12.9	15.5	15.9	9.2
Medtronic	34.5	35.4	28.6	27.4
St. Jude Medical	48.8	43.5	49.5	58.4

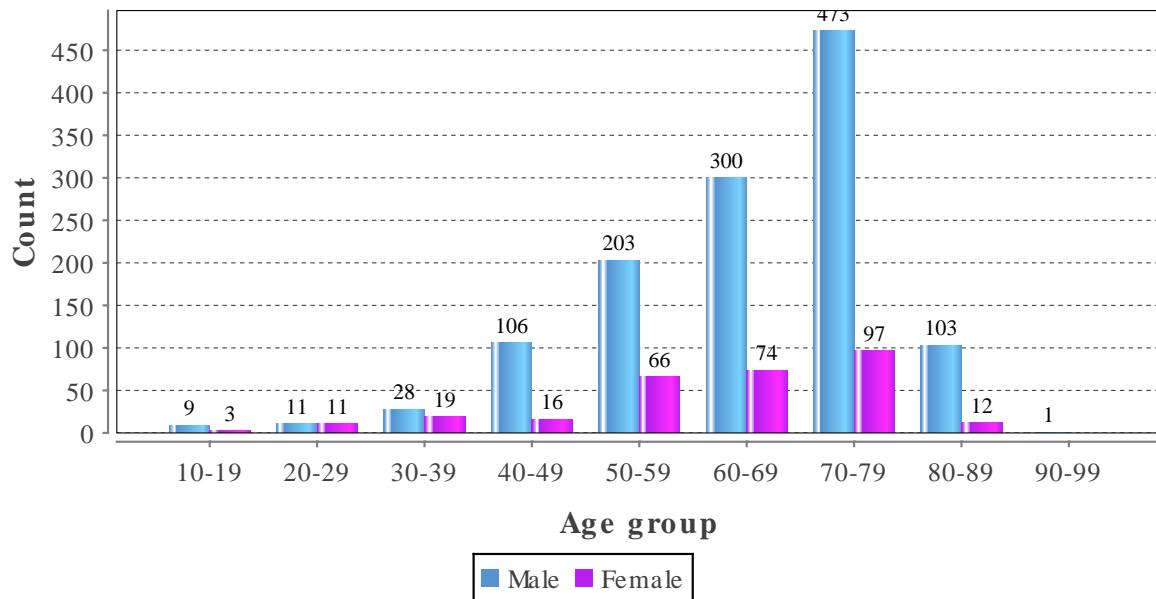
Boston Scientific includes Cameron Health from 2015



## STATISTICS – ICD – AGE DISTRIBUTION MALES/FEMALES

*Age and gender distribution for new implants, total numbers*

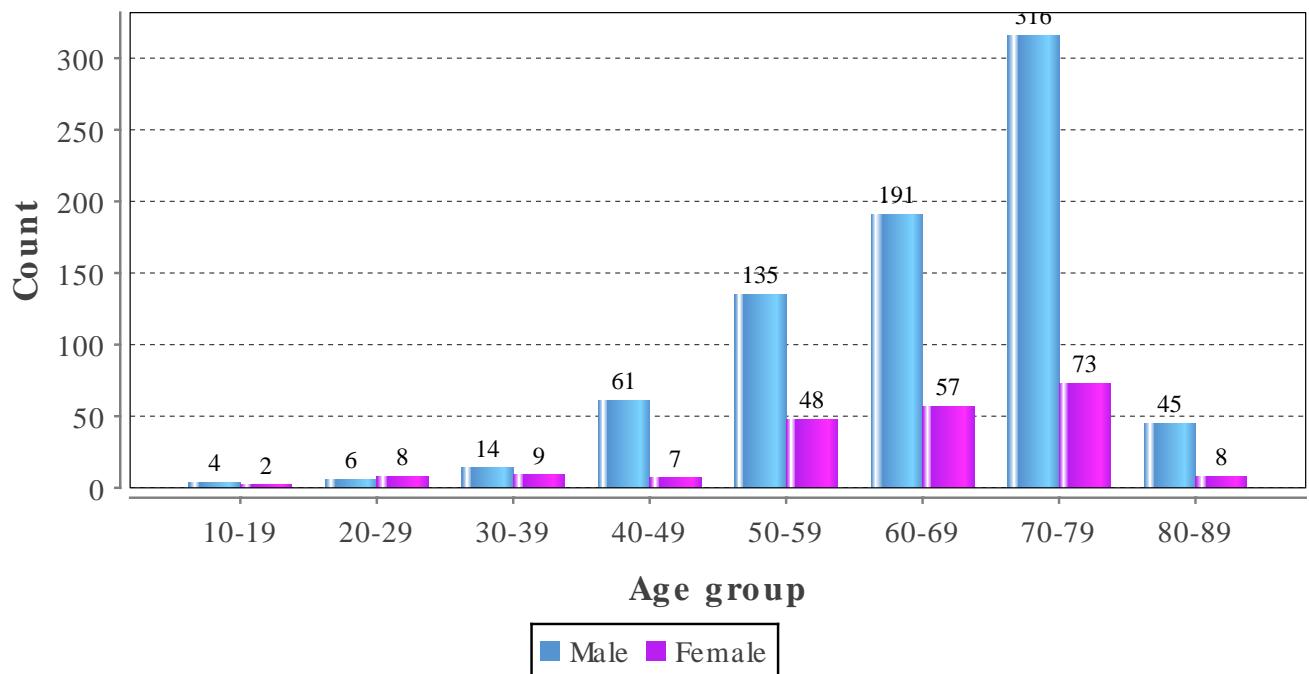
<b>Age (years)</b>	<b>Total no</b>	<b>%</b>	<b>Male</b>	<b>Female</b>
10-19	12	0.8	9	3
20-29	22	1.4	11	11
30-39	47	3.1	28	19
40-49	122	8.0	106	16
50-59	269	17.6	203	66
60-69	374	24.4	300	74
70-79	570	37.2	473	97
80-89	115	7.5	103	12
90-99	1	0.1	1	0
Average age	65	-	65	61
Total number of implants: 1532				



## STATISTICS – ICD – AGE DISTRIBUTION PRIMARY PREVENTION

*Primary prevention divided by gender and age.*

<b>Age (years)</b>	<b>Total no</b>	<b>%</b>	<b>Male</b>	<b>Female</b>
10-19	6	0.6	4	2
20-29	14	1.4	6	8
30-39	23	2.3	14	9
40-49	68	6.9	61	7
50-59	183	18.6	135	48
60-69	248	25.2	191	57
70-79	389	39.5	316	73
80-89	53	5.4	45	8
Average age	65	-	65	63
Total number of implants: 984				

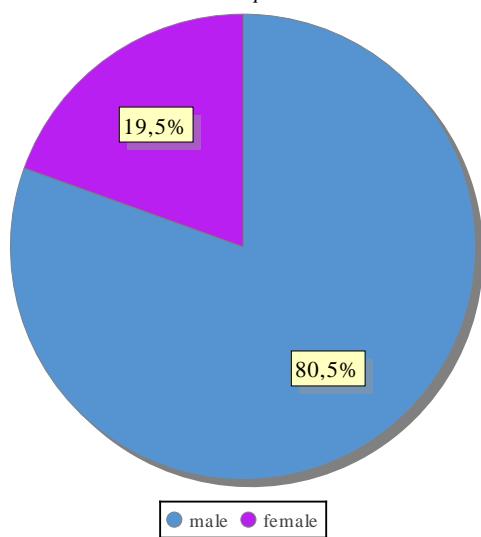


## STATISTICS – ICD – TYPE OF IMPLANTS

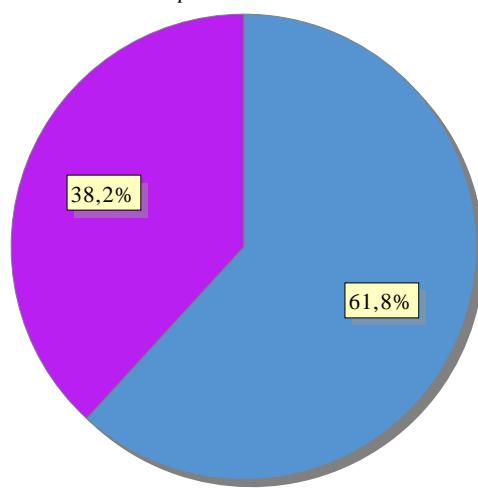
*Ratio of new implants versus generator changes*

	Total		Male		Female	
	no	%	no	%	no	%
First implant	1532	61.8	1234	80.5	298	19.5
Replacement	948	38.2	769	81.1	179	18.9
Total	2480	100.0	2003	80.8	477	19.2

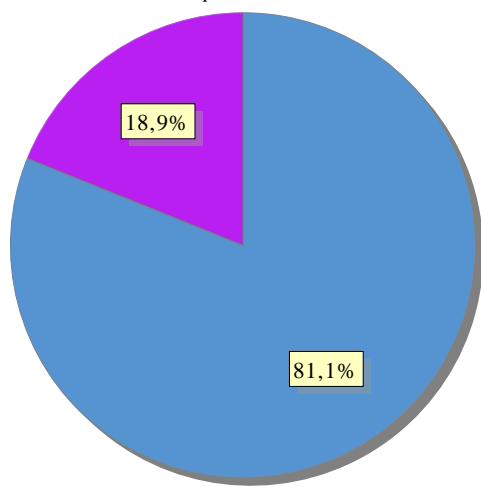
*First implant*



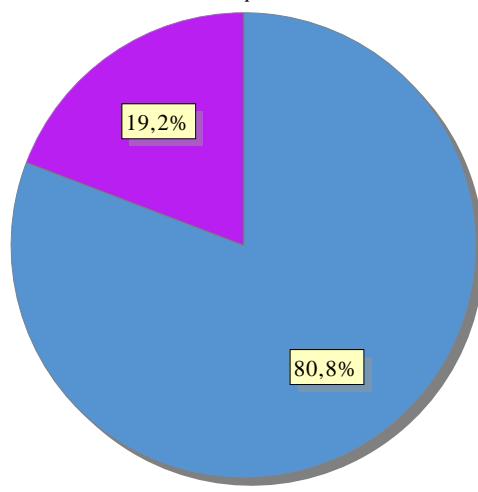
*Replacement ratio*



*Replacement*



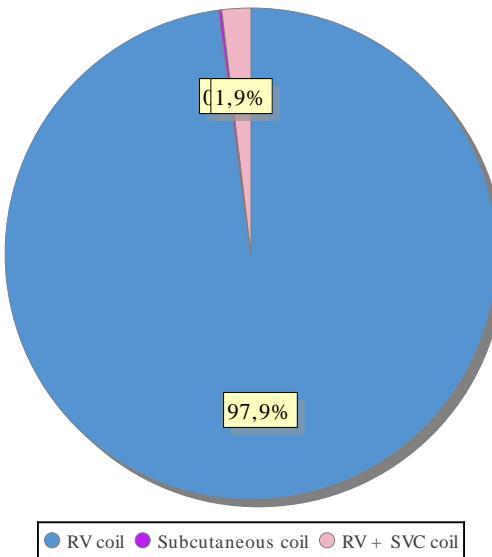
*All implant*



## STATISTICS – ICD – LEAD TYPES

*Lead type distribution for atrial and ventricular use for new implants and replacements.*

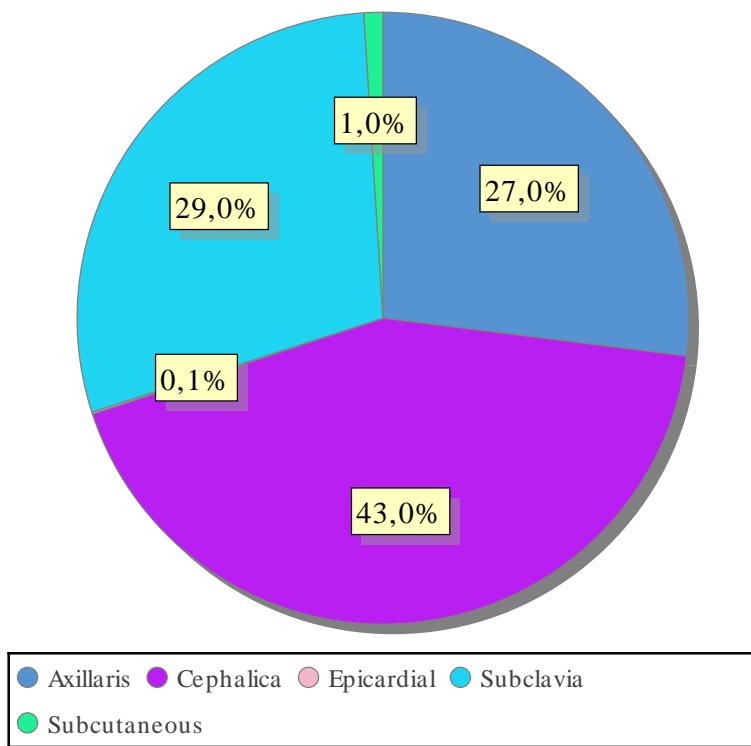
	2021		2020	
	no	%	no	%
RV coil	1661	97.9	1523	96.4
Subcutaneous coil	3	0.2	1	0.1
RV + SVC coil	32	1.9	56	3.5
Active fixation	1682	99.2	1572	99.5
Passive fixation	14	0.8	8	0.5
Total number of leads - 2021: 1696, 2020: 1580				



## STATISTICS – ICD – LEAD ACCESS

*Venous access for new implants and replacements, all type of pacemakers*

Lead access	No	%
Axillaris	461	27,0
Cephalica	735	43,0
Epicardial	1	0,1
Subclavia	496	29,0
Subcutaneous	17	1,0



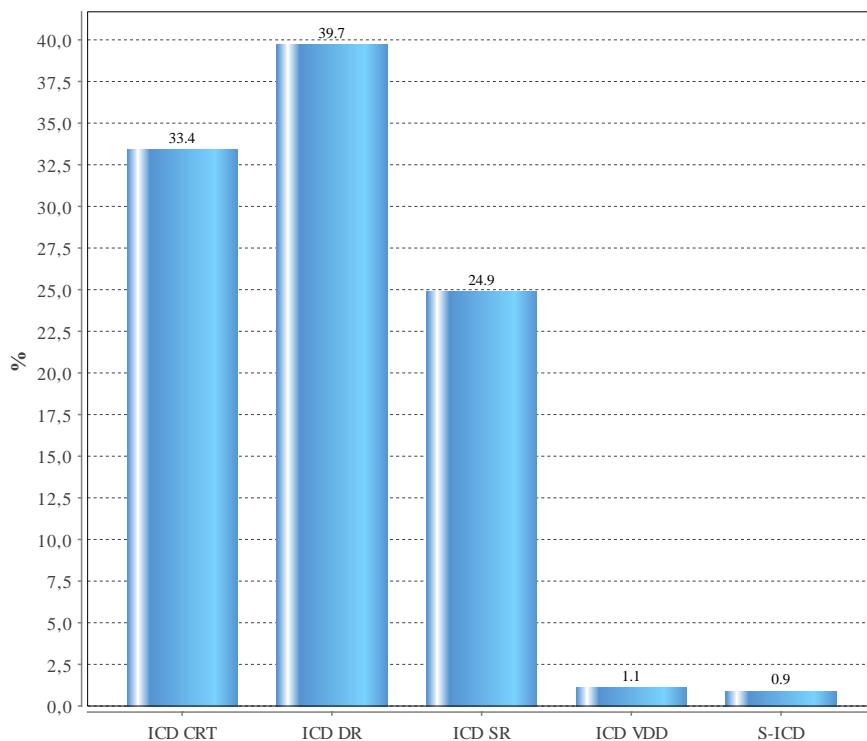
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## STATISTICS – ICD – SUB TYPE

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*ICD subtype for new implants*

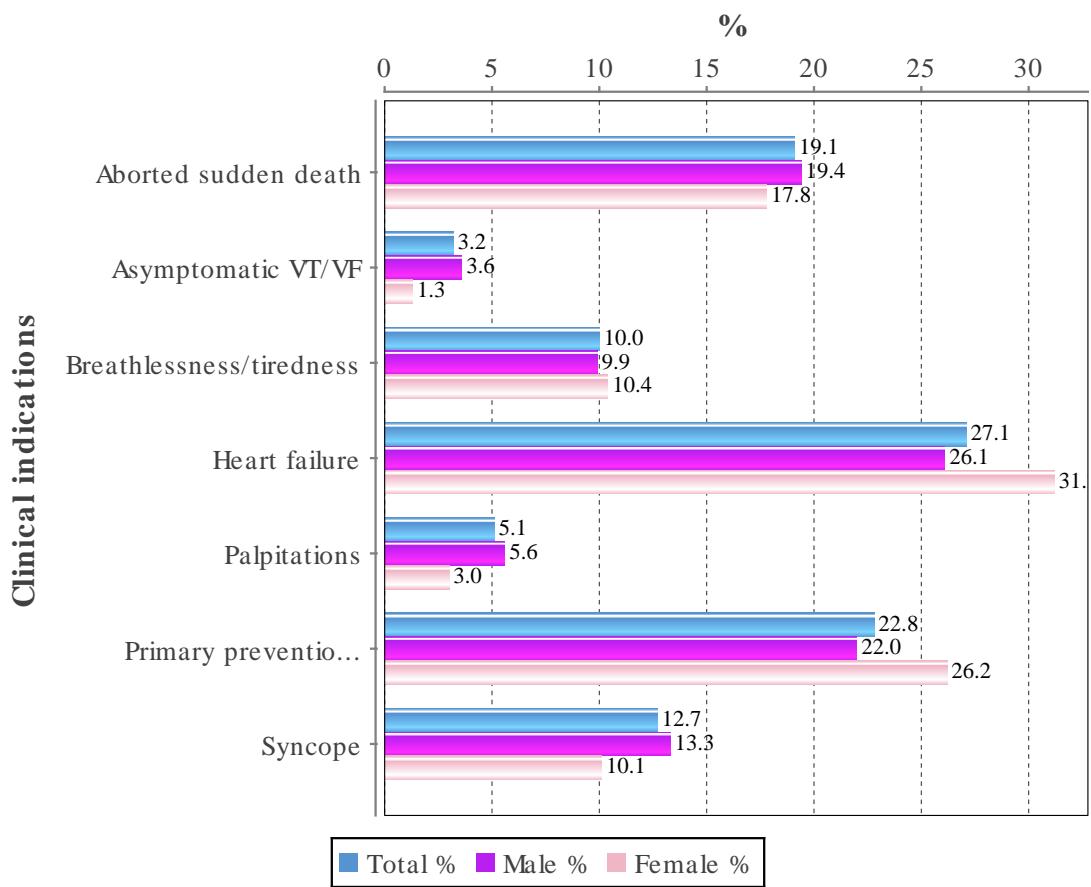
Mode	%	No
ICD CRT	33.4	511
ICD DR	39.7	608
ICD SR	24.9	382
ICD VDD	1.1	17
S-ICD	0.9	14



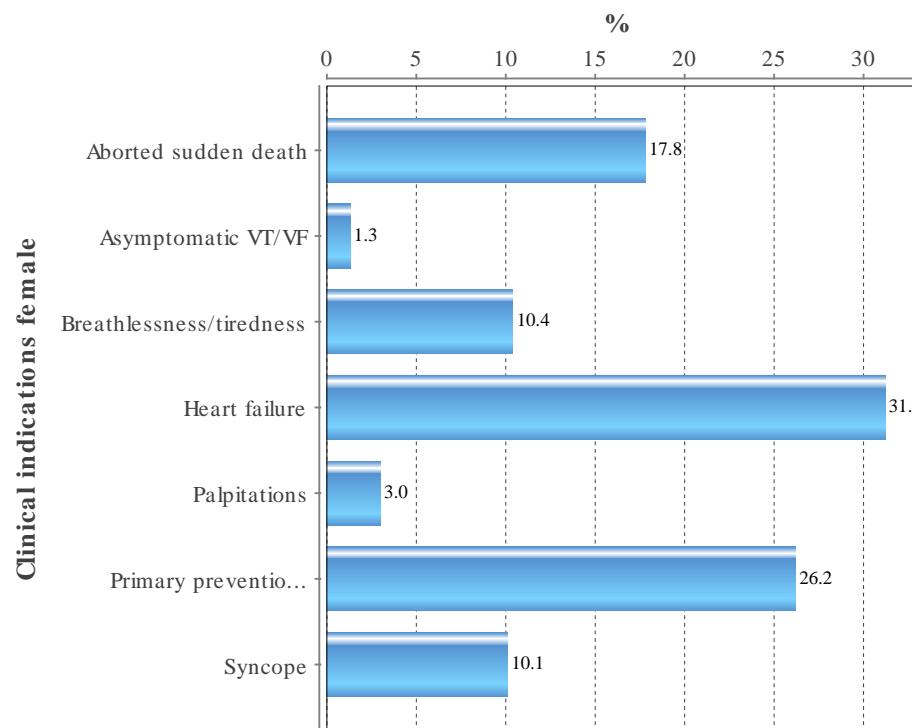
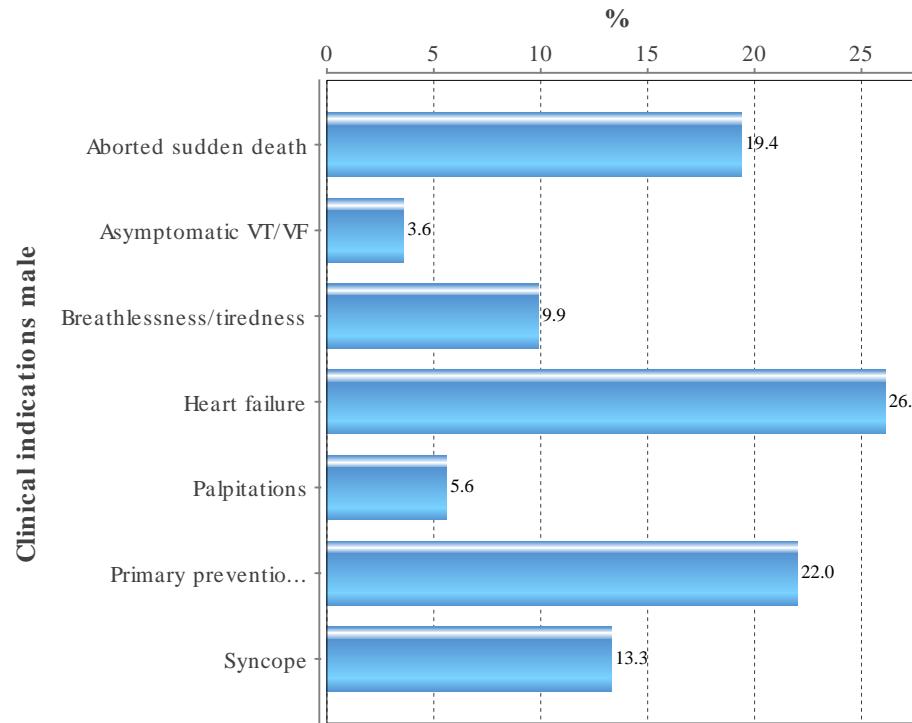
## STATISTICS – ICD – CLINICAL INDICATIONS FIRST IMPLANT

*Main symptom for implanting ICDs*

<b>Indication</b>	<b>Total %</b>	<b>Male %</b>	<b>Female %</b>
Aborted sudden death	19.1	19.4	17.8
Asymptomatic VT/VF	3.2	3.6	1.3
Breathlessness/tiredness	10.0	9.9	10.4
Heart failure	27.1	26.1	31.2
Palpitations	5.1	5.6	3.0
Primary prevention, asymptomatic	22.8	22.0	26.2
Syncope	12.7	13.3	10.1



## STATISTICS – ICD – CLINICAL INDICATIONS FIRST IMPLANT



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## STATISTICS – ICD – CLINICAL INDICATIONS

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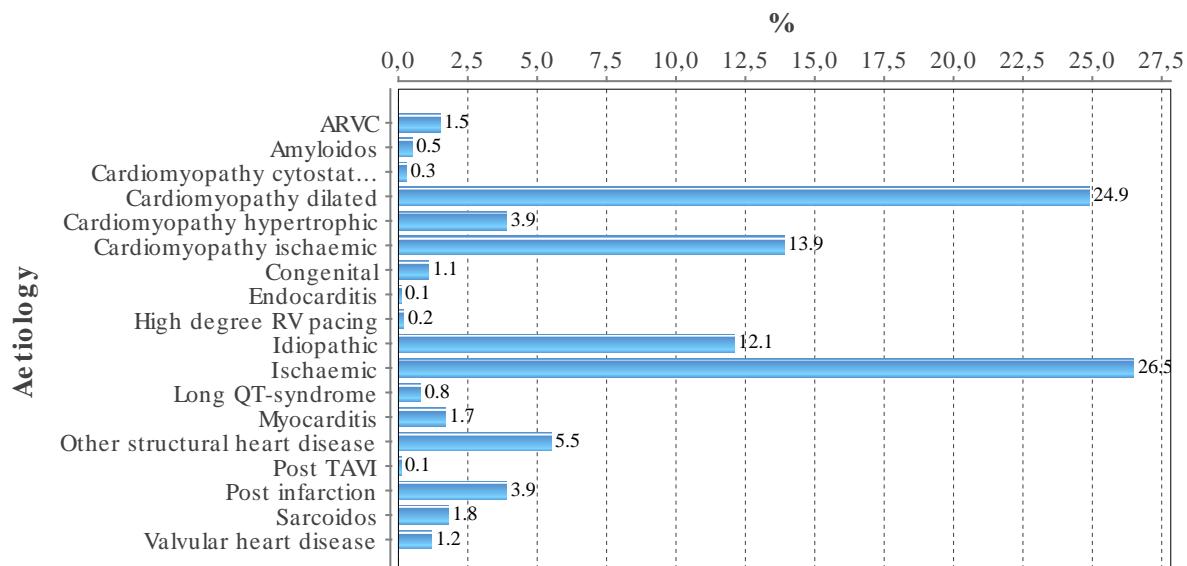
*Main symptom for implanting ICDs, historical distribution*

Indication	2020 %	2021 %
Aborted sudden death	20.6	19.1
Asymptomatic VT/VF	3.3	3.2
Primary prevention	63.8	65.0
Syncope	12.3	12.7

## STATISTICS – ICD - AETIOLOGY FIRST IMPLANT

*Main aetiology for implanting pacemakers*

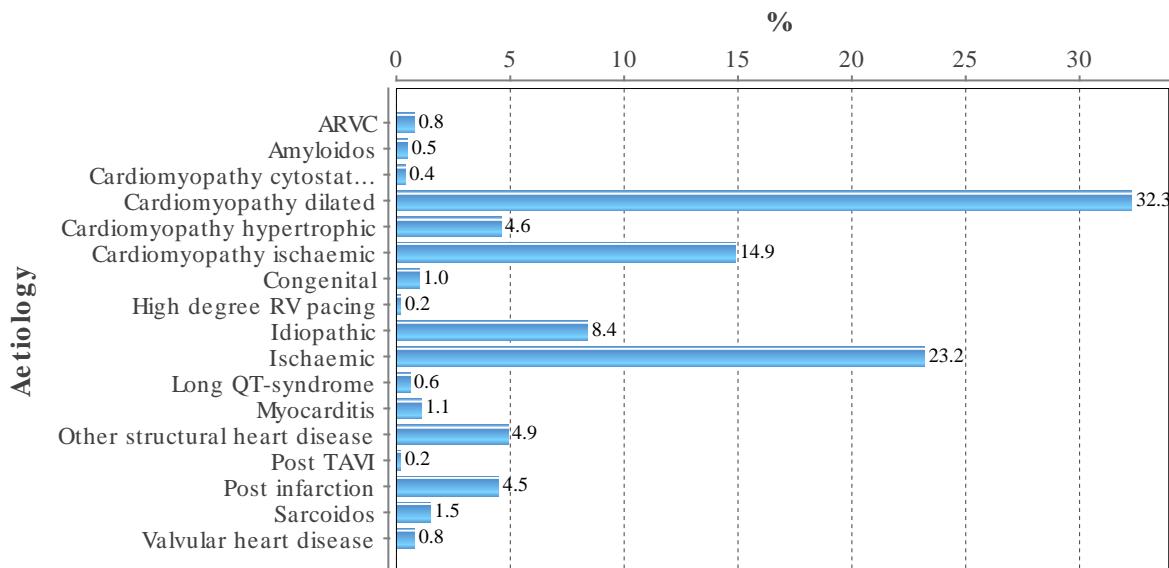
<b>Aetiology</b>	<b>Total %</b>	<b>Male %</b>	<b>Female %</b>
ARVC	1.5	1.7	0.7
Amyloidos	0.5	0.6	0.0
Cardiomyopathy cytostatic induced	0.3	0.2	0.7
Cardiomyopathy dilated	24.9	23.8	29.5
Cardiomyopathy hypertrophic	3.9	3.7	4.4
Cardiomyopathy ischaemic	13.9	14.3	12.4
Congenital	1.1	0.9	2.0
Endocarditis	0.1	0.1	0.0
High degree RV pacing	0.2	0.2	0.0
Idiopathic	12.1	11.7	13.8
Ischaemic	26.5	29.4	14.4
Long QT-syndrome	0.8	0.2	3.4
Myocarditis	1.7	1.5	2.3
Other structural heart disease	5.5	4.7	9.1
Post TAVI	0.1	0.2	0.0
Post infarction	3.9	4.1	3.4
Sarcoidos	1.8	1.8	1.7
Valvular heart disease	1.2	0.9	2.3



## STATISTICS – ICD - AETIOLOGY PRIMARY PREVENTION

*Main aetiology for implanting ICDs due to primary prevention*

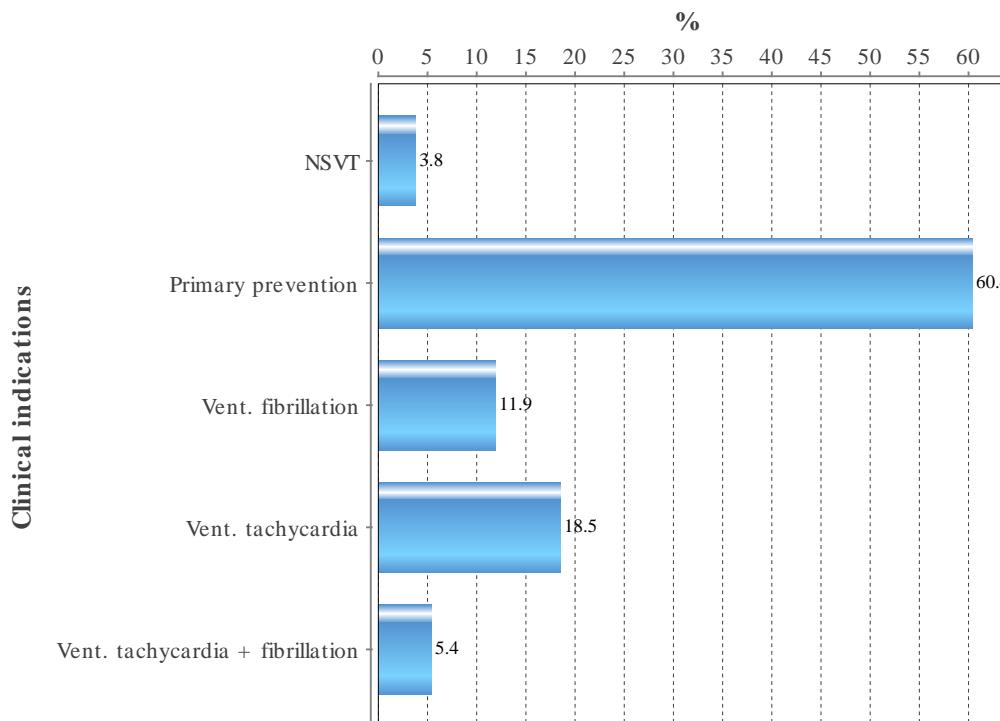
<b>Aetiology</b>	<b>Total %</b>	<b>Male %</b>	<b>Female %</b>
ARVC	0.8	1.0	0.0
Amyloidos	0.5	0.6	0.0
Cardiomyopathy cytostatic induced	0.4	0.3	0.9
Cardiomyopathy dilated	32.3	30.7	38.2
Cardiomyopathy hypertrophic	4.6	4.3	5.7
Cardiomyopathy ischaemic	14.9	15.4	13.2
Congenital	1.0	0.8	1.9
High degree RV pacing	0.2	0.3	0.0
Idiopathic	8.4	8.7	7.5
Ischaemic	23.2	25.6	14.2
Long QT-syndrome	0.6	0.3	1.9
Myocarditis	1.1	0.9	1.9
Other structural heart disease	4.9	3.9	8.5
Post TAVI	0.2	0.3	0.0
Post infarction	4.5	4.8	3.3
Sarcoidos	1.5	1.6	1.4
Valvular heart disease	0.8	0.6	1.4



## STATISTICS – ICD – ECG INDICATIONS (TACHY) FIRST IMPLANT

Documented ECG leading to ICD implant. (NSVT=non sustained VT)

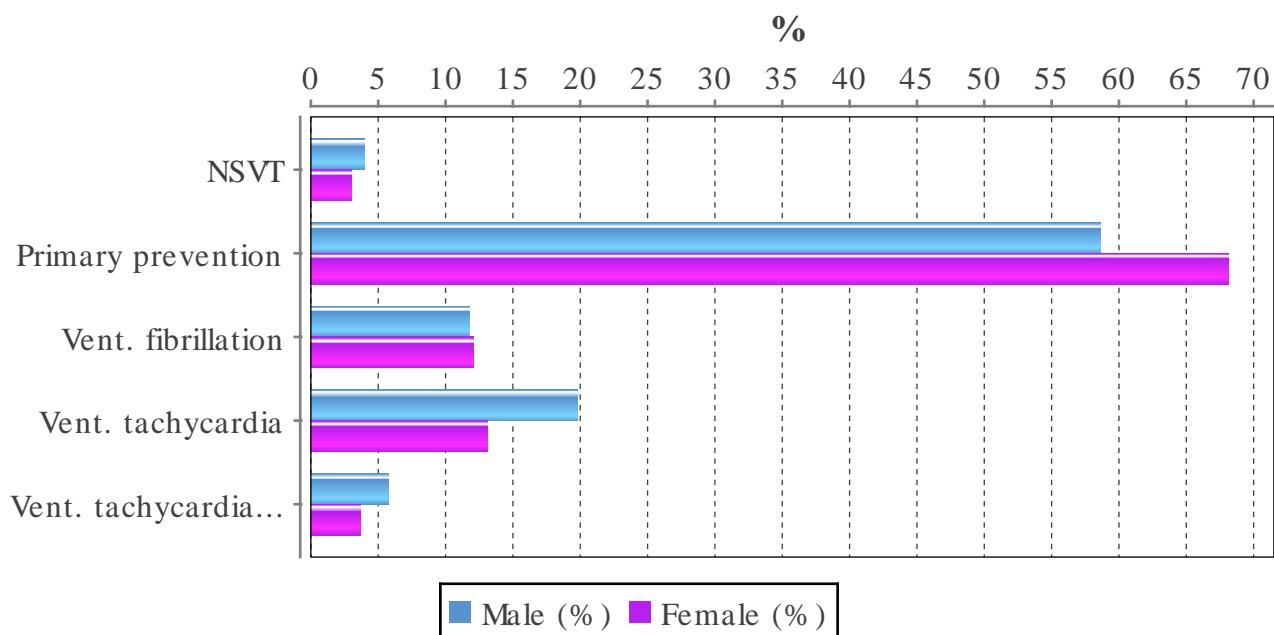
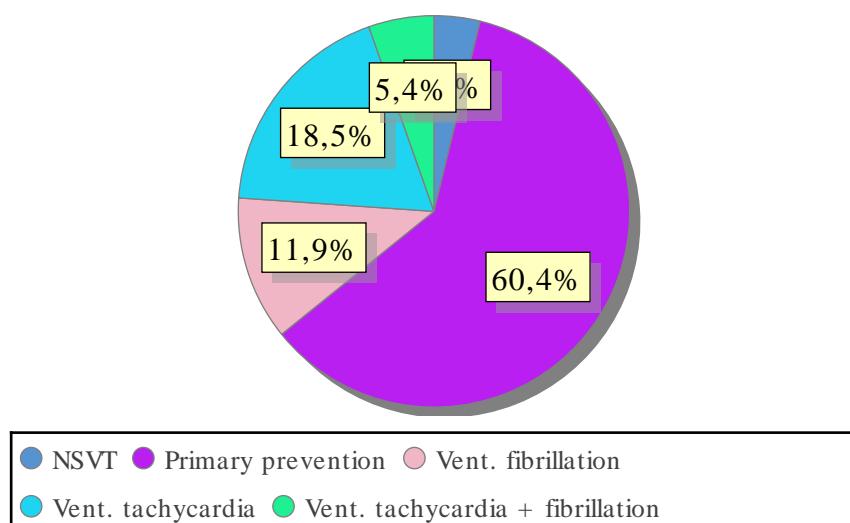
Indication	%
NSVT	3.8
Primary prevention	60.4
Vent. fibrillation	11.9
Vent. tachycardia	18.5
Vent. tachycardia + fibrillation	5.4



## STATISTICS – ICD – PREPACING ECG (TACHY)

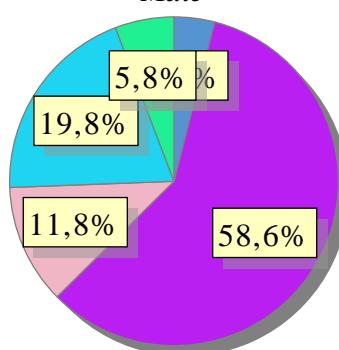
*Documented ECG leading to ICD implant.(NSVT = non sustained VT) by gender and patients < 18 years*

Indication	No	Total %	Male (%)	Female (%)	It 18 (%)
NSVT	58	3.8	4.0	3.0	20.0
Primary prevention	926	60.4	58.6	68.1	40.0
Vent. fibrillation	182	11.9	11.8	12.1	20.0
Vent. tachycardia	283	18.5	19.8	13.1	0.0
Vent. tachycardia + fibrillation	83	5.4	5.8	3.7	20.0
Total number of implants 1532					



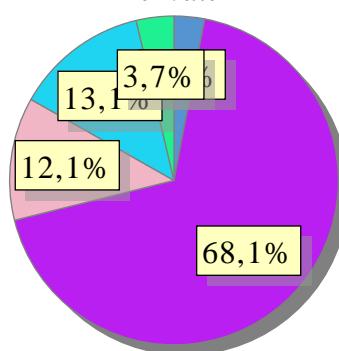
## STATISTICS – ICD – PREPACING ECG (TACHY)

*Male*



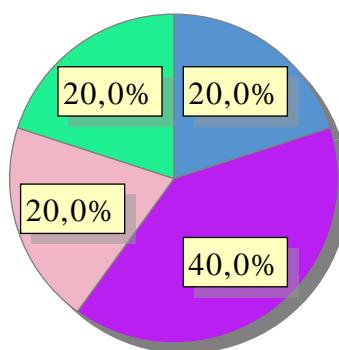
● NSVT ● Primary prevention ● Vent. fibrillation  
● Vent. tachycardia ● Vent. tachycardia + fibrillation

*Female*



● NSVT ● Primary prevention ● Vent. fibrillation  
● Vent. tachycardia ● Vent. tachycardia + fibrillation

*< 18*



● NSVT ● Primary prevention ● Vent. fibrillation  
● Vent. tachycardia + fibrillation

## STATISTICS – ICD – USE OF PACING MODES FIRST IMPLANT PER HOSPITAL

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*Use of ICD sub type for all indications per hospital (number of new implants / year and hospital))*

Hospital	Number	ICD DR %	ICD SR %	ICD CRT %
Akademiska sjukhuset	54	38.9	33.3	27.8
Blekingesjukhuset	50	60.0	4.0	36.0
Centrallasarettet Växjö	17	41.2	11.8	47.1
Centralsjukhuset Karlstad	37	35.1	13.5	51.4
Centralsjukhuset Kristianstad	31	74.2	25.8	0.0
Centralsjukhuset Västerås	43	18.6	55.8	25.6
Danderyds sjukhus	70	50.0	8.6	41.4
Falu lasarett	52	25.0	38.5	36.5
Gävle sjukhus	48	33.3	10.4	56.3
Helsingborgs lasarett	27	55.6	40.7	3.7
Hudiksvalls sjukhus	8	87.5	12.5	0.0
Karolinska Universitetssjukhuset	122	59.0	19.7	21.3
Linköpings Universitetssjukhus	105	41.0	7.6	51.4
Länssjukhuset Kalmar	45	17.8	40.0	42.2
Länssjukhuset Ryhov	46	60.9	39.1	0.0
Mälarsjukhuset	42	19.0	52.4	28.6
Norrlands Universitetssjukhus	32	28.1	40.6	31.3
Sahlgrenska Universitetssjukhuset	60	46.7	28.3	25.0
Skaraborgs sjukhus Skövde	28	50.0	10.7	39.3
Skellefteå lasarett	2	100.0	0.0	0.0
Skånes universitetssjukhus, Lund	178	32.6	21.9	45.5
Skånes universitetssjukhus, Malmö	36	52.8	47.2	0.0
St Görans sjukhus	34	50.0	29.4	20.6
Sunderby sjukhus	42	52.4	7.1	40.5
Sundsvalls sjukhus	46	43.5	39.1	17.4
Södersjukhuset	45	40.0	40.0	20.0
Södra Älvsborgs sjukhus	21	42.9	4.8	52.4
Trollhättan, NÄL	37	45.9	10.8	43.2
Universitetssjukuset Örebro	40	35.0	40.0	25.0
Varbergs sjukhus	69	29.0	42.0	29.0
Örnsköldsviks sjukhus	17	41.2	11.8	47.1
Östersunds sjukhus	17	82.4	5.9	11.8

## STATISTICS – ICD – REASON FOR GENERATOR EXPLANT

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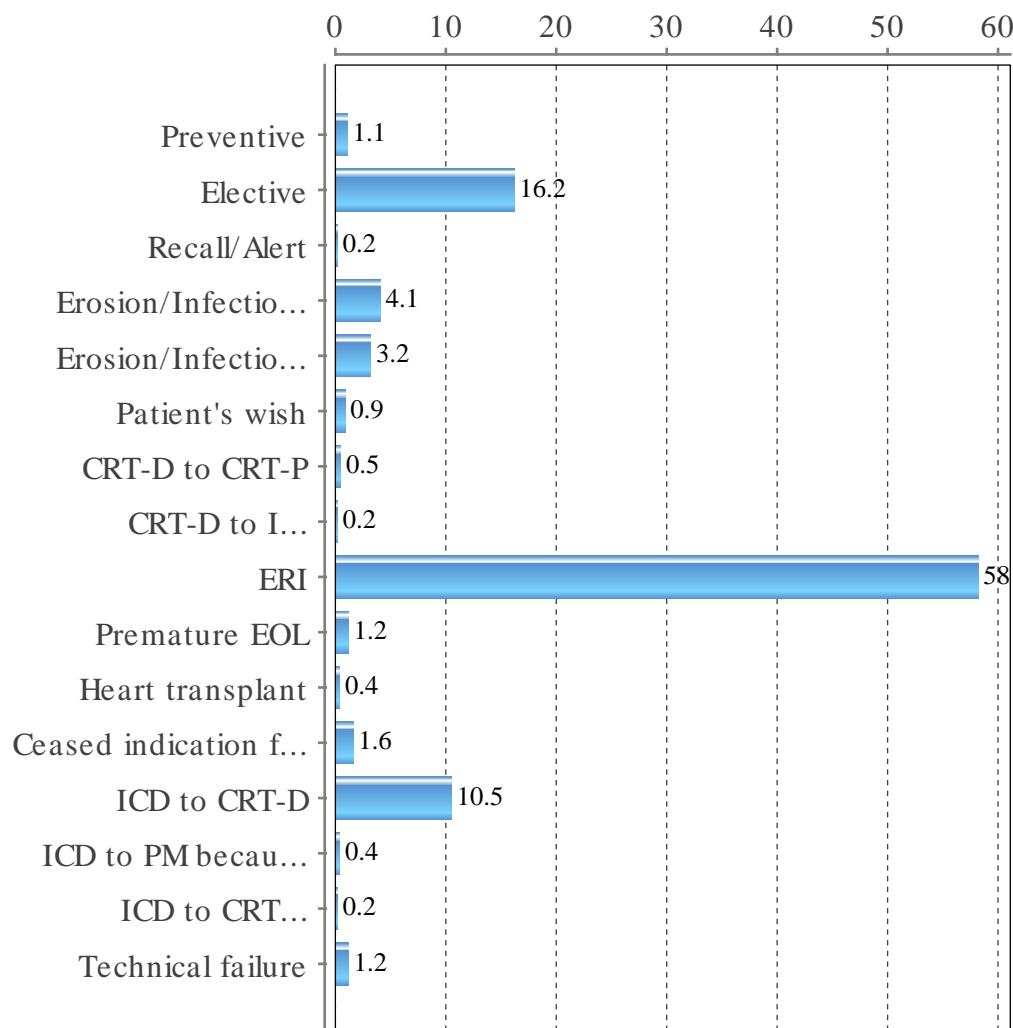
*Reason for generator explant. Elective used for changes performed before reached ERI/EOL*

<b>Reason</b>	<b>All hospitals %</b>	<b>(large) %</b>	<b>(medium) %</b>	<b>(small) %</b>
Preventive	1.1	0.6	1.9	3.6
Elective	16.2	14.5	20.7	3.6
Recall/Alert	0.2	0.2	0.3	0.0
Erosion/Infection, local	4.1	5.4	1.6	0.0
Erosion/Infection, systemic	3.2	4.2	1.3	0.0
Patient's wish	0.9	1.1	0.6	0.0
CRT-D to CRT-P	0.5	0.5	0.6	0.0
CRT-D to ICD because of ceased CRT-indication	0.2	0.2	0.3	0.0
ERI	58.2	58.2	56.1	82.1
Premature EOL	1.2	1.1	1.3	3.6
Heart transplant	0.4	0.6	0.0	0.0
Ceased indication for ICD therapy	1.6	1.7	1.6	0.0
ICD to CRT-D	10.5	10.3	11.3	7.1
ICD to PM because of ceased indication	0.4	0.0	1.3	0.0
ICD to CRT-P because of heart failure	0.2	0.2	0.3	0.0
Technical failure	1.2	1.4	0.9	0.0

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## STATISTICS – ICD – REASON FOR GENERATOR EXPLANT

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## STATISTICS – ICD – REASON FOR GENERATOR EXPLANT

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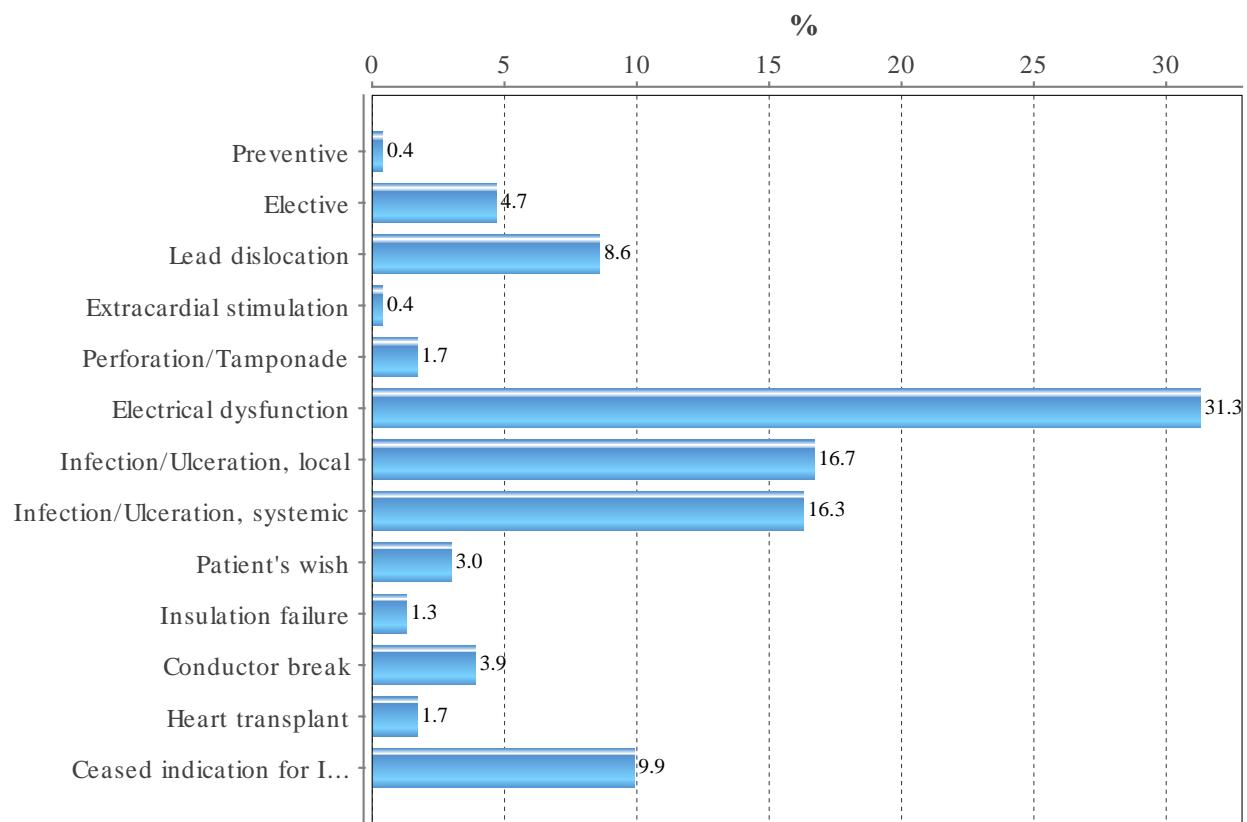
*Historical explants indications*

Reason	2019 %	2020 %	2021 %
Preventive	3.2	1.6	1.1
Elective	9.3	14.8	16.2
System change hemodynamic	0.5	0.0	0.0
Recall/Alert	0.5	0.8	0.2
Erosion/Infection, local	4.6	4.8	4.1
Erosion/Infection, systemic	5.3	2.9	3.2
Patient's wish	0.6	0.5	0.9
CRT-D to CRT-P	1.1	1.0	0.5
CRT-D to ICD because of ceased CRT-indication	0.1	0.2	0.2
ERI	58.1	57.2	58.2
Premature EOL	2.0	1.6	1.2
Heart transplant	1.0	0.3	0.4
Ceased indication for ICD therapy	1.9	1.0	1.6
ICD to CRT-D	9.8	11.4	10.5
ICD to PM because of ceased indication	0.6	0.8	0.4
ICD to CRT-P because of heart failure	0.2	0.0	0.2
Technical failure	1.0	0.8	1.2

## STATISTICS – ICD – REASON FOR LEAD EXPLANT

*Historical lead explants indications*

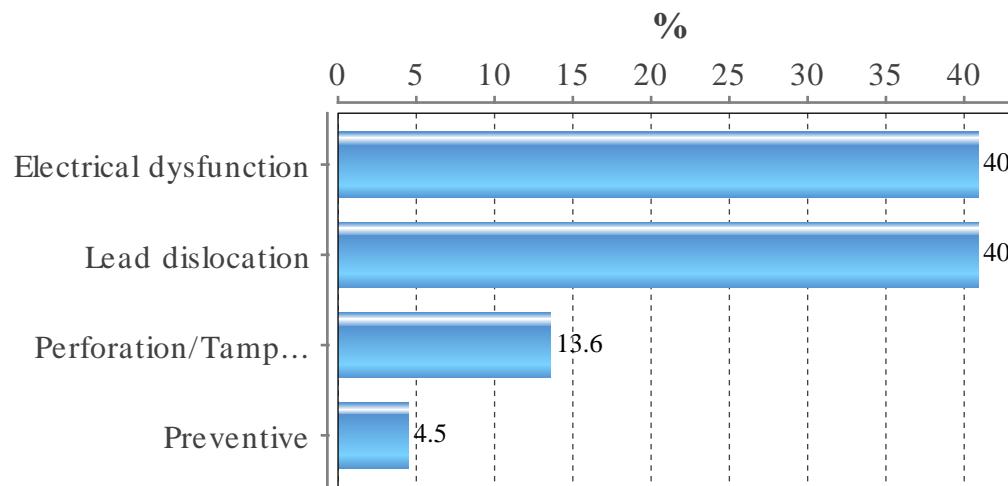
Reason	2019 %	2020 %	2021 %
Preventive	0.4	0.5	0.4
Elective	3.6	5.2	4.7
Lead dislocation	6.0	8.5	8.6
Perforation/Tamponade	1.2	0.5	1.7
Electrical dysfunction	32.8	32.1	31.3
Infection/Ulceration, local	18.0	19.8	16.7
Infection/Ulceration, systemic	22.8	18.9	16.3
Patient's wish	0.8	0.0	3.0
Insulation failure	2.0	0.5	1.3
Conductor break	2.4	4.7	3.9
Heart transplant	4.0	1.4	1.7
Ceased indication for ICD therapy	6.0	7.1	9.9
Extracardial stimulation	0.0	0.9	0.4



## STATISTICS – ICD – REASON FOR LEAD CORRECTION

*Lead correction indications*

Reason	%
Electrical dysfunction	40.9
Lead dislocation	40.9
Perforation/Tamponade	13.6
Preventive	4.5
Total no 22	



## STATISTICS – ICD – OPERATORCODE FOR IMPLANTS

*Procedures per operator (exclusive CRT)*

Hospital	Operator	No
Akademiska sjukhuset	Arvanitis	8
	Falasca Zamponi	25
	Sciaraffia	9
	Teder	11
Ålands centralsjukhus	Slotte	5
Blekingesjukhuset	Anders Ericsson	1
	Genadi Kaninski	8
	Jan-Olov Borg	4
	Martin Stefanik	7
	Michael Ringborn	12
Centrallasarettet Växjö	Nicoleta Sora	6
	Annan	8
	Carin Pålman	2
	Jonasson	3
	Rosén Helena	3
Centralsjukhuset Karlstad	Strandberg	2
	Khalili	8
	Niklas Aldergård	17
	Saidi	4
Centralsjukhuset Kristianstad	Babiak	12
	Bakos	19
	Östenson	1
Centralsjukhuset Västerås	Amra Kåregren	4
	Johanna Sandström	2
	SkoglundAndersson	15
	Wiberg	20
	1	21
Danderyds sjukhus	2	15
	3	15
	4	22
	6	1
	Monheim	11
Falu lasarett	Berglund	9
	Forsgren	22
	Niclas Svedberg	4
	Falck	2
Gävle sjukhus	Kastberg	15
	Kris Lutter	2
	Magnusson Peter	11
	Mati Jalakas	16
	Bläckberg	4
Helsingborgs lasarett	Jacobsson	3
	Rorsman	9
	Utter	16
	Roussinne	13

Hospital	Operator	No
Karolinska Universitetssjukhus	Annan	3
	Gadler	56
	Hörnsten	52
	Reistam	43
	Reistam/ Hörnsten	1
Ålands centralsjukhus	Ståhlberg/ Hörnsten	5
	Ståhlberg/ Reistam	1
	Länssjukhuset Kalmar	21
	David Olsson	13
Länssjukhuset Ryhov	Hendrik Schreyer	13
	Lagerberg	31
	Stumpf	18
	Walid El-Saadi	11
Linköpings universitetssjukhus	Pinna C	14
	Säfström K	14
	Sonesson L	31
	Svenson A	11
	Szymanowski A	9
Mälarsjukhuset	Carl Westholm	12
	Georgios Matthaiou	9
	Kave Keshavarz	10
	Linda Årlehag	8
	Andersson	11
Norrlands Universitetssjukhus	Annan	1
	Erik Benedik	2
	Höglund	3
	Ioannis Katsoularis	2
	Jensen	7
Örnsköldsviks sjukhus	Kesek	1
	Landström	2
	Lauri Salonen	1
	Rönn	4
	Ehlin	7
Östersunds sjukhus	Meidell	3
	Björklund	1
	Christian Gjessing	7
	F.Björklund/ C.Gjessing	1
	Friberg	14
Sahlgrenska universitetssjukhuset	Alice David	7
	Amar Taha	15
	Konstantinos Liakatsidas	6

## STATISTICS – ICD – OPERATORCODE FOR IMPLANTS

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Hospital	Operator	No
	Nicola Heinze	1
	Piotr Szamlewski	26
	Shabbar Jamaly	6
	Stefan Jakobsson	9
Skaraborgs sjukhus Skövde	Anna Widunder	11
	Annan	2
	Lorentzen	9
	Paulsson	3
	Winterfeldt	7
Skånes universitetssjukhus, Lund	David Mörtsell	10
	Johan Brandt	41
	LingWei Wang	39
	Maiwand Farouq	11
	Patrycja Näsgaard	2
	Pyotr Platonov	13
	Rasmus Borgquist	11
	Steen Jensen	1
	Uzma Chaudhry	34
Skånes universitetssjukhus, Malmö	Annan	18
	Maiwand Farouq	6
	Torbjörn Persson	14
Skellefteå lasarett	E Bygdén	1
	G Lindqvist	7
	K Lindqvist	1
Södersjukhuset	Jonsson J-E	13
	Kjellman B	22
	Olson J	17
	Rydlund K	15
	Scorza R	1
Södra Älvsborgs sjukhus	Lodin	10
	Riemer	15
St Görans sjukhus	1	17
	1+2	1
	2	8
	3	12
Sunderby sjukhus	Agneta Johansson	15
	Annica Wennberg	9
	Marcus Baas	8
	Peter Rangson	10
Sundsvalls sjukhus	Benedik Erik	11
	Haupt Jan	2

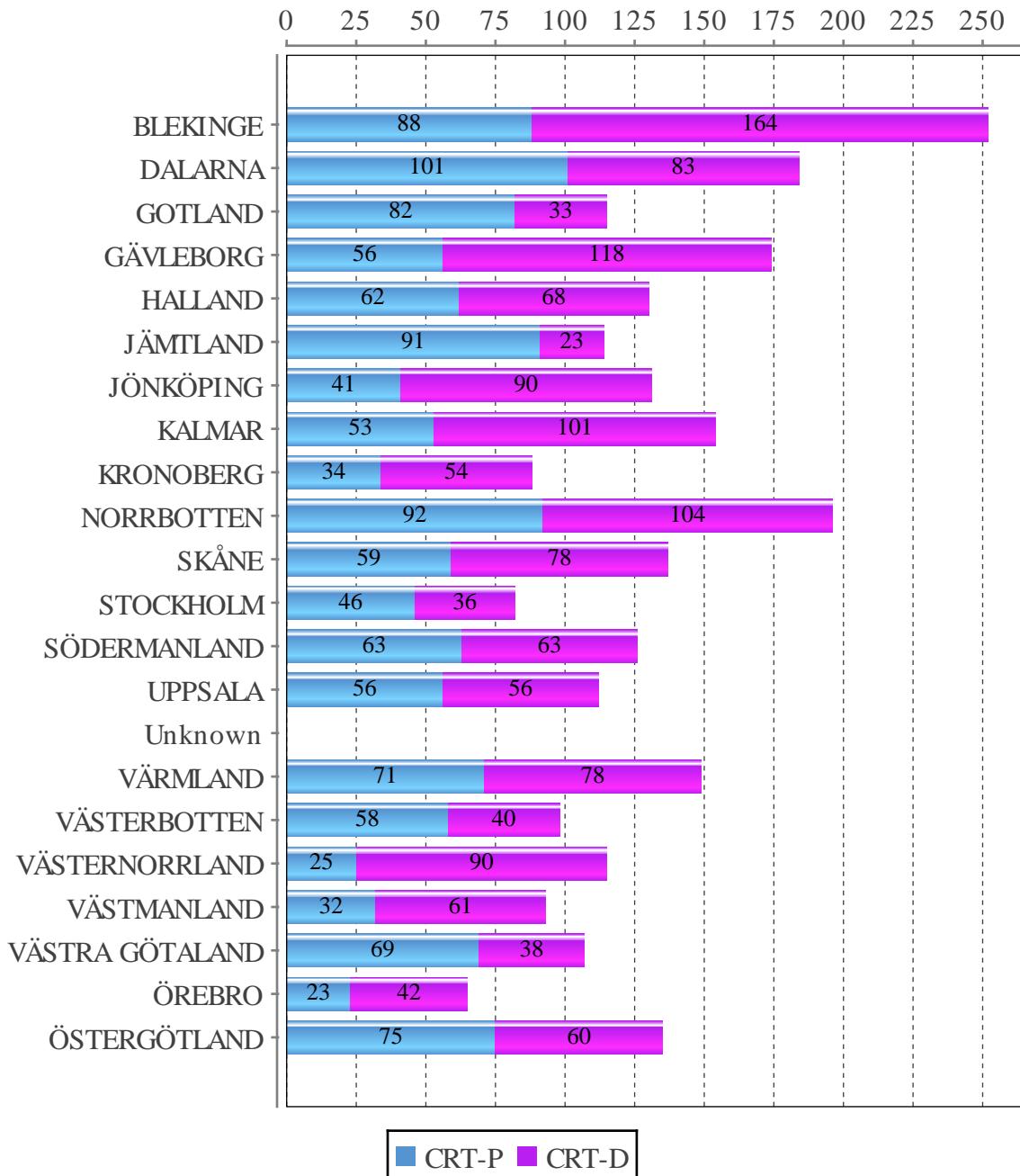
Hospital	Operator	No
	Hayder Kadhim	30
	Sundelin	4
	Torbjörn	
	Teder Priit	3
Trollhättan, NÄL	Jabbar	6
	Javid	11
	Orsolya Bene	17
Universitetssjukhuset Örebro	Anna Björkenheim	22
	Emanuel Frimodig	3
	Lindell	22
Varbergs sjukhus	Emma Sandgren	26
	Rorsman	28
	Verdin	1
Visby lasarett	Jacobsson L	7

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## STATISTICS – CRT

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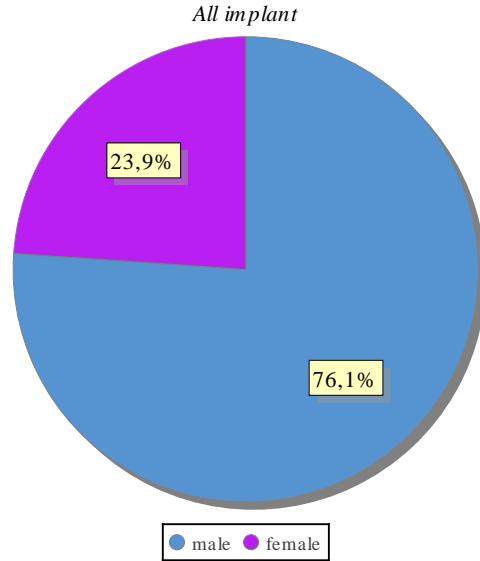
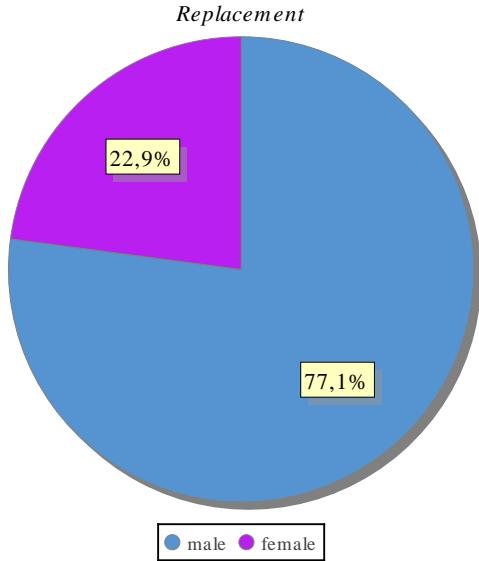
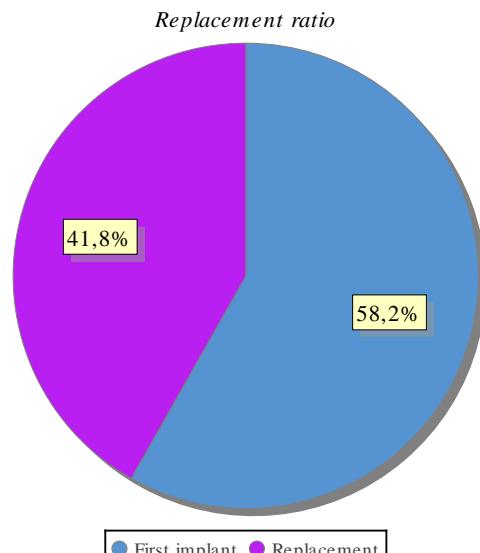
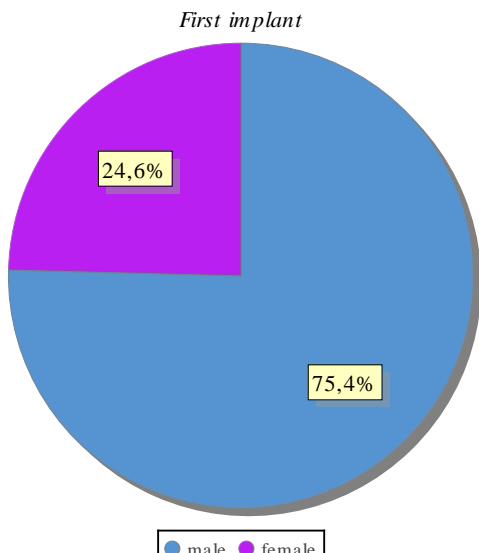
## STATISTICS – CRT – IMPLANTS PER COUNTY



## STATISTICS – CRT – TYPE OF IMPLANTS

*Based on both CRT-P and CRT-D*

	Total	Male		Female		
	no	%	no	%	no	%
First implant	1234	58.2	930	75.4	304	24.6
Replacement	885	41.8	682	77.1	203	22.9
Total	2119	100.0	1612	76.1	507	23.9



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## STATISTICS – CRT – HISTORICAL IMPLANT RATES

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*CRT Historical implant rates per hundred thousand residents*

Year	Population	No First Impl	CRT-P		CRT-D	
			No	Rate	No	Rate
2017	10120242	1191	549	5.4	642	6.3
2018	10230185	1209	611	6.0	598	5.8
2019	10327589	1312	650	6.3	662	6.4
2020	10379295	1162	563	5.4	599	5.8
2021	10457147	1236	606	5.8	630	6.0

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## STATISTICS – CRT – SYSTEM STATUS

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*CRT-P (generator)*

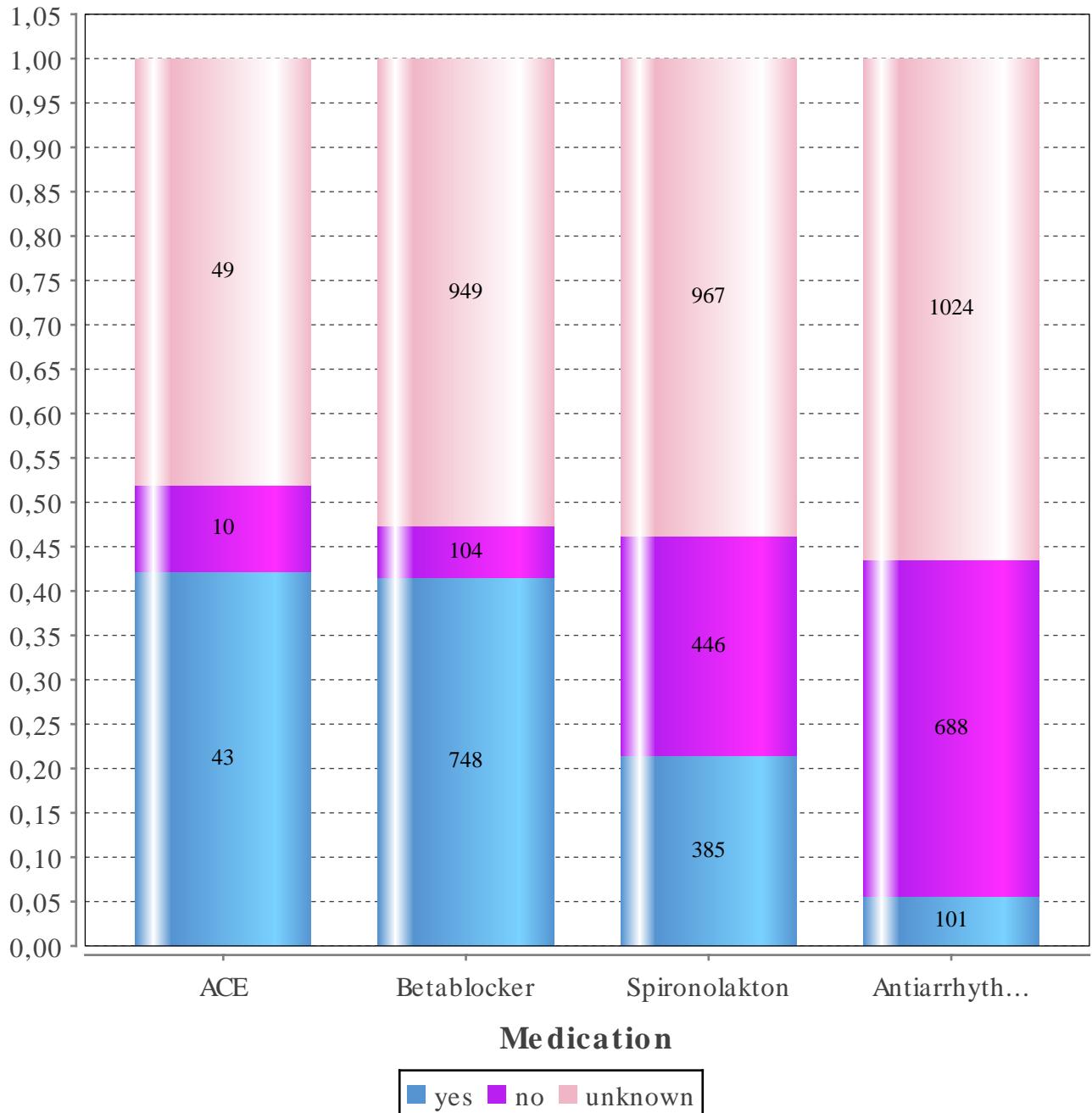
<b>Status</b>	<b>First implant</b>	<b>Replacement</b>
SC-lead plugged	11	8
SC-lead failed implant	4	3
SC-lead active system	614	395

*CRT-D (generator)*

<b>Status</b>	<b>First implant</b>	<b>Replacement</b>
SC-lead plugged	8	2
SC-lead failed implant	22	6
SC-lead active system	629	479

## STATISTICS – CRT – MEDICATION

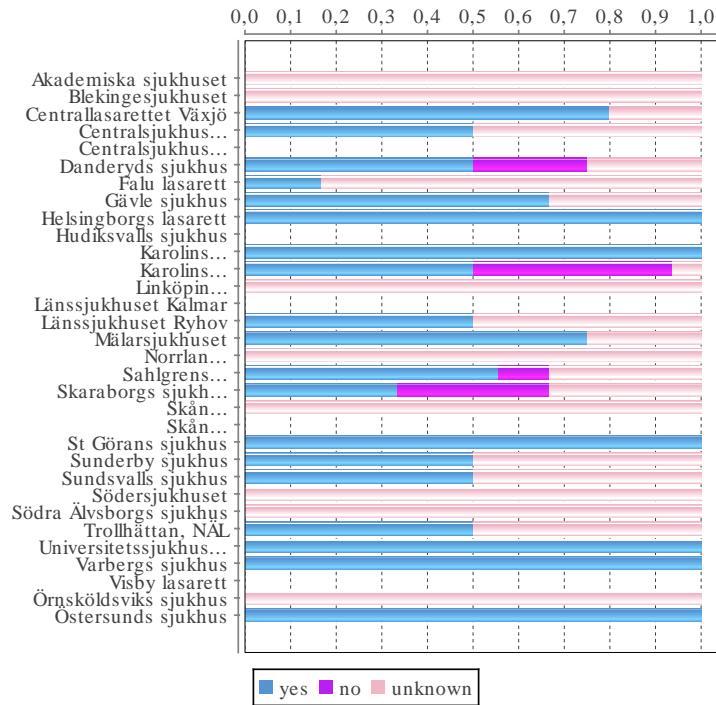
Previous medication for patients having CRT implant



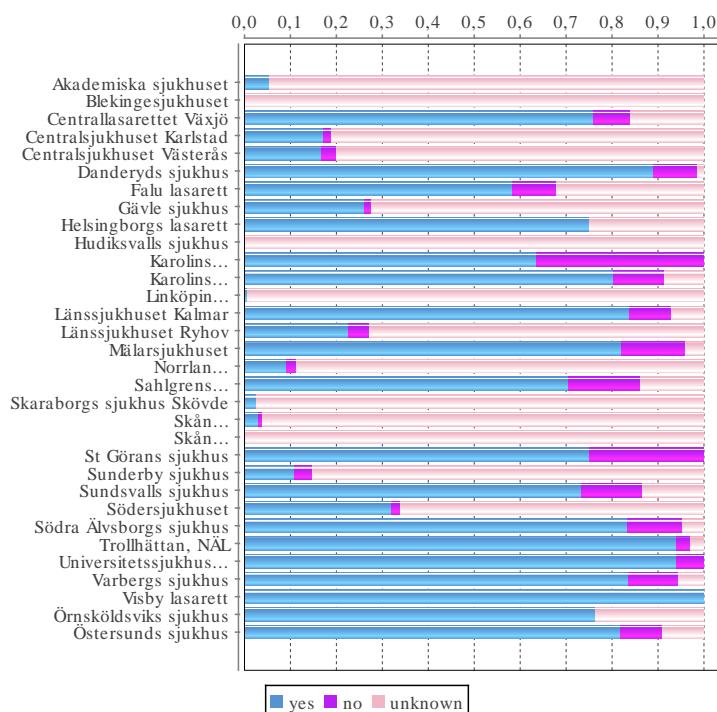
## STATISTICS – CRT – MEDICATION PER HOSPITAL

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**ACE**

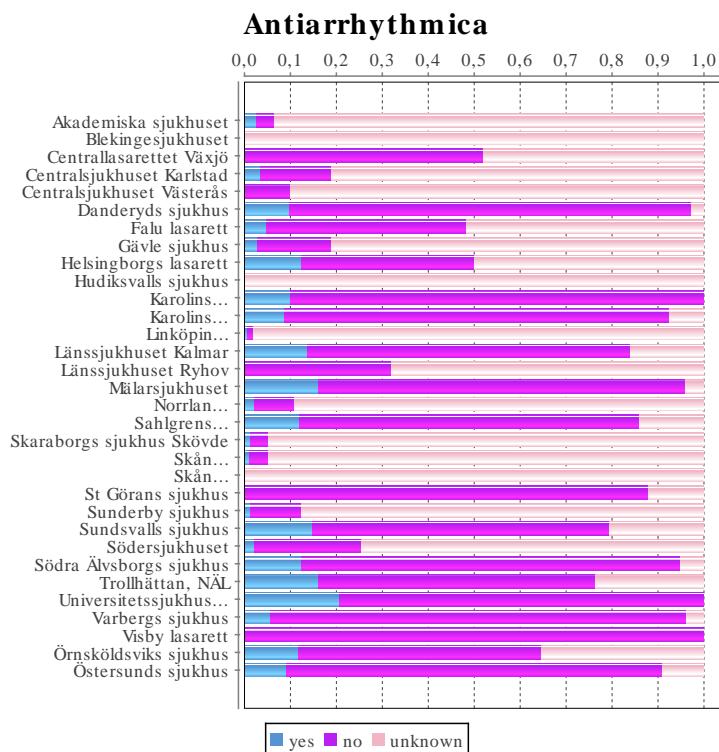
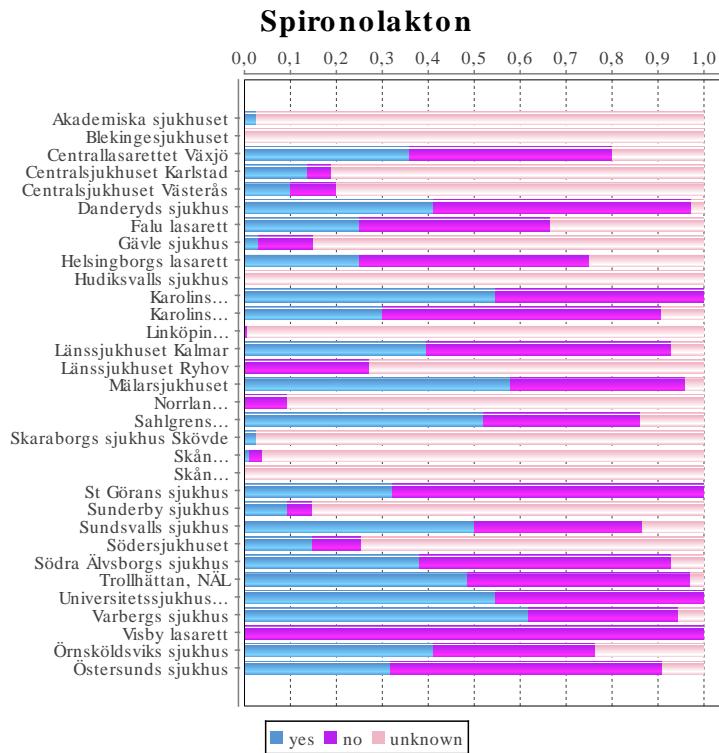


**Betalblocker**



## STATISTICS – CRT – MEDICATION PER HOSPITAL

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## STATISTICS – CRT-P – OPERATORCODE FOR IMPLANTS

*Procedures per operator*

Hospital	Operator	No
Akademiska sjukhuset	Arvanitis	8
	Falasca Zamponi	9
	Teder	5
Ålands centralsjukhus	Slotte	4
Blekingesjukhuset	Genadi Kaninski	5
	Jan-Olov Borg	2
	Martin Stefanik	2
	Michael Ringborn	1
	Nicoleta Sora	3
Centrallasarettet Växjö	Johansson P	1
	Jonasson	3
	Strandberg	1
	Strandberg-Jonasson	1
Centralsjukhuset Karlstad	Niklas Aldergård	20
Centralsjukhuset Västerås	SkoglundAndersson	6
	Wiberg	1
Danderyds sjukhus	1	4
	3	4
	4	22
Falu lasarett	Monheim	7
	Forsgren	25
Gävle sjukhus	Falck	5
	Kastberg	9
Helsingborgs lasarett	Rorsman	4
Karolinska Universitetssjukhus	Annan	2
	Gadler	30
	Hörnsten	18
	Reistam	12
	Reistam/Hörnsten	1
Länssjukhuset Kalmar	David Olsson	5
	Hendrik Schreyer	6
Linköpings universitetssjukhus	Pinna C	5
	Säfström K	8
	Sonesson L	32
	Svenson A	1
	Szymanowski A	6
Mälarsjukhuset	Carl Westholm	18
Norrlands Universitetssjukhus	Andersson	7
	Ioannis Katsoularis	1
	Jensen	1
	Landström	9
	Rönn	1

Hospital	Operator	No
Östersunds sjukhus	Björklund Friberg	10
	Friberg	1
Sahlgrenska universitetssjukhuset	Alice David	2
	Amar Taha	11
	Gäbel/Szamlewski	1
	Konstantinos Liakatsidas	8
	Piotr Szamlewski	15
	Shabbar Jamaly	2
	Stefan Jakobsson	6
Skaraborgs sjukhus Skövde	Anna Widunder	5
	Annan	1
	Falmer	1
	Lorentzen	26
	Paulsson	10
Skånes universitetssjukhus, Lund	Annan	1
	David Mörtzell	19
	Johan Brandt	4
	LingWei Wang	34
	Maiwand Farouq	6
	Rasmus Borgquist	22
	Uzma Chaudhry	1
Södersjukhuset	Jonsson J-E	4
	Kjellman B	9
	Olson J	10
Södra Älvborgs sjukhus	Riemer	17
St Görans sjukhus	1	3
	1+2	1
	2	3
Sunderby sjukhus	Baas och Rangson	1
	Marcus Baas	12
	Peter Johansson	3
	Peter Rangson	7
Sundsvalls sjukhus	Teder Priit	6
Trollhättan, NÄL	Javid	14
	Orsolya Bene	5
Universitetssjukhuset Örebro	Anna Björkenheim	2
	Lindell	4
Varbergs sjukhus	Emma Sandgren	6
	Rorsman	13

## STATISTICS – CRT-D – OPERATORCODE FOR IMPLANTS

*Procedures per operator*

<b>Hospital</b>	<b>Operator</b>	<b>No</b>
Akademiska sjukhuset	Arvanitis	8
	Falasca Zamponi	9
	Teder	6
Ålands centralsjukhus	Slotte	3
Blekingesjukhuset	Genadi Kaninski	4
	Jan-Olov Borg	6
	Martin Stefanik	1
	Michael Ringborn	5
	Nicoleta Sora	6
Centrallasarettet Växjö	Johansson P	3
	Rosén Helena	4
	Strandberg-Jonasson-Rosén	1
Centralsjukhuset Karlstad	Niklas Aldergård	23
Centralsjukhuset Västerås	SkoglundAndersson	8
	Wiberg	5
Danderyds sjukhus	1	4
	3	8
	4	17
Falu lasarett	Monheim	6
	Berglund	1
	Forsgren	17
Gävle sjukhus	Falck	14
	Kastberg	22
Helsingborgs lasarett	Rorsman	1
Karolinska Universitetssjukhus	Annan	1
	Gadler	21
	Hörnsten	16
	Reistam	14
	Reistam/Hörnsten	2
Länssjukhuset Kalmar	David Olsson	9
	Hendrik Schreyer	12
Länssjukhuset Ryhov	Walid El-Saadi	1
Linköpings universitetssjukhus	Annan	1
	Pinna C	8
	Säfström K	29
	Sonesson L	20
	Szymanowski A	10
Mälarsjukhuset	Carl Westholm	17
Norrlands Universitetssjukhus	Andersson	4
	Höglund	1
	Jensen	1
	Landström	7
	Rönn	2

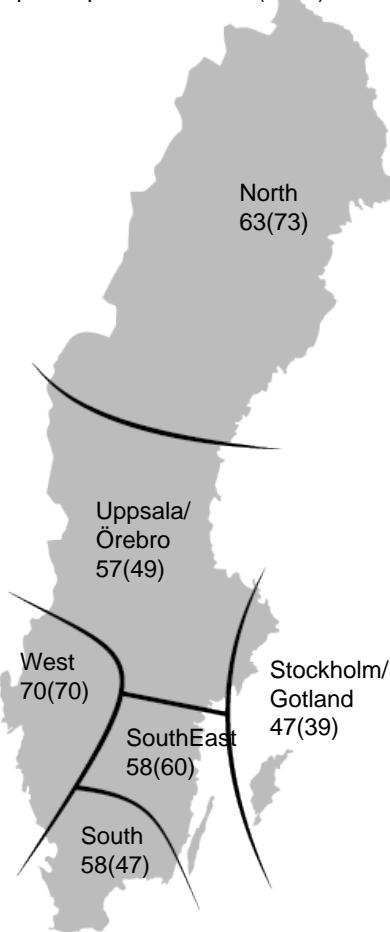
<b>Hospital</b>	<b>Operator</b>	<b>No</b>
Örnsköldsviks sjukhus	Ehlin	11
Östersunds sjukhus	Björklund Friberg	4
Sahlgrenska universitetssjukhuset	Amar Taha	7
	Konstantinos Liakatsidas	2
	Piotr Szamlewski	5
	Shabbar Jamaly	2
	Stefan Jakobsson	3
Skaraborgs sjukhus Skövde	Anna Widunder	3
	Lorentzen	9
	Paulsson	2
Skånes universitetssjukhus, Lund	David Mörtzell	22
	Johan Brandt	3
	LingWei Wang	65
	Maiwand Farouq	8
	Rasmus Borgquist	23
	Uzma Chaudhry	2
Södersjukhuset	Jonsson J-E	3
	Kjellman B	7
	Olson J	4
Södra Älvsborgs sjukhus	Riemer	12
St Görans sjukhus	1	8
Sunderby sjukhus	Agneta Johansson	1
	Baas och Rangson	2
	Marcus Baas	11
	Peter Johansson	5
	Peter Rangson	10
Sundsvalls sjukhus	Haupt Jan	2
	Teder Priit	11
Trollhättan, NÄL	Javid	10
	Orsolya Bene	10
Universitetssjukhuset Örebro	Anna Björkenheim	6
	Lindell	9
Varbergs sjukhus	Emma Sandgren	12
	Rorsman	10

## STATISTICS – CRT-P – IMPLANTS PER REGION

*The regions are based on where the patients live, not where they are treated*

Region	Population	No of first impl	No per million
Stockholm/Gotland	2476140	117	47
Uppsala/Örebro	2141936	122	57
South-East Sweden	1083943	63	58
Southern Sweden	1906213	110	58
Western Sweden	1943591	136	70
Northern Sweden	900503	57	63
Total	10452326	605	58

Implants per million 2021(2020)



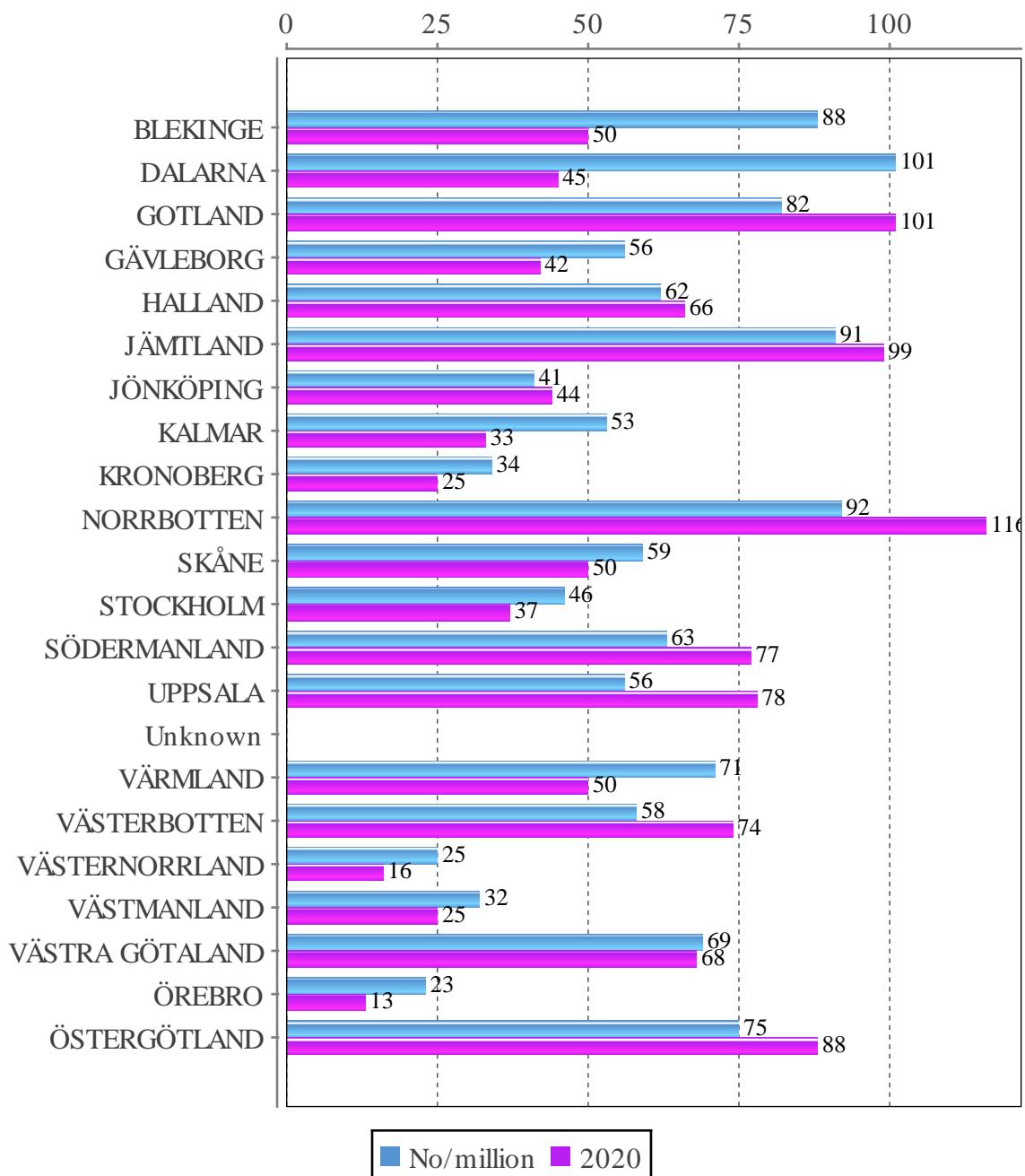
## STATISTICS – CRT-P – IMPLANTS PER COUNTY

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*The regions are based on where the patients live, not where they are treated*

	<b>Population</b>	<b>No first impl</b>	<b>No/million</b>
BLEKINGE	158937	14	88
DALARNA	288387	29	101
GOTLAND	61001	5	82
GÄVLEBORG	287767	16	56
HALLAND	340243	21	62
JÄMTLAND	132054	12	91
JÖNKÖPING	367064	15	41
KALMAR	247175	13	53
KRONOBERG	203340	7	34
NORRBOTTEN	249693	23	92
SKÅNE	1402425	83	59
STOCKHOLM	2415139	112	46
SÖDERMANLAND	301801	19	63
UPPSALA	395026	22	56
Unknown	0	3	0
VÄRMLAND	283196	20	71
VÄSTERBOTTEN	274563	16	58
VÄSTERNORRLAND	244193	6	25
VÄSTMANLAND	278967	9	32
VÄSTRA GÖTALAND	1744859	121	69
ÖREBRO	306792	7	23
ÖSTERGÖTLAND	469704	35	75
Total	10452326	608	58

## STATISTICS – CRT-P – IMPLANTS PER COUNTY

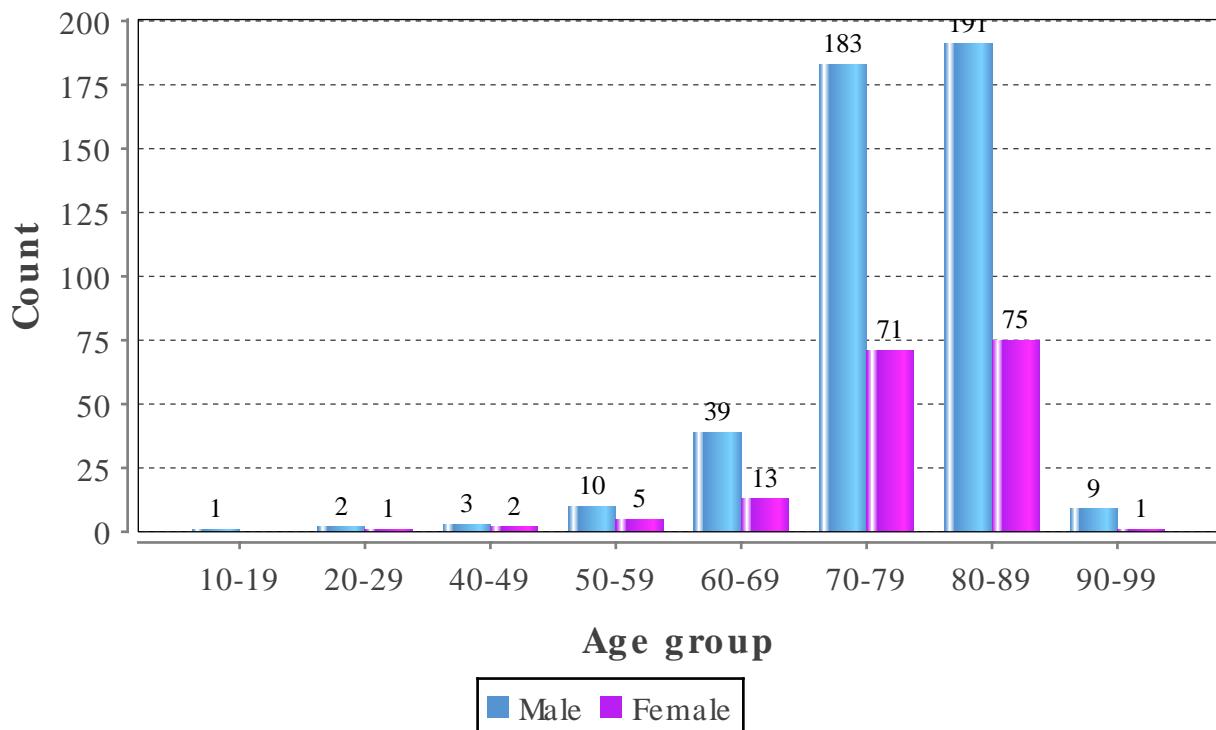


## STATISTICS – CRT-P – AGE DISTRIBUTION MALES/FEMALES

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*Age and gender distribution for new implants, total numbers*

<b>Age (years)</b>	<b>Total no</b>	<b>%</b>	<b>Male</b>	<b>Female</b>
10-19	1	0.2	1	0
20-29	3	0.5	2	1
40-49	5	0.8	3	2
50-59	15	2.5	10	5
60-69	52	8.6	39	13
70-79	254	41.9	183	71
80-89	266	43.9	191	75
90-99	10	1.7	9	1
Average age	77	0.0	77	77
Total number of implants: 606				

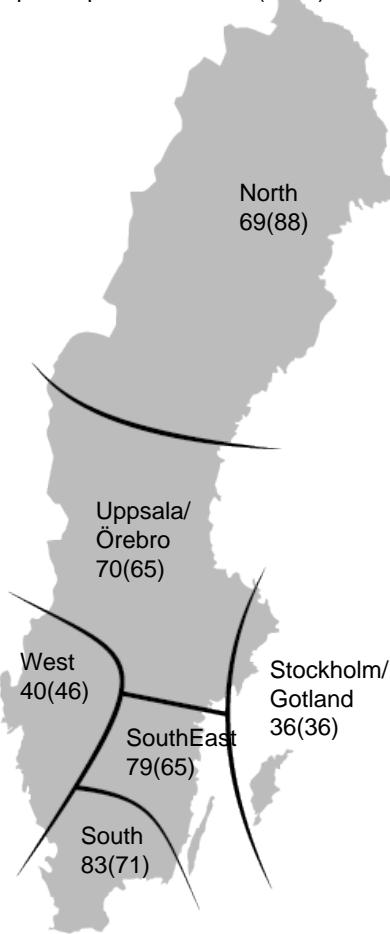


## STATISTICS – CRT-D – IMPLANTS PER REGION

*The regions are based on where the patients live, not where they are treated*

Region	Population	No of first impl	No per million
Stockholm/Gotland	2476140	90	36
Uppsala/Örebro	2141936	151	70
South-East Sweden	1083943	86	79
Southern Sweden	1906213	159	83
Western Sweden	1943591	78	40
Northern Sweden	900503	62	69
Total	10452326	626	60

Implants per million 2021(2020)



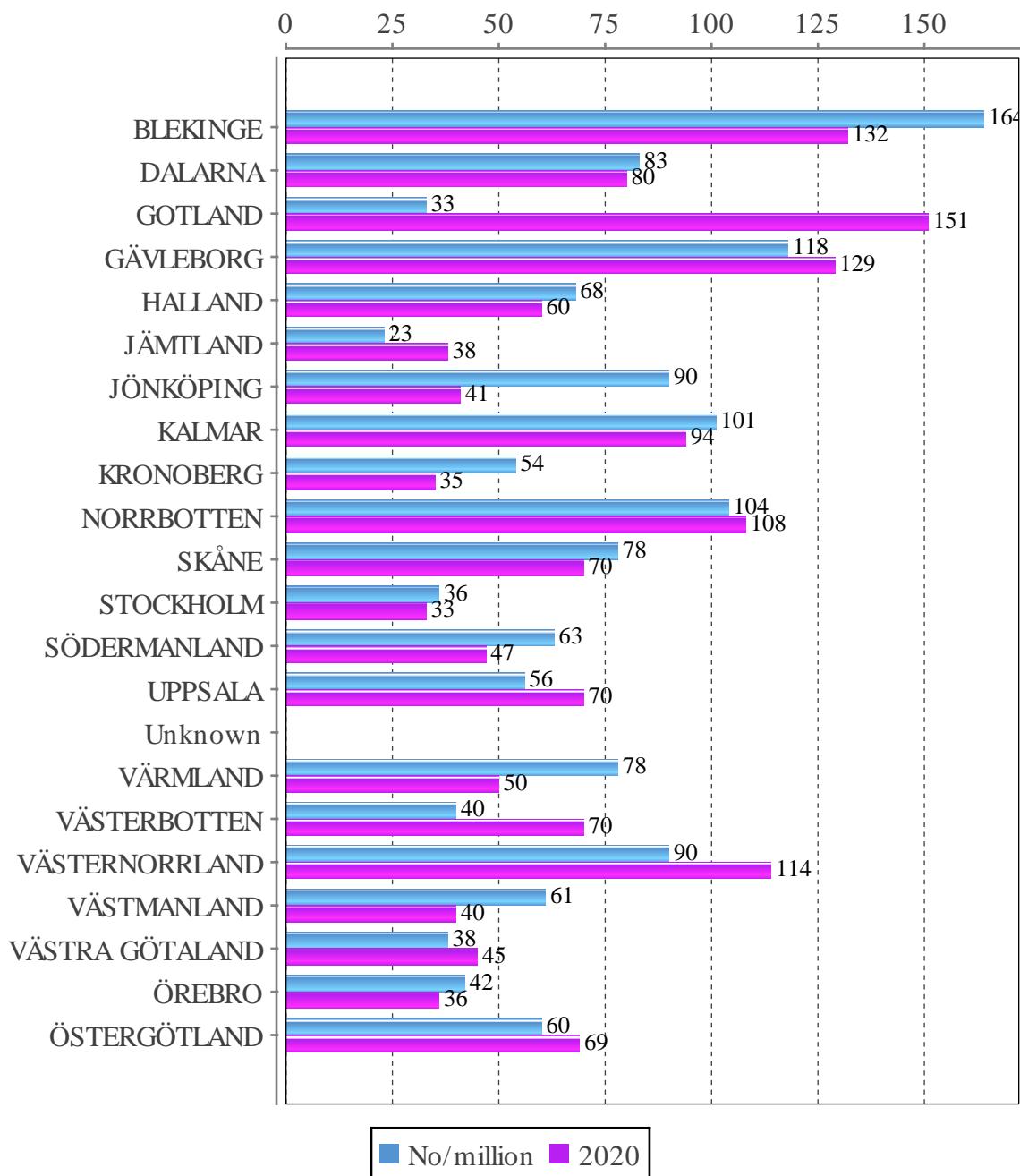
## STATISTICS – CRT-D – IMPLANTS PER COUNTY

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*The regions are based on where the patients live, not where they are treated*

	<b>Population</b>	<b>No first impl</b>	<b>No/million</b>
BLEKINGE	158937	26	164
DALARNA	288387	24	83
GOTLAND	61001	2	33
GÄVLEBORG	287767	34	118
HALLAND	340243	23	68
JÄMTLAND	132054	3	23
JÖNKÖPING	367064	33	90
KALMAR	247175	25	101
KRONOBERG	203340	11	54
NORRBOTTEN	249693	26	104
SKÅNE	1402425	110	78
STOCKHOLM	2415139	88	36
SÖDERMANLAND	301801	19	63
UPPSALA	395026	22	56
Unknown	0	9	0
VÄRMLAND	283196	22	78
VÄSTERBOTTEN	274563	11	40
VÄSTERNORRLAND	244193	22	90
VÄSTMANLAND	278967	17	61
VÄSTRA GÖTALAND	1744859	66	38
ÖREBRO	306792	13	42
ÖSTERGÖTLAND	469704	28	60
Total	10452326	634	61

## STATISTICS – CRT-D – IMPLANTS PER COUNTY



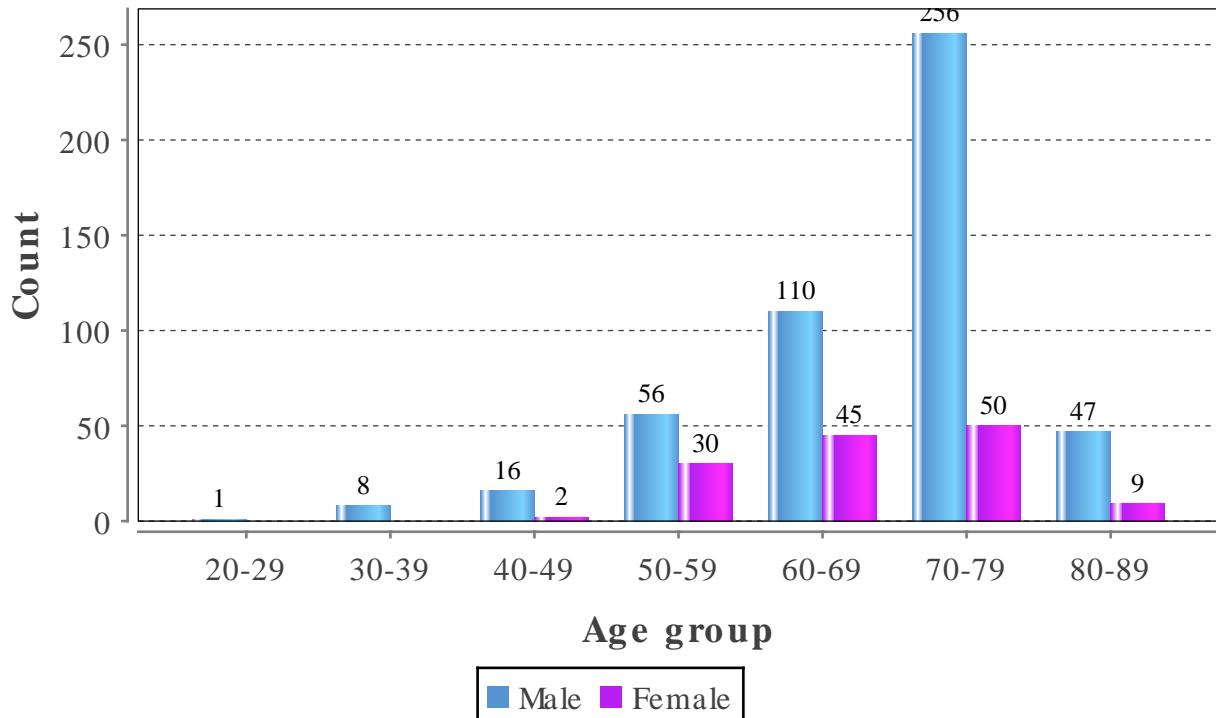
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## STATISTICS – CRT-D – AGE DISTRIBUTION MALES/FEMALES

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*Age and gender distribution for new implants, total numbers*

Age (years)	Total no	%	Male	Female
20-29	1	0.2	1	0
30-39	8	1.3	8	0
40-49	18	2.9	16	2
50-59	86	13.7	56	30
60-69	155	24.6	110	45
70-79	306	48.6	256	50
80-89	56	8.9	47	9
Average age	69	0.0	69	67
Total number of implants: 630				



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## STATISTICS – ILR

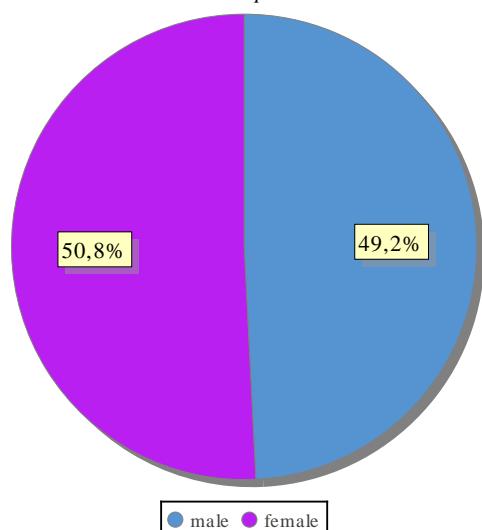
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## STATISTICS – ILR – TYPE OF IMPLANTS

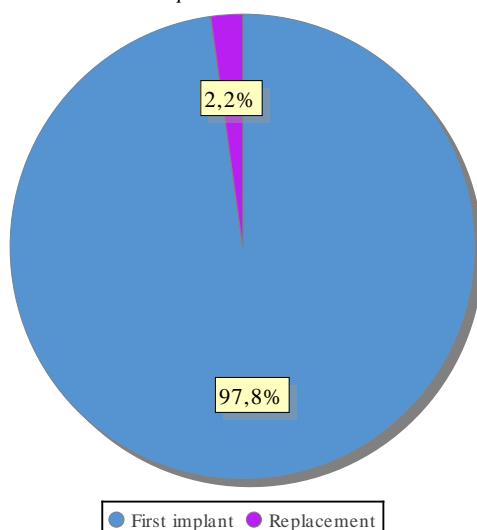
*Ratio of new implants versus generator changes*

	Total		Male		Female	
	no	%	no	%	no	%
First implant	1196	97.8	588	49.2	608	50.8
Replacement	27	2.2	11	40.7	16	59.3
Total	1223	100.0	599	49.0	624	51.0

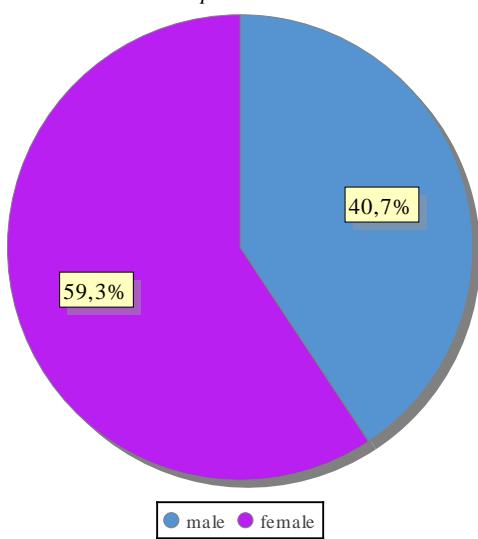
*First implant*



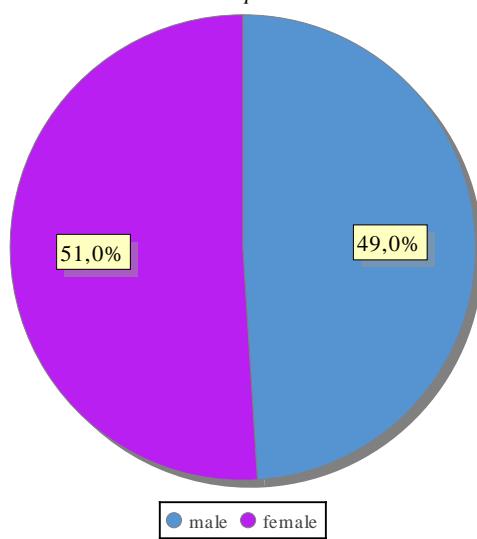
*Replacement ratio*



*Replacement*



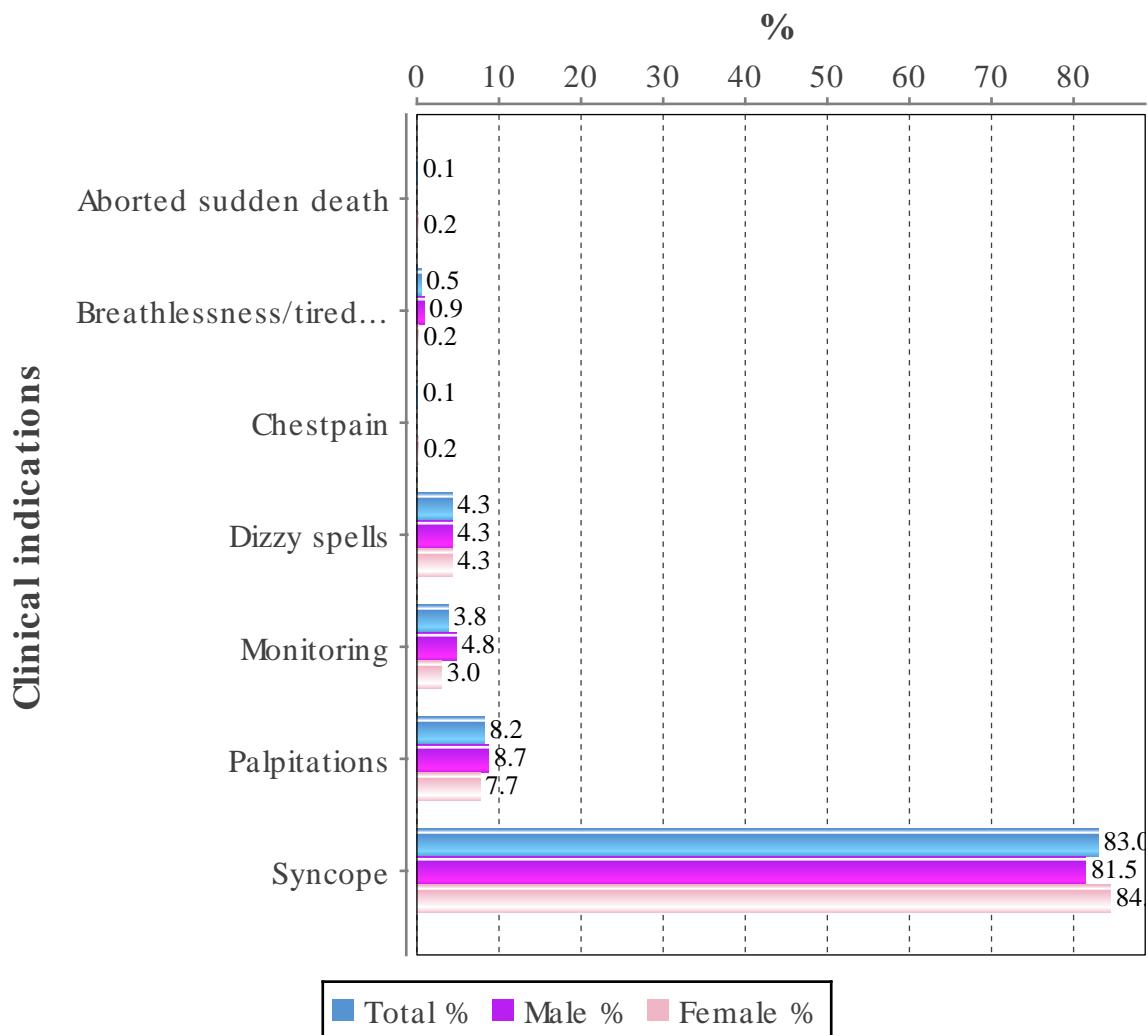
*All implant*



## STATISTICS – ILR – CLINICAL INDICATIONS

*Main symptom for implanting ILR*

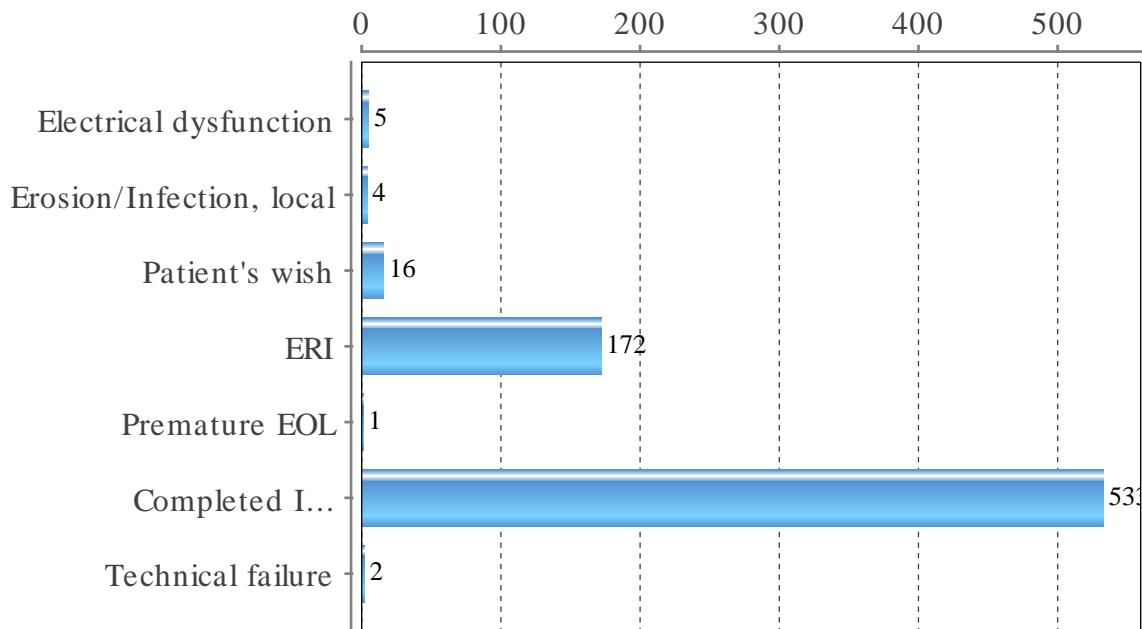
<b>Indication</b>	<b>Total %</b>	<b>Male %</b>	<b>Female %</b>
Aborted sudden death	0.1	0.0	0.2
Breathlessness/tiredness	0.5	0.9	0.2
Chestpain	0.1	0.0	0.2
Dizzy spells	4.3	4.3	4.3
Monitoring	3.8	4.8	3.0
Palpitations	8.2	8.7	7.7
Syncope	83.0	81.5	84.5



## STATISTICS – ILR – REASON FOR REMOVAL

*Reason for generator removal*

Reason	No	%
Electrical dysfunction	5	0.7
Erosion/Infection, local	4	0.5
Patient's wish	16	2.2
ERI	172	23.5
Premature EOL	1	0.1
Completed ILR investigation	533	72.7
Technical failure	2	0.3



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## STATISTICS – ILR – ACTION AFTER ILR

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*Investigation after first ILR implant in % of completed ILR investigation*

Action	No	%
Pacemaker implant	341	64.0
ICD implant	34	6.4
New ILR implant	27	5.1

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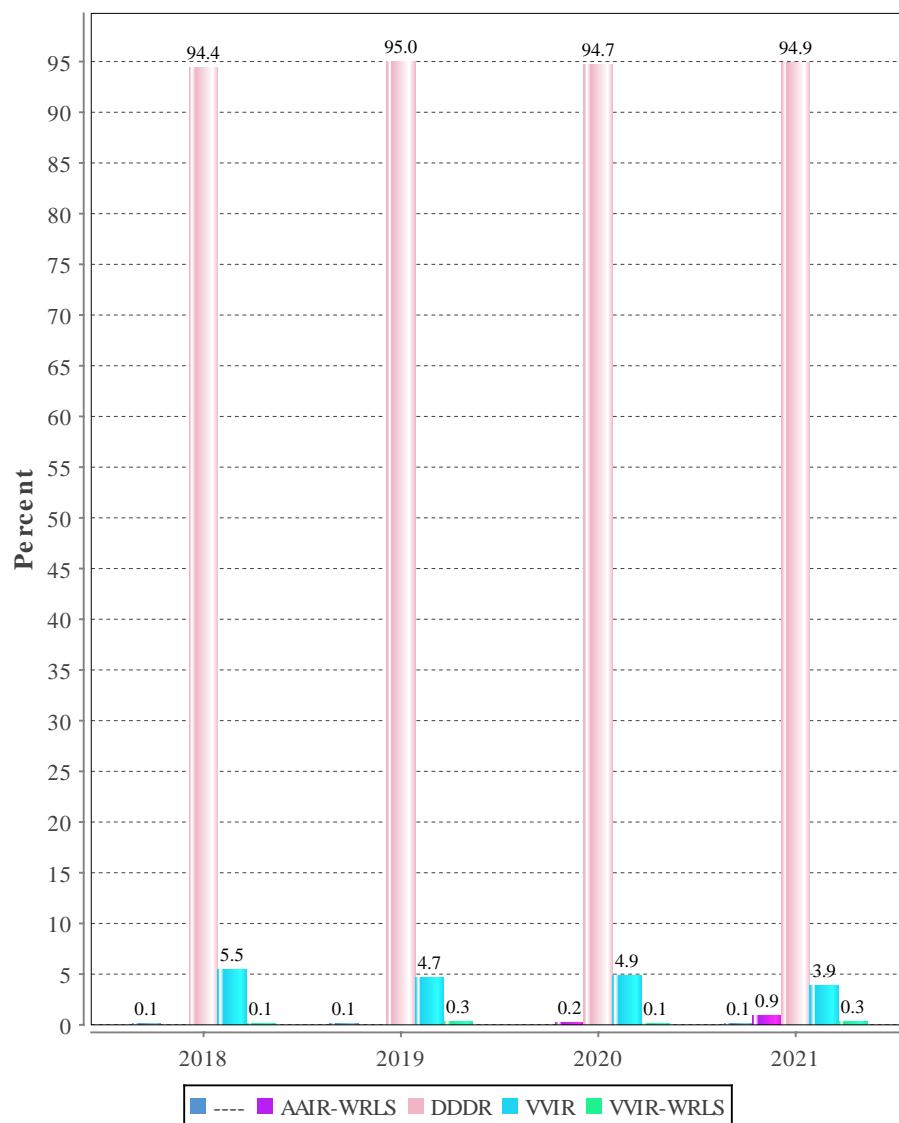
## QUALITY

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## QUALITY – PACEMAKER – FIRST IMPLANT HIGH DEGREE AV-BLOCK

*Use of pacing mode for total AV block indication, historical data*

Mode %	2018	2019	2020	2021
----	0.1	0.1	0.0	0.1
AAIR-WRLS	0.0	0.0	0.2	0.9
DDDR	94.4	95.0	94.7	94.9
VVIR	5.5	4.7	4.9	3.9
VVIR-WRLS	0.1	0.3	0.1	0.3



## QUALITY – PACEMAKER – AV BLOCK MODES USED PER HOSPITAL

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*Use of pacing mode for total AV block indication per hospital (number of new implants / year)*

Hospital (%)	DDD	VVI
Akademiska sjukhuset	89.2	10.8
Alingsås lasarett	97.7	2.3
Blekingesjukhuset	100.0	-
Centrallasarettet Växjö	97.1	2.9
Centralsjukhuset Karlstad	98.9	1.1
Centralsjukhuset Kristianstad	97.8	2.2
Centralsjukhuset Västerås	98.5	1.5
Danderyds sjukhus	99.6	0.4
Falu lasarett	99.0	1.0
Gävle sjukhus	96.6	3.4
Helsingborgs lasarett	95.5	4.5
Hudiksvalls sjukhus	80.0	20.0
Karolinska Universitetssjukhuset	97.5	2.5
Kungälvs sjukhus	93.2	6.8
Linköpings Universitetssjukhus	98.9	1.1
Länssjukhuset Halmstad	100.0	-
Länssjukhuset Kalmar	75.0	25.0
Länssjukhuset Ryhov	91.5	8.5
Mälarsjukhuset	100.0	-
Norrlands Universitetssjukhus	96.3	3.7
Sahlgrenska Universitetssjukhuset	93.9	6.1
Skaraborgs sjukhus Skövde	100.0	-
Skellefteå lasarett	91.7	8.3
Skånes universitetssjukhus, Lund	96.9	3.1
Skånes universitetssjukhus, Malmö	98.9	1.1
Sollefteå sjukhus	85.7	14.3
St Görans sjukhus	97.6	2.4
Sunderby sjukhus	96.2	3.8
Sundsvalls sjukhus	94.9	5.1
Södersjukhuset	95.1	4.9
Södra Älvborgs sjukhus	98.8	1.2
Torsby sjukhus	91.7	8.3
Trollhättan, NÄL	82.8	17.2
Universitetssjukhuset Örebro	98.9	1.1
Varbergs sjukhus	96.8	3.2
Visby lasarett	100.0	-
Västerviks sjukhus	100.0	-
Örnsköldsviks sjukhus	93.5	6.5
Östersunds sjukhus	100.0	-

## QUALITY – PACEMAKER – AV BLOCK MODES USED PER HOSPITAL

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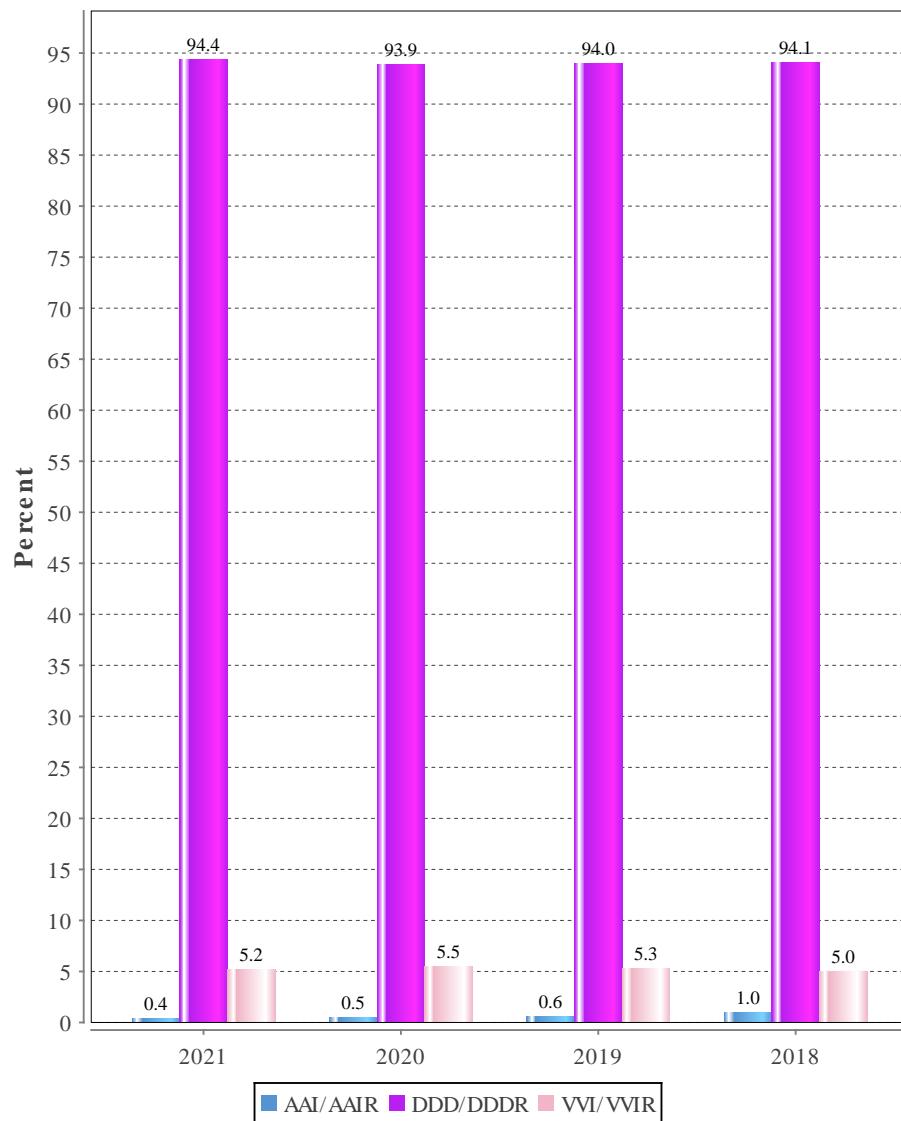
*Use of pacing mode for total AV block indication per hospital size*

<b>Year</b>	<b>Mode</b>	<b>All hospitals (%)</b>	<b>Large (%)</b>	<b>Medium (%)</b>	<b>Small (%)</b>
2021	DDD	96.0	95.5	97.2	94.2
	VVI	4.0	4.5	2.8	5.8
2020	DDD	95.1	95.8	94.0	95.0
	VVI	4.9	4.2	6.0	5.0
2019	DDD	95.3	94.4	96.7	97.8
	VVI	4.7	5.6	3.3	2.2
2018	DDD	94.5	94.8	95.3	91.3
	VVI	5.5	5.2	4.7	8.7
2017	DDD	95.2	95.0	97.5	89.7
	VVI	4.8	5.0	2.5	10.3
2016	DDD	95.1	95.9	95.4	88.8
	VVI	4.9	4.1	4.6	11.2
2015	DDD	95.2	95.9	96.0	85.7
	VVI	4.8	4.1	4.0	14.3
2014	DDDR	95.7	97.0	94.2	89.3
	DDDC	-	-	-	-
	VVIC	-	0.1	-	-
	VVIR	4.3	2.9	5.8	10.7
2013	DDDR	94.4	95.8	92.9	90.1
	DDDC	-	0.1	-	-
	VVIC	-	-	-	-

## QUALITY – PACEMAKER – FIRST IMPLANT SINUS NODE DYSFUNCTION

*Use of pacing mode for Sinus Node Disease, historical data*

Mode (%)	2021	2020	2019	2018
AAI/AAIR	0.4	0.5	0.6	1.0
DDD/DDDR	94.4	93.9	94.0	94.1
VVI/VVIR	5.2	5.5	5.3	5.0



**QUALITY – PACEMAKER – FIRST IMPLANT  
SINUS NODE DYSFUNCTION PER HOSPITAL**

*Use of pacing mode for Sinus Node Dysfunction indication per hospital size (number of new implants / year)*

<b>Year</b>	<b>Mode</b>	<b>All hospitals</b>	<b>Small %</b>	<b>Medium %</b>	<b>Large %</b>
2021	AAI	0.4	2.2	0.2	0.3
	VVI	5.2	9.0	5.8	4.5
	DDD	94.4	88.8	93.9	95.1
2020	AAI	0.5	1.6	0.6	0.4
	VVI	5.5	4.1	6.7	5.1
	DDD	93.9	94.3	92.7	94.5
2019	AAI	0.6	0.7	0.8	0.6
	VVI	5.3	6.7	5.9	5.0
	DDD	94.0	92.7	93.3	94.5
2018	AAI	1.0	1.6	1.5	0.6
	VVI	5.0	10.5	3.1	4.7
	DDD	94.1	87.9	95.4	94.7
2017	AAI	0.4	2.8	0.2	0.2
	VVI	5.5	17.9	2.4	5.1
	DDD	94.1	79.3	97.4	94.7
2016	AAI	0.5	2.4	0.3	0.3
	VVI	5.7	17.1	6.5	3.8
	DDD	93.8	80.6	93.2	95.9
2015	AAI	0.4	1.9	0.3	0.3
	VVI	5.1	12.3	6.5	3.8
	DDD	94.5	85.8	93.2	95.9
2014	AAIR	0.8	1.1	0.9	0.8
	VVIR	5.9	16.1	7.7	4.1
	DDDR	93.3	82.8	91.4	95.1
2013	AAIR	1.1	0.9	1.0	1.2
	VVIR	6.6	12.8	8.7	4.7
	DDDR	92.2	86.3	90.0	94.2
2012	AAIC	-	-	-	-
	DDDC	-	-	-	-
	AAIR	1.2	0.6	1.3	1.2
2011	VVIC	-	0.6	-	-
	VVIR	7.8	13.4	8.6	6.1
	DDDR	91.0	85.4	90.2	92.6
2010	AAIC	-	-	-	-
	AAIR	1.4	0.4	1.0	2.3
	VVIC	0.1	0.4	0.1	-
2009	VVIR	7.5	19.6	8.3	2.8
	DDDR	91.0	79.6	90.6	95.0
	AAIR	3.4	2.5	2.9	4.2
2009	VVIC	0.1	1.2	-	-
	VVIR	9.2	20.1	10.3	6.1
	DDDR	87.3	76.2	86.8	89.7
2009	AAIR	5.1	6.3	4.8	5.2
	VVIC	0.2	-	0.1	-
	VVIR	9.3	17.6	11.9	5.6
2009	DDDR	85.4	73.9	83.2	89.2

**QUALITY – PACEMAKER – FIRST IMPLANT  
SINUS NODE DYSFUNCTION PER HOSPITAL**

*Use of pacing mode for Sinus Node Dysfunction indication per hospital (number of new implants / year)*

Hospital (%)	DDD	VVI	AAI
Akademiska sjukhuset	96.6	3.4	-
Alingsås lasarett	88.2	-	11.8
Blekingesjukhuset	98.2	1.8	-
Centrallasarettet Växjö	100.0	-	-
Centralsjukhuset Karlstad	88.0	12.0	-
Centralsjukhuset Kristianstad	95.2	4.8	-
Centralsjukhuset Västerås	84.1	15.9	-
Danderyds sjukhus	100.0	-	-
Falu lasarett	93.4	6.6	-
Gävle sjukhus	92.3	7.7	-
Helsingborgs lasarett	96.4	3.6	-
Hudiksvalls sjukhus	86.4	13.6	-
Karolinska Universitetssjukhuset	95.7	4.3	-
Kungälvs sjukhus	93.1	6.9	-
Linköpings Universitetssjukhus	98.0	2.0	-
Länssjukhuset Halmstad	100.0	-	-
Länssjukhuset Kalmar	78.7	21.3	-
Länssjukhuset Ryhov	83.8	16.3	-
Mälarsjukhuset	96.1	3.9	-
Norrlands Universitetssjukhus	92.5	5.0	2.5
Sahlgrenska Universitetssjukhuset	91.4	7.1	1.4
Skaraborgs sjukhus Skövde	97.5	2.5	-
Skellefteå lasarett	75.0	25.0	-
Skånes universitetssjukhus, Lund	99.2	-	0.8
Skånes universitetssjukhus, Malmö	98.1	1.9	-
Söllefteå sjukhus	83.3	16.7	-
St Görans sjukhus	99.0	1.0	-
Sunderby sjukhus	97.3	2.7	-
Sundsvalls sjukhus	85.1	14.9	-
Södersjukhuset	96.8	2.1	1.1
Södra Älvborgs sjukhus	93.0	5.3	1.8
Torsby sjukhus	100.0	-	-
Trollhättan, NÄL	93.4	6.6	-
Universitetssjukhuset Örebro	96.2	3.8	-
Varbergs sjukhus	97.8	2.2	-
Visby lasarett	75.0	25.0	-
Västerviks sjukhus	100.0	-	-
Örnsköldsviks sjukhus	100.0	-	-
Östersunds sjukhus	100.0	-	-

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## QUALITY – PACEMAKER – LEAD DISLOCATION

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*Dislocation rate for different lead types in atrial or ventricular placement. Based on all implants implanted 2007 and later and explanted/corrected 2021 or earlier*

Type	Right atrium %	Right ventricle %	Left ventricle %	Total %
Fixed screw	1.6	0.9	0.9	1.2
Retractable screw	1.6	0.9	0.9	1.2
Passive	3.4	1.6	2.0	1.3
All	1.6	1.0	1.7	1.3

## QUALITY – LEAD EXTRACTIONS

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*Extractions per hospital*

Hospital	No of leads
Akademiska sjukhuset	66
Blekingesjukhuset	12
Karolinska Solna	182
Norrlands Universitetssjukhus	7
Sahlgrenska universitetssjukhuset	83
Skånes universitetssjukhus, Lund	127
Universitetssjukhuset Örebro	6

*Extractions per type*

Type	Extractions
ICD lead	91
Pacemaker lead	419

*Extractions per model (more than 5 extractions)*

Manufacturer	Model	Extractions
Biotronik	Solia S53 MRI	7
Biotronik	Solia S60 MRI	9
Boston Scientific	4470 Fineline II Sterox EZ MRI	10
Boston Scientific	4474 Fineline II Sterox EZ MRI	8
Boston Scientific	7741 Ingevity MRI	11
Boston Scientific	7742 Ingevity MRI	10
Medtronic	4076 CapSureFix Novus MRI	83
Medtronic	5076 CapSureFix MRI	8
Medtronic	6935M Sprint Quattro S MRI DF4	19
St Jude Medical/ Abbott	1258T QuickFlex	6
St Jude Medical/ Abbott	1458Q Quartet MRI	16
St Jude Medical/ Abbott	1948 Isoflex MRI	9
St Jude Medical/ Abbott	1999 Optisense	26
St Jude Medical/ Abbott	2088TC Tendril STS MRI	110
St Jude Medical/ Abbott	7122Q Durata	19
St Jude Medical/ Abbott	LDA210Q Optisure DF4	15
St Jude Medical/ Abbott	LPA1200M52cm TendrilMRI	8
St Jude Medical/ Abbott	LPA1200M58cm TendrilMRI	6

## QUALITY – LEAD EXTRACTIONS

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*Extractions per reason*

<b>Reason</b>	<b>Extractions</b>
Ceased indication for ICD therapy	11
Ceased indication for PM therapy	10
Conductor break	7
Elective	34
Electrical dysfunction	70
Heart transplant	9
Infection/Ulceration, local	155
Infection/Ulceration, systemic	183
Lead dislocation	9
Patient's wish	12

*Extraction positions\**

<b>Hospital</b>	<b>Femoral</b>	<b>Left superior</b>	<b>N/A</b>	<b>Right superior</b>
Akademiska sjukhuset	1	60	1	4
Blekingesjukhuset	0	12	0	0
Karolinska Solna	1	170	0	11
Norrlands Universitetssjukhus	0	6	0	1
Skånes universitetssjukhus, Lund	1	126	0	0
Universitetssjukhuset Örebro	0	6	0	0

\*Hospital Sahlgrenska and Sunderby excluded

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## QUALITY – LEAD EXTRACTIONS

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*Extraction problems\**

Hospital	I	E	O	P	X	D
Akademiska sjukhuset	0	0	0	0	0	0
Blekingesjukhuset	0	2	0	0	0	0
Karolinska Solna	0	0	1	0	0	0
Norrlands Universitetssjukhus	0	1	0	0	0	0
Skånes universitetssjukhus, Lund	0	0	0	1	0	0
Universitetssjukhuset Örebro	0	0	0	0	0	0

(\*Hospital Sahlgrenska and Sunderby excluded), I: Insulation break, E: Conductor break, O: Unintentional extraction of another lead, P: Perforation/Tamponade, X: Pneumothorax, D: Death

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## QUALITY – LEAD EXTRACTIONS

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*Extraction results\**

Hospital	Failed	Partially successfull	Successfull
Akademiska sjukhuset	0	0	65
Blekingesjukhuset	0	0	12
Karolinska Solna	0	5	177
Norrlands Universitetssjukhus	0	0	7
Skånes universitetssjukhus, Lund	0	0	127
Universitetssjukhuset Örebro	0	0	6

\*Hospital Sahlgrenska and Sunderby excluded

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## QUALITY – LEAD EXTRACTIONS

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*Extraction tools\**

Hospital	SS	LS	PS	AM	L	S	PK	EK	AL
Akademiska sjukhuset	19	45	7	39	0	1	0	2	0
Blekingesjukhuset	0	5	0	2	0	0	0	0	0
Karolinska Solna	10	11	25	95	1	0	0	0	0
Norrlands Universitetssjukhus	0	0	0	0	0	0	0	0	0
Skånes universitetssjukhus, Lund	28	7	3	74	0	1	0	0	0
Universitetssjukhuset Örebro	6	0	0	0	0	0	0	0	0

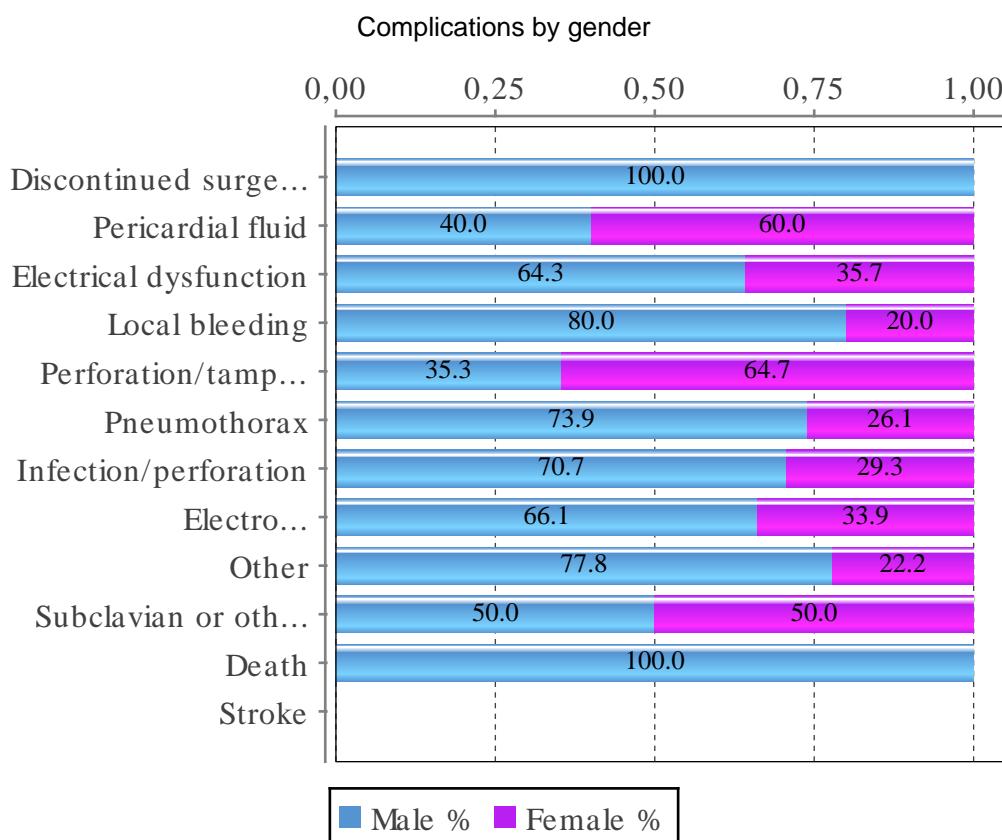
(\*Hospital Sahlgrenska and Sunderby excluded), SS: Standard stylet, LS: Locking stylet,  
PS: Passive sheath, AM: Active mechanical sheath, L: Lasso, S: Snare, PK: Pigtail  
catheter, EP: EP catheter, AL: Active laser sheath

## QUALITY – PACEMAKER – COMPLICATIONS

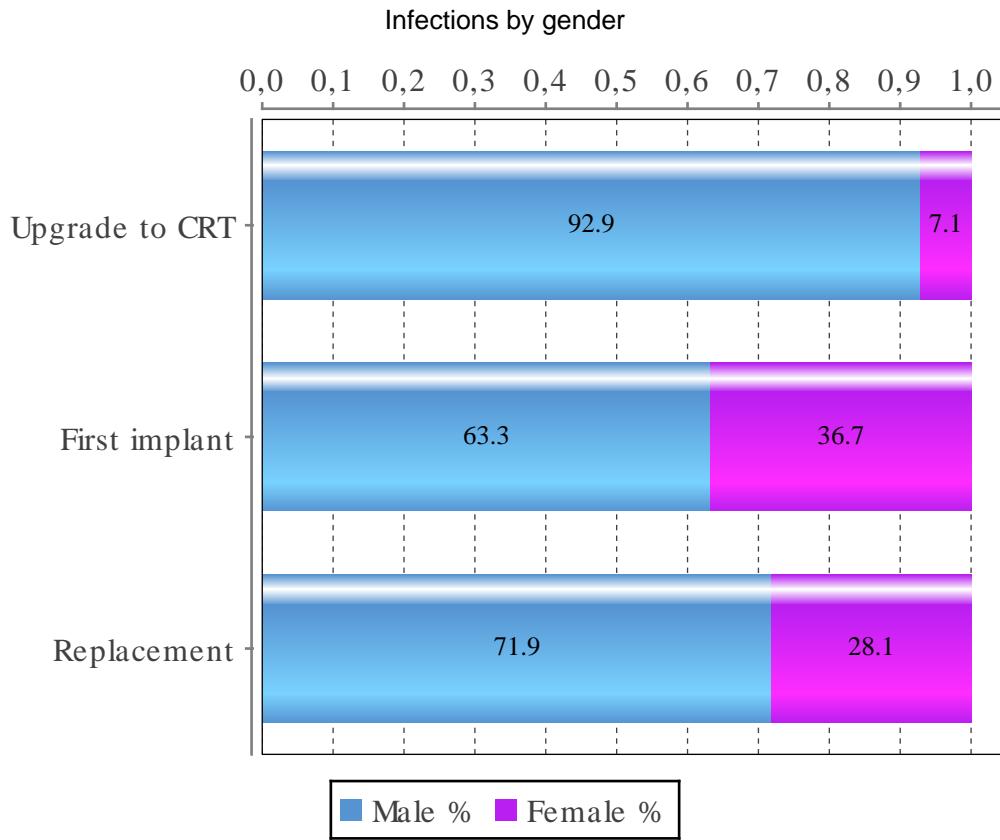
*Registered complications for new implants and for bleeding, infection and other also including replacements*

Complication	2020 %	2021 %	Based on
Discontinued surgery due to hemodynamic reasons	0.0	0.0	A
Pericardial fluid	0.1	0.0	A
Electrical dysfunction	0.4	0.3	B
Local bleeding	0.3	0.2	A
Perforation/tamponade	0.3	0.2	B
Pneumothorax	0.4	0.3	B
Infection/perforation	0.5	0.5	A
Electrode displacement	1.3	1.5	B
Other	0.5	0.2	A
Subclavian or other related thrombosis	0.1	0.1	B
Death	0.0	0.0	A
Stroke	0.0	0.0	A
Discontinued surgery due to lack of venous access	0.0	0.0	A
Discontinued surgery due to LV-lead impl. failure	0.1	0.1	A
Total	4.0	3.4	

Based on A=10949 (all implants) alternatively B=8061 (first implants + lead replacement)  
validated events



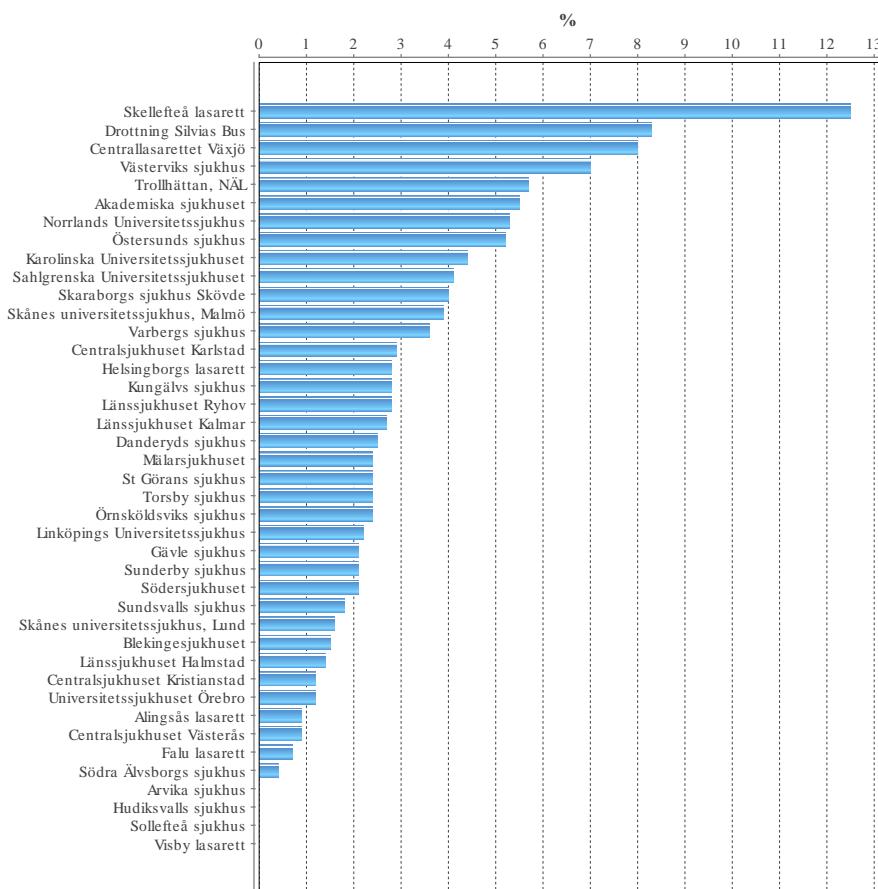
## QUALITY – PACEMAKER INFECTIONS



*Infections related to all interventions by gender*

Reason	Male %	Female %
First implant	0.7	0.6
Replacement	1.2	0.6
Upgrade to CRT	1.9	0.5

## QUALITY – PACEMAKER – COMPLICATIONS PER HOSPITAL



## QUALITY – PACEMAKER – COMPLICATIONS PER HOSPITAL

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**De.:** Death, **Dc.:** Discontinued surgery, **Df.:** Electrical dysfunction, **Dp.:** Lead dislocation, **In.:** Infection/Perforation, **Tr.:** Subclavian or other related thrombosis

Hospital	No	De. %	Dc. %	Df. %	Dp. %	In. %	Tr. %
Akademiska sjukhuset	472	-	-	0.2	2.3	1.3	-
Alingsås lasarett	106	-	-	-	-	0.9	-
Arvika sjukhus	1	-	-	-	-	-	-
Blekingesjukhuset	259	-	-	-	-	0.8	-
Centrallasarettet Växjö	163	-	-	0.6	1.8	-	-
Centralsjukhuset Karlstad	274	-	-	-	0.7	1.5	-
Centralsjukhuset Kristianstad	328	-	-	0.3	0.3	0.3	-
Centralsjukhuset Västerås	224	-	-	-	-	-	-
Danderyds sjukhus	643	-	-	0.8	0.6	0.2	0.2
Drottning Silvias Bus	12	-	-	8.3	-	-	-
Falu lasarett	415	-	-	0.2	-	0.2	-
Gävle sjukhus	288	-	0.3	-	0.3	0.3	-
Helsingborgs lasarett	322	-	-	0.3	0.6	0.6	0.3
Hudiksvalls sjukhus	69	-	-	-	-	-	-
Karolinska Universitetssjukhuset	565	-	-	0.5	2.5	0.5	0.4
Kungälvs sjukhus	143	-	-	0.7	1.4	-	-
Linköpings Universitetssjukhus	505	-	-	-	1.4	0.4	-
Länssjukhuset Halmstad	143	-	-	0.7	0.7	-	-
Länssjukhuset Kalmar	188	-	-	-	0.5	-	-
Länssjukhuset Ryhov	326	-	0.3	-	0.9	0.6	-
Mälarsjukhuset	286	-	-	0.3	1.4	0.3	-
Norrlands Universitetssjukhus	247	-	-	0.8	0.4	2.0	-
Sahlgrenska Universitetssjukhuset	762	0.1	-	-	2.2	0.7	-
Skaraborgs sjukhus Skövde	346	-	-	1.4	2.0	-	-
Skellefteå lasarett	64	-	-	1.6	4.7	4.7	-
Skånes universitetssjukhus, Lund	628	-	-	-	0.6	-	-
Skånes universitetssjukhus, Malmö	233	-	-	0.9	1.3	0.4	-
Sollefteå sjukhus	30	-	-	-	-	-	-
St Görans sjukhus	421	-	-	-	1.0	0.5	0.5
Sunderby sjukhus	380	-	-	-	0.3	0.5	0.3
Sundsvalls sjukhus	275	-	-	-	0.4	0.4	-
Södersjukhuset	438	-	-	0.2	1.1	0.2	-
Södra Älvborgs sjukhus	243	-	-	-	-	-	-
Torsby sjukhus	42	-	-	-	-	-	-
Trollhättan, NÄL	384	-	-	0.3	2.3	1.6	-
Universitetssjukhuset Örebro	322	-	-	-	-	1.2	-
Varbergs sjukhus	225	-	-	-	2.2	-	-
Visby lasarett	45	-	-	-	-	-	-
Västerviks sjukhus	57	-	-	-	3.5	1.8	1.8
Örnsköldsviks sjukhus	83	-	-	-	1.2	-	-
Östersunds sjukhus	173	-	-	0.6	3.5	-	-

## QUALITY – PACEMAKER – COMPLICATIONS PER HOSPITAL

**Bl.:** Bleeding, **Ot.:** Other, **Tm.:** Perforation/Tamponade, **Pn.:** Pneumothorax, **Pf.:** Pericardial fluid, **St.:** Stroke

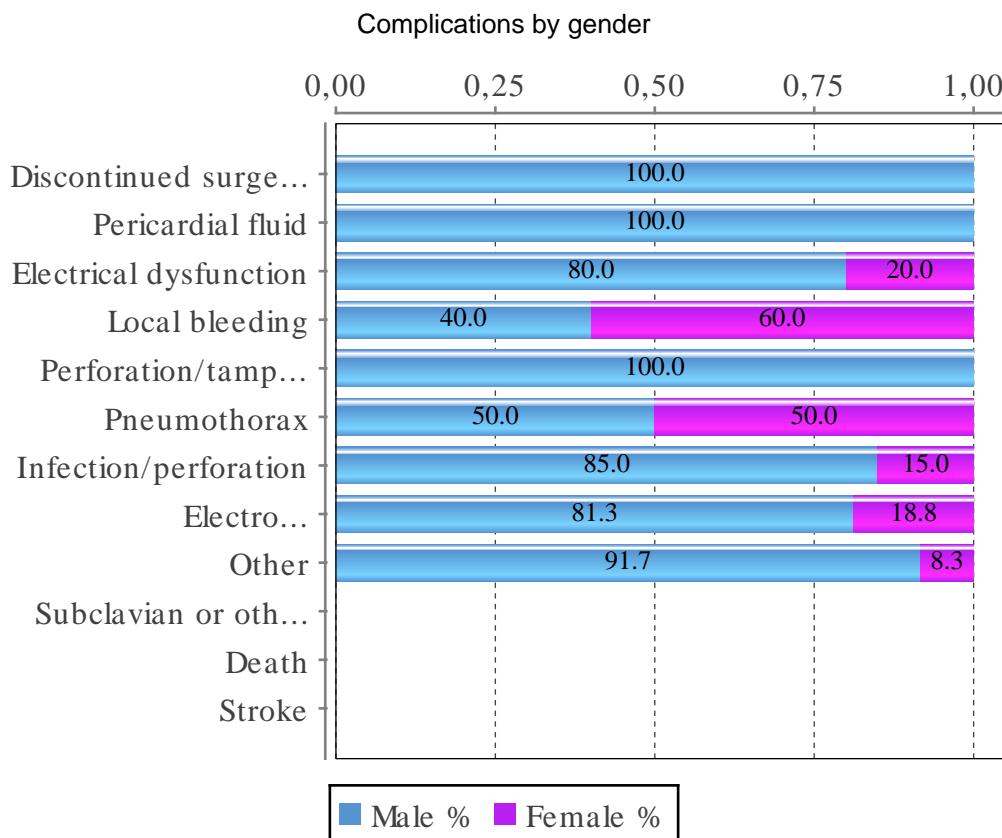
Hospital	No	Bl. %	Ot. %	Tm. %	Pn. %	Pf. %	St. %	All %
Akademiska sjukhuset	472	0.4	0.2	0.2	0.8	-	-	5.5
Alingsås lasarett	106	-	-	-	-	-	-	0.9
Arvika sjukhus	1	-	-	-	-	-	-	-
Blekingesjukhuset	259	-	-	-	0.4	-	0.4	1.5
Centrallasarettet Växjö	163	1.2	4.3	-	-	-	-	8.0
Centralsjukhuset Karlstad	274	-	-	0.7	-	-	-	2.9
Centralsjukhuset Kristianstad	328	-	-	-	0.3	-	-	1.2
Centralsjukhuset Västerås	224	0.4	-	0.4	-	-	-	0.9
Danderyds sjukhus	643	0.2	-	0.5	0.2	-	-	2.5
Drottning Silvias Bus	12	-	-	-	-	-	-	8.3
Falu lasarett	415	0.2	-	-	-	-	-	0.7
Gävle sjukhus	288	-	0.3	-	0.3	0.3	-	2.1
Helsingborgs lasarett	322	0.3	0.3	-	-	0.3	-	2.8
Hudiksvalls sjukhus	69	-	-	-	-	-	-	-
Karolinska Universitetssjukhuset	565	0.2	-	-	0.4	-	-	4.4
Kungälvs sjukhus	143	-	0.7	-	-	-	-	2.8
Linköpings Universitetssjukhus	505	-	-	0.4	-	-	-	2.2
Länssjukhuset Halmstad	143	-	-	-	-	-	-	1.4
Länssjukhuset Kalmar	188	0.5	0.5	-	1.1	-	-	2.7
Länssjukhuset Ryhov	326	-	0.6	0.3	-	-	-	2.8
Mälarsjukhuset	286	-	-	-	0.3	-	-	2.4
Norrlands Universitetssjukhus	247	0.4	1.6	-	-	-	-	5.3
Sahlgrenska Universitetssjukhuset	762	0.5	0.1	0.1	0.1	0.1	-	4.1
Skaraborgs sjukhus Skövde	346	0.3	-	0.3	-	-	-	4.0
Skellefteå lasarett	64	1.6	-	-	-	-	-	12.5
Skånes universitetssjukhus, Lund	628	0.2	0.2	-	0.5	0.2	-	1.6
Skånes universitetssjukhus, Malmö	233	0.4	0.4	0.4	-	-	-	3.9
Sollefteå sjukhus	30	-	-	-	-	-	-	-
St Görans sjukhus	421	-	-	0.2	0.2	-	-	2.4
Sunderby sjukhus	380	0.3	-	0.3	0.5	-	-	2.1
Sundsvalls sjukhus	275	0.4	-	-	0.7	-	-	1.8
Södersjukhuset	438	-	0.2	0.2	-	-	-	2.1
Södra Älvborgs sjukhus	243	-	0.4	-	-	-	-	0.4
Torsby sjukhus	42	-	2.4	-	-	-	-	2.4
Trollhättan, NÄL	384	0.5	-	0.3	0.8	-	-	5.7
Universitetssjukhuset Örebro	322	-	-	-	-	-	-	1.2
Varbergs sjukhus	225	0.4	0.9	-	-	-	-	3.6
Visby lasarett	45	-	-	-	-	-	-	-
Västerviks sjukhus	57	-	-	-	-	-	-	7.0
Örnsköldsviks sjukhus	83	-	-	-	-	1.2	-	2.4
Östersunds sjukhus	173	0.6	0.6	-	-	-	-	5.2

## QUALITY – ICD – COMPLICATIONS

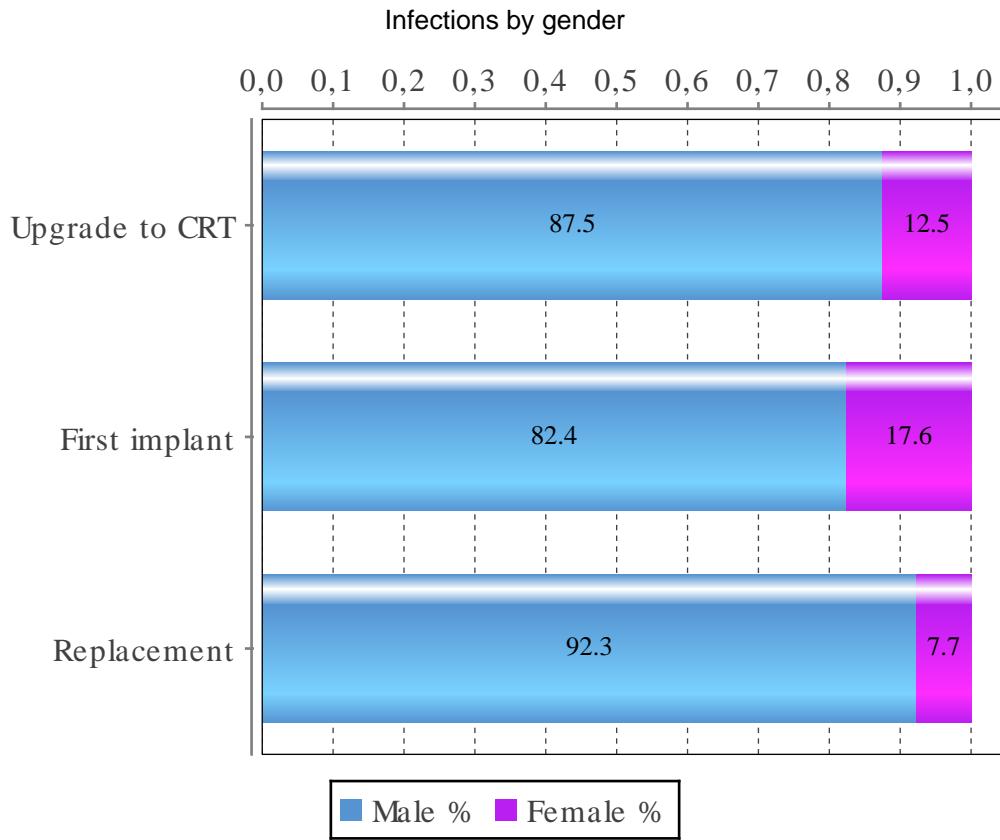
*Registered complications for new implants and for bleeding, infection and other also including replacements*

Complication	2020 %	2021 %
Discontinued surgery due to hemodynamic reasons	0.0	0.0
Electrical dysfunction	0.9	0.6
Local bleeding	0.7	0.2
Perforation/tamponade	0.1	0.2
Pneumothorax	0.1	0.1
Infection/perforation	0.9	0.8
Electrode displacement	2.2	1.9
Other	0.5	0.5
Subclavian or other related thrombosis	0.0	0.0
Death	0.0	0.0
Pericardial fluid	0.0	0.0
Stroke	0.0	0.0
Discontinued surgery due to lack of venous access	0.1	0.0
Discontinued surgery due to LV-lead impl. failure	0.6	0.4
Total	6.1	4.7

Based on 2480 (all implants) alternatively 1689 (first implants + lead replacements)  
validated events



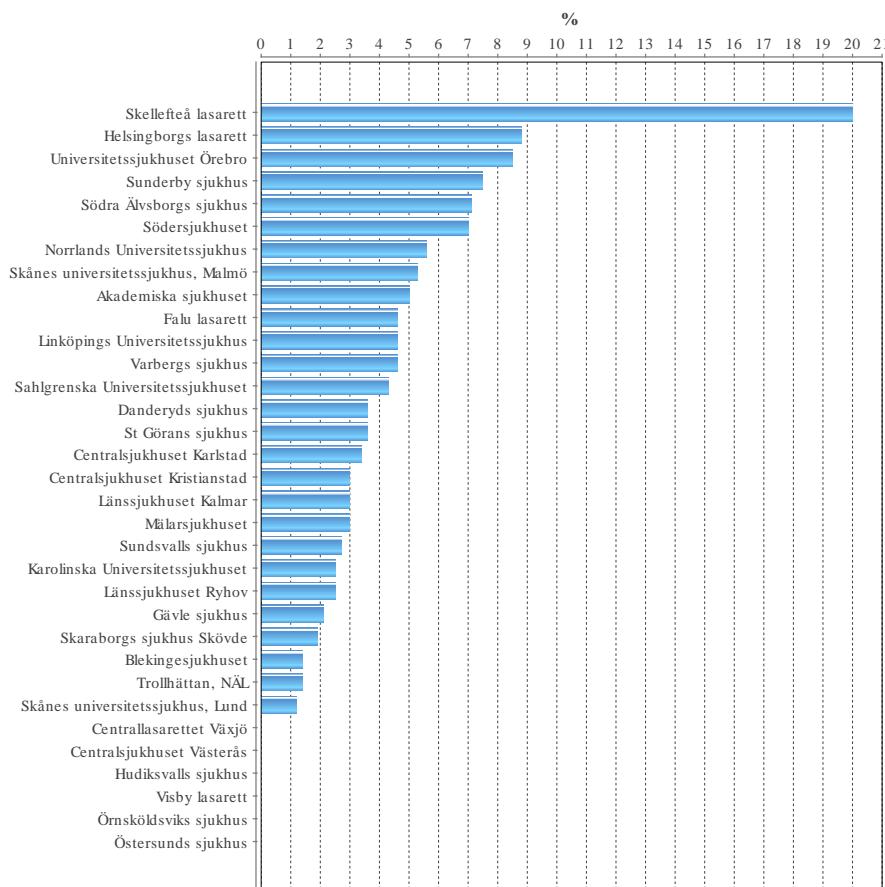
## QUALITY – ICD INFECTIONS



*Infections related to all interventions by gender*

Reason	Male %	Female %
First implant	1.1	1.0
Replacement	1.6	0.6
Upgrade to CRT	1.2	0.7

## QUALITY – ICD – COMPLICATIONS PER HOSPITAL



## QUALITY – ICD – COMPLICATIONS PER HOSPITAL

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**De.:** Death, **Dc.:** Discontinued surgery, **Df.:** Electrical dysfunction, **Dp.:** Lead dislocation, **In.:** Infection/Perforation, **Tr.:** Subclavian and other related trombosis, **Bl.:** Bleeding

Hospital	No	De. %	Dc. %	Df. %	Dp. %	In. %	Tr. %	Bl. %
Akademiska sjukhuset	100	-	-	-	2.0	2.0	-	-
Blekingesjukhuset	71	-	-	-	-	-	-	-
Centralallasarettet Växjö	35	-	-	-	-	-	-	-
Centralsjukhuset Karlstad	58	-	-	1.7	-	1.7	-	-
Centralsjukhuset Kristianstad	33	-	-	-	3.0	-	-	-
Centralsjukhuset Västerås	67	-	-	-	-	-	-	-
Danderyds sjukhus	111	-	-	-	1.8	0.9	-	-
Falu lasarett	87	-	-	1.1	2.3	-	-	-
Gävle sjukhus	95	-	-	1.1	1.1	-	-	-
Helsingborgs lasarett	34	-	-	-	2.9	-	-	-
Hudiksvalls sjukhus	15	-	-	-	-	-	-	-
Karolinska Universitetssjukhuset	244	-	-	0.8	0.8	0.8	-	-
Linköpings Universitetssjukhus	173	-	-	-	2.9	1.2	-	-
Länssjukhuset Kalmar	66	-	-	-	3.0	-	-	-
Länssjukhuset Ryhov	80	-	-	-	-	1.3	-	-
Mälarsjukhuset	67	-	-	-	1.5	-	-	-
Norrlands Universitetssjukhus	54	-	-	-	5.6	-	-	-
Sahlgrenska Universitetssjukhuset	117	-	-	-	3.4	-	-	-
Skaraborgs sjukhus Skövde	53	-	-	-	-	-	-	1.9
Skellefteå lasarett	10	-	-	-	10.0	10.0	-	-
Skånes universitetssjukhus, Lund	335	-	-	0.3	0.6	-	-	-
Skånes universitetssjukhus, Malmö	38	-	-	-	-	-	-	-
St Görans sjukhus	55	-	-	1.8	-	1.8	-	-
Sunderby sjukhus	93	-	1.1	-	1.1	2.2	-	1.1
Sundsvalls sjukhus	73	-	-	-	-	-	-	1.4
Södersjukhuset	86	-	-	3.5	1.2	2.3	-	-
Södra Älvborgs sjukhus	42	-	-	-	2.4	2.4	-	-
Trollhättan, NÄL	72	-	-	-	-	-	-	-
Universitetssjukhuset Örebro	71	-	-	1.4	1.4	5.6	-	-
Varbergs sjukhus	87	-	-	1.1	-	-	-	2.3
Visby lasarett	9	-	-	-	-	-	-	-
Örnsköldsviks sjukhus	28	-	-	-	-	-	-	-
Östersunds sjukhus	31	-	-	-	-	-	-	-

## QUALITY – ICD – COMPLICATIONS PER HOSPITAL

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Ot.: Other, Pa.: Perioperative arrhythmia, Tm.: Perforation/Tamponade, Pn.: Pneumothorax, Pf.: Pericardial fluid, St.: Stroke

Hospital	No	Ot. %	Pa. %	Tm. %	Pn. %	Pf. %	St. %	All %
Akademiska sjukhuset	100	1.0	-	-	-	-	-	5.0
Blekingesjukhuset	71	1.4	-	-	-	-	-	1.4
Centralallasarettet Växjö	35	-	-	-	-	-	-	-
Centralsjukhuset Karlstad	58	-	-	-	-	-	-	3.4
Centralsjukhuset Kristianstad	33	-	-	-	-	-	-	3.0
Centralsjukhuset Västerås	67	-	-	-	-	-	-	-
Danderyds sjukhus	111	-	-	-	-	-	0.9	3.6
Falu lasarett	87	-	-	1.1	-	-	-	4.6
Gävle sjukhus	95	-	-	-	-	-	-	2.1
Helsingborgs lasarett	34	5.9	-	-	-	-	-	8.8
Hudiksvalls sjukhus	15	-	-	-	-	-	-	-
Karolinska Universitetssjukhuset	244	-	-	-	-	-	-	2.5
Linköpings Universitetssjukhus	173	0.6	-	-	-	-	-	4.6
Länssjukhuset Kalmar	66	-	-	-	-	-	-	3.0
Länssjukhuset Ryhov	80	-	-	1.3	-	-	-	2.5
Mälarsjukhuset	67	-	-	1.5	-	-	-	3.0
Norrlands Universitetssjukhus	54	-	-	-	-	-	-	5.6
Sahlgrenska Universitetssjukhuset	117	0.9	-	-	-	-	-	4.3
Skaraborgs sjukhus Skövde	53	-	-	-	-	-	-	1.9
Skellefteå lasarett	10	-	-	-	-	-	-	20.0
Skånes universitetssjukhus, Lund	335	0.3	-	-	-	-	-	1.2
Skånes universitetssjukhus, Malmö	38	2.6	-	-	2.6	-	-	5.3
St Görans sjukhus	55	-	-	-	-	-	-	3.6
Sunderby sjukhus	93	1.1	-	-	1.1	-	-	7.5
Sundsvalls sjukhus	73	1.4	-	-	-	-	-	2.7
Södersjukhuset	86	-	-	-	-	-	-	7.0
Södra Älvsborgs sjukhus	42	-	-	2.4	-	-	-	7.1
Trollhättan, NÄL	72	1.4	-	-	-	-	-	1.4
Universitetssjukhuset Örebro	71	-	-	-	-	-	-	8.5
Varbergs sjukhus	87	1.1	-	-	-	-	-	4.6
Visby lasarett	9	-	-	-	-	-	-	-
Örnsköldsviks sjukhus	28	-	-	-	-	-	-	-
Östersunds sjukhus	31	-	-	-	-	-	-	-

## QUALITY – CRT – COMPLICATIONS

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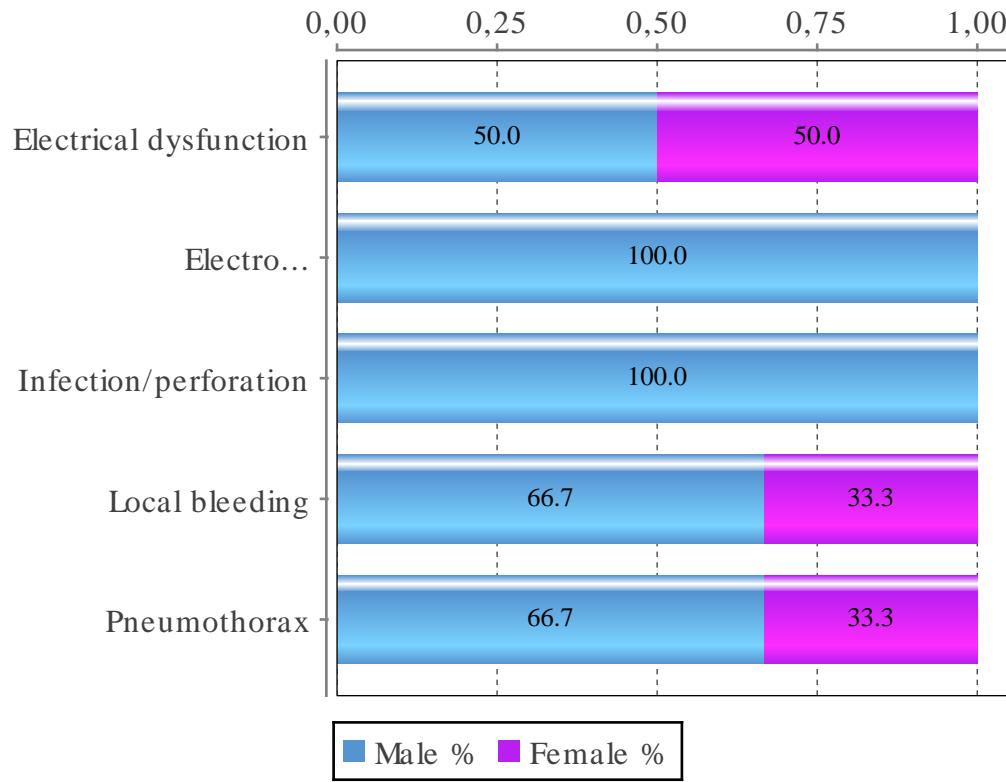
*Registered complications for new implants and for bleeding, infection and other also including replacements.*

CRT-P Complication	%
Death	-
Discontinued surgery due to LV-lead impl. failure	-
Discontinued surgery due to hemodynamic reasons	-
Discontinued surgery due to lack of venous access	-
Electrical dysfunction	0.3
Electrode displacement	1.0
Infection/perforation	1.1
Local bleeding	0.5
Other	-
Perforation/tamponade	-
Pericardial fluid	-
Peroperative arrhythmia requiring acute medication	-
Pneumothorax	1.0
Stroke	-
Subclavian or other related thrombosis	-
Total	3.9
Total no of implants 611	

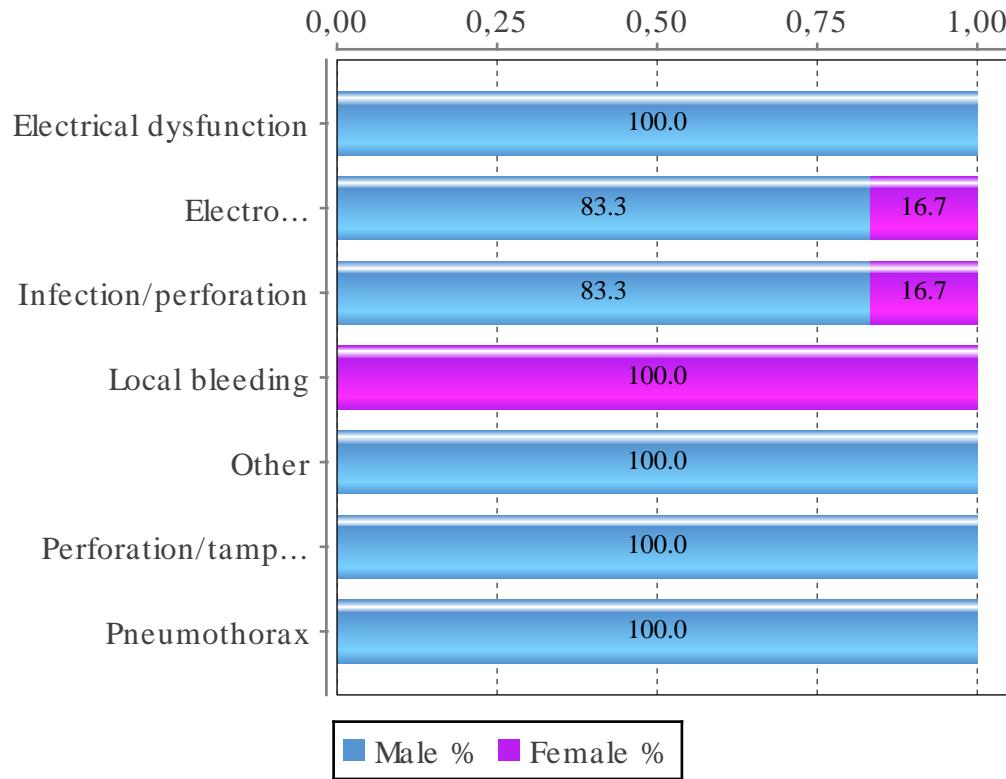
CRT-D Complication	%
Death	-
Discontinued surgery due to LV-lead impl. failure	-
Discontinued surgery due to hemodynamic reasons	-
Discontinued surgery due to lack of venous access	-
Electrical dysfunction	0.2
Electrode displacement	1.9
Infection/perforation	0.9
Local bleeding	0.3
Other	0.3
Perforation/tamponade	0.2
Pericardial fluid	-
Peroperative arrhythmia requiring acute medication	-
Pneumothorax	0.2
Stroke	-
Subclavian or other related thrombosis	-
Total	3.9
Total no of implants 639	

## QUALITY – CRT – COMPLICATIONS

CRT-P complications by gender



CRT-D complications by gender

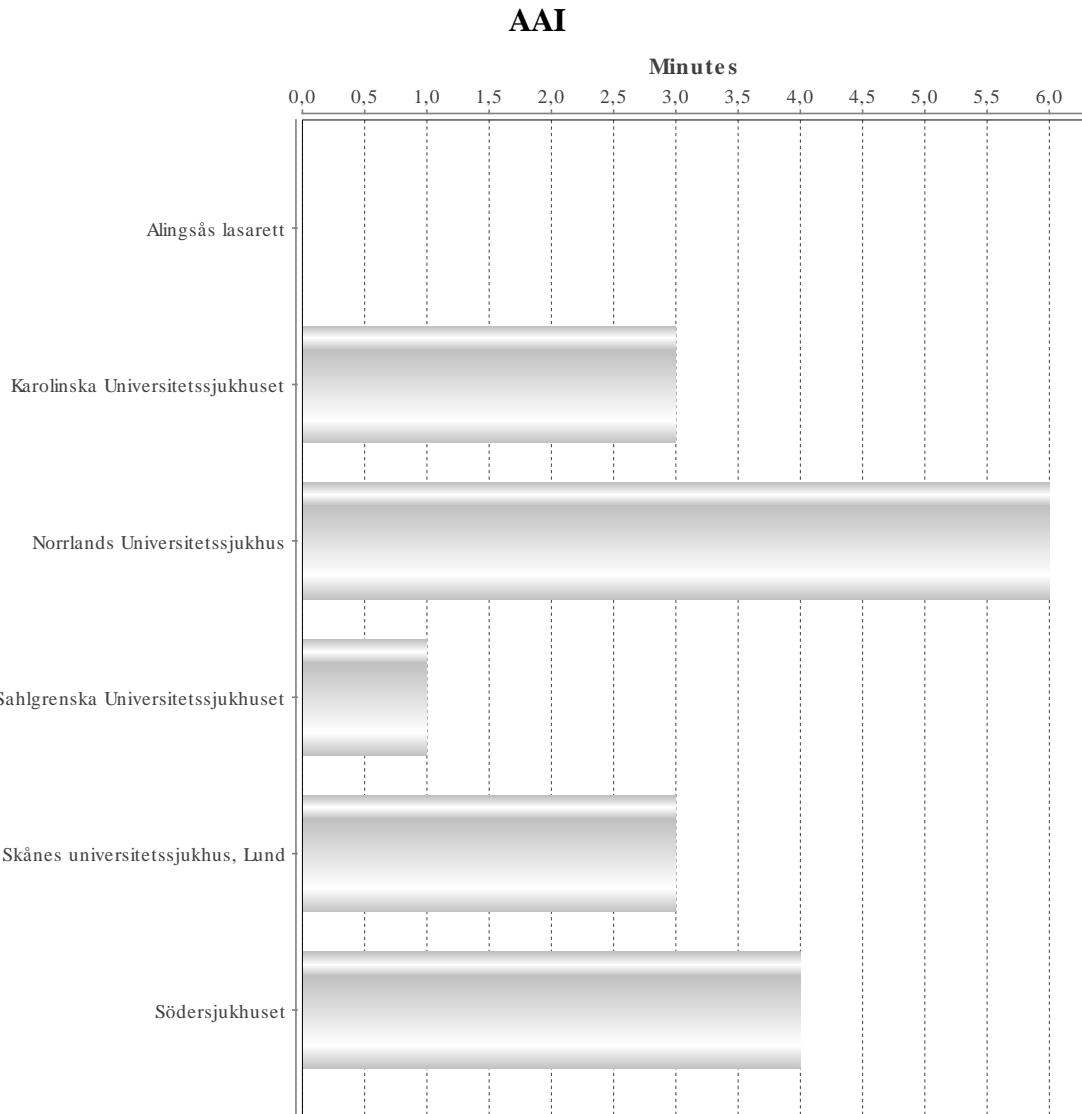


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## QUALITY – PACEMAKER – FLUOROSCOPY PER HOSPITAL

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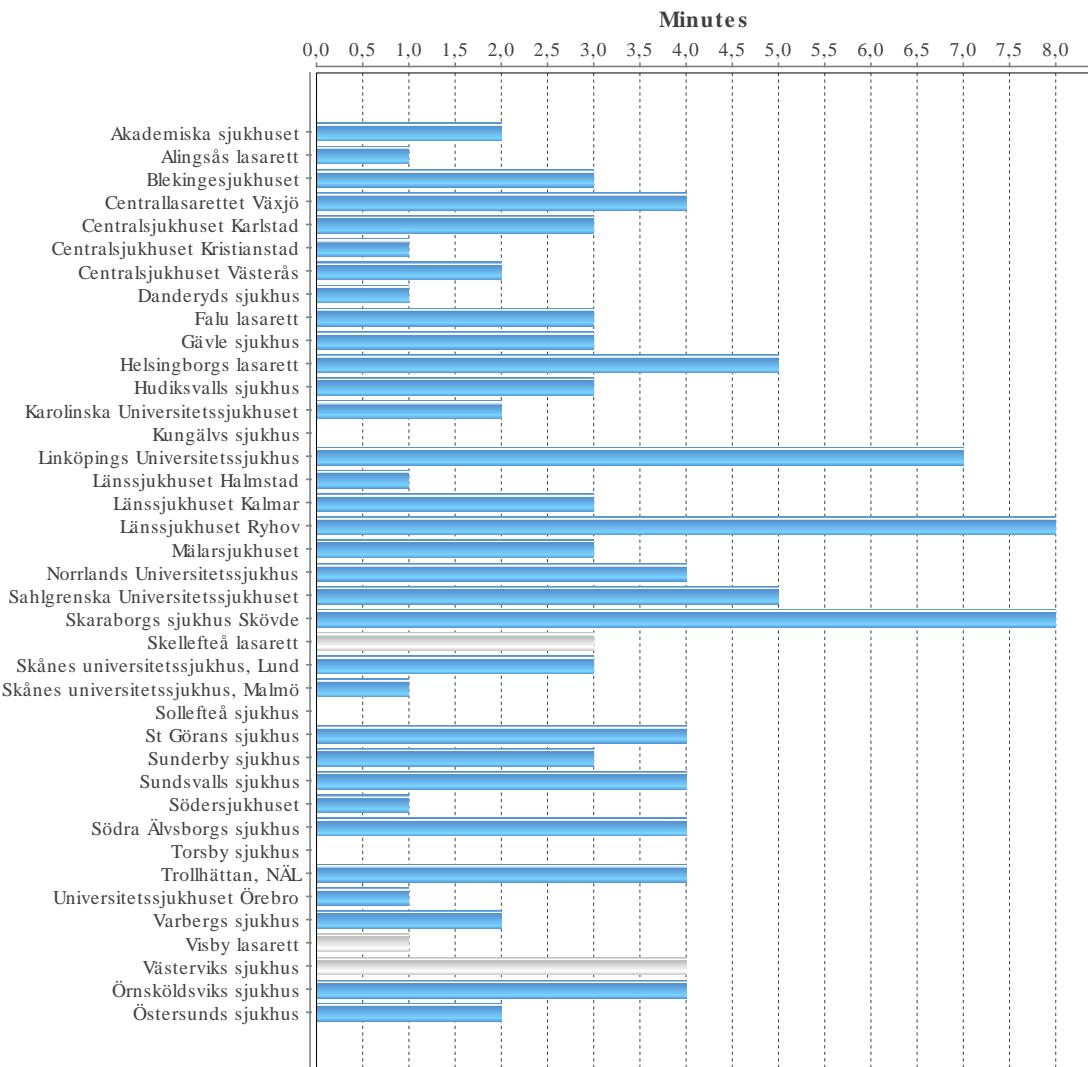
*Mean fluoroscopy duration for a new implant of different subtypes per hospital.  
Hospitals with less than 10 implants of a specific subtype are marked in grey, blue  
indicates 10 or more implants of this subtype, performed yearly at this hospital.*



## QUALITY – PACEMAKER – FLUOROSCOPY PER HOSPITAL

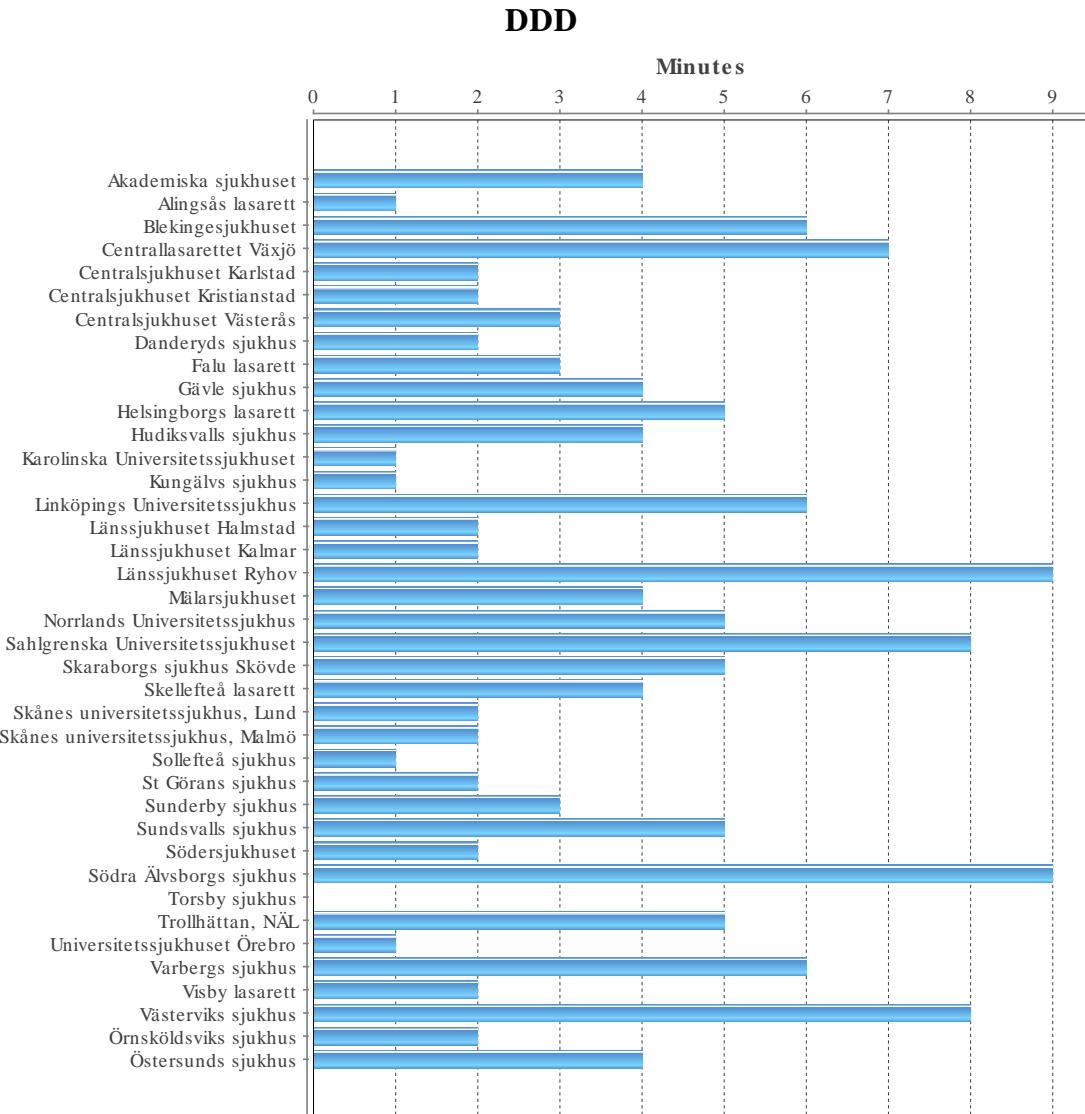
*Mean fluoroscopy duration for a new implant of different subtypes per hospital.  
Hospitals with less than 10 implants of a specific subtype are marked in grey, blue  
indicates 10 or more implants of this subtype, performed yearly at this hospital.*

### VVI



## QUALITY – PACEMAKER – FLUOROSCOPY PER HOSPITAL

*Mean fluoroscopy duration for a new implant of different subtypes per hospital.  
Hospitals with less than 10 implants of a specific subtype are marked in grey, blue  
indicates 10 or more implants of this subtype, performed yearly at this hospital.*



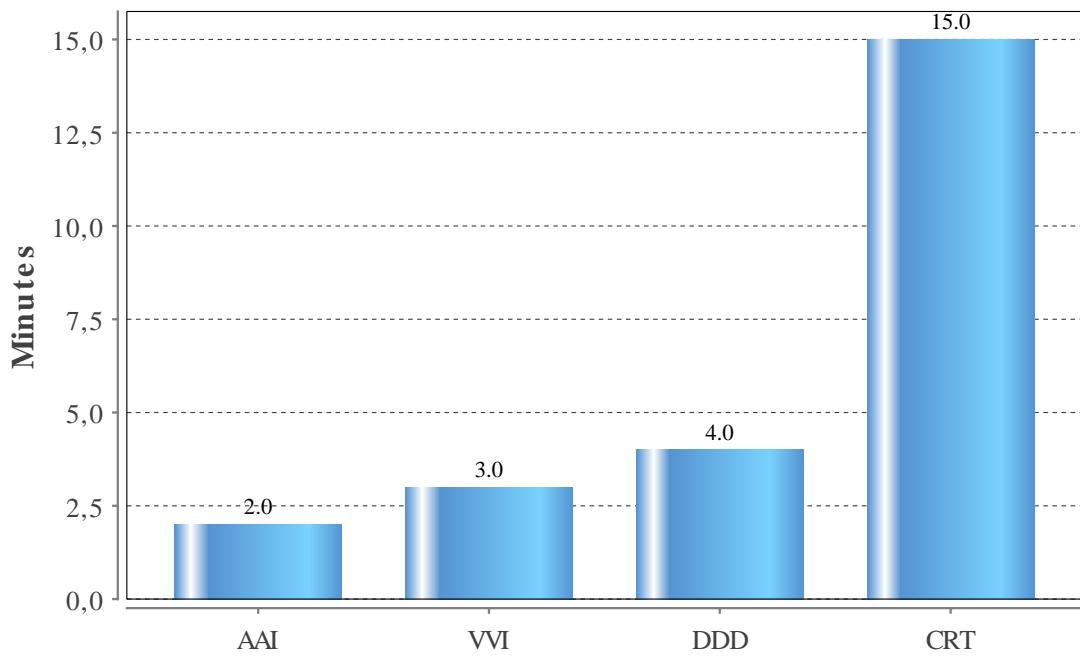
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## QUALITY – PACEMAKER – FLUOROSCOPY PER SUBTYPE

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*National mean fluoroscopy duration for a new implant of different subtypes*

Fluoroscopy time	Average	Standard deviation
AAI	2.0	1.8
VVI	3.0	5.6
DDD	4.0	5.0
CRT	15.0	12.2

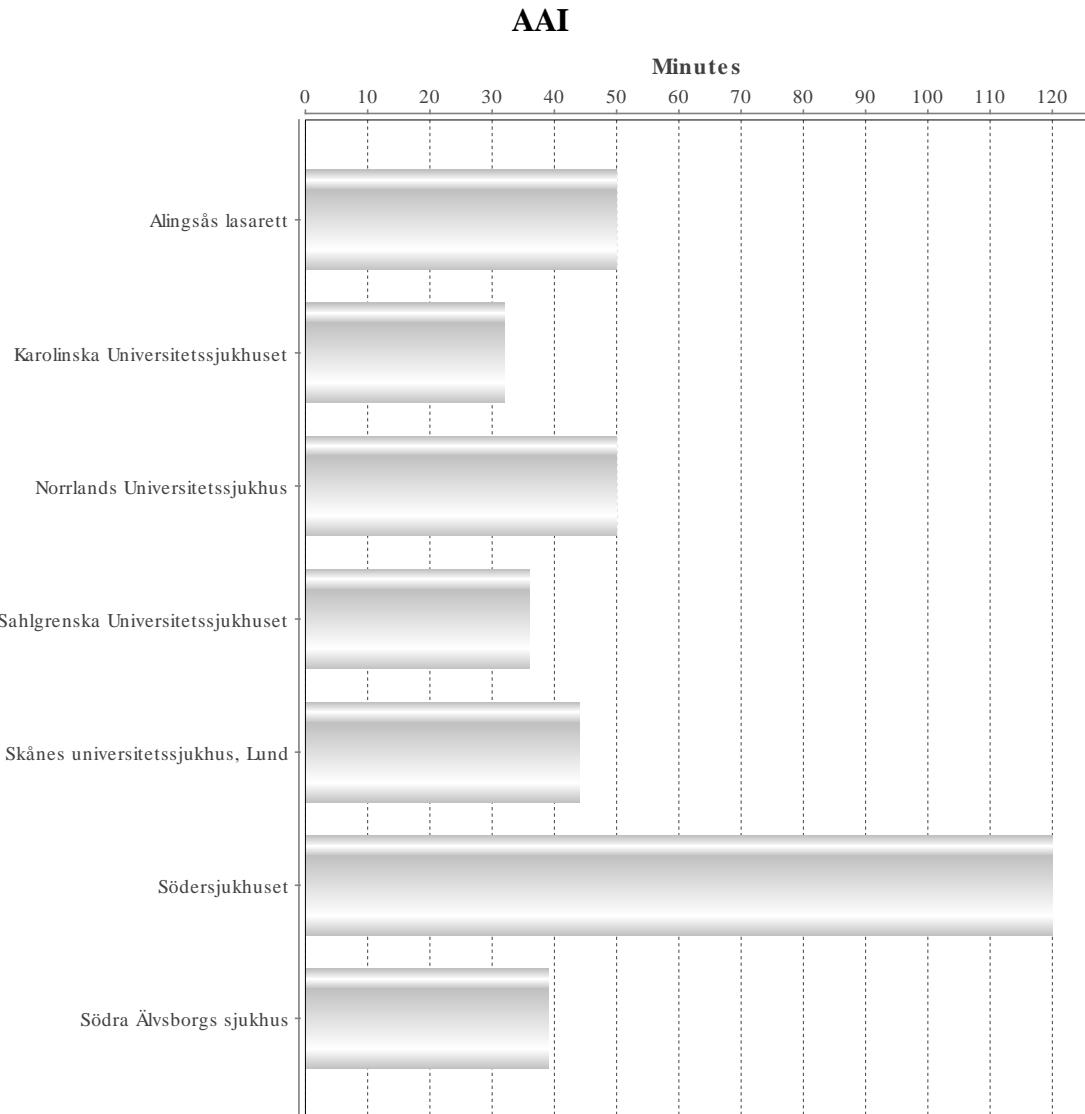


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## QUALITY – PACEMAKER – KNIFE TIME PER HOSPITAL

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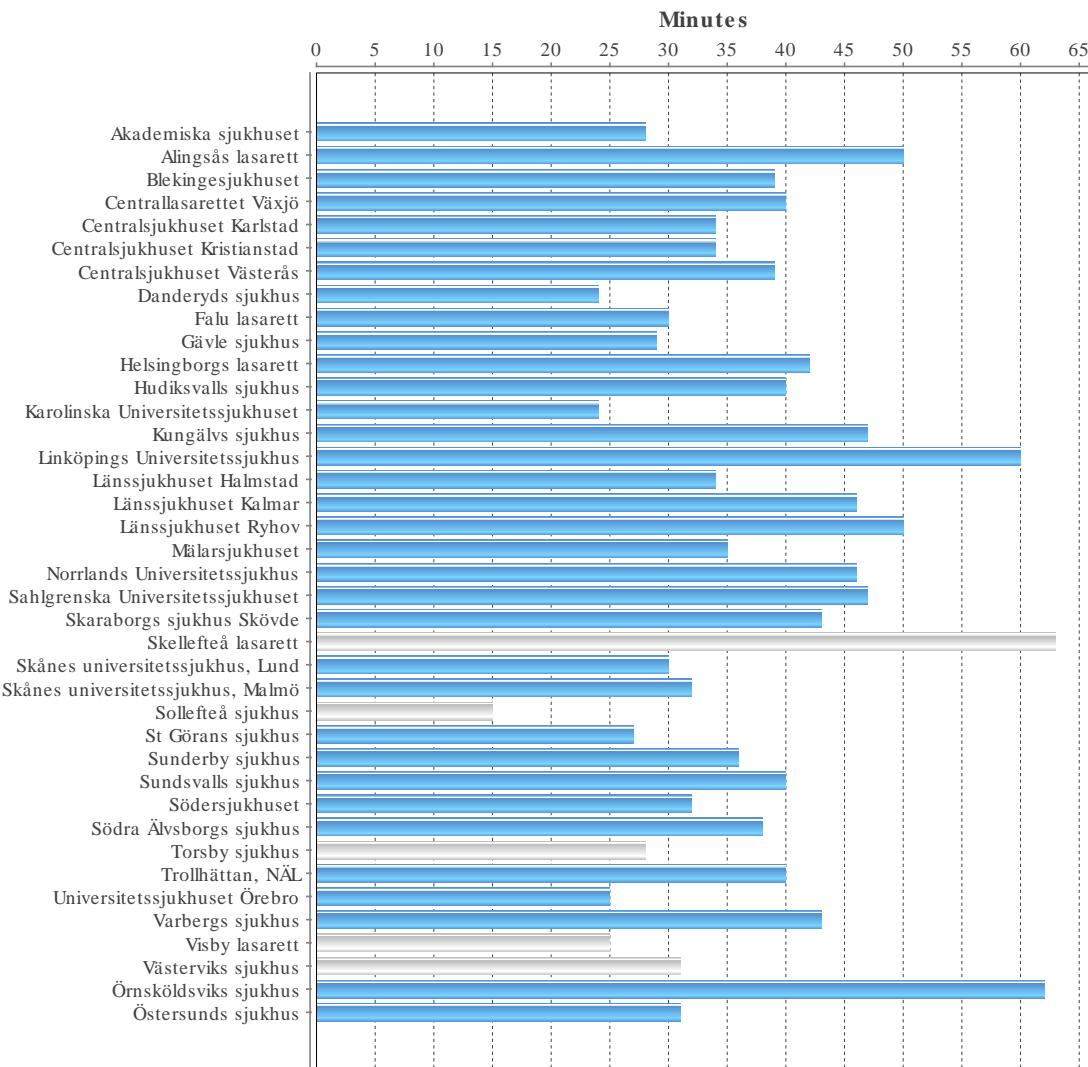
*Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.*



## QUALITY – PACEMAKER – KNIFE TIME PER HOSPITAL

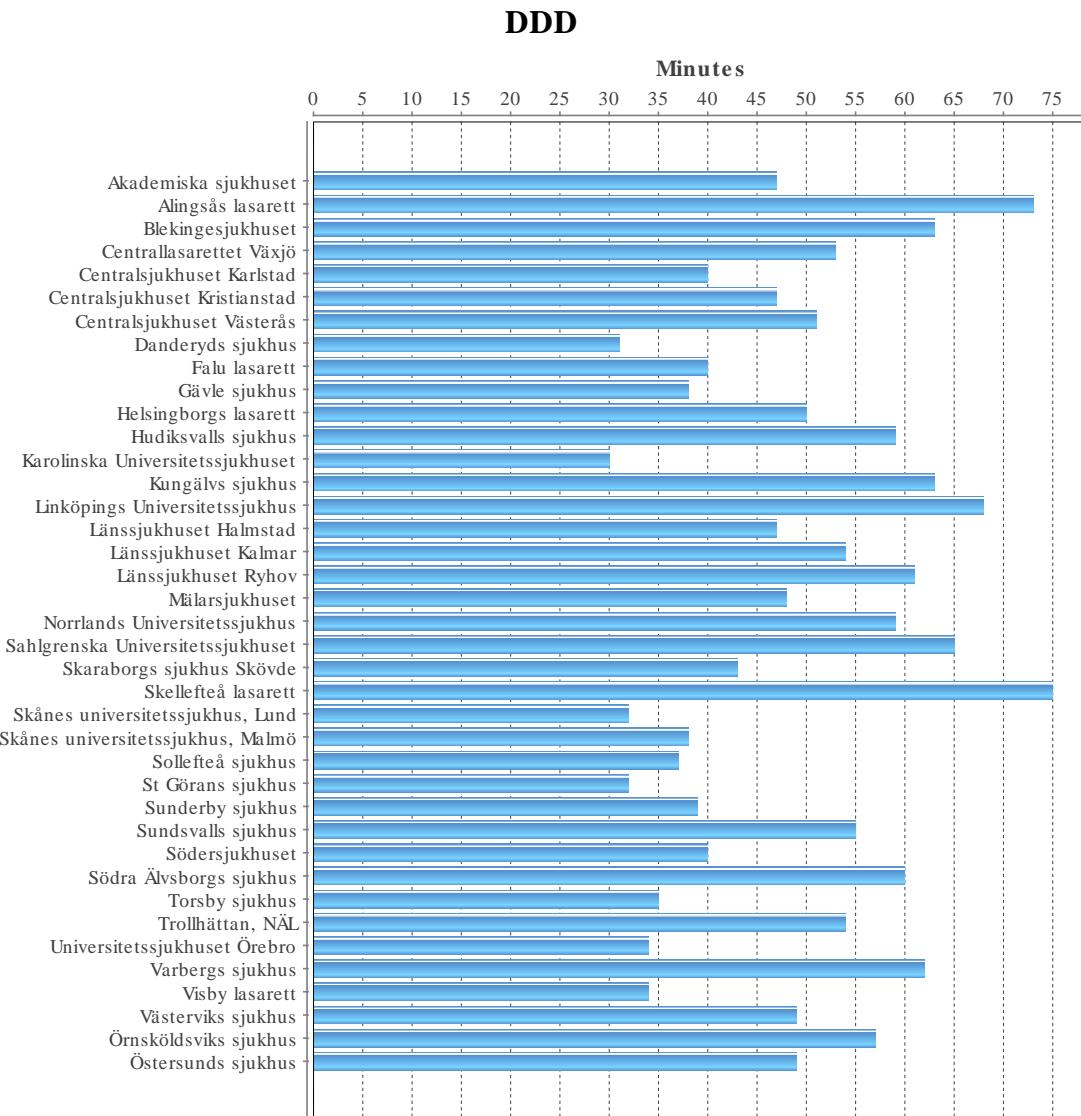
*Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.*

### VVI



## QUALITY – PACEMAKER – KNIFE TIME PER HOSPITAL

*Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.*



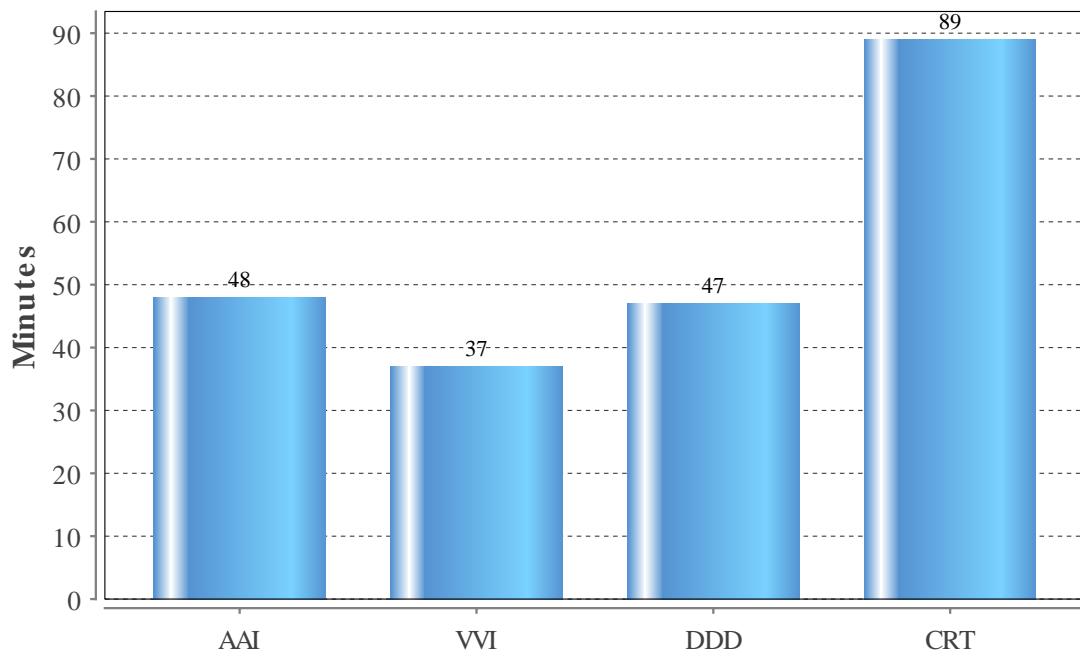
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## QUALITY – PACEMAKER – KNIFE TIME PER SUBTYPE

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*National mean skin to skin duration for a new implant of different subtypes*

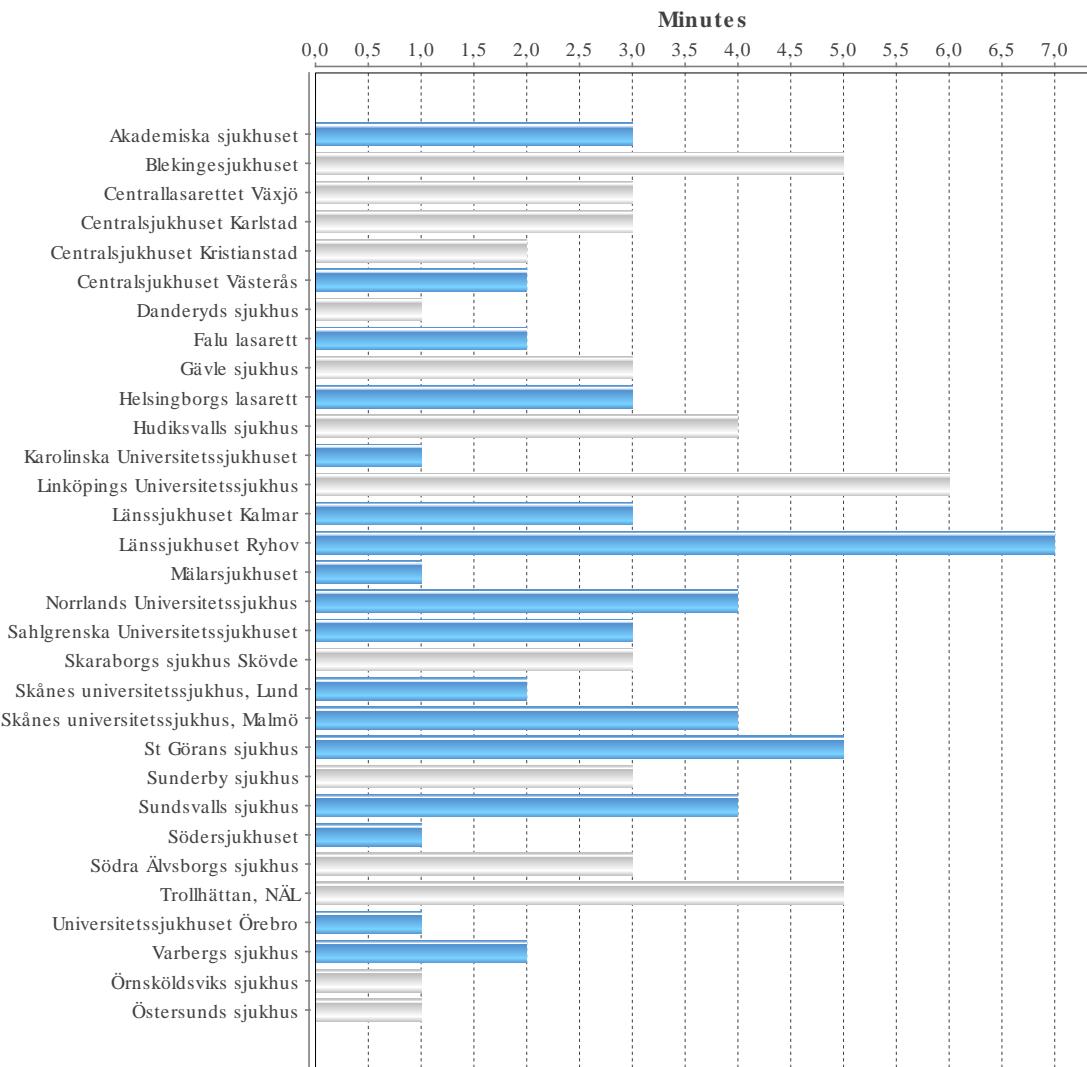
Knife time	Average	Standard deviation
AAI	48	26.0
VVI	37	20.9
DDD	47	22.7
CRT	89	40.2



## QUALITY – ICD – FLUOROSCOPY PER HOSPITAL

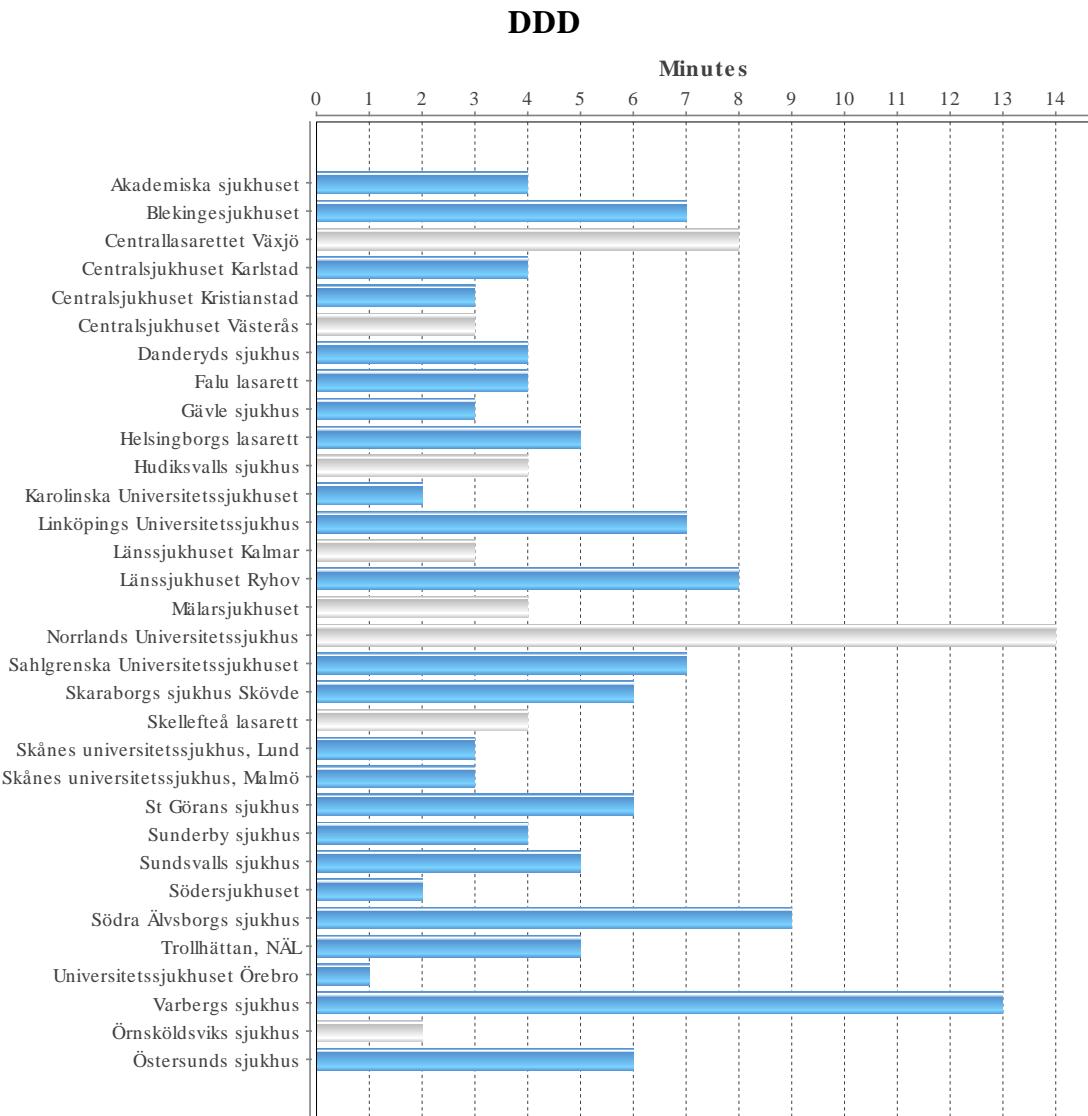
*Mean fluoroscopy duration for a new implant of different subtypes per hospital.  
Hospitals with less than 10 implants of a specific subtype are marked in grey, blue  
indicates 10 or more implants of this subtype, performed yearly at this hospital.*

### VVI



## QUALITY – ICD – FLUOROSCOPY PER HOSPITAL

*Mean fluoroscopy duration for a new implant of different subtypes per hospital.  
Hospitals with less than 10 implants of a specific subtype are marked in grey, blue  
indicates 10 or more implants of this subtype, performed yearly at this hospital.*



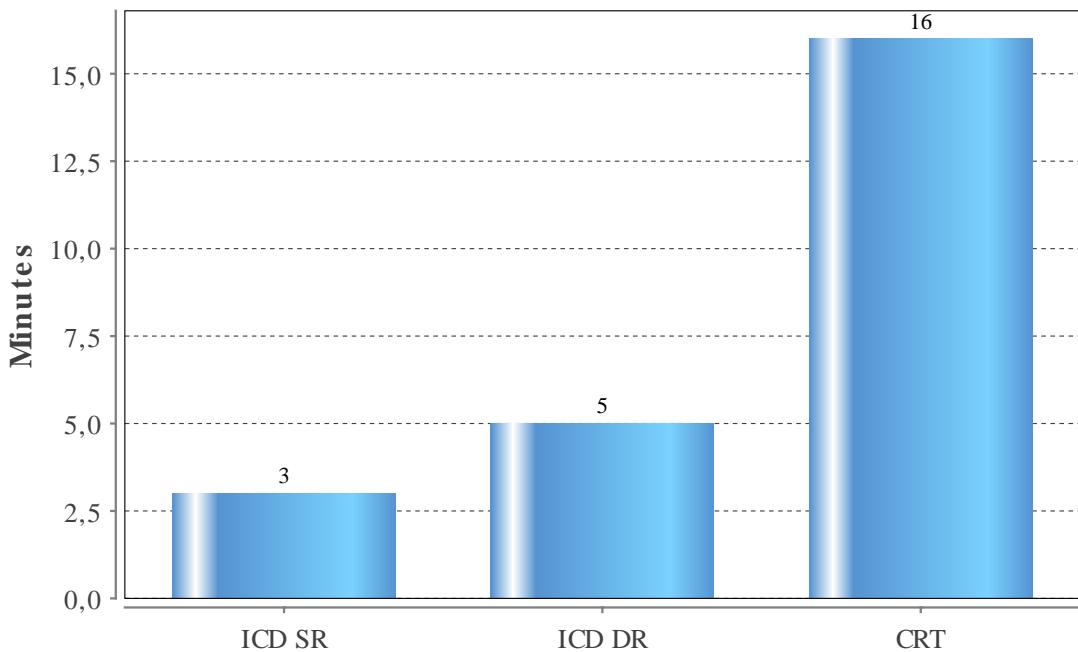
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## QUALITY – ICD – FLUOROSCOPY PER SUBTYPE

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*National mean fluoroscopy duration for a new implant of different subtypes*

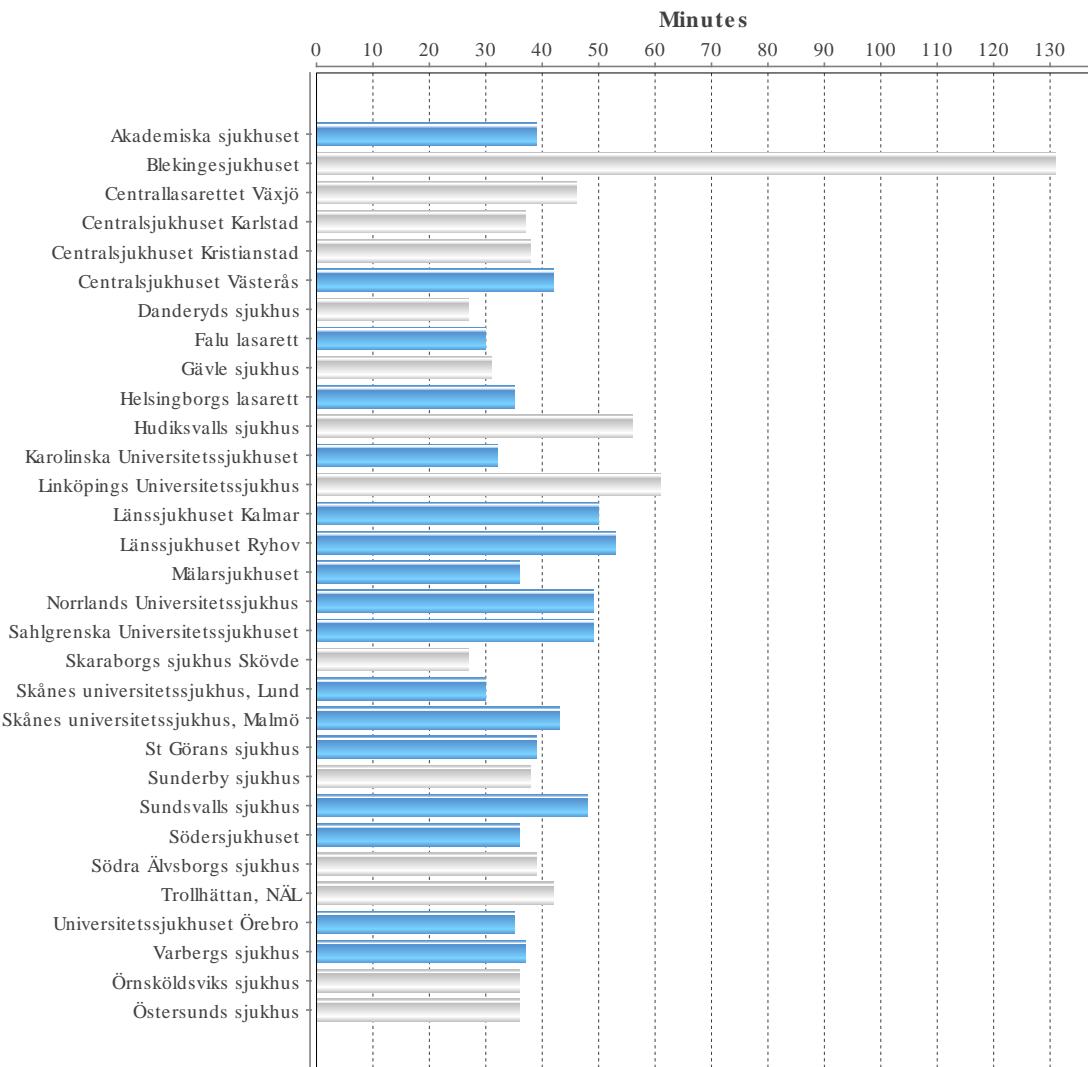
Fluoroscopy time	Average	Standard deviation
ICD SR	3	3.4
ICD DR	5	7.6
CRT	16	12.8



## QUALITY – ICD – KNIFE TIME PER HOSPITAL

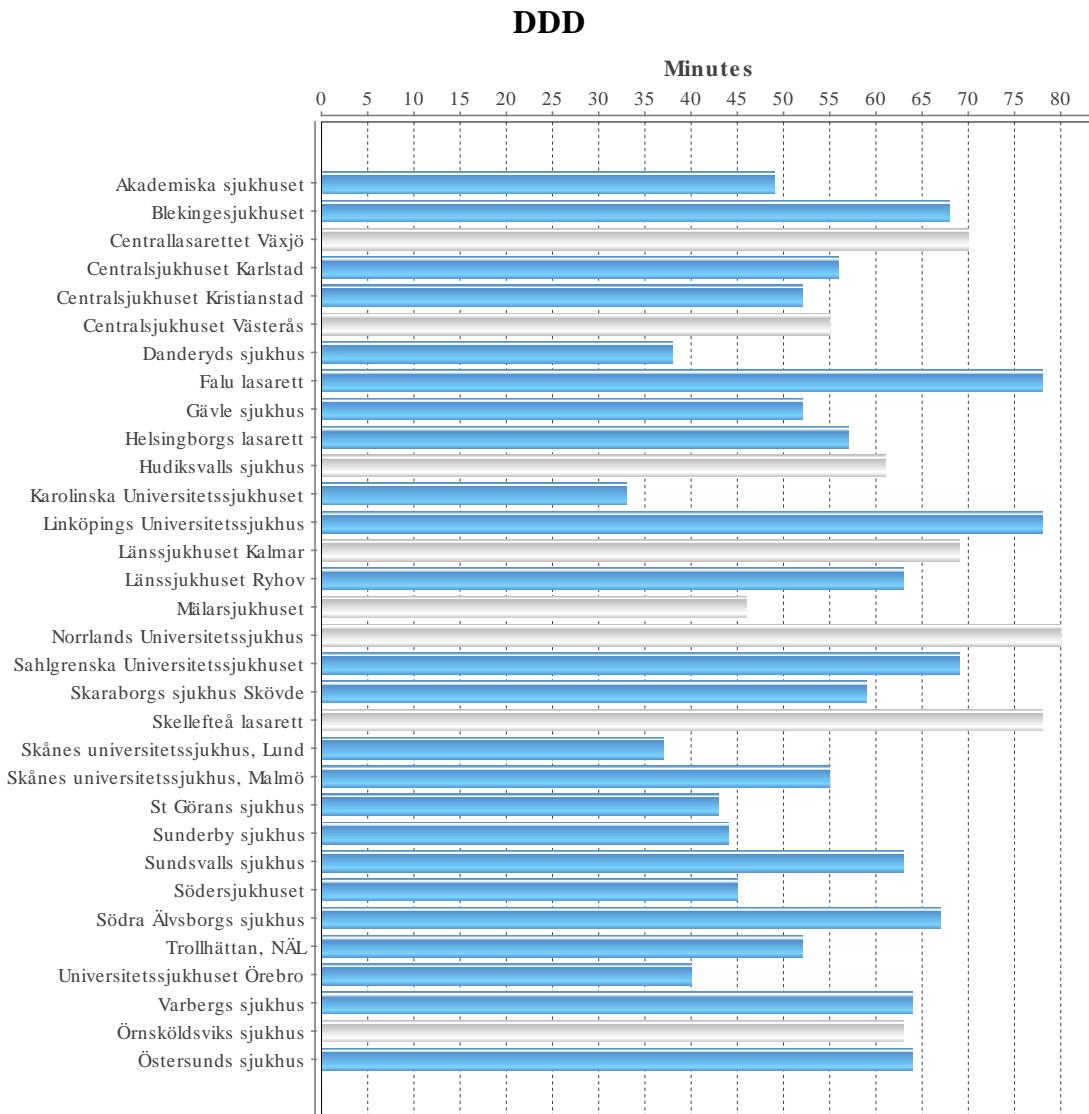
*Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.*

### VVI



## QUALITY – ICD – KNIFE TIME PER HOSPITAL

*Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.*



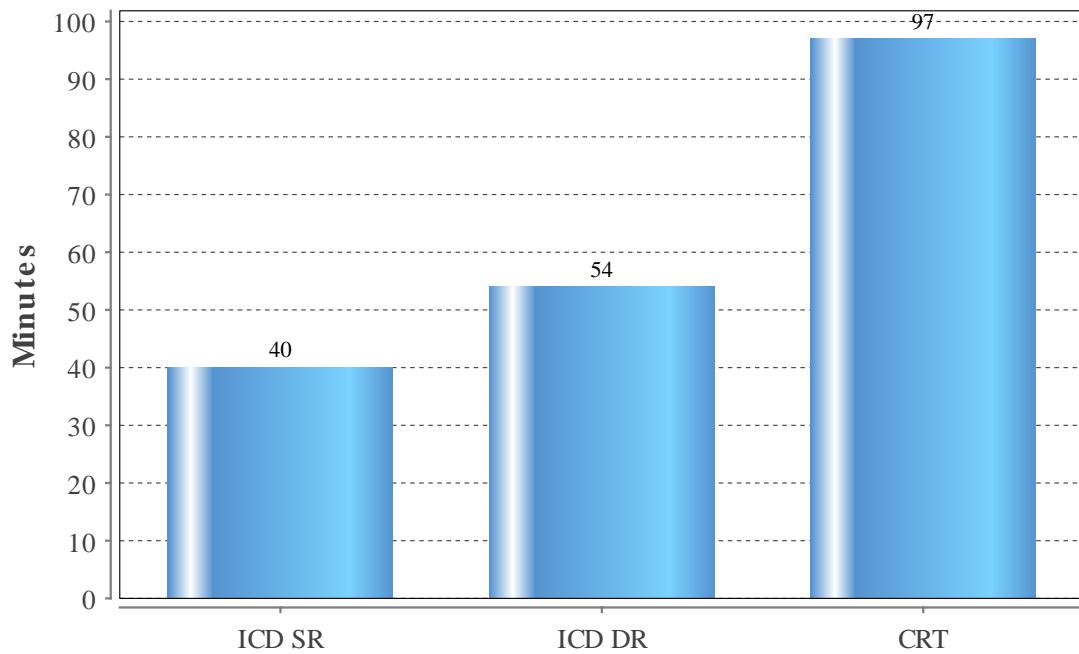
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## QUALITY – ICD – KNIFE TIME PER SUBTYPE

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*National mean skin to skin duration for a new implant of different subtypes*

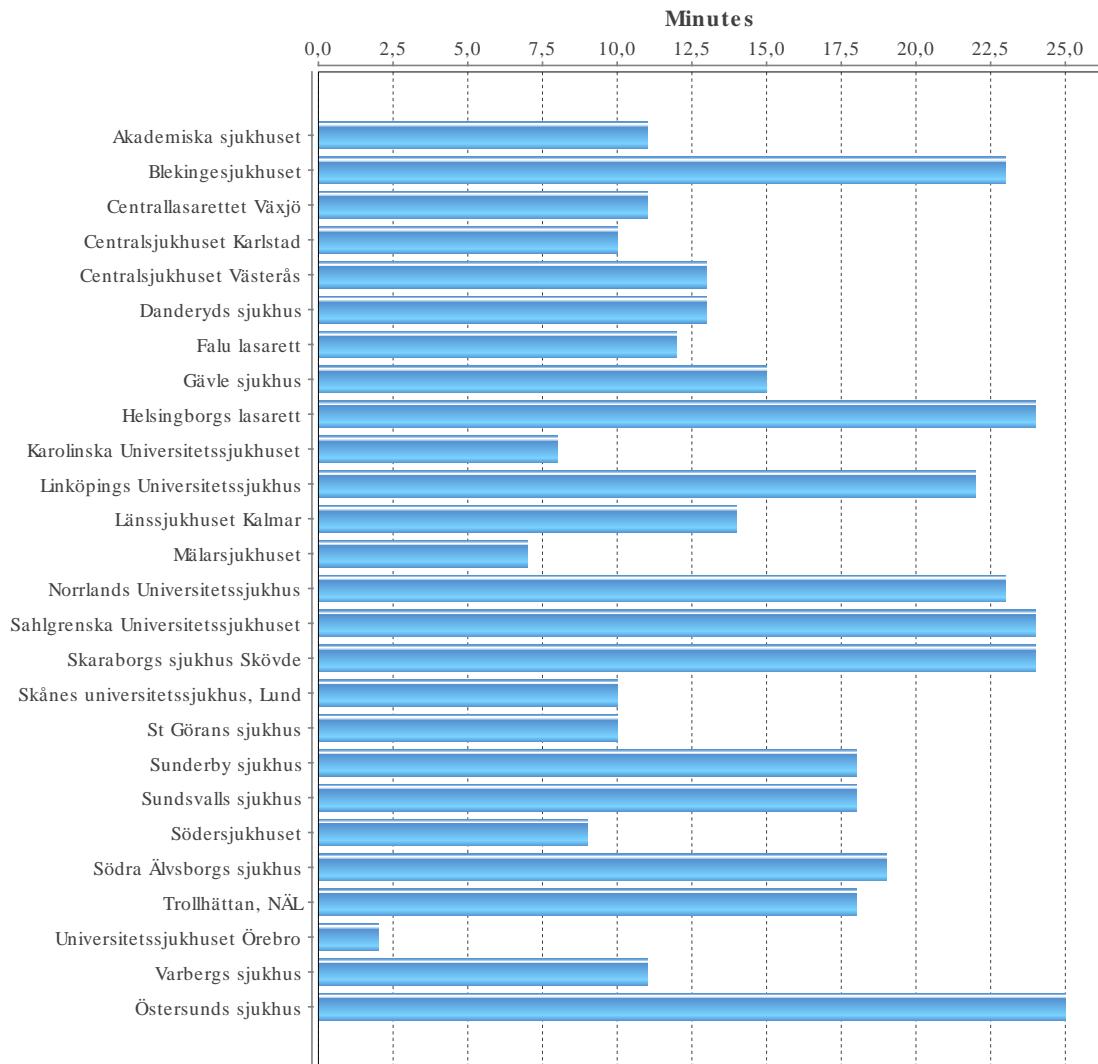
Knife time	Average	Standard deviation
ICD SR	40	17.5
ICD DR	54	31.7
CRT	97	43.0



## QUALITY – CRT – FLUOROSCOPY

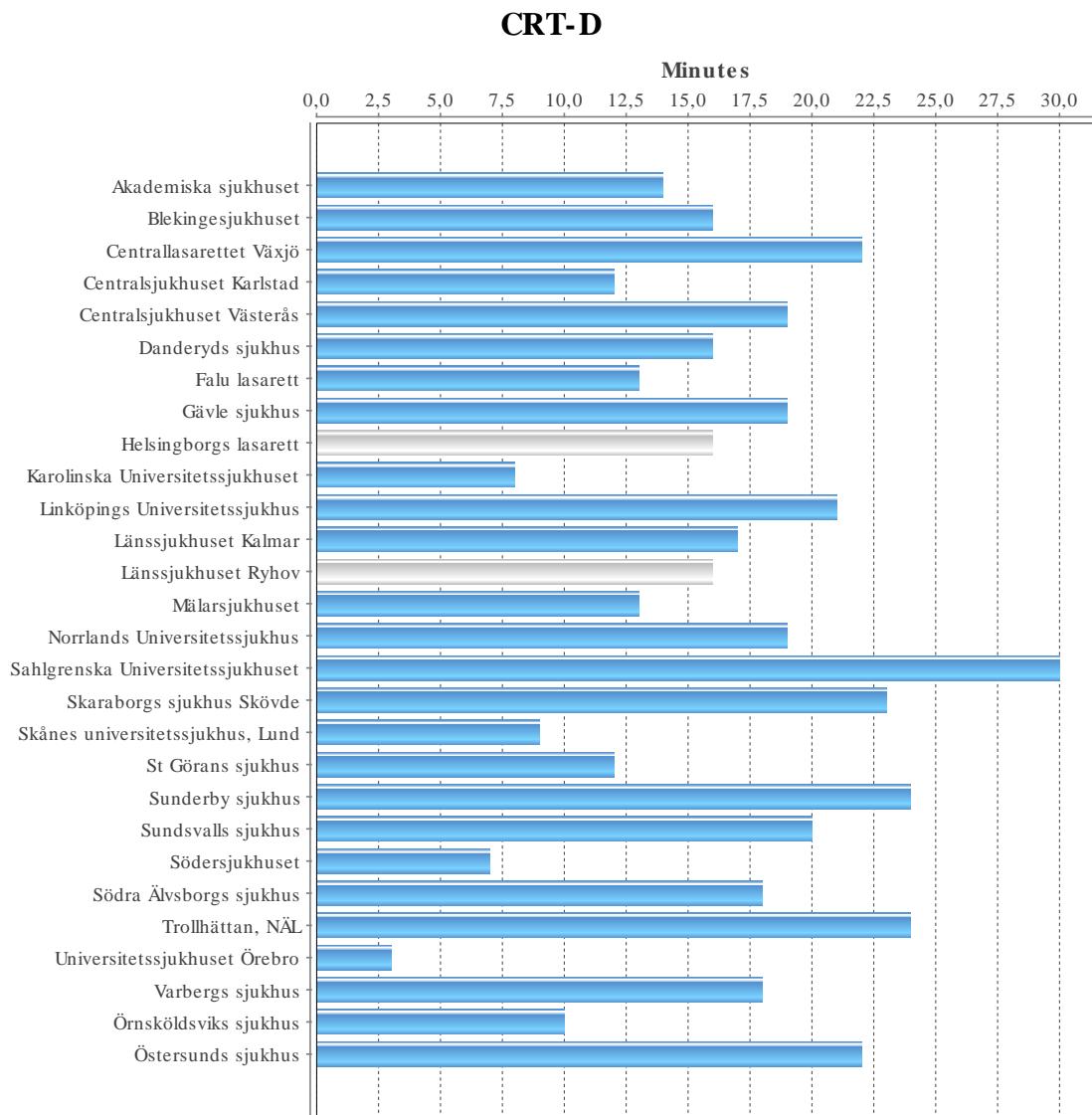
*Mean fluoroscopy duration per different CRT implantation per hospital. Bars colored in grey are based on less than 10 observations*

**CRT-P**



## QUALITY – CRT – FLUOROSCOPY

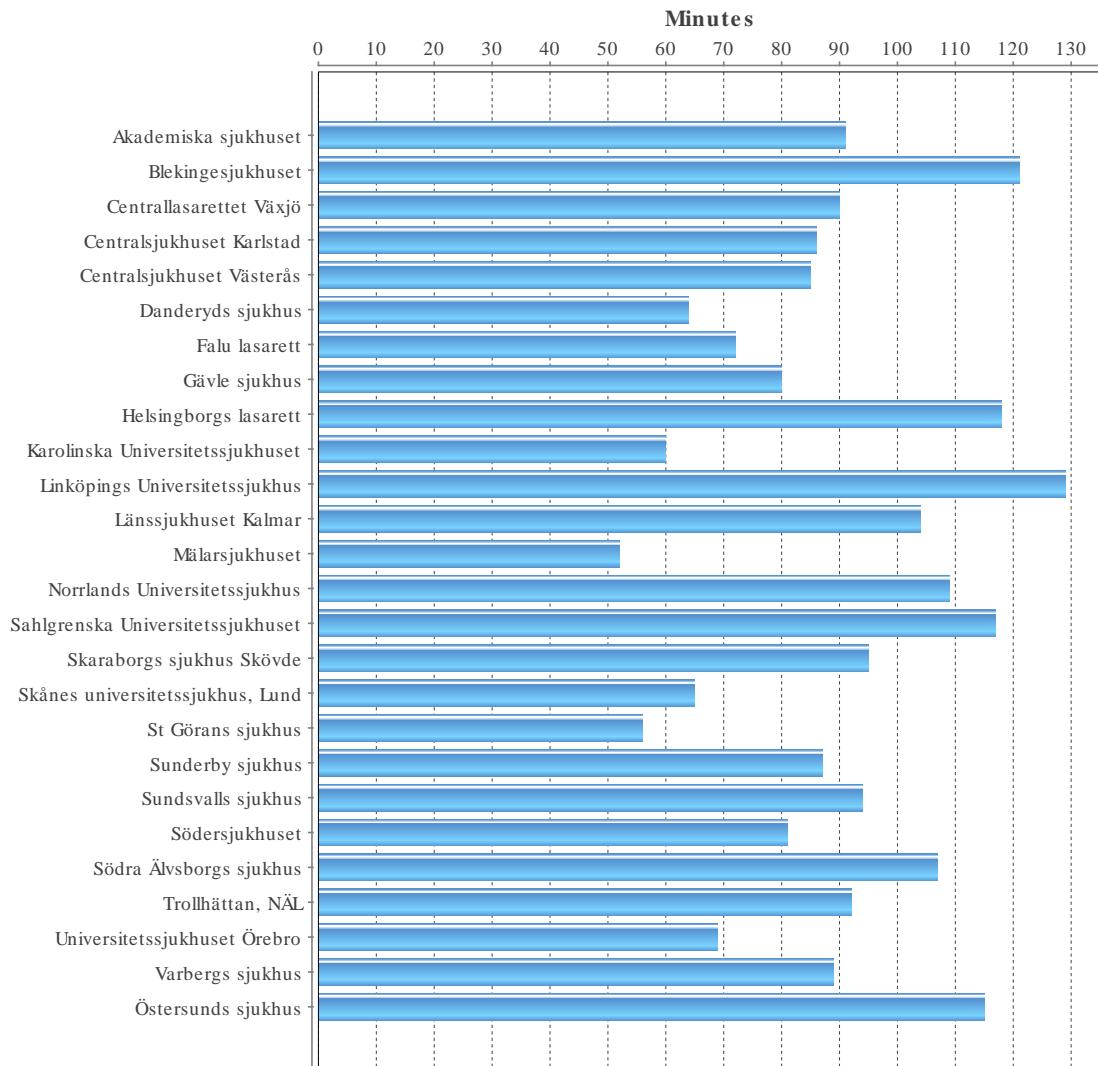
*Mean fluoroscopy duration per different CRT implantation per hospital. Bars colored in grey are based on less than 10 observations*



## QUALITY – CRT – KNIFE TIME PER HOSPITAL

*Mean skin to skin duration per subtype and hospital. Bars colored in grey are based on less than 10 observations*

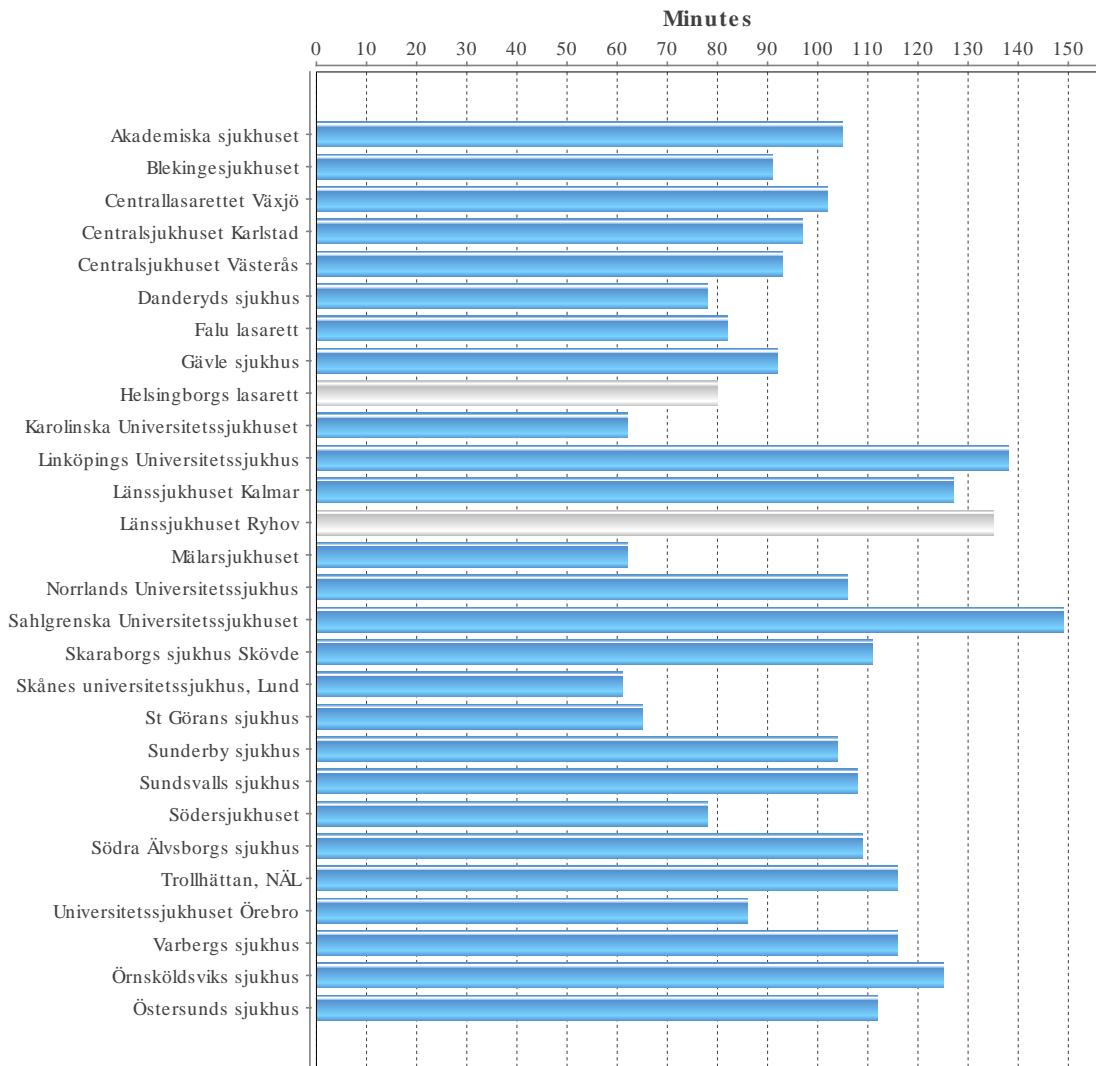
### CRT-P



## QUALITY – CRT – KNIFE TIME PER HOSPITAL

*Mean skin to skin duration per subtype and hospital. Bars colored in grey are based on less than 10 observations*

### CRT-D



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**QUALITY – PACEMAKER – GENERATOR SURVIVAL**

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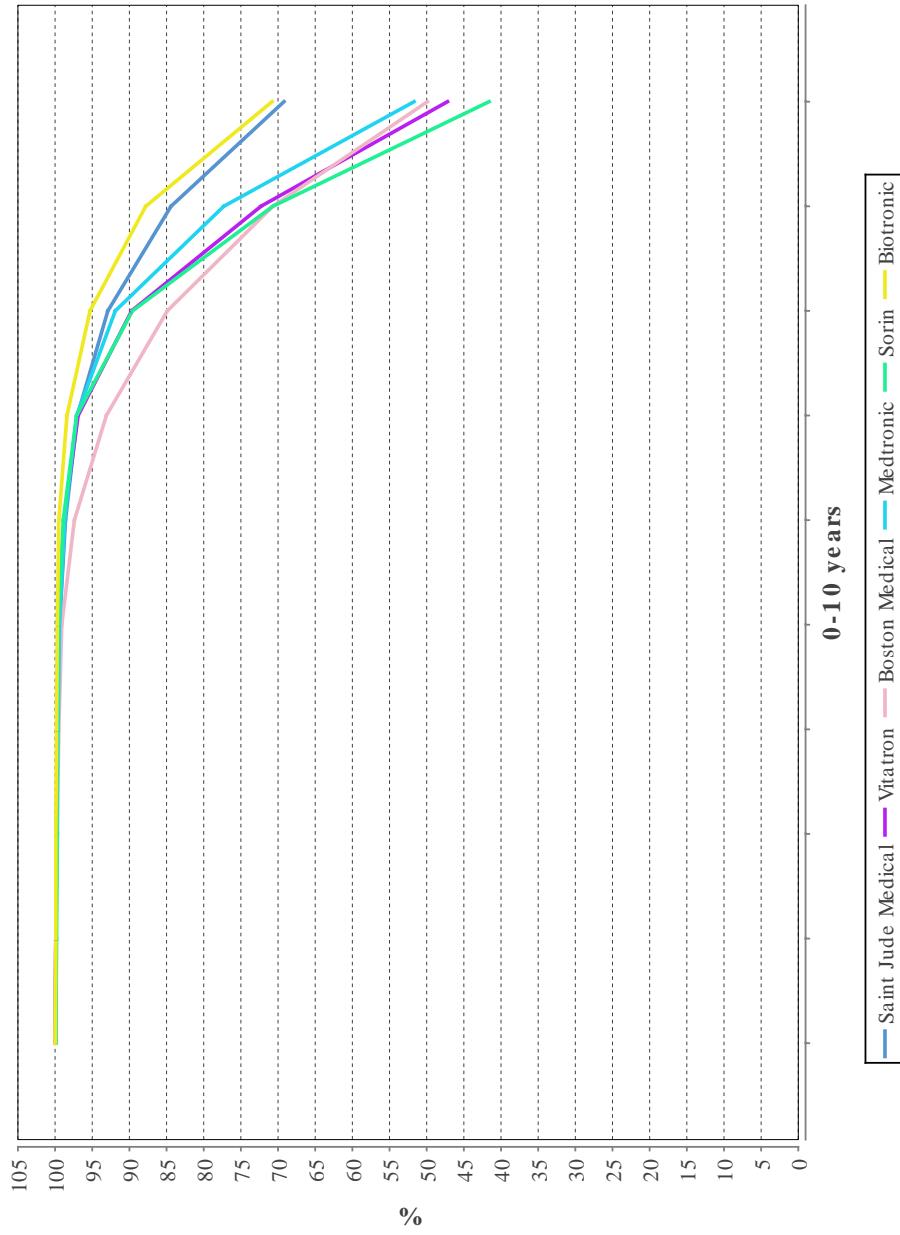
<b>Year</b>	<b>At risk</b>	<b>Survival probability %</b>
1	135315	100.0
2	116474	99.9
3	96718	99.8
4	79271	99.7
5	63713	99.4
6	50269	98.6
7	38446	96.6
8	27252	90.9
9	16196	77.6
10	6788	55.4

Overall survival probability for all PM generators as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 2006

Year	At risk	Surv. prob. %	Biotronic		Boston Scient		Medtronic		St Jude Medical		Vitatron		Sorin	
			At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %
1	135277	100.0	13727	100.0	16938	100.0	31079	99.9	49720	100.0	19643	100.0	4170	99.9
2	116442	99.9	11392	99.9	14934	99.9	27323	99.9	42169	99.9	16848	99.9	3776	99.8
3	96688	99.8	8709	99.9	12745	99.7	23787	99.8	33961	99.8	14035	99.8	3451	99.7
4	79247	99.7	6465	99.8	10558	99.5	20159	99.6	27000	99.7	11904	99.7	3161	99.7
5	63697	99.5	4493	99.7	8688	99.1	16897	99.4	20844	99.4	9933	99.5	2842	99.6
6	50253	98.6	3029	99.5	6896	97.4	13894	98.7	15631	98.6	8298	98.8	2505	98.9
7	38435	96.6	2084	98.4	4890	93.1	11008	97.1	11508	97.0	6769	96.9	2176	97.1
8	27244	90.7	1301	95.3	3135	84.9	8117	91.9	7949	92.9	5064	89.7	1678	89.6
9	16192	77.2	781	87.8	1787	70.7	4964	77.3	4856	84.4	2795	72.3	1009	70.7
10	6788	55.1	346	70.8	741	49.9	2106	51.7	2100	69.2	1091	47.2	404	41.6

## QUALITY – PACEMAKER – GENERATOR SURVIVAL PER MANUFACTURER

*Overall survival probability for all pacemaker generators as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 1990*



## QUALITY – PACEMAKER – GENERATOR SURVIVAL PER MODEL

*Models that have at least 100 implants and 50 explants*

<b>Manuf</b>	<b>Model</b>	<b>Year 1 %</b>	<b>Year 2 %</b>	<b>Year 3 %</b>	<b>Year 4 %</b>	<b>Year 5 %</b>	<b>Year 6 %</b>	<b>Year 7 %</b>	<b>Year 8 %</b>	<b>Year 9 %</b>
Biotronik	Philos SR	100.0	100.0	100.0	100.0	100.0	100.0	96.0	96.0	96.0
Biotronik	Axios SR	100.0	100.0	100.0	100.0	100.0	94.7	77.3	71.3	61.1
Biotronik	Evia DR-T ProMRI	100.0	100.0	100.0	100.0	100.0	100.0	95.9	93.6	84.8
Biotronik	Ecuro DR-T	100.0	100.0	99.1	99.1	99.1	99.1	99.1	99.1	99.1
Biotronik	Estella DR-T ProMRI	100.0	100.0	100.0	100.0	100.0	100.0	98.6	98.6	96.3
Biotronik	Etrinsa 8 DR- T ProMRI	99.8	99.8	99.8	99.8	99.5	99.5	NaN	NaN	NaN
Biotronik	Philos II DR-T	99.7	99.7	99.4	99.4	99.4	98.4	94.3	79.9	46.8
Biotronik	Philos II DR	100.0	100.0	99.6	99.2	98.8	97.2	87.0	63.6	42.9
Biotronik	Enitra 8 SR-T ProMRI	100.0	100.0	100.0	100.0	NaN	NaN	NaN	NaN	NaN
Biotronik	Etrinsa 6 DR- T ProMRI	99.9	99.7	99.7	99.7	99.7	99.7	99.7	NaN	NaN
Biotronik	Enitra 6 SR-T ProMRI	100.0	100.0	100.0	100.0	NaN	NaN	NaN	NaN	NaN
Biotronik	Effecta DR	100.0	100.0	99.9	99.7	99.4	99.4	99.4	98.9	97.2
Biotronik	Talos SR	99.8	99.8	99.8	99.8	99.8	99.4	96.6	82.6	35.3
Biotronik	Effecta SR	99.9	99.9	99.8	99.8	99.4	99.4	99.0	99.0	99.0
Biotronik	Enitra 8 DR-T ProMRI	100.0	100.0	100.0	100.0	100.0	NaN	NaN	NaN	NaN
Biotronik	Enitra 6 DR-T ProMRI	100.0	100.0	100.0	100.0	NaN	NaN	NaN	NaN	NaN
Boston Scientific	1294 Insignia I	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	58.8
Boston Scientific	1297 Insignia I	100.0	100.0	100.0	100.0	96.7	96.7	92.1	85.9	72.5
Boston Scientific	1192 Insignia	100.0	100.0	100.0	100.0	97.9	97.9	97.9	88.6	66.4
Boston Scientific	J172 Ingenio	98.6	98.6	98.6	98.6	96.5	96.5	96.5	90.4	90.4
Boston Scientific	J174 Ingenio EL	100.0	100.0	100.0	100.0	100.0	99.2	99.2	97.2	93.2
Boston Scientific	J062 Advantio	99.4	98.7	98.7	98.7	98.7	97.4	95.7	95.7	92.9
Boston Scientific	J065 Advantio	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Boston Scientific	U225 Visionist CRT-P	100.0	99.5	97.8	95.7	95.7	88.4	88.4	NaN	NaN
Boston Scientific	W173 Invive CRT	100.0	100.0	99.4	98.8	97.4	94.9	84.6	71.6	59.4
Boston Scientific	U228 Visonist X4 CRT-P MRI	100.0	100.0	100.0	100.0	100.0	100.0	100.0	NaN	NaN
Boston Scientific	S601 Altrua 60	100.0	99.5	99.0	99.0	99.0	95.6	85.2	61.5	40.2
Boston Scientific	S603 Altrua 60	100.0	100.0	99.5	98.5	96.8	87.7	59.7	37.3	9.4
Boston Scientific	S402 Altrua 40	99.6	99.6	99.6	99.6	98.9	98.9	96.0	90.3	74.4
Boston Scientific	J064 Adventio EL	99.8	99.8	99.8	99.8	99.8	98.7	98.7	97.8	97.0

## QUALITY – PACEMAKER – GENERATOR SURVIVAL PER MODEL

<b>Manuf</b>	<b>Model</b>	<b>Year 1 %</b>	<b>Year 2 %</b>	<b>Year 3 %</b>	<b>Year 4 %</b>	<b>Year 5 %</b>	<b>Year 6 %</b>	<b>Year 7 %</b>	<b>Year 8 %</b>	<b>Year 9 %</b>
Boston Scientific	S606 Altrua 60	99.6	99.6	99.6	99.1	97.9	95.8	91.8	82.3	61.9
Boston Scientific	H140 Contak Renewal TR2	100.0	100.0	99.4	98.6	95.4	85.5	60.1	28.1	7.8
Boston Scientific	1291 Insignia I	99.4	99.4	99.4	99.4	98.3	95.8	92.8	80.9	53.6
Boston Scientific	S602 Altrua 60	100.0	99.4	99.4	99.0	98.2	95.7	91.1	81.3	56.5
Boston Scientific	S501 Altrua 50	100.0	100.0	99.2	99.2	98.8	97.4	93.2	79.1	52.7
Boston Scientific	J277 Vitalio MRI	99.5	99.2	99.2	99.2	99.2	99.2	98.8	96.1	96.1
Boston Scientific	S404 EL Altrua 40	100.0	99.9	99.7	99.3	98.9	98.3	96.0	87.9	68.3
Boston Scientific	1190 Insignia	99.9	99.0	98.5	98.3	96.6	92.9	84.4	64.3	41.2
Boston Scientific	L210 Proponent MRI SR	100.0	99.7	99.4	98.7	94.9	89.4	85.0	NaN	NaN
Boston Scientific	1290 Insignia I	99.9	99.8	99.6	98.6	92.9	79.3	57.7	32.3	8.8
Boston Scientific	L231 Proponent MRI EL DR	99.9	99.8	99.7	99.3	98.2	95.3	94.9	NaN	NaN
Medtronic	KDR931 Kappa DR	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.1	58.7
Medtronic	SS303 Sigma S	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	NaN
Medtronic	P1501DR EnRhythm	100.0	100.0	100.0	100.0	97.2	79.3	46.6	27.8	16.4
Medtronic	ADSR01 Adapta	100.0	99.1	99.1	99.1	99.1	99.1	77.0	42.5	16.0
Medtronic	Micra MC1VR01 MRI	99.4	99.4	99.4	97.7	94.9	94.9	94.9	NaN	NaN
Medtronic	KSR703 Kappa SR	100.0	100.0	100.0	97.1	93.8	79.4	49.4	29.3	10.1
Medtronic	E2DR31 EnPulse	100.0	100.0	100.0	98.8	98.8	98.8	97.2	92.0	75.9
Medtronic	E2SR01 EnPulse	100.0	100.0	100.0	99.3	96.6	91.5	53.4	13.1	4.4
Medtronic	W1TR06 Solara CRT-P MRI	99.6	99.6	99.6	99.6	NaN	NaN	NaN	NaN	NaN
Medtronic	KSR901 Kappa SR	98.6	98.6	98.6	98.6	98.6	89.5	45.0	15.6	6.8
Medtronic	SEDR01 Sensia	100.0	100.0	100.0	100.0	99.6	99.1	95.4	78.1	53.4
Medtronic	EN1SR01 Ensura SR MRI	99.8	99.8	99.6	99.1	99.1	99.1	99.1	NaN	NaN
Medtronic	ADDR01 Adapta	100.0	99.8	99.6	99.3	98.0	97.7	94.4	78.3	40.9

## QUALITY – PACEMAKER – GENERATOR SURVIVAL PER MODEL

<b>Manuf</b>	<b>Model</b>	<b>Year 1 %</b>	<b>Year 2 %</b>	<b>Year 3 %</b>	<b>Year 4 %</b>	<b>Year 5 %</b>	<b>Year 6 %</b>	<b>Year 7 %</b>	<b>Year 8 %</b>	<b>Year 9 %</b>
Medtronic	C2TR01 Syncra CRT	99.8	99.7	99.3	98.3	94.2	86.8	71.5	56.1	30.8
Medtronic	VEDR01 Versa	100.0	99.6	99.4	99.2	99.0	96.9	93.1	72.1	39.2
Medtronic	W3DR01 Azure S DR MRI	100.0	99.5	99.5	99.5	NaN	NaN	NaN	NaN	NaN
Medtronic	X2DR01 Astra XT DR MRI	100.0	99.9	99.8	NaN	NaN	NaN	NaN	NaN	NaN
Medtronic	A3DR01 Advisa DR MRI	100.0	100.0	100.0	100.0	99.8	99.1	96.9	85.6	69.3
Medtronic	8042 InSync III	100.0	99.8	99.0	97.9	95.8	87.4	68.4	37.5	10.6
Medtronic	E2DR01 EnPulse	100.0	99.8	99.7	99.1	98.4	96.5	88.9	60.1	21.7
Medtronic	SESR01 Sensia	99.8	99.8	99.6	99.2	98.2	96.6	89.3	61.2	31.0
Medtronic	RESR01 Relia SR	99.7	99.7	99.7	99.3	98.6	97.1	89.9	69.7	38.3
Medtronic	ADDRL1 Adapta	99.9	99.7	99.6	99.5	99.4	99.0	98.9	96.2	84.4
Medtronic	EN1DR01 Ensura DR MRI	99.8	99.8	99.7	99.6	99.0	98.1	94.4	81.7	61.8
Medtronic	SEDRL1 Sensia	99.9	99.9	99.8	99.8	99.6	99.3	98.6	97.0	93.4
Medtronic	REDR01 Relia DR	99.9	99.8	99.7	99.5	99.3	98.3	96.1	85.0	54.9
Sorin/LivaNova	Kora 100 DR	100.0	100.0	100.0	100.0	97.1	90.7	86.7	86.7	NaN
Sorin/LivaNova	Esprit SR	100.0	100.0	100.0	100.0	100.0	100.0	94.1	87.4	87.4
Sorin/LivaNova	2530 Rhapsody	100.0	100.0	100.0	100.0	100.0	97.6	94.9	86.6	68.2
Sorin/LivaNova	Reply 200 SR	100.0	100.0	100.0	100.0	98.8	95.2	95.2	95.2	NaN
Sorin/LivaNova	Kora 250 DR	100.0	99.3	98.5	98.5	95.6	93.5	NaN	NaN	NaN
Sorin/LivaNova	Reply SR	100.0	100.0	100.0	100.0	98.6	96.9	92.8	90.2	72.4
Sorin/LivaNova	Esprit DR	100.0	100.0	100.0	99.6	99.6	98.1	87.3	69.2	43.0
Sorin/LivaNova	2550 Symphony DR	100.0	100.0	100.0	100.0	99.4	98.8	96.4	91.4	76.6
Sorin/LivaNova	Reply 200 DR	99.9	99.6	99.4	99.4	99.0	94.9	79.3	53.9	NaN
Sorin/LivaNova	Reply DR	99.7	99.6	99.6	99.5	98.9	97.9	92.0	70.9	36.4
St Jude Medical/ Abbott	5157 M/S Verity ADx XL SR	100.0	100.0	100.0	100.0	100.0	90.3	90.3	90.3	90.3
St Jude Medical/ Abbott	3120 Allure	100.0	100.0	100.0	100.0	97.5	94.3	85.5	74.8	NaN
St Jude Medical/ Abbott	5610 Victory	100.0	100.0	100.0	100.0	97.1	84.0	46.9	12.4	NaN
St Jude Medical/ Abbott	1210 Accent SR	100.0	98.2	98.2	95.2	95.2	95.2	95.2	95.2	95.2

## QUALITY – PACEMAKER – GENERATOR SURVIVAL PER MODEL

<b>Manuf</b>	<b>Model</b>	<b>Year 1 %</b>	<b>Year 2 %</b>	<b>Year 3 %</b>	<b>Year 4 %</b>	<b>Year 5 %</b>	<b>Year 6 %</b>	<b>Year 7 %</b>	<b>Year 8 %</b>	<b>Year 9 %</b>
St Jude Medical/ Abbott	2525T Microny II	98.8	98.8	98.8	95.2	83.2	80.6	68.7	46.1	26.0
St Jude Medical/ Abbott	5180 Identity ADx SR	100.0	100.0	97.9	97.9	88.2	77.7	51.1	13.9	4.6
St Jude Medical/ Abbott	3112 Anthem	100.0	100.0	98.9	97.7	93.7	89.0	73.2	51.3	22.6
St Jude Medical/ Abbott	1110 Accent SR	100.0	100.0	100.0	100.0	100.0	100.0	98.5	98.5	98.5
St Jude Medical/ Abbott	5810 Victory DR	100.0	100.0	94.4	87.4	69.2	42.5	26.5	16.3	12.2
St Jude Medical/ Abbott	2162 Endurity DR	100.0	100.0	100.0	100.0	100.0	100.0	100.0	NaN	NaN
St Jude Medical/ Abbott	2240 Assurity DR	99.6	99.6	99.6	99.0	99.0	98.4	98.4	98.4	NaN
St Jude Medical/ Abbott	1136 Sustain XL	100.0	100.0	100.0	99.2	99.2	99.2	99.2	96.9	92.1
St Jude Medical/ Abbott	5356 Verity ADx XL DR	100.0	100.0	100.0	99.0	96.5	96.5	96.5	93.5	65.9
St Jude Medical/ Abbott	3262 Quadra Allure MP RF	100.0	100.0	99.6	99.1	98.5	97.8	NaN	NaN	NaN
St Jude Medical/ Abbott	2136 Sustain XL DR	99.4	99.4	99.4	99.0	98.6	98.1	97.0	89.1	80.3
St Jude Medical/ Abbott	1172 Endurity MRI SR	100.0	100.0	100.0	100.0	100.0	100.0	NaN	NaN	NaN
St Jude Medical/ Abbott	3242 Allure Quadra RF	99.8	99.8	99.8	99.8	98.3	91.8	87.8	82.1	NaN
St Jude Medical/ Abbott	1162 Endurity SR	99.8	99.8	99.8	99.8	99.5	99.5	99.5	NaN	NaN
St Jude Medical/ Abbott	5596 Frontier II	100.0	100.0	99.3	97.4	89.8	79.1	59.2	37.8	20.7
St Jude Medical/ Abbott	2160 Endurity	99.5	99.5	99.5	99.5	99.1	99.1	98.8	96.8	96.8
St Jude Medical/ Abbott	2172 Endurity MRI DR	100.0	100.0	100.0	99.8	99.3	99.3	NaN	NaN	NaN
St Jude Medical/ Abbott	2224 Accent DR MRI	99.8	99.8	99.8	99.4	99.4	99.0	98.7	97.0	90.0
St Jude Medical/ Abbott	1160 Endurity SR	99.9	99.7	99.7	99.7	99.7	99.7	98.9	98.3	NaN
St Jude Medical/ Abbott	2212 Accent DR	99.8	99.6	99.6	98.8	98.0	97.4	93.6	82.8	61.4
St Jude Medical/ Abbott	3212 Anthem	99.6	99.1	98.3	97.1	92.6	80.5	69.3	45.4	23.0
St Jude Medical/ Abbott	5386 Identity ADx XL DR	98.9	98.5	98.0	98.0	95.1	94.4	90.9	75.2	54.2
St Jude Medical/ Abbott	3222 Allure RF	99.8	99.7	99.7	97.9	94.3	88.0	83.2	70.3	70.3
St Jude Medical/ Abbott	5626 Zephyr XL SR	99.8	99.5	99.5	99.2	99.0	99.0	98.7	95.5	89.4
St Jude Medical/ Abbott	3562 Quadra Allure MP RF MRI	100.0	100.0	100.0	99.8	98.6	NaN	NaN	NaN	NaN

## QUALITY – PACEMAKER – GENERATOR SURVIVAL PER MODEL

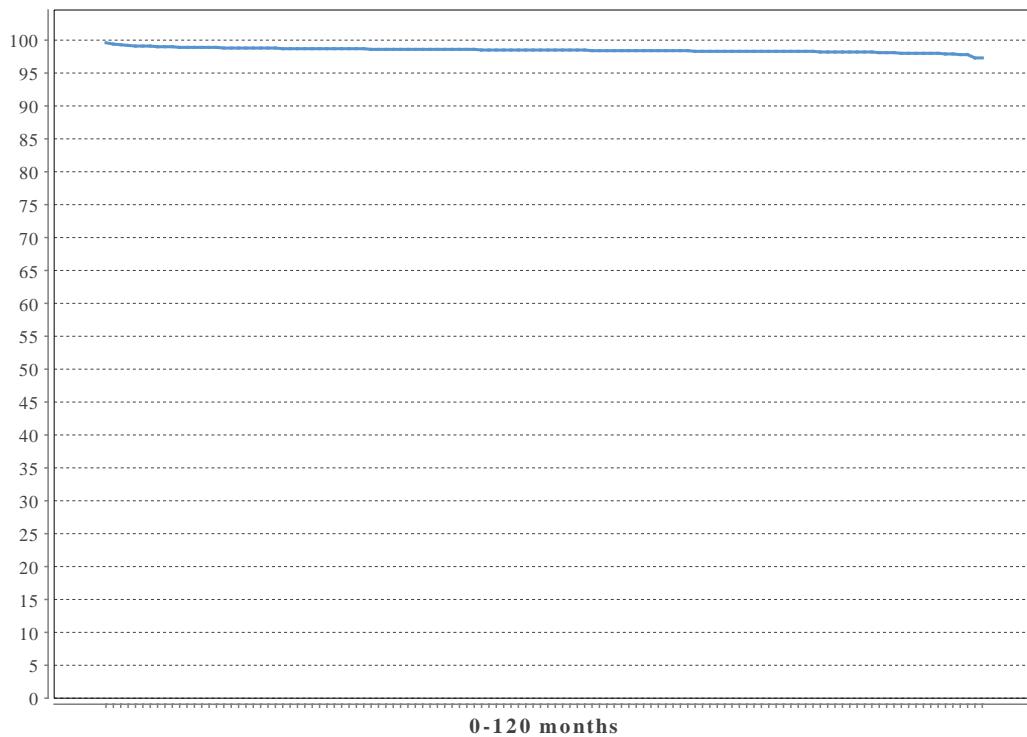
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<b>Manuf</b>	<b>Model</b>	<b>Year 1 %</b>	<b>Year 2 %</b>	<b>Year 3 %</b>	<b>Year 4 %</b>	<b>Year 5 %</b>	<b>Year 6 %</b>	<b>Year 7 %</b>	<b>Year 8 %</b>	<b>Year 9 %</b>
St Jude Medical/ Abbott	2112 Accent DR	99.9	99.9	99.9	99.8	99.7	98.8	97.3	92.0	80.2
St Jude Medical/ Abbott	2260 Assurity + DR	99.7	99.7	99.6	99.5	99.1	98.7	98.0	97.0	96.7
St Jude Medical/ Abbott	5156 Verity ADx XL SR	99.9	99.9	99.9	99.6	99.5	98.8	98.5	97.7	94.2
St Jude Medical/ Abbott	1272 Assurity MRI SR	100.0	100.0	100.0	100.0	99.7	99.7	99.7	NaN	NaN
St Jude Medical/ Abbott	5826 Zephyr XL DR	99.8	99.6	99.5	99.3	98.8	97.7	89.5	73.3	57.2
St Jude Medical/ Abbott	5816 Victory XL	99.8	99.6	99.5	99.4	98.7	97.0	89.7	77.9	54.4
St Jude Medical/ Abbott	2272 Assurity MRI DR	99.9	99.9	99.8	99.8	99.6	99.4	99.0	99.0	99.0
Vitatron	T20SR	99.8	99.8	99.8	99.1	97.7	94.7	91.4	87.1	79.2
Vitatron	C10S	99.9	99.9	99.7	99.4	99.0	98.4	96.0	93.3	91.1
Vitatron	G20A2 SR MRI	99.8	99.4	99.4	99.4	NaN	NaN	NaN	NaN	NaN
Vitatron	C70DR	100.0	100.0	100.0	100.0	99.8	97.5	86.1	59.8	22.9
Vitatron	T70DR	99.5	99.3	99.3	98.9	96.8	91.6	70.6	41.6	17.7
Vitatron	E60A1 DR	100.0	100.0	100.0	99.6	99.2	98.2	95.2	88.8	59.0
Vitatron	C20SR	100.0	99.9	99.9	99.9	98.9	96.5	93.1	89.1	76.2
Vitatron	T60DR	100.0	100.0	99.6	99.2	98.1	95.4	82.0	54.4	28.8
Vitatron	G20A1	99.9	99.9	99.9	99.5	98.8	96.7	86.6	60.9	29.4
Vitatron	Q80A2 DR MRI	99.8	99.8	99.8	99.8	NaN	NaN	NaN	NaN	NaN
Vitatron	C60DR	99.9	99.8	99.6	99.3	98.3	95.5	83.4	56.4	26.7
Vitatron	G70A1	99.9	99.8	99.8	99.7	99.5	98.8	97.7	91.0	75.4

## QUALITY – PM – LEAD SURVIVAL

*Based on all implants after 1990*

Year	At risk	Survival probability %
1	191100	99.6
2	164781	98.9
3	137021	98.7
4	111751	98.6
5	88453	98.6
6	67996	98.5
7	50262	98.4
8	34936	98.3
9	21496	98.3
10	9892	98.0



## QUALITY – PACEMAKER – LEAD SURVIVAL PER MODEL

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*Models that have at least 50 implants and 10 explants*

Manufacturer	Model	Years								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
Biotronik	Y53-BP	100.0	100.0	100.0	100.0	100.0	95.0	95.0	95.0	95.0
Biotronik	Selox SR 60	97.4	97.4	95.7	95.7	95.7	95.7	95.7	95.7	95.7
Biotronik	PX60-UP	99.9	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.7
Biotronik	Selox ST 60	100.0	100.0	100.0	98.9	98.9	98.9	98.9	98.9	98.9
Biotronik	Safio ProMRI S53	99.0	98.6	98.2	98.2	98.2	98.2	98.2	98.2	98.2
Biotronik	Y60-BP	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.7
Biotronik	PX60-BP	99.8	99.8	99.8	99.8	99.8	99.8	99.8	99.8	99.8
Biotronik	Safio ProMRI S60	99.1	99.1	99.1	99.1	99.1	99.1	99.1	99.1	99.1
Biotronik	Siello S60	98.2	98.2	98.2	98.2	98.2	98.2	98.2	98.2	98.2
Biotronik	Siello S53	98.4	98.2	98.1	98.1	98.1	98.1	98.1	98.1	98.1
Biotronik	Solia S60 MRI	99.0	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9
Biotronik	Solia S53 MRI	98.8	98.6	98.5	98.5	98.5	98.3	98.3	98.3	98.3
Boston Scientific	4480 Fineline II Sterox EZ MRI	95.8	95.8	95.2	94.5	94.5	94.5	94.5	94.5	94.5
Boston Scientific	4542 Easytrak	95.8	94.6	93.2	91.5	91.5	88.9	88.9	88.9	88.9
Boston Scientific	7732 Ingevity MRI	99.0	98.7	98.7	98.7	98.7	98.7	98.7	98.7	NaN
Boston Scientific	4474 Fineline II Sterox EZ MRI	99.5	99.0	98.6	98.3	98.0	97.9	97.7	97.3	97.3
Boston Scientific	4471 Fineline II Sterox EZ MRI	97.2	97.0	97.0	97.0	96.9	96.5	96.5	96.5	95.3
Boston Scientific	4457 Fineline II Sterox EZ MRI	99.4	99.3	99.1	99.0	99.0	98.8	98.8	98.8	98.8
Boston Scientific	4473 Fineline II Sterox EZ MRI	98.9	98.7	98.6	98.6	98.5	98.5	98.5	98.3	98.3
Boston Scientific	7742 Ingevity MRI	98.6	98.6	98.6	98.6	98.5	98.5	98.5	98.5	NaN
Boston Scientific	7741 Ingevity MRI	98.6	98.6	98.5	98.5	98.5	98.5	98.5	98.5	NaN
Boston Scientific	4470 Fineline II Sterox EZ MRI	99.3	99.3	99.2	99.2	99.2	99.1	99.1	99.0	98.8
Medtronic	4195 Attain StarFix	93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.9	78.3
Medtronic	4073 CapSure Sense	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4
Medtronic	4396 Attain Ability MRI	97.9	97.9	97.9	97.9	97.9	97.9	97.9	97.9	97.9
Medtronic	4965 CapSure Epi	98.5	98.5	98.5	97.3	95.9	92.7	92.7	92.7	92.7
Medtronic	4194 Attain OTW	94.1	93.6	93.6	92.0	92.0	90.7	88.7	88.7	88.7

**QUALITY – PACEMAKER – LEAD SURVIVAL PER MODEL**

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<b>Manufacturer</b>	<b>Model</b>	<b>Years</b>								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
Medtronic	4196 Attain Ability MRI	96.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8
Medtronic	4193 Attain OTW	94.4	93.5	93.0	92.6	91.7	91.1	90.3	88.9	88.9
Medtronic	3830 SelectSecure MRI	97.7	97.7	97.7	97.7	82.7	82.7	82.7	82.7	0.0
Medtronic	5092 Capture SP Novus	98.7	98.4	98.4	98.3	98.1	98.1	97.7	97.2	97.2
Medtronic	5086 CapSureFix MRI	97.0	97.0	97.0	97.0	97.0	96.4	96.4	96.4	96.4
Medtronic	4296 Attain Ability MRI	96.4	95.3	95.3	95.3	95.3	94.9	94.9	94.9	94.9
Medtronic	4598 Attain Performa MRI	99.1	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9
Medtronic	4796 Attain Stability MRI	99.2	98.7	98.5	98.5	98.5	98.5	98.5	98.5	98.5
Medtronic	4968 CapSure Epi	99.6	99.2	98.5	98.5	97.5	97.5	96.6	95.8	91.2
Medtronic	4798 Attain Stability Quad MRI	98.3	98.2	98.2	98.2	NaN	NaN	NaN	NaN	NaN
Medtronic	5054 CapSure Z Novus	98.9	98.7	98.4	98.4	98.2	98.1	98.1	97.6	97.6
Medtronic	4074 Capture Sense MRI	98.9	98.9	98.8	98.8	98.8	98.6	98.6	98.5	98.5
Medtronic	5076 CapSureFix MRI	99.0	98.9	98.8	98.7	98.7	98.6	98.6	98.5	98.1
Medtronic	4076 CapSureFix Novus MRI	99.3	99.2	99.2	99.1	99.1	99.1	99.0	98.9	98.9
N/A	N/A	99.5	99.4	99.4	99.1	98.9	98.5	97.6	96.8	96.8
Osycka	KY-5	93.1	88.1	85.9	82.1	80.3	80.3	77.3	77.3	77.3
St Jude Medical/ Abbott	1058T	96.6	96.6	96.6	96.6	96.6	96.6	96.6	96.6	96.6
St Jude Medical/ Abbott	1699T OptiSense	97.5	96.1	96.1	96.1	96.1	96.1	96.1	96.1	96.1
St Jude Medical/ Abbott	1056K QuickSite	96.9	96.2	95.5	94.5	94.5	94.5	90.6	90.6	90.6
St Jude Medical/ Abbott	1458QL Quartet MRI	98.6	98.6	98.6	98.6	98.6	98.6	NaN	NaN	NaN
St Jude Medical/ Abbott	1084T Myodex	99.1	99.1	99.1	99.1	99.1	99.1	99.1	99.1	99.1
St Jude Medical/ Abbott	1480T	98.8	98.2	98.1	98.1	97.9	97.7	97.5	97.5	97.5
St Jude Medical/ Abbott	1488T Tendril SDX	98.5	98.2	97.9	97.7	97.5	97.1	96.9	96.0	95.1
St Jude Medical/ Abbott	1456Q Quartet MRI	96.8	96.8	96.5	96.5	96.5	96.5	NaN	NaN	NaN

**QUALITY – PACEMAKER – LEAD SURVIVAL PER MODEL**

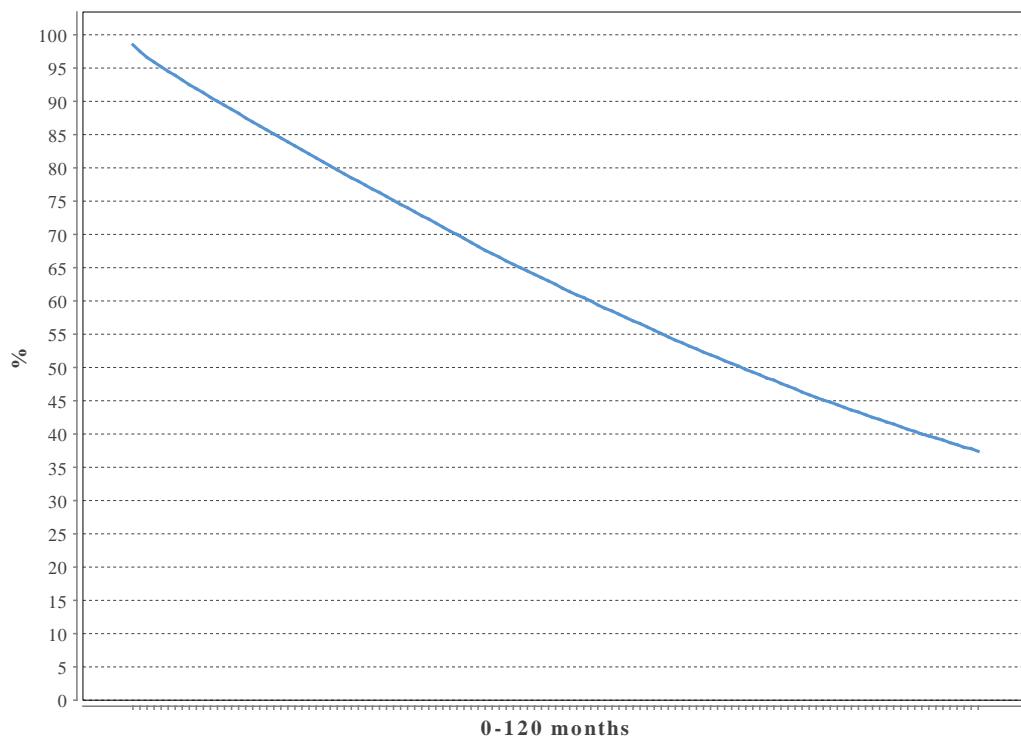
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<b>Manufacturer</b>	<b>Model</b>	<b>Years</b>								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
St Jude Medical/ Abbott	1156T Quickflex	96.2	95.5	94.6	94.6	93.8	93.8	93.8	93.8	91.0
St Jude Medical/ Abbott	1056T QuickSite	95.9	95.2	94.3	93.5	93.2	92.8	92.8	92.8	87.3
St Jude Medical/ Abbott	1699TC OptiSense	98.1	97.6	97.4	97.0	97.0	96.7	96.3	96.3	96.3
St Jude Medical/ Abbott	1636T Isoflex	97.5	97.3	96.9	96.9	96.6	96.2	96.2	95.6	94.5
St Jude Medical/ Abbott	LPA1200M52cm TendrilMRI	98.1	98.0	97.8	97.7	97.6	97.5	97.4	96.8	96.8
St Jude Medical/ Abbott	1788TC Tendril ST	96.3	96.1	96.1	95.9	95.6	95.6	95.6	95.6	94.9
St Jude Medical/ Abbott	LPA1200M58cm TendrilMRI	99.1	98.9	98.9	98.7	98.6	98.4	98.4	98.2	98.2
St Jude Medical/ Abbott	1788T Tendril ST	97.3	96.6	95.9	95.6	95.6	95.6	95.6	95.6	95.6
St Jude Medical/ Abbott	1888TC Tendril ST	97.8	97.6	97.5	97.5	97.5	97.3	97.1	97.1	97.1
St Jude Medical/ Abbott	1688T Tendril SDX	97.1	96.5	96.2	95.9	95.4	95.0	95.0	94.4	94.1
St Jude Medical/ Abbott	1258T QuickFlex	97.7	97.4	97.2	97.0	96.5	95.9	95.6	95.5	95.2
St Jude Medical/ Abbott	1646T Isoflex	98.3	98.1	97.8	97.8	97.7	97.7	97.6	97.4	97.1
St Jude Medical/ Abbott	1458Q Quartet MRI	98.2	97.6	97.4	97.1	97.0	97.0	96.7	96.7	96.7
St Jude Medical/ Abbott	1948 Isoflex MRI	98.7	98.6	98.5	98.4	98.3	98.2	98.1	98.1	97.7
St Jude Medical/ Abbott	1999 Optisense	99.0	98.7	98.6	98.5	98.4	98.3	98.2	98.1	97.7
St Jude Medical/ Abbott	2088TC Tendril STS MRI	99.3	99.2	99.1	99.0	99.0	98.9	98.8	98.8	98.7
Vitatron	ICM09JB Crystalline	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Vitatron	ICL08 Crystalline	97.3	96.8	96.8	96.8	96.8	95.9	94.6	94.6	94.6
Vitatron	ICF09 Crystalline	97.4	97.2	97.2	97.0	96.8	96.6	96.2	96.2	95.6
Vitatron	IHP09B	98.0	97.8	97.8	97.8	97.8	97.8	97.8	97.8	97.8
Vitatron	ICF09B Crystalline	98.0	97.8	97.8	97.8	97.8	97.8	97.8	97.8	97.8
Vitatron	ICM09B Crystalline	98.6	98.5	98.5	98.4	98.3	98.1	98.1	98.1	97.9
Vitatron	ICQ09B Crystalline	99.0	98.8	98.7	98.7	98.6	98.5	98.5	98.5	98.5

## QUALITY – PACEMAKER – PATIENT SURVIVAL

*Based on all implants after 1990*

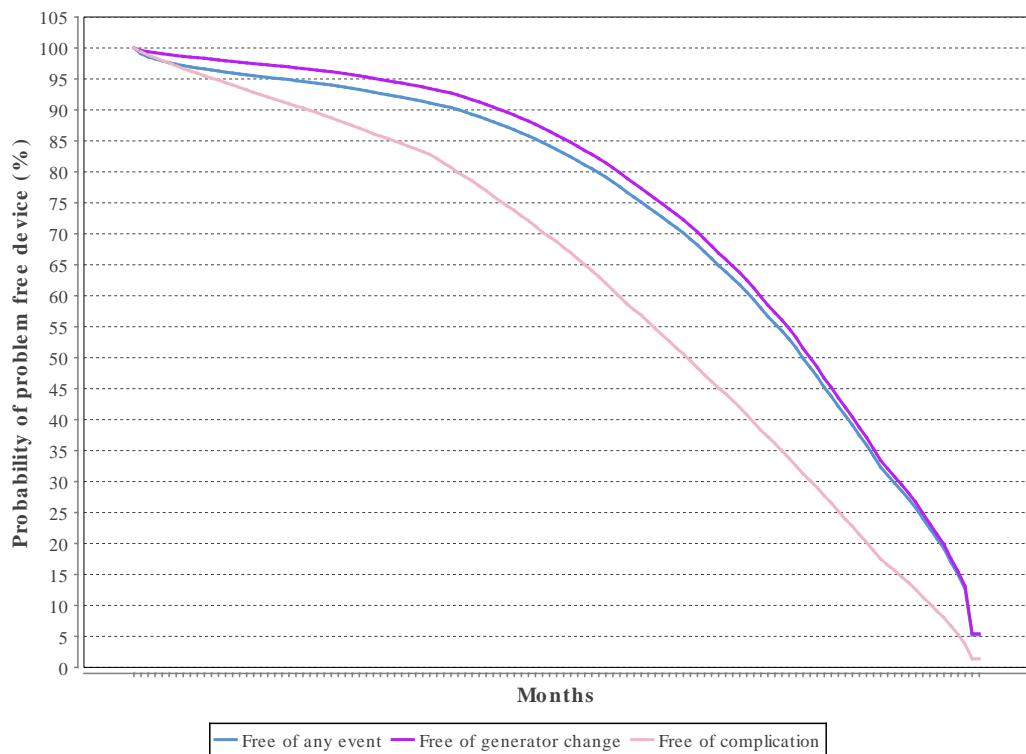
Year	At risk	Survival probability %
1	144583	98.5
2	124709	90.0
3	105021	82.7
4	87541	75.7
5	71952	68.8
6	58582	62.5
7	46809	56.6
8	35593	51.0
9	24592	45.9
10	15175	41.5



## QUALITY – ICD – FREE OF EVENT

*Probability of event free ICD-device*

<b>Year</b>	<b>At risk</b>	<b>Free of any event %</b>	<b>Free of generator change %</b>	<b>Free of complication %</b>
1	34994	96.3	98.1	94.8
2	32132	94.6	96.7	90.3
3	29127	92.5	94.7	85.4
4	25309	89.3	91.6	78.6
5	19957	83.6	85.9	68.8
6	14184	75.1	77.4	56.9
7	8921	63.9	65.9	44.2
8	4426	48.4	50.0	30.1
9	1321	29.7	30.8	15.7
10	53	5.3	5.4	1.4



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## QUALITY – ICD – GENERATOR SURVIVAL

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<b>Year</b>	<b>At risk</b>	<b>Survival probability %</b>
1	27554	99.9
2	24970	99.8
3	21227	99.4
4	17690	98.8
5	14315	96.9
6	10793	91.4
7	7340	81.2
8	4377	66.2
9	2021	45.5
10	580	24.1

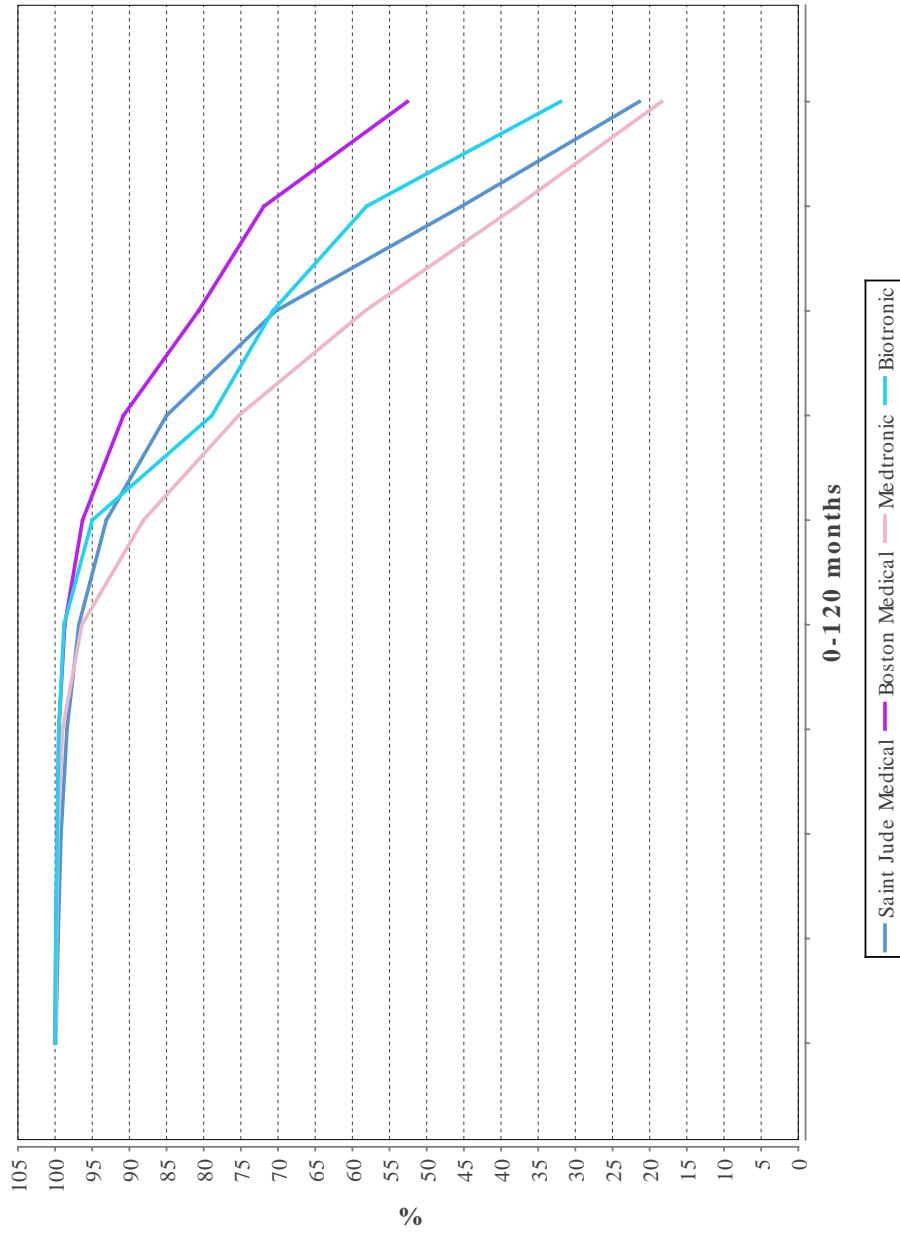
## QUALITY – ICD – GENERATOR SURVIVAL PER MANUFACTURER

*Overall survival probability for all ICD generators as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 2006*

Year	At risk	Surv. prob. %	Biotronic		Boston Scientific		Medtronic		St Jude Medical	
			At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %
1	27489	133.3	1243	100.0	3102	100.0	11214	99.9	11930	99.9
2	24910	133.1	1147	99.9	2849	99.9	10239	99.8	10675	99.6
3	21171	132.7	990	99.7	2449	99.7	8843	99.6	8889	99.2
4	17637	132.1	818	99.5	1986	99.5	7456	99.0	7377	98.4
5	14265	130.2	666	98.8	1559	98.7	6035	96.4	6005	96.8
6	10748	124.2	519	95.0	1165	96.3	4456	88.1	4608	93.1
7	7305	110.0	332	78.9	819	90.8	2950	75.3	3204	85.0
8	4359	93.3	211	70.7	507	80.7	1685	58.3	1956	70.3
9	2017	71.1	128	58.1	347	71.9	687	37.9	855	45.3
10	579	41.5	44	32.0	136	52.6	185	18.4	214	21.4

## QUALITY – ICD – GENERATOR SURVIVAL PER MANUFACTURER

*Overall survival probability for all ICD generators as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 1990*



## QUALITY – ICD – GENERATOR SURVIVAL PER MODEL

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*Models that have at least 50 implants and 10 explants*

<b>Manuf</b>	<b>Model</b>	<b>Year 1 %</b>	<b>Year 2 %</b>	<b>Year 3 %</b>	<b>Year 4 %</b>	<b>Year 5 %</b>	<b>Year 6 %</b>	<b>Year 7 %</b>	<b>Year 8 %</b>	<b>Year 9 %</b>
Biotronik	Lumax 540 VR-T	100.0	100.0	100.0	100.0	97.3	97.3	97.3	92.9	14.5
Biotronik	Lumax 340 DR-T	100.0	100.0	98.3	96.5	78.9	7.8	3.1	3.1	3.1
Biotronik	Lumax 540 DR-T	100.0	98.9	98.9	97.7	97.7	96.3	91.6	49.4	1.5
Boston Scientific	P142 Energen	100.0	100.0	100.0	100.0	96.0	96.0	91.1	85.3	71.2
Boston Scientific	F140 Energen	100.0	98.3	98.3	96.4	96.4	96.4	94.0	94.0	94.0
Boston Scientific	F142 Energen	100.0	100.0	100.0	100.0	98.4	94.7	90.6	88.3	88.3
Boston Scientific	F102 Teligen	100.0	100.0	100.0	100.0	100.0	95.8	77.6	72.7	57.9
Boston Scientific	H247 Livian	100.0	100.0	100.0	100.0	93.8	71.6	34.6	28.5	0.0
Boston Scientific	F111 Teligen	100.0	100.0	100.0	100.0	95.3	89.7	80.1	80.1	80.1
Boston Scientific	P108 Cognis CRT	100.0	100.0	100.0	95.5	92.2	90.5	78.2	71.3	47.8
Boston Scientific	P107 Cognis CRT	98.9	98.9	98.9	98.9	95.4	93.4	79.1	75.3	53.0
Boston Scientific	A219 Emblem S-ICD MRI	100.0	97.7	95.8	87.5	51.8	NaN	NaN	NaN	NaN
Boston Scientific	G179 Autogen X4 CRT	100.0	100.0	100.0	100.0	100.0	100.0	85.1	85.1	NaN
Boston Scientific	T167 Vitality 2	100.0	100.0	98.8	97.6	95.1	81.9	77.4	62.8	14.6
Boston Scientific	D432 Resonate EL	99.5	99.5	99.5	99.5	NaN	NaN	NaN	NaN	NaN
Boston Scientific	D176 Autogen EL	100.0	100.0	99.5	99.5	99.5	99.5	99.5	NaN	NaN
Boston Scientific	D174 Autogen EL	99.6	99.6	99.6	99.6	99.6	99.6	99.6	NaN	NaN
Boston Scientific	F110 Teligen	100.0	99.2	99.2	98.3	96.4	90.4	82.0	73.4	70.9
Boston Scientific	D433 Resonate EL	100.0	100.0	100.0	100.0	NaN	NaN	NaN	NaN	NaN
Medtronic	D354VRM Protecta	100.0	100.0	98.0	98.0	95.8	95.8	95.8	87.8	17.8
Medtronic	D264VRM Maximo II	100.0	100.0	100.0	100.0	100.0	97.5	94.3	78.2	36.5
Medtronic	D354VRG Protecta	100.0	98.0	98.0	98.0	95.4	95.4	91.9	61.4	36.6
Medtronic	DVMC3D1 Evera MRI S VR DF-1	98.6	96.8	96.8	96.8	NaN	NaN	NaN	NaN	NaN
Medtronic	D364DRM Protecta	100.0	100.0	100.0	100.0	98.0	90.7	42.2	14.1	NaN
Medtronic	DTBA2D1 Viva XT DF1/ IS1	100.0	98.7	96.8	93.0	85.8	65.5	57.3	43.4	14.5
Medtronic	D154ATG EnTrust	100.0	100.0	100.0	98.2	86.1	56.1	18.3	1.1	NaN
Medtronic	DTBC2QQ Brava	100.0	98.6	97.2	95.6	88.4	73.5	41.6	NaN	NaN

**QUALITY – ICD – GENERATOR SURVIVAL PER MODEL**

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<b>Manuf</b>	<b>Model</b>	<b>Year 1 %</b>	<b>Year 2 %</b>	<b>Year 3 %</b>	<b>Year 4 %</b>	<b>Year 5 %</b>	<b>Year 6 %</b>	<b>Year 7 %</b>	<b>Year 8 %</b>	<b>Year 9 %</b>
Medtronic	D164VWC Virtuoso	100.0	100.0	98.0	96.0	91.4	88.8	79.8	50.8	30.1
Medtronic	D264TRM Maximo II	100.0	100.0	100.0	92.0	56.8	14.1	0.0	NaN	NaN
Medtronic	DTMB2D4 Amplia MRI DF4 CRT-D	100.0	98.1	98.1	98.1	98.1	98.1	NaN	NaN	NaN
Medtronic	7278 Maximo	100.0	100.0	100.0	94.6	85.5	67.4	12.9	0.0	0.0
Medtronic	D354TRM Protecta	100.0	100.0	98.7	95.8	60.3	30.0	3.0	NaN	NaN
Medtronic	DTBA2D4 Viva XT DF4/ IS1	100.0	100.0	100.0	98.8	93.8	86.5	69.0	42.4	17.0
Medtronic	7304 Maximo	100.0	98.8	97.4	74.6	34.6	7.5	5.0	-	NaN
Medtronic	DTBC2D4 Brava	99.2	99.2	98.1	98.1	93.2	75.9	51.8	19.6	19.6
Medtronic	DVBC3D1 Evera S VR	100.0	100.0	99.3	99.3	99.3	99.3	96.5	91.6	NaN
Medtronic	DVMC3D4 Evera S MRI VR DF4	100.0	100.0	100.0	100.0	100.0	97.9	97.9	97.9	NaN
Medtronic	D354DRG Protecta	100.0	100.0	100.0	99.1	94.0	85.5	51.4	11.7	5.9
Medtronic	DTBA2QQ Viva XT DF4/ IS4	100.0	100.0	99.3	96.0	91.9	79.5	58.0	26.4	NaN
Medtronic	DVBC3D4 Evera S VR	100.0	100.0	100.0	100.0	99.4	99.4	99.4	99.4	99.4
Medtronic	D354TRG Protecta	100.0	99.3	94.6	85.6	58.2	30.7	13.0	8.7	8.7
Medtronic	D264DRM Maximo II	100.0	100.0	100.0	100.0	97.7	86.8	63.1	23.7	0.0
Medtronic	7288 Intrinsic	100.0	98.9	97.6	97.6	88.8	61.2	17.2	NaN	NaN
Medtronic	D354DRM Protecta	100.0	100.0	100.0	100.0	98.5	90.2	59.7	7.9	0.0
Medtronic	7298 Sentry	100.0	99.1	93.9	68.8	31.7	4.9	0.8	NaN	NaN
Medtronic	C174AWK Concerto	99.5	98.9	97.7	91.0	64.5	38.9	20.1	9.7	0.0
Medtronic	DTMC2D4 Comphia MRI DF4 CRT-D	100.0	99.5	98.9	97.9	95.1	95.1	NaN	NaN	NaN
Medtronic	D364VRG Protecta	99.5	99.5	99.5	98.2	96.7	96.7	89.9	75.4	37.3
Medtronic	DTBC2D1 Brava	100.0	100.0	97.6	96.1	84.1	76.5	64.8	32.4	NaN
Medtronic	D364TRG Protecta	100.0	99.5	96.9	85.9	57.9	26.5	6.9	3.7	1.8
Medtronic	DDMC3D1 Evera S MRI DR DF1	100.0	100.0	99.4	99.4	99.4	NaN	NaN	NaN	NaN

**QUALITY – ICD – GENERATOR SURVIVAL PER MODEL**

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<b>Manuf</b>	<b>Model</b>	<b>Year 1 %</b>	<b>Year 2 %</b>	<b>Year 3 %</b>	<b>Year 4 %</b>	<b>Year 5 %</b>	<b>Year 6 %</b>	<b>Year 7 %</b>	<b>Year 8 %</b>	<b>Year 9 %</b>
Medtronic	DDBC3D1 Evera S DR DF1	100.0	99.4	98.7	98.7	98.3	96.9	96.9	84.7	84.7
Medtronic	DTMB2QQ Amplia MRI Quad CRT-D	100.0	100.0	100.0	99.2	98.1	94.6	NaN	NaN	NaN
Medtronic	D164AWG Virtuoso	100.0	98.7	98.7	96.6	88.3	76.0	61.6	29.1	2.1
Medtronic	DTMC2QQ Compiia MRI Quad CRT-D	99.1	99.1	98.5	98.5	98.5	NaN	NaN	NaN	NaN
Medtronic	DDBC3D4 Evera S DR DF4	99.5	99.5	99.5	99.1	98.4	97.2	94.9	88.9	84.5
Medtronic	7232Cx Maximo VR	100.0	100.0	98.9	98.4	97.1	95.8	87.0	53.0	14.5
Medtronic	DVFC3D4 Visia AF MRI S VR DF4	99.6	99.6	99.6	99.6	99.6	99.6	NaN	NaN	NaN
Medtronic	D284VRC Maximo II	99.7	99.7	99.4	99.4	98.2	96.5	90.6	73.7	36.0
Medtronic	D364DRG Protecta	99.5	99.5	99.0	98.1	94.6	75.8	48.8	20.8	4.5
Medtronic	D284TRK Maximo II	99.8	99.8	98.9	87.2	53.9	11.6	5.9	2.5	2.0
Medtronic	D284DRG Maximo II	99.8	99.8	99.4	98.7	94.0	77.7	42.5	13.9	1.3
Medtronic	DDMC3D4 Evera S MRI DR DF4	99.8	99.8	99.7	99.7	99.2	98.2	97.4	97.4	NaN
St Jude Medical/ Abbott	1233-40 Fortify	100.0	100.0	96.9	96.9	96.9	92.5	86.7	71.5	53.0
St Jude Medical/ Abbott	3367-40C Quadra Assura	100.0	94.2	91.6	88.7	85.5	82.0	72.6	36.3	NaN
St Jude Medical/ Abbott	1211-36 Current VR	100.0	100.0	100.0	100.0	100.0	97.7	95.2	73.5	6.3
St Jude Medical/ Abbott	3251-40 Unify Quadra	98.7	98.7	97.0	93.3	83.6	75.8	57.4	20.6	0.0
St Jude Medical/ Abbott	2277-36Q Ellipse	100.0	98.6	98.6	98.6	96.8	94.5	79.6	46.5	30.6
St Jude Medical/ Abbott	V-341 Atlas + DR	98.5	98.5	98.5	88.1	65.0	39.8	35.8	10.6	0.0
St Jude Medical/ Abbott	V-193 Atlas + VR	98.0	98.0	98.0	95.6	95.6	95.6	89.6	75.7	17.8
St Jude Medical/ Abbott	1377-36C Ellipse VR	100.0	99.1	99.1	99.1	99.1	99.1	99.1	99.1	NaN
St Jude Medical/ Abbott	2233-40 Fortify DR	100.0	100.0	100.0	96.8	93.1	87.1	83.1	75.9	61.2
St Jude Medical/ Abbott	1359-40C Fortify Assura	100.0	100.0	97.7	96.2	90.9	88.5	85.2	85.2	NaN
St Jude Medical/ Abbott	1233-40Q Fortify	100.0	100.0	98.8	98.8	95.8	90.8	81.1	81.1	78.2

## QUALITY – ICD – GENERATOR SURVIVAL PER MODEL

<b>Manuf</b>	<b>Model</b>	<b>Year 1 %</b>	<b>Year 2 %</b>	<b>Year 3 %</b>	<b>Year 4 %</b>	<b>Year 5 %</b>	<b>Year 6 %</b>	<b>Year 7 %</b>	<b>Year 8 %</b>	<b>Year 9 %</b>
St Jude Medical/ Abbott	3239-40Q Promote	99.2	99.2	99.2	99.2	98.0	94.3	90.1	77.7	46.0
St Jude Medical/ Abbott	V-168 Atlas 2 VR	100.0	100.0	100.0	97.4	94.7	88.3	76.6	28.6	NaN
St Jude Medical/ Abbott	3235-40Q Unify	100.0	100.0	100.0	98.7	93.5	81.9	63.5	30.9	18.6
St Jude Medical/ Abbott	1211-36Q Current VR	99.2	99.2	99.2	99.2	96.9	95.7	92.8	85.2	14.2
St Jude Medical/ Abbott	3215-36 Promote HF	99.2	98.4	98.4	94.0	90.6	65.8	10.2	0.8	0.0
St Jude Medical/ Abbott	3211-36 Promote	99.3	99.3	97.5	96.4	87.9	36.0	6.4	2.1	2.1
St Jude Medical/ Abbott	V-243 Atlas + DR	100.0	100.0	100.0	98.7	97.2	92.6	73.6	42.1	0.0
St Jude Medical/ Abbott	2211-36 Current + DR	99.3	99.3	98.5	98.5	98.5	88.8	65.6	17.1	- Infinity
St Jude Medical/ Abbott	2377-36C Ellipse DR	100.0	100.0	100.0	100.0	100.0	96.0	91.4	91.4	NaN
St Jude Medical/ Abbott	1359-40QC Fortify Assura	99.5	98.4	98.4	98.4	92.9	91.7	91.7	91.7	NaN
St Jude Medical/ Abbott	1207-36 Current VR	100.0	100.0	99.3	96.9	95.2	94.3	93.2	83.8	53.3
St Jude Medical/ Abbott	3211-36Q Promote	99.4	99.4	99.4	97.1	91.0	62.0	14.4	3.8	0.0
St Jude Medical/ Abbott	3371- 40C Quadra Assura MP	99.6	99.6	98.1	96.8	96.8	91.3	91.3	NaN	NaN
St Jude Medical/ Abbott	3235-40 Unify	100.0	100.0	98.7	94.5	84.7	72.7	61.2	17.5	0.0
St Jude Medical/ Abbott	2359-40C Fortify Assura	97.9	95.6	94.0	92.9	91.0	91.0	91.0	83.0	NaN
St Jude Medical/ Abbott	V-367 Atlas II	99.5	98.2	94.8	83.2	54.0	29.9	14.2	0.5	0.5
St Jude Medical/ Abbott	3367-40QC Quadra Assura	100.0	98.1	93.9	92.2	89.1	83.2	76.8	53.2	NaN
St Jude Medical/ Abbott	2233-40Q Fortify DR	99.5	98.9	98.2	94.1	91.0	82.3	76.5	73.3	50.9
St Jude Medical/ Abbott	V-268 Atlas II	100.0	100.0	99.1	98.1	87.1	64.4	14.9	NaN	NaN
St Jude Medical/ Abbott	3251-40Q Unify Quadra	99.6	97.4	96.3	94.6	91.4	88.4	75.1	40.1	12.6
St Jude Medical/ Abbott	3213-36 Promote HF	99.6	99.3	98.0	96.7	86.2	57.4	19.2	7.5	1.7
St Jude Medical/ Abbott	2207-36 Current DR	99.6	99.6	99.6	96.7	95.0	90.7	79.8	36.2	0.0
St Jude Medical/ Abbott	3361-40QC Unify Assura	99.4	98.1	97.4	94.5	94.5	88.0	80.7	60.0	NaN
St Jude Medical/ Abbott	3361-40C Unify Assura	99.2	96.8	94.7	92.0	88.3	83.6	55.5	32.9	NaN
St Jude Medical/ Abbott	2359-40QC Fortify Assura	99.8	99.6	98.6	96.1	95.1	93.3	91.7	86.8	NaN

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**QUALITY – ICD – GENERATOR SURVIVAL PER MODEL**

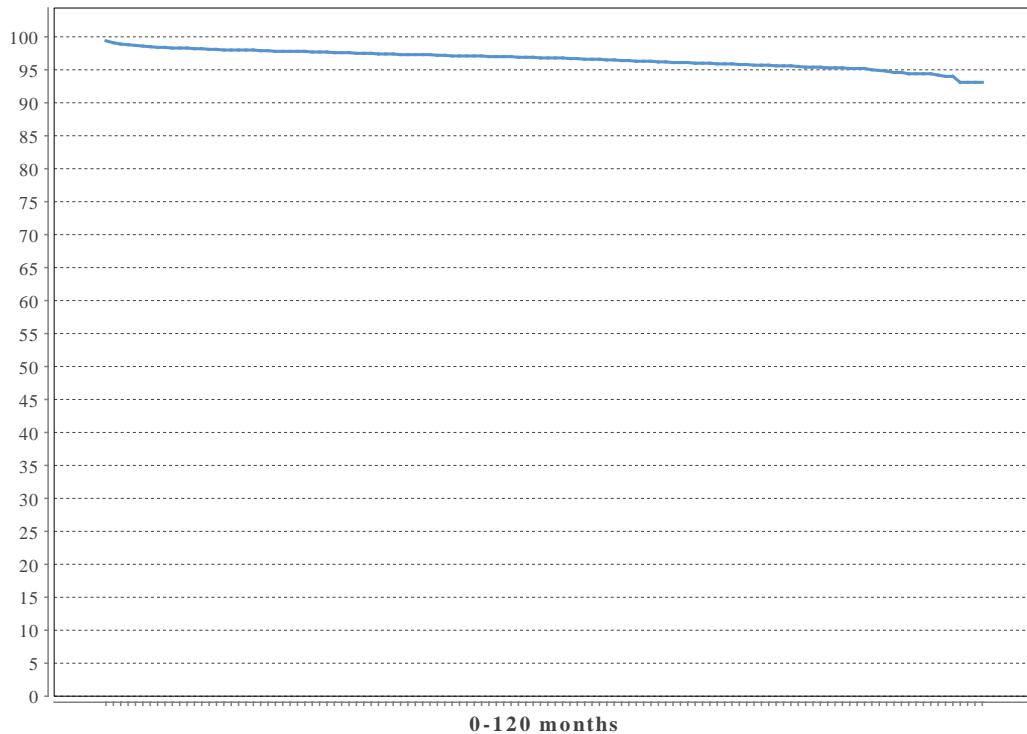
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<b>Manuf</b>	<b>Model</b>	<b>Year 1 %</b>	<b>Year 2 %</b>	<b>Year 3 %</b>	<b>Year 4 %</b>	<b>Year 5 %</b>	<b>Year 6 %</b>	<b>Year 7 %</b>	<b>Year 8 %</b>	<b>Year 9 %</b>
St Jude Medical/ Abbott	2211-36Q Current + DR	100.0	100.0	99.7	99.7	98.3	93.8	82.5	34.3	5.7
St Jude Medical/ Abbott	1377-36QC Ellipse VR	100.0	100.0	99.8	99.8	99.8	99.8	99.8	99.8	NaN
St Jude Medical/ Abbott	2377-36QC Ellipse DR	99.7	99.6	99.6	99.5	99.5	98.5	95.6	84.6	NaN
St Jude Medical/ Abbott	3371-40QC Quadra Assura MP	99.6	99.5	99.1	98.2	96.4	92.5	82.3	69.3	NaN

## QUALITY – ICD – LEAD SURVIVAL

*Overall survival probability for all ICD leads as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 1990*

Year	At risk	Survival probability %
1	18157	99.4
2	15968	98.2
3	13603	97.8
4	11316	97.5
5	9190	97.1
6	7185	96.8
7	5404	96.3
8	3807	95.9
9	2283	95.4
10	1037	94.6



## QUALITY – ICD – LEAD SURVIVAL PER MODEL

*Models that have at least 50 implants and 20 explants*

Manufacturer	Model	Years								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
Biotronik	Protego DF4 ProMRI SD 65/18	96.6	96.6	95.6	94.5	94.5	93.2	93.2	93.2	NaN
Biotronik	Linox Smart ProMRI S65	99.5	99.5	97.6	97.6	96.8	96.8	96.8	96.8	96.8
Biotronik	Linox Smart SD 65/18	96.1	95.2	92.3	92.3	90.0	88.7	86.9	86.9	86.9
Biotronik	Linox Smart S75	97.4	96.9	96.9	96.9	96.9	96.0	95.0	92.4	86.7
Boston Scientific	0174 Reliance	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7
Boston Scientific	0184 Reliance	98.7	98.7	98.7	98.7	96.5	93.5	93.5	93.5	93.5
Boston Scientific	0292 Reliance	99.3	98.6	97.8	97.8	97.8	97.8	97.8	97.8	97.8
Boston Scientific	0692 Reliance	98.0	97.7	97.6	97.4	97.1	97.1	97.1	97.1	97.1
Medtronic	6948 Sprint Fidelis DF1	98.1	98.1	94.5	90.4	90.4	88.3	82.8	74.1	66.7
Medtronic	6944 Sprint Quattro DF1	97.4	96.7	95.9	95.9	92.5	89.7	88.2	88.2	88.2
Medtronic	6949 Sprint Fidelis DF1	97.0	94.7	92.0	85.9	84.9	81.3	76.8	76.8	68.3
Medtronic	6935 Sprint Quattro S MRI DF1	99.4	99.4	99.4	98.6	98.2	97.7	97.0	97.0	97.0
Medtronic	6947M Sprint Quattro S MRI DF4	99.3	99.1	99.1	99.1	99.0	99.0	99.0	99.0	98.4
Medtronic	6947 Sprint Quattro S MRI DF1	98.9	98.7	98.2	97.7	97.3	97.3	96.9	96.3	96.3
Medtronic	6935M Sprint Quattro S MRI DF4	99.4	99.3	99.2	98.9	98.5	98.3	98.3	98.3	98.3
St Jude Medical/ Abbott	1571 Riata	96.7	96.7	96.7	91.8	91.8	91.8	91.8	91.8	91.8
St Jude Medical/ Abbott	1581 Riata	95.9	95.9	95.9	93.1	90.1	86.5	86.5	73.6	55.2
St Jude Medical/ Abbott	7041 Riata ST	97.6	97.6	97.6	97.6	86.1	86.1	86.1	68.9	68.9
St Jude Medical/ Abbott	7172Q Durata	99.2	97.4	95.6	95.6	95.6	94.3	94.3	94.3	83.8
St Jude Medical/ Abbott	7001 Riata ST	94.6	94.6	94.6	94.6	94.6	91.3	86.7	86.7	86.7
St Jude Medical/ Abbott	7170 Durata	96.3	94.6	93.6	91.1	91.1	91.1	91.1	91.1	91.1
St Jude Medical/ Abbott	7122 Durata	98.8	98.3	97.1	97.1	96.8	95.9	95.2	93.3	91.6
St Jude Medical/ Abbott	7120Q Durata	98.2	97.6	97.4	97.2	97.1	96.4	95.8	95.8	95.8
St Jude Medical/ Abbott	7120 Durata	96.3	95.7	95.5	95.0	94.7	94.3	93.8	93.2	93.2
St Jude Medical/ Abbott	LDA210Q Optisure DF4	97.6	97.2	97.0	96.9	96.6	96.3	96.3	96.3	NaN

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## QUALITY – ICD – LEAD SURVIVAL PER MODEL

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Manufacturer	Model	Years								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
St Jude Medical/ Abbott	7122Q Durata	97.9	97.5	97.3	97.2	97.2	97.1	96.8	96.6	96.6

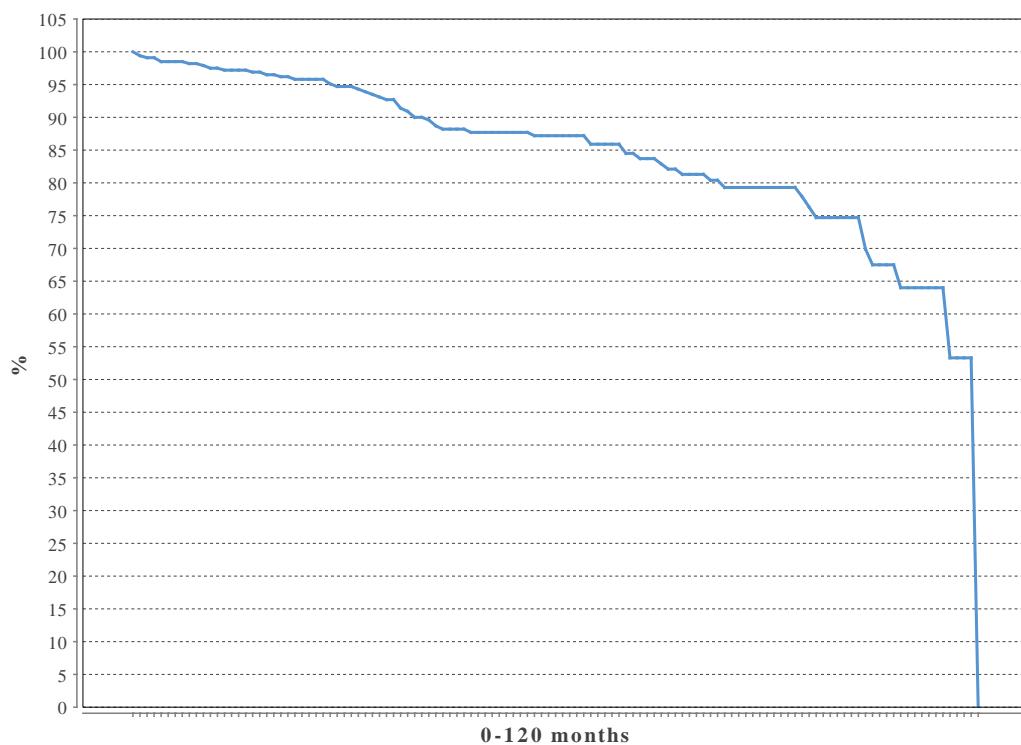
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## QUALITY – ICD – SURVIVAL MEDTRONIC SPRINT FIDELIS

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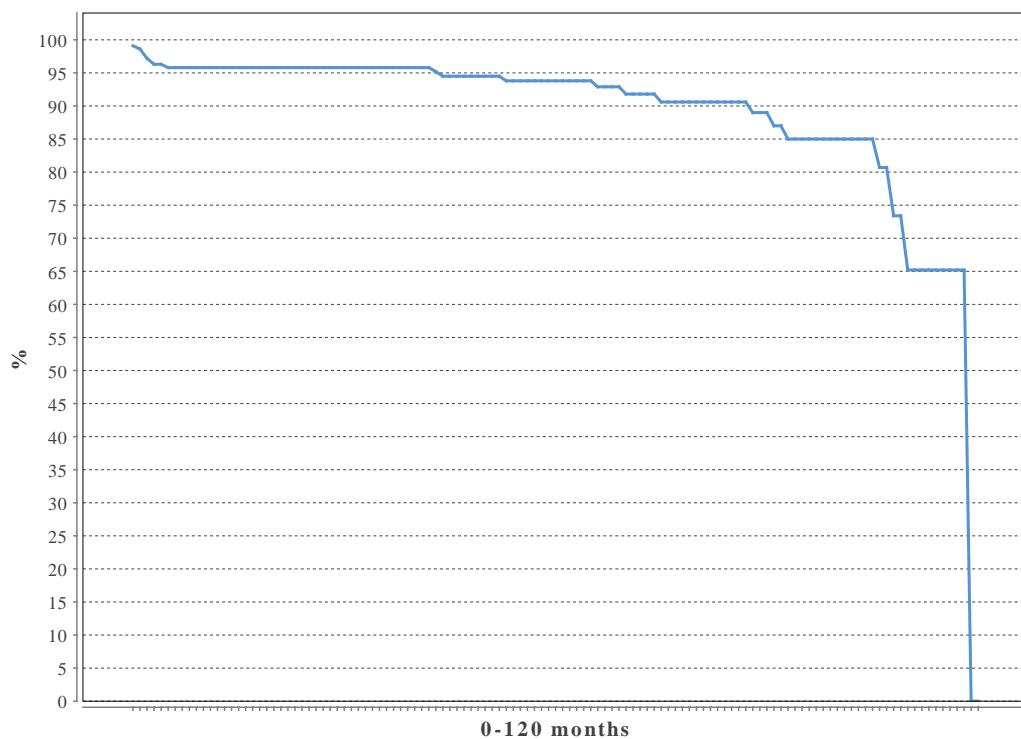
*Survival probability for ICD lead Medtronic Sprint Fidelis. Elective replacement and replacements due to infections and system changes have been considered as censored events.*

Year	At risk	Survival probability %
1	344	100.0
2	300	97.5
3	268	95.8
4	220	92.7
5	180	87.7
6	151	87.2
7	115	83.7
8	80	79.3
9	49	76.3
10	23	67.5



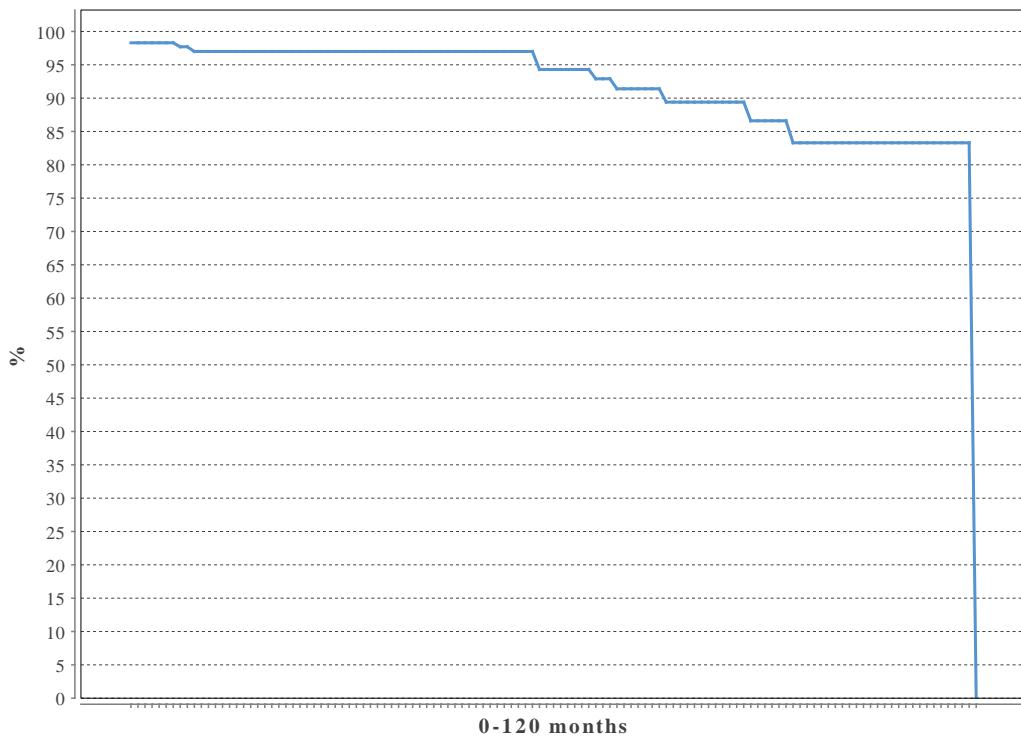
*Survival probability for SJM lead type 1561,1570,1571,1572,1580,1581,1582,1591. Elective replacement and replacements due to infections and system changes have been considered as censored events.*

Year	At risk	Survival probability %
1	219	99.1
2	193	95.8
3	176	95.8
4	158	95.8
5	138	94.5
6	114	93.8
7	80	91.8
8	60	90.6
9	39	85.0
10	11	73.4



*Survival probability for SJM lead type 7000,7001,7002,7040,7041,7042. Elective replacement and replacements due to infections and system changes have been considered as censored events.*

Year	At risk	Survival probability %
1	177	98.3
2	141	97.0
3	129	97.0
4	115	97.0
5	93	97.0
6	71	94.3
7	55	91.4
8	39	89.4
9	23	83.3
10	13	83.3



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## QUALITY – ICD – SURVIVAL SJM Fortify

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*Survival probability for SJM ICD Fortify. Elective replacement and replacements due to infections and system changes have been considered as censored events.*

Year	At risk	Survival probability %
1	1996	99.6
2	1813	97.1
3	1617	94.9
4	1437	92.3
5	1203	88.5
6	946	84.4
7	692	80.0
8	454	75.6
9	270	70.1
10	114	59.1

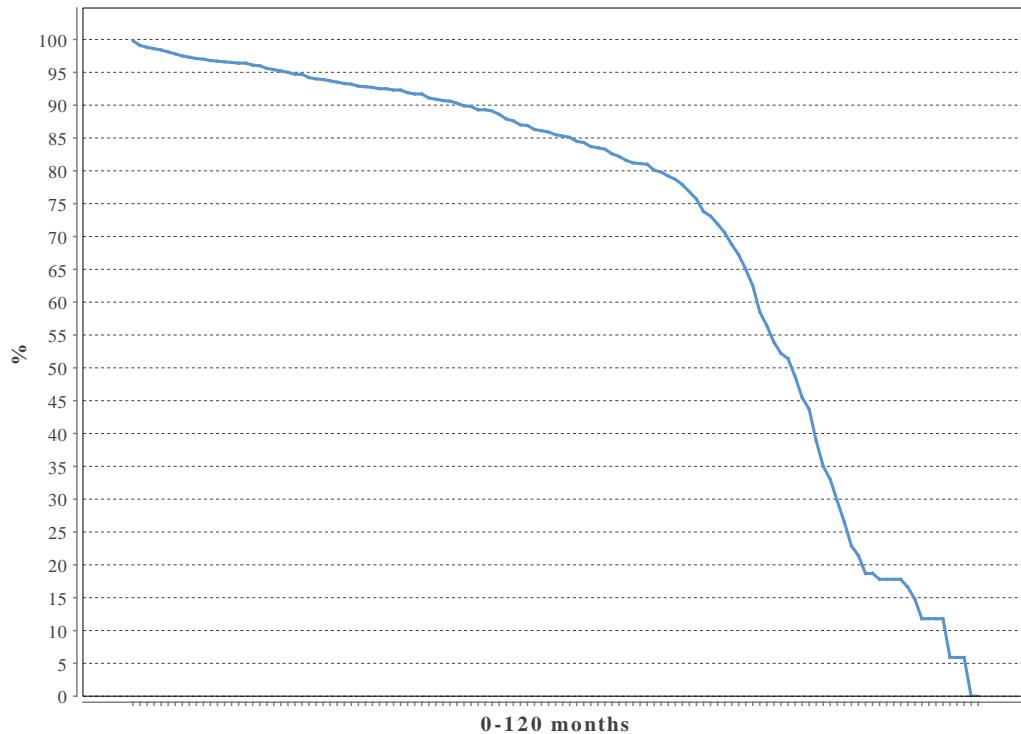
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## QUALITY – ICD – SURVIVAL SJM Unify

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*Survival probability for SJM ICD Unify. Elective replacement and replacements due to infections and system changes have been considered as censored events.*

Year	At risk	Survival probability %
1	1964	99.8
2	1717	96.7
3	1527	94.7
4	1303	92.5
5	1088	89.8
6	859	85.5
7	644	81.1
8	388	70.6
9	124	43.7
10	19	17.8



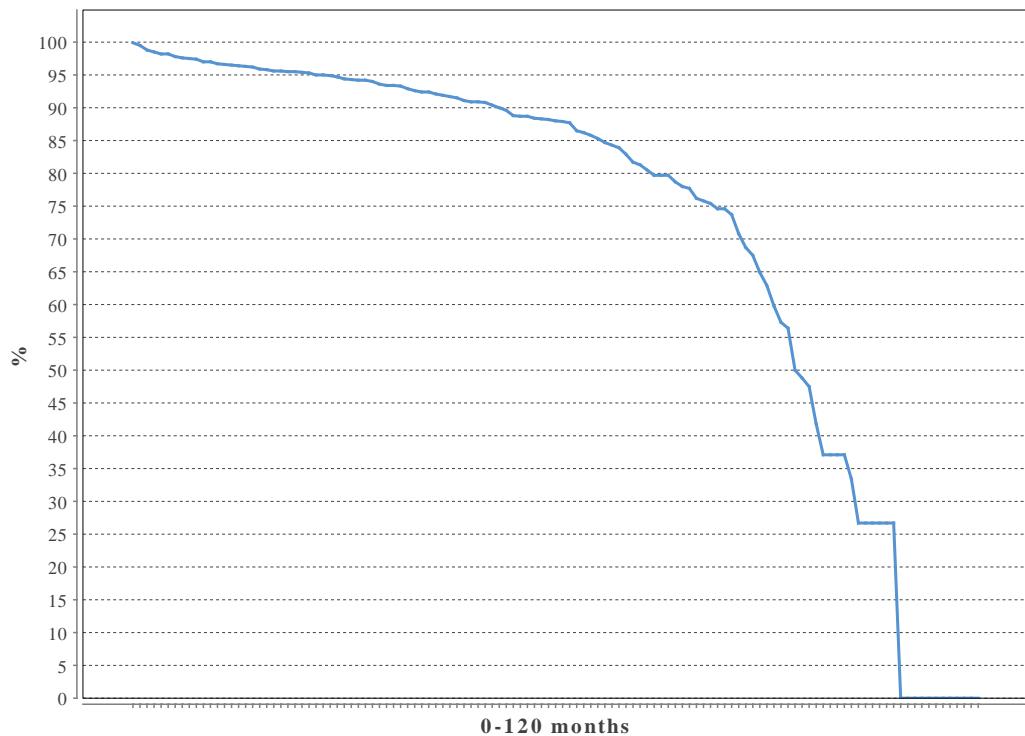
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## QUALITY – ICD – SURVIVAL SJM Quadra

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*Survival probability for SJM ICD Quadra. Elective replacement and replacements due to infections and system changes have been considered as censored events.*

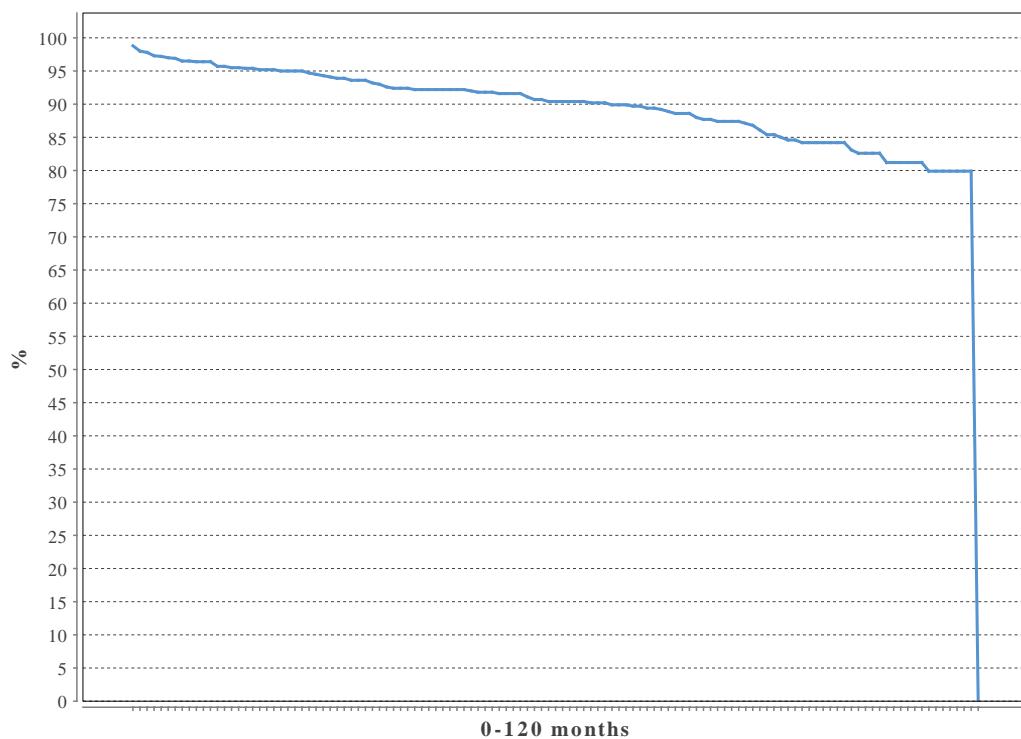
Year	At risk	Survival probability %
1	2388	99.9
2	2024	96.7
3	1611	95.4
4	1231	93.4
5	911	90.9
6	607	88.0
7	336	81.3
8	177	74.6
9	37	47.5
10	1	26.7



## QUALITY – ICD – LEAD SURVIVAL Biotronik Linox

*Survival probability for Biotronic ICD Linox. Elective replacement and replacements due to infections and system changes have been considered as censored events.*

Year	At risk	Survival probability %
1	643	98.8
2	573	95.7
3	536	95.0
4	475	92.6
5	440	92.0
6	393	90.4
7	352	89.7
8	287	87.4
9	201	84.2
10	113	81.2



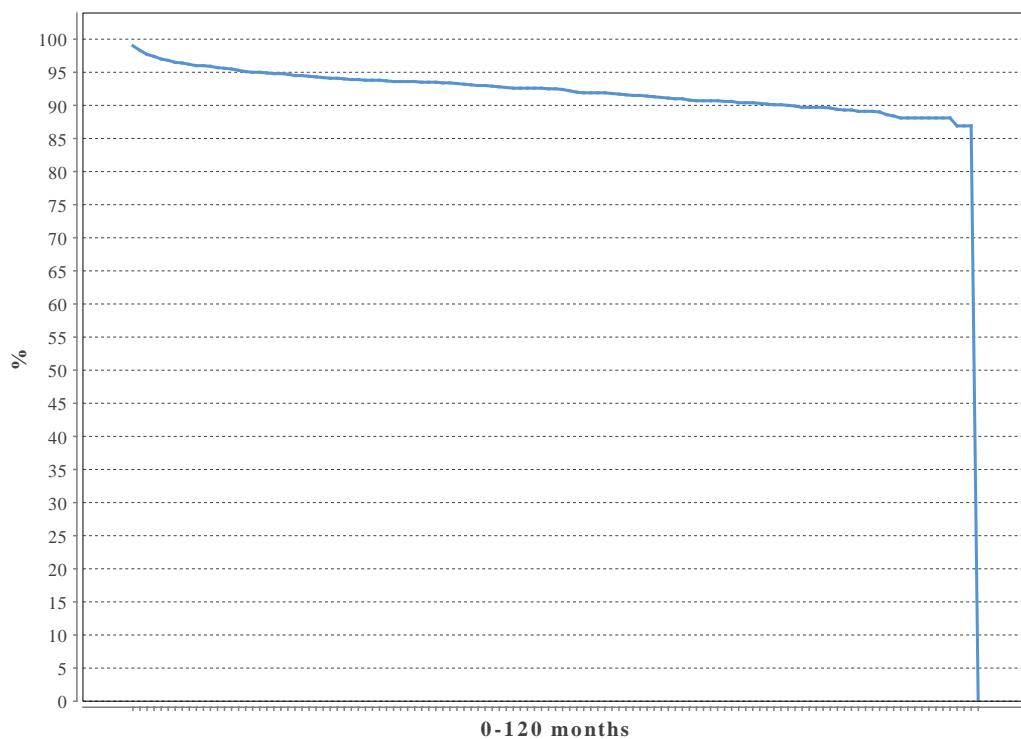
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## QUALITY – ICDLEAD – SURVIVAL SJM Durata

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*Survival probability for SJM ICDLEAD Durata. Elective replacement and replacements due to infections and system changes have been considered as censored events.*

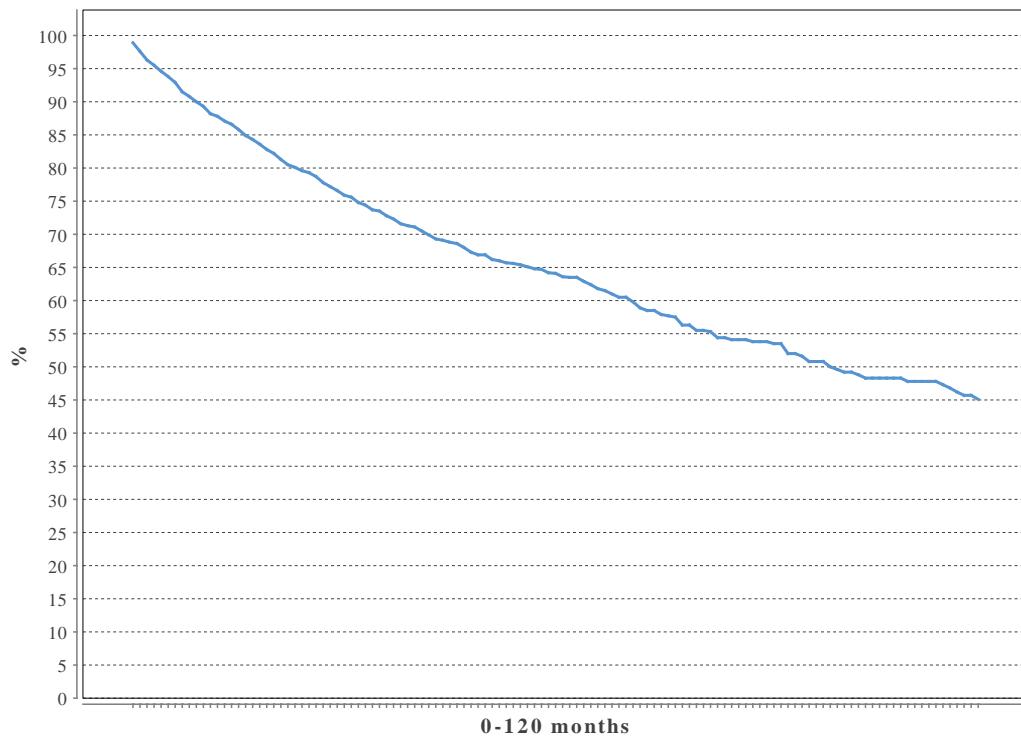
Year	At risk	Survival probability %
1	5627	99.0
2	4909	95.7
3	4333	94.5
4	3828	93.7
5	3295	93.1
6	2717	92.5
7	2188	91.5
8	1563	90.6
9	997	89.7
10	423	88.4



## QUALITY – ICD – PATIENT SURVIVAL

*Based on all implants after 1990*

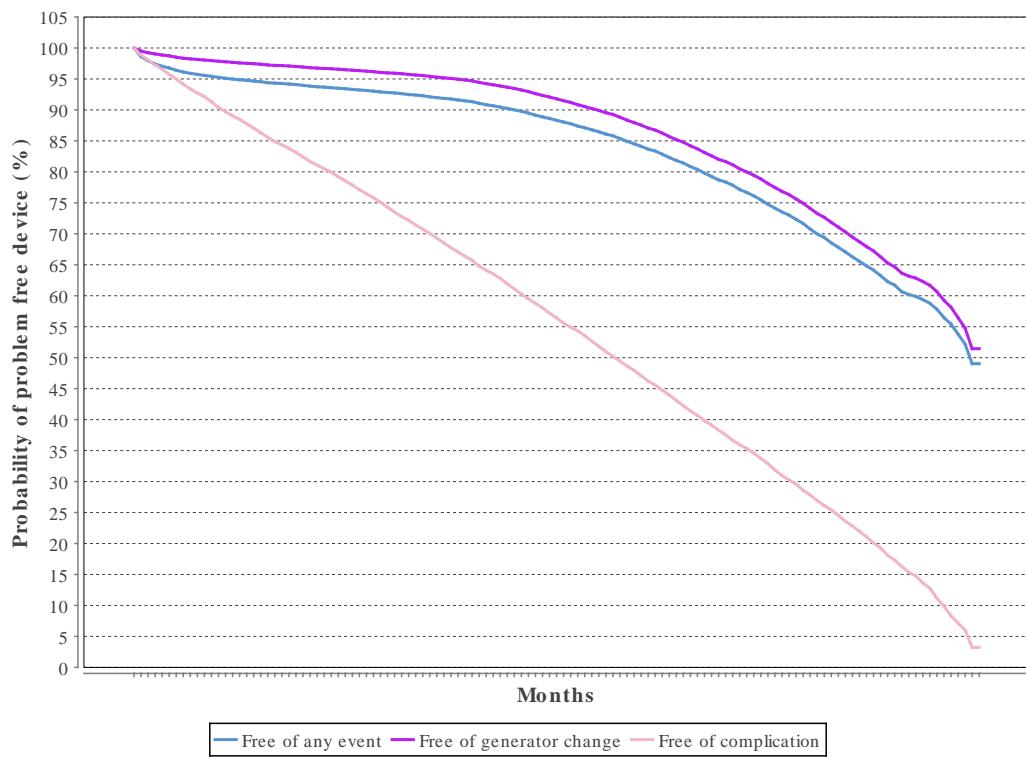
Year	At risk	Survival probability %
1	1941	98.9
2	1638	87.8
3	1421	79.6
4	1136	72.8
5	822	67.3
6	532	64.1
7	324	58.9
8	191	54.4
9	133	50.8
10	104	48.3



## QUALITY – CRT – FREE OF EVENT

*Probability of event free CRT-device*

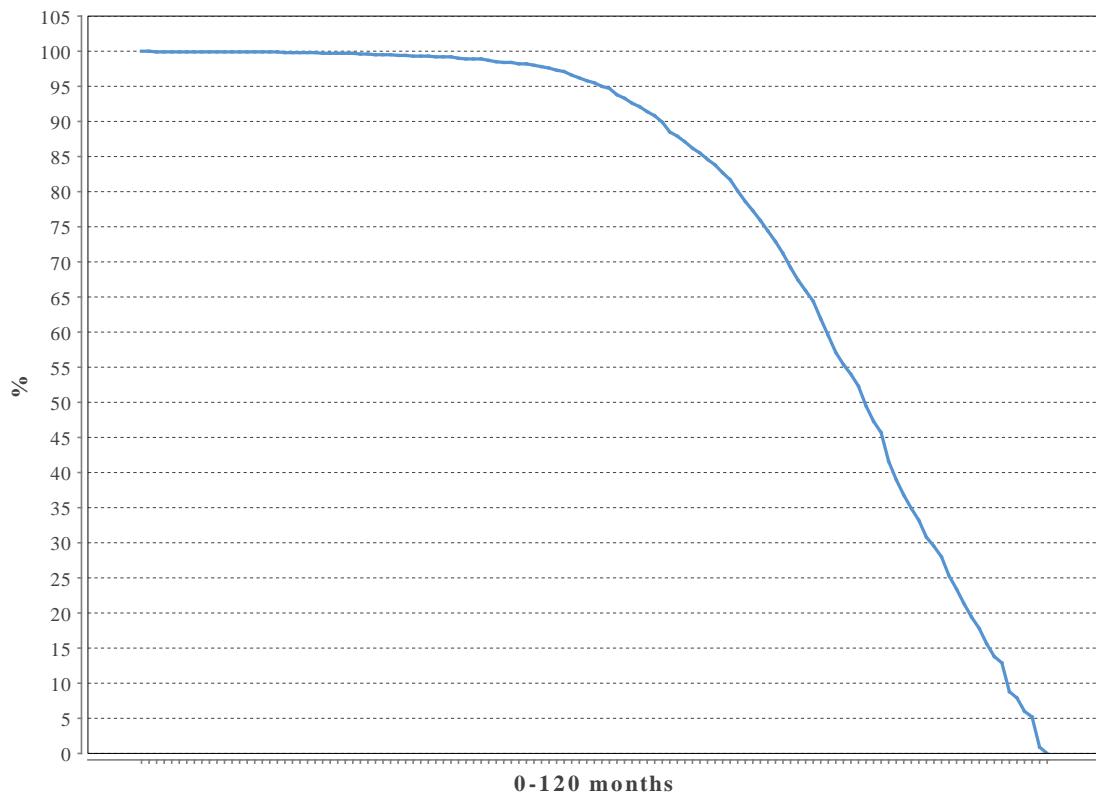
<b>Year</b>	<b>At risk</b>	<b>Free of any event %</b>	<b>Free of generator change %</b>	<b>Free of complication %</b>
1	53523	95.3	97.9	90.4
2	44511	94.0	96.9	82.4
3	36610	92.8	96.0	74.3
4	28982	91.3	94.7	65.7
5	21799	88.3	91.8	56.4
6	15498	84.1	87.6	47.1
7	9960	78.4	81.7	37.6
8	5579	70.8	74.1	27.8
9	2273	61.7	64.7	17.3
10	149	49.0	51.5	3.2



## QUALITY – CRT-P – GENERATOR SURVIVAL

*Overall CRT-P generator survival as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 2006*

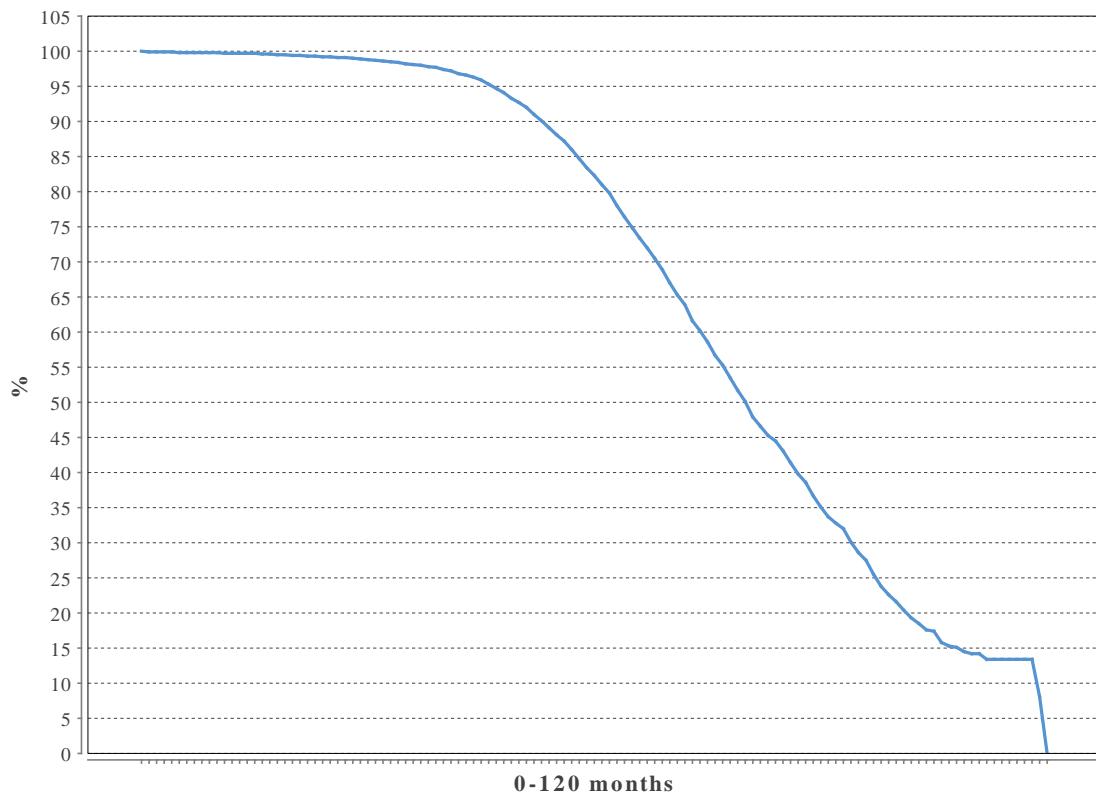
Year	At risk	Survival probability %
1	8520	100.0
2	7112	99.9
3	5747	99.7
4	4543	99.3
5	3491	98.4
6	2575	95.5
7	1778	87.1
8	1068	72.9
9	487	49.5
10	133	23.4



## QUALITY – CRT-D – GENERATOR SURVIVAL

*Overall CRT-D generator survival as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 2006*

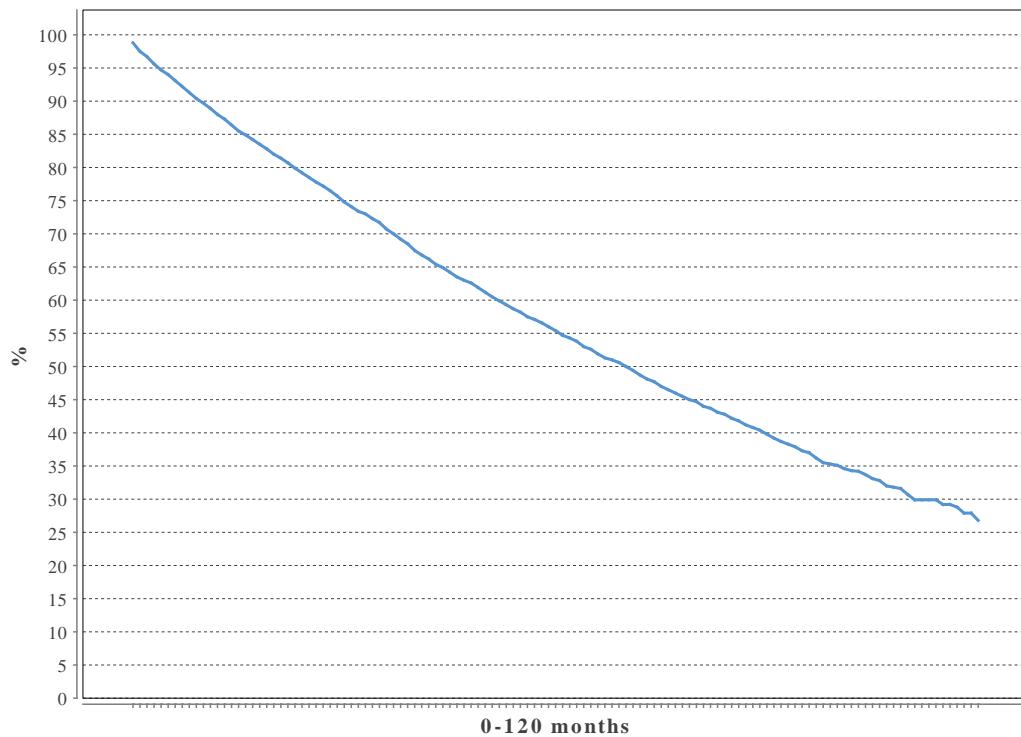
Year	At risk	Survival probability %
1	9770	100.0
2	8501	99.7
3	7098	99.2
4	5751	98.1
5	4442	94.1
6	2969	82.3
7	1630	63.9
8	743	44.5
9	291	27.5
10	66	15.1



## QUALITY – CRT-P – PATIENT SURVIVAL

*Overall patient survival probability for patients receiving CRT-P therapy. Based on all implants after 2006*

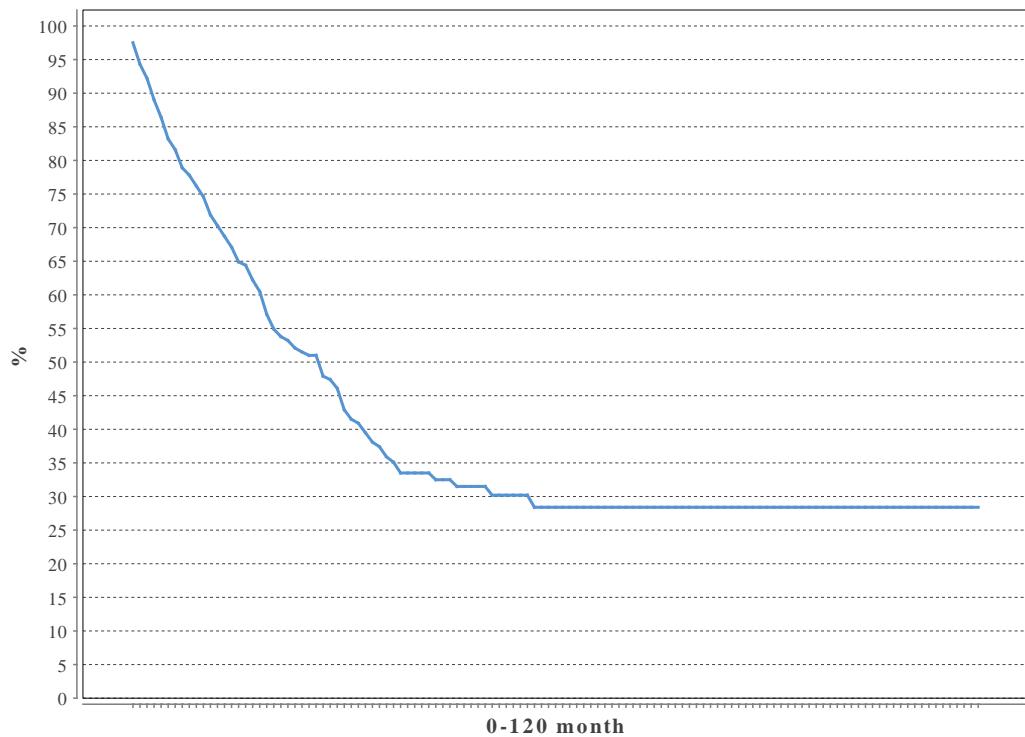
Year	At risk	Survival probability %
1	8668	98.8
2	7168	88.0
3	5804	79.2
4	4606	70.7
5	3532	62.6
6	2615	55.4
7	1824	48.7
8	1112	42.8
9	530	37.0
10	176	31.8



## QUALITY – CRT-D – PATIENT SURVIVAL

Overall patient survival probability for patients receiving CRT-D therapy. Based on all implants after 1990

Year	At risk	Survival probability %
1	197	97.5
2	135	70.3
3	94	51.5
4	51	35.9
5	29	31.5
6	15	28.4
7	12	28.4
8	11	28.4
9	10	28.4
10	10	28.4



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## QUALITY – DEAD WITHIN ONE YEAR FROM IMPLANT

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*Ratio of patients being dead one year after implantation*

Type	Implants in 2021	Death within year	%
PM	10628	991	9.3
ICD	2378	105	4.4
CRT-P	599	71	11.9
CRT-D	617	30	4.9

## QUALITY – INTERVENTION RATIO

---

*Intervention ratio (primary/correction)*

<b>Region</b>	<b>Hospital</b>	<b>Type</b>	<b>Count</b>
Norra Sverige	Norrlands Universitetssjukhus	PFE	246
	Norrlands Universitetssjukhus	PFG	53
	Örnsköldsviks sjukhus	PFE	81
	Örnsköldsviks sjukhus	PFG	24
	Östersunds sjukhus	PFE	169
	Östersunds sjukhus	PFG	29
	Skellefteå lasarett	PFE	61
	Skellefteå lasarett	PFG	9
	Sollefteå sjukhus	PFE	29
	Sunderby sjukhus	PFE	373
	Sunderby sjukhus	PFG	83
	Sundsvalls sjukhus	PFE	268
	Sundsvalls sjukhus	PFG	68
Södra Sverige	Blekingesjukhuset	PFE	259
	Blekingesjukhuset	PFG	70
	Centrallasarettet Växjö	PFE	159
	Centrallasarettet Växjö	PFG	33
	Centralsjukhuset Kristianstad	PFE	326
	Centralsjukhuset Kristianstad	PFG	32
	Helsingborgs lasarett	PFE	320
	Helsingborgs lasarett	PFG	33
	Länssjukhuset Halmstad	PFE	143
	Skånes universitetssjukhus, Lund	PFE	622
	Skånes universitetssjukhus, Lund	PFG	320
	Skånes universitetssjukhus, Malmö	PFE	227
	Skånes universitetssjukhus, Malmö	PFG	38
	Varbergs sjukhus	PFE	221
	Varbergs sjukhus	PFG	86
Stockholm/Gotland	Danderyds sjukhus	PFE	641
	Danderyds sjukhus	PFG	108
	Karolinska Huddinge	PFE	248
	Karolinska Huddinge	PFG	78
	Karolinska Solna	PFE	300
	Karolinska Solna	PFG	154
	Södersjukhuset	PFE	431
	Södersjukhuset	PFG	85
	St Görans sjukhus	PFE	420
	St Görans sjukhus	PFG	55
	Visby lasarett	PFE	44
	Visby lasarett	PFG	8
Sydöstra Sverige	Länssjukhuset Kalmar	PFE	185
	Länssjukhuset Kalmar	PFG	65
	Länssjukhuset Ryhov	PFE	323
	Länssjukhuset Ryhov	PFG	80
	Linköpings universitetssjukhus	PFE	496
	Linköpings universitetssjukhus	PFG	162
	Västerviks sjukhus	PFE	57
Uppsala/Örebro	Akademiska sjukhuset	PFE	456
	Akademiska sjukhuset	PFG	98
	Arvika sjukhus	PFE	1

## QUALITY – INTERVENTION RATIO

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<b>Region</b>	<b>Hospital</b>	<b>Type</b>	<b>Count</b>
	Centralsjukhuset Karlstad	PFE	272
	Centralsjukhuset Karlstad	PFG	56
	Centralsjukhuset Västerås	PFE	223
	Centralsjukhuset Västerås	PFG	67
	Falu lasarett	PFE	408
	Falu lasarett	PFG	80
	Gävle sjukhus	PFE	283
	Gävle sjukhus	PFG	85
	Hudiksvalls sjukhus	PFE	69
	Hudiksvalls sjukhus	PFG	15
	Mälarsjukhuset	PFE	284
	Mälarsjukhuset	PFG	67
	Torsby sjukhus	PFE	42
	Universitetssjukhuset Örebro	PFE	316
	Universitetssjukhuset Örebro	PFG	68
Utländ	Ålands centralsjukhus	PFE	40
	Ålands centralsjukhus	PFG	8
	Utländ	PFE	16
	Utländ	PFG	4
Västra Sverige	Alingsås lasarett	PFE	106
	Drottning Silvias Bus	PFE	12
	Kungälvs sjukhus	PFE	141
	Sahlgrenska universitetssjukhuset	PFE	745
	Sahlgrenska universitetssjukhuset	PFG	107
	Skaraborgs sjukhus Skövde	PFE	326
	Skaraborgs sjukhus Skövde	PFG	53
	Södra Älvsborgs sjukhus	PFE	238
	Södra Älvsborgs sjukhus	PFG	42
	Trollhättan, NÄL	PFE	378
	Trollhättan, NÄL	PFG	69