

SWISS STATISTICS OF CATHETER ABLATIONS 2019



Stiftung für Herzschrittmacher und Elektrophysiologie
Fondation pour la stimulation cardiaque et électrophysiologie
Fondazione per la stimolazione cardiaca ed elettrofisiologia

Preamble

Since 1992, I was responsible for the annual Swiss pacemaker statistics. I took over this task from Prof. Michael Jaeger, who compiled the data between 1975 and 1981 and Dr. Thomas Cueni, who was in charge between 1982 and 1991. Since 1995, the annual Swiss report on “Pacing, ICD and catheter ablation” was put together on behalf of the Working Group Pacing and Electrophysiology of the Swiss Society of Cardiology.

In 1992, I devised the DOS-based program *CHPACE* to capture the data. *CHPACE* was distributed to the participating hospitals, the respective reports were then sent in print and aggregated to the annual Swiss report.

In 2004, *CHPACE* was replaced by *CHPACE PLUS*, which allowed for printing the patient's pacemaker IDs. In 2006, this service was extended to ICD patients by *ICD PLUS*. The hospitals still reported their statistics as hardcopies which were summarized in the annual “Swiss statistic for pacemaker, ICD and catheter ablation”. This report was distributed as a hardcopy to all participating centers and could be accessed in the public part of the website of the working group (www.pacemaker.ch).

The decentralized data management proved to be prone to mistakes and incomplete reporting. For that reason the working group decided to develop the web-based version of *CHPACE WEB* which was first used in 6 pilot hospitals in 2009. The development phase was completed end of 2011 and since January 2013 the capture of the procedural data was declared obligatory by the working group for all Swiss hospitals implanting pacemaker, ICD, or CRT and performing catheter ablation.

At the end of 2013, 74 of 76 implanting hospitals were using *CHPACE WEB* and documented more than 20'000 procedures. The *Stiftung für Herzschrittmacher und Elektrophysiologie* (Foundation for Pacemaker and Electrophysiology) is responsible for its operation.

The annual report is published in German, French and Italian, the ablation statistics in English.

The present copy is the last report which is published under my auspice after 28 years. The foundation will move to Basel and the future annual reports will be issued from there.

Zürich, January 2020
Dr. I. Babotai

Overview

Ablation centers	31
Included in this statistic	28
Number of patients	6948
Number of interventions*	7299
thereof number of EPS	479
Number of ablations	7745

** All completely recorded and non-aborted interventions are evaluated.*

Ablation Centers

Clinic No.	Center	Interventions/ thereof incomplete	thereof aborted	Ablations*
101	Universitätsspital Basel	795 / 0 (0%)	0	788
102	Inselspital Bern	882 / 0 (0%)	0	952
103	Hôpital Cantonal Universitaire de Genève	306 / 0 (0%)	0	351
104	Centre Hospitalier Universitaire Vaudois (CHUV)	393 / 0 (0%)	4	403
105	Universitätsspital Zürich	544 / 0 (0%)	2	502
106	Universitäts-Kinderkliniken Zürich	32 / 0 (0%)	0	26
201	Kantonsspital Aarau	115 / 1 (1%)	4	101
209	Kantonsspital Graubünden, Chur	49 / 0 (0%)	0	52
211	Hôpital Fribourgeois	36 / 0 (0%)	0	30
216	Cardiocentro Ticino, Lugano	178 / 0 (0%)	0	199
217	Kantonsspital Luzern, Sursee und Wolhusen	585 / 0 (0%)	0	614
218	Klinik St. Anna, Luzern	41 / 0 (0%)	0	40
220	Hôpital de la Tour	200 / 0 (0%)	4	220
228	Hôpital de Sion	70 / 0 (0%)	3	65
230	Solothurner Spitäler AG	111 / 0 (0%)	0	112
231	Kantonsspital St. Gallen	382 / 0 (0%)	0	352
233	GZO Spital Wetzikon	213 / 0 (0%)	0	207
234	Kantonsspital Winterthur	155 / 0 (0%)	0	157
236	Stadtspital Triemli, Zürich	322 / 0 (0%)	0	341
239	Klinik Beau-Site Bern	357 / 0 (0%)	0	362
241	HerzKlinik Hirslanden, Zürich	232 / 0 (0%)	2	343
246	Hirslandenklinik Aarau	191 / 0 (0%)	0	204
250	Klinik Im Park, Zürich	592 / 0 (0%)	0	750
267	Clinique Cécil	410 / 0 (0%)	0	453
268	Clinique des Grangettes	2 / 0 (0%)	0	2
278	Centre de Cardiologie du Valais	14 / 0 (0%)	2	13
284	Clinique de Genolier	96 / 0 (0%)	0	89
287	HerzGefässKlinik Bethanien	1 / 1 (100%)	0	0
288	Herz&Rhythmus Zentrum	19 / 1 (5%)	0	17
Total	29	7323 / 3 (0%)	21	7745

* Only ablations of completely recorded and non-aborted interventions are evaluated.

Omissions

3 centers that did not report data to CHPACE WEB and are therefore not included in the statistics

No.	Center
214	HerzZentrum & Rhythmologie Hirslanden, Zürich
251	Herzzentrum Bodensee, Kreuzlingen
287	HerzGefässKlinik Bethanien
Total	3

1 center with more than 10% incomplete data reporting

No.	Center	interventions	thereof incomplete	incomplete (%)
287	HerzGefässKlinik Bethanien	1	1	100
Total	1			

Ablation centers

11 centers with more than 250 interventions

Interventions and Ablations

according to number of interventions

No.	Center	Interventions	thereof aborted	Ablations
102	Inselspital Bern	882	0	952
101	Universitätsspital Basel	795	0	788
250	Klinik Im Park, Zürich	592	0	750
217	Kantonsspital Luzern, Sursee und Wolhusen	585	0	614
105	Universitätsspital Zürich	544	2	502
267	Clinique Cécil	410	0	453
104	Centre Hospitalier Universitaire Vaudois (CHUV)	393	4	403
231	Kantonsspital St. Gallen	382	0	352
239	Klinik Beau-Site Bern	357	0	362
236	Stadtspital Triemli, Zürich	322	0	341
103	Hôpital Cantonal Universitaire de Genève	306	0	351
Total	11	5568	6	5868

Ablation Procedures

according to number of interventions

No.	Center	AF	RAFlu	LAFlu	AT	AP	AVNRT	VT	PVC	AVN	AVN(R)	Other
102	Inselspital Bern	355	255	38	16	39	114	54	43	10	28	0
101	Universitätsspital Basel	351	148	6	21	21	107	51	36	9	38	0
250	Klinik Im Park, Zürich	327	204	16	30	7	110	17	6	0	31	2
217	Kantonsspital Luzern, Sursee und Wolhusen	221	98	6	42	23	125	26	37	19	16	1
105	Universitätsspital Zürich	166	97	11	27	30	107	23	21	6	14	0
267	Clinique Cécil	170	95	10	9	16	63	4	23	23	38	2
104	Centre Hospitalier Universitaire Vaudois (CHUV)	134	83	10	15	22	44	37	31	0	27	0
231	Kantonsspital St. Gallen	151	56	6	16	15	75	1	12	0	20	0
239	Klinik Beau-Site Bern	210	66	4	17	12	21	4	15	3	10	0
236	Stadtspital Triemli, Zürich	160	81	18	14	9	44	2	1	3	9	0
103	Hôpital Cantonal Universitaire de Genève	106	89	41	10	14	52	12	8	3	15	1
Total	11	2351	1272	166	217	208	862	231	233	76	246	6

Ablation centers

8 centers with 100 to 250 interventions

Interventions and Ablations

according to number of interventions

No.	Center	Interventions	thereof aborted	Ablations
241	HerzKlinik Hirslanden, Zürich	232	2	343
233	GZO Spital Wetzikon	213	0	207
220	Hôpital de la Tour	200	4	220
246	Hirslandenklinik Aarau	191	0	204
216	Cardiocentro Ticino, Lugano	178	0	199
234	Kantonsspital Winterthur	155	0	157
201	Kantonsspital Aarau	114	4	101
230	Solothurner Spitäler AG	111	0	112
Total	8	1394	10	1543

Ablation Procedures

according to number of interventions

No.	Center	AF	RAFlu	LAFlu	AT	AP	AVNRT	VT	PVC	AVN	AVN(R)	Other
241	HerzKlinik Hirslanden, Zürich	139	109	5	16	6	32	4	4	4	22	2
233	GZO Spital Wetzikon	94	43	1	7	6	38	1	8	0	8	1
220	Hôpital de la Tour	81	55	7	6	10	33	2	10	4	11	1
246	Hirslandenklinik Aarau	93	25	5	18	6	35	0	6	7	8	1
216	Cardiocentro Ticino, Lugano	84	42	6	4	12	23	7	6	0	15	0
234	Kantonsspital Winterthur	81	38	3	2	3	21	2	2	3	2	0
230	Solothurner Spitäler AG	17	29	1	6	3	27	10	10	0	9	0
201	Kantonsspital Aarau	42	12	2	2	1	32	1	4	3	2	0
Total	8	631	353	30	61	47	241	27	50	21	77	5

Ablation centers

9 centers with less than 100 interventions

Interventions and Ablations

according to number of interventions

No.	Center	Interventions	thereof aborted	Ablations
284	Clinique de Genolier	96	0	89
228	Hôpital de Sion	70	3	65
209	Kantonsspital Graubünden, Chur	49	0	52
218	Klinik St. Anna, Luzern	41	0	40
211	Hôpital Fribourgeois	36	0	30
106	Universitäts-Kinderkliniken Zürich	32	0	26
288	Herz&Rhythmus Zentrum	18	0	17
278	Centre de Cardiologie du Valais	14	2	13
268	Clinique des Grangettes	2	0	2
Total	9	358	5	334

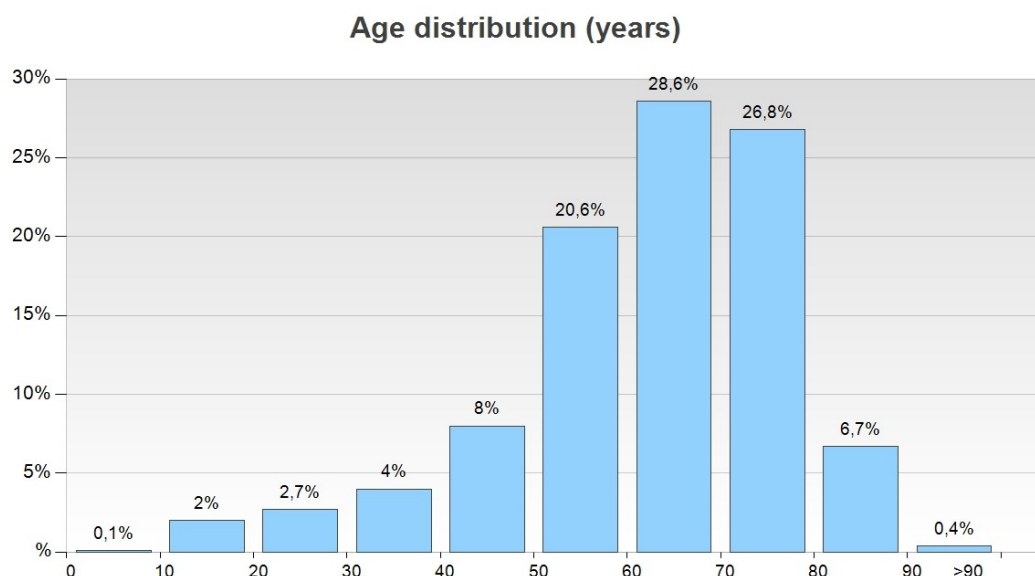
Ablation procedures

according to number of interventions

No.	Center	AF	RAFlu	LAFlu	AT	AP	AVNRT	VT	PVC	AVN	AVN(R)	Other
284	Clinique de Genolier	30	39	1	5	1	6	0	0	2	5	0
228	Hôpital de Sion	0	23	0	6	4	22	0	0	0	10	0
209	Kantonsspital Graubünden, Chur	19	8	3	2	2	17	0	0	0	1	0
218	Klinik St. Anna, Luzern	16	7	0	2	1	13	0	0	0	1	0
211	Hôpital Fribourgeois	6	7	0	1	1	5	2	0	2	6	0
106	Universitäts-Kinderkliniken Zürich	0	0	0	5	10	9	1	1	0	0	0
288	Herz&Rhythmus Zentrum	15	1	0	0	0	1	0	0	0	0	0
278	Centre de Cardiologie du Valais	6	0	0	1	1	4	0	0	0	1	0
268	Clinique des Grangettes	1	0	0	0	0	0	0	0	0	1	0
Total	9	93	85	4	22	20	77	3	1	4	25	0

All ablation types

Number of ablations, not aborted: 7745



Age (years)	min.	Ø	max.
Female	2	63	103
Male	0	62	96
All	0	63	103

Number of patients	n	%
Females	2563	36,89
Males	4385	63,11
Total	6948	

Anesthesia	n	%
Local	5369	73,56
General	1930	26,44
Total	7299	

Combinations of ablations performed during one intervention

Number of interventions		6820
AF		2356
	AVNRT	1087
	RAFlu	1022
AF	RAFlu	536
	AVN(R)	338
	PVC	278
	AP	259
	VT	250
	AT	192
	AVN	91
	LAFIu	87
AF	LAFIu	60
	RAFlu	31
AF	AT	25
AF	LAFIu	25
AF	AVNRT	23
	RAFlu	21
AF	RAFlu	21
	AT	19
	AVNRT	18
	LAFIu	18
AF	RAFlu	18
	AVNRT	18
	Other	9
	AVN	7
	AVN(R)	7
	AP	6
	AVNRT	6
	RAFlu	6
	AP	6
	RAFlu	3
	VT	3
	LAFIu	3
	AT	3
	RAFlu	2
	AVN(R)	2
AF	VT	2
AF	AP	2
	VT	2
	PVC	2
	LAFIu	2
	RAFlu	2
	AT	2
	VT	1
	AVN	1
	AVNRT	1
	VT	1
	AP	1
	VT	1
	AT	1
	VT	1
	AT	1
	AP	1
	AVNRT	1
	RAFlu	1
	PVC	1
	LAFIu	1
	AVNRT	1
AF	AVN	1
AF	LAFIu	1
	AT	1
AF	LAFIu	1
	RAFlu	1
	AT	1
	AVNRT	1
	PVC	1
	AT	1
	PVC	1
	RAFlu	1
	AVN	1
	RAFlu	1
	AT	1
	AVN(R)	1
	LAFIu	1
	Other	1
AF	Other	1
AF	PVC	1
AF	RAFlu	1
	AT	1
AF	AVNRT	1
AF	LAFIu	1
	AVNRT	1

Only completely documented and non-aborted interventions are counted.

Ablation procedures or EPS

Atrial Fibrillation	3075
Paroxysmal	2037
Persistent	956
Long-standing Persistent	82

Left Atrial Flutter	200
Roof-dependent	69
Perimitral	76
Peri-Incisional	5
Peri Ostial Pulm. Vein	22
Other	74

Accessory Pathway	275
Concealed	83
WPW	171
Asymptomatic Preexcitation	13
Atrio-Fascicular	2
PJRT	0
Mahaim	6
Other	4

AVN (to Resync.)	101
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AVN (Rate Control)	348
Paroxysmal	100
Persistent	161
Long-standing Persistent	87

Other Arrhythmia	11
PAC	5
JET	4
SNT	1
Other	1

Right Atrial Flutter	1710
Cavotricuspid	1676
Scar Related	39
Other	14

Atrial Tachycardia	300
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AVNRT	1180
Slow-Fast	1115
Fast-Slow	35
Slow-Slow	46

VT	261
Monomorphic	231
Polymorphic	34
RVOT / Cusp / PA	39
Tricuspid Annulus	10
Right Pap Muscle	4
Parahisian	2
BB Reentry	3
LVOT / Cusp	44
Mitral Annulus	30
Fascicular	23
Left Pap Muscle	15
Epicardial LV / RV	13
Other	127

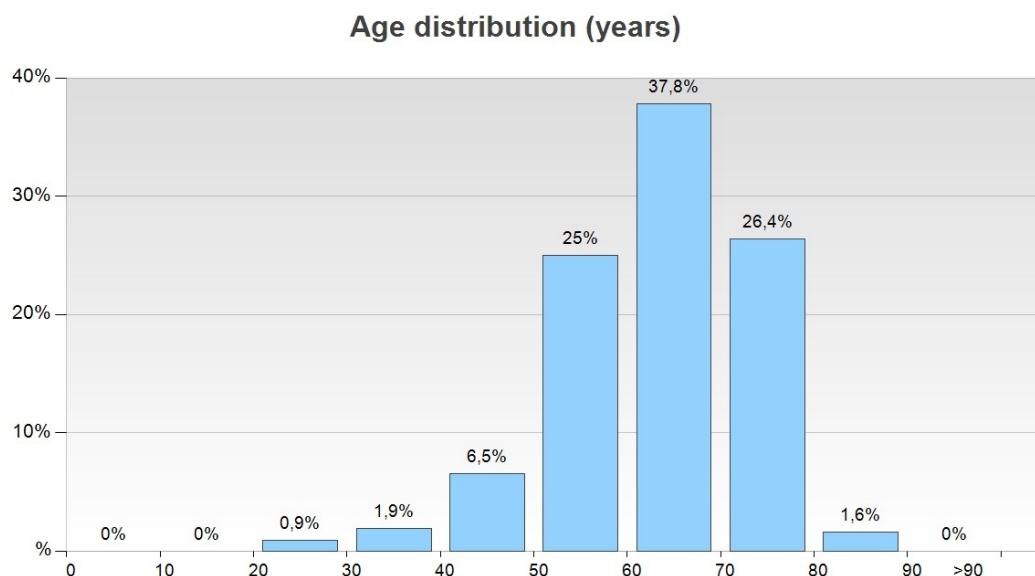
PVC	284
Monomorphic	253
Polymorphic	30
Ischemic	2
RVOT	125
LVOT / Aortic Cusp	98
Left Fascicular VT	6
HP System	14
Other	62

EPS only	479
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Atrial Fibrillation

Ablation of Atrial Fibrillation (AF)	n
All interventions	3075
AF combined with others	719
AF combined with RAFLa	536
AF only	2356

The following statistics include AF only procedures



Age (years)	min.	Ø	max.
Female	15	67	85
Male	24	62	87
All	15	64	87

Number of patients	n	%
Females	755	33,19
Males	1520	66,81
Total	2275	

Atrial Fibrillation

Cardiopathy (Underlying heart disease)	n	%
None	1396	59,25
Hypertensive Cardiomyopathy	341	14,47
Ischemic	184	7,81
Tachycardiomyopathy	169	7,17
Valvular	90	3,82
Dilated	61	2,59
Other	43	1,83
H(O)CM	39	1,66
Congenital	13	0,55
Post Valvular Surgery	12	0,51
Angioplasty	3	0,13
Brugada Syndrome	2	0,08
Post Congenital Surgery	1	0,04
CABG	1	0,04
Channelopathy long QT	1	0,04
Channelopathy short QT	0	0
Infiltrative	0	0
Catecholaminergic Polymorphic VT	0	0
RV Cardiomyopathy	0	0
Early Repolarization Syndrome	0	0
Total	2356	

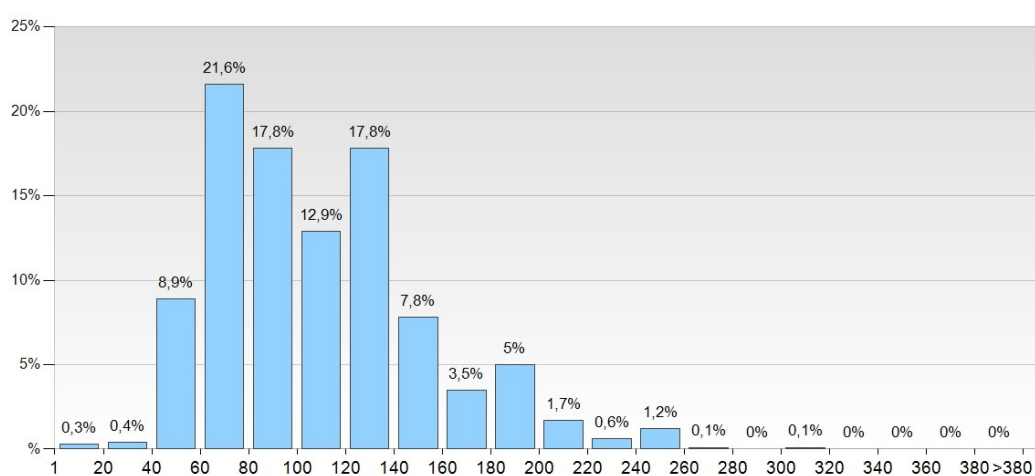
Symptoms	n
Palpitations	1990
Dyspnea	717
Fatigue	614
Dizziness	325
Other	87
Angina Pectoris	61
None	46
Syncope	42
SCD	1

Atrial Fibrillation

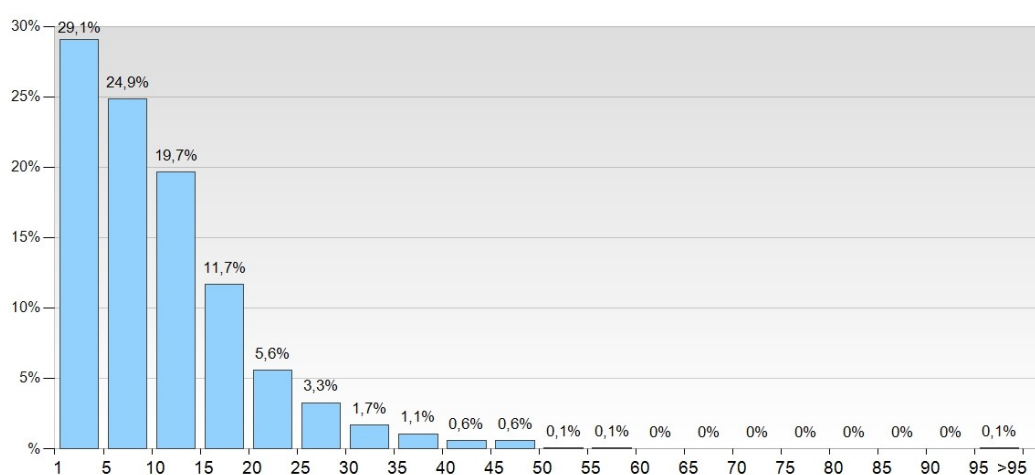
Anesthesia	n	%
Local	1299	55,14
General	1057	44,86
Total	2356	

Minutes	min.	Ø	max.	n	n ₀ *
Investigation time	2	105,9	500	2351	5
Fluoroscopy time	1	11,1	450	2327	29

Investigation time (minutes)



Fluoroscopy time (minutes)



Atrial Fibrillation

Type of AF	n	%
Paroxysmal	1563	66,34
Persistent	721	30,6
Long-standing Persistent (>1 Year)	72	3,06

EHRA-Score	n	%
Score I	261	11,08
Score II	1190	50,51
Score III	881	37,39
Score IV	24	1,02

Type of Intervention	n	%
Percutaneous	2345	99,53
Hybrid (Epicardial + Endovascular)	0	0
Surgical Ablation	11	0,47

Intervention	n	%
Primary Intervention	1798	76,32
Redo	558	23,68

Antiarrhythmic Drugs	n
Beta Blocker	1482
Amiodarone	516
None	399
Flecainide	263
Sotalol	113
Calcium Antagonist	89
Dronedarone	19
Other	18
Digitalis	13
Propafenone	11

Thromboembolic Risk Factors	n
Hypertension	1054
Congestive Heart Failure, LV dysfunction	158
Prior MI, Per. Artery Disease, Aortic Plaque	149
Diabetes	146
Stroke, TIA, Other Embolic Event	89

Atrial Fibrillation

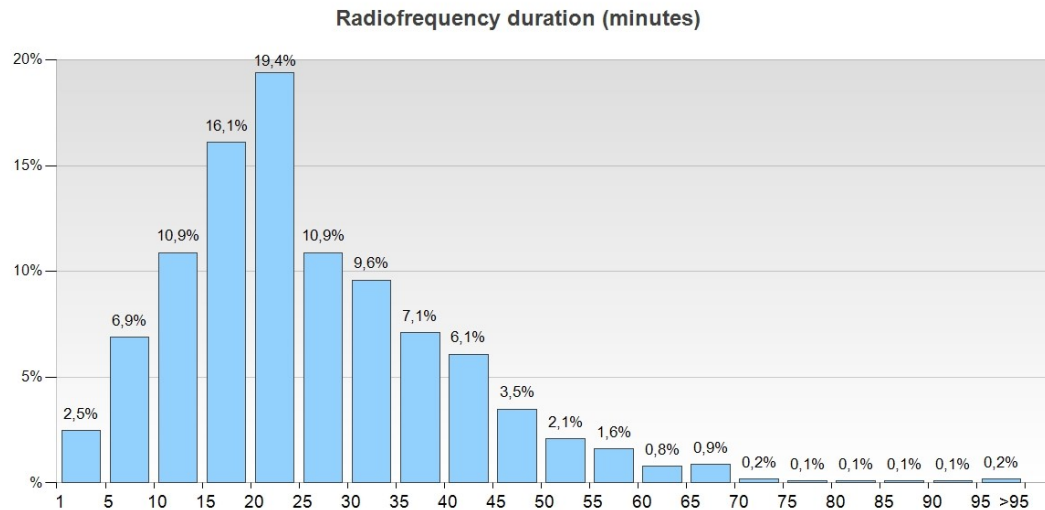
Anticoagulation, Antiaggregation	n
Factor Xa-Antagonist	1965
None	149
Vitamin K-Antagonist	127
Direct Thrombin Inhibitor	83
Aspirin	23
Other	16
Clopidogrel	14
Prasugrel	0
Ticagrelor	0

CHA₂DS₂-VASc Score	n
Score = 0	519
Score = 1	684
Score = 2	562
Score = 3	368
Score = 4	170
Score = 5	42
Score = 6	6
Score = 7	5
Average Score	1,64

Site of Ablation	n
RIPV	2167
RSPV	2136
LSPV	2121
LIPV	2094
CFAE	81
SVC	67
Roof Line	62
Non-PV Focus	46
Mitral Isthmus Line	38
RMPV	35
Other Lines	33
Septal Line	16
Vein of Marshall	11
Other Veins	6

Atrial Fibrillation

Radiofrequency	min.	Ø	max.	n	n ₀ *
Duration (minutes)	1	26	175	1647	11
Irrigated Technology				1595	
RF Duty Cycled				166	



Atrial Fibrillation

Cryoablation	min.	Ø	max.	n	n₀*
Total Duration (minutes)	2	18,7	479	537	0

	n
Additional RF or Cryo Cath Needed	1

	n
Laser Balloon	1

	n
Contact Force	779

	n
Irrigated Multielectrode Ablation	2

Access	n	%
Trans-septal, Puncture	2109	89,52
Trans-septal, PFO	233	9,89
Epicardial, Thoracoscopy	9	0,38
Other	5	0,21
Arterial	0	0
Trans-septal Puncture+arterial	0	0
Epicardial, Coronary Sinus	0	0
Venous	0	0
Epicardial, Sub-xiphoid	0	0
Epicardial, Thoracotomy	0	0
Total	2356	

Mapping	n	%
3D Mapping	1597	67,78
Conventional	415	17,61
Lasso	301	12,78
Other	20	0,85
Basket	11	0,47
HD Mesh	7	0,3
Non Contact	5	0,21
Total	2356	

Atrial Fibrillation

Catheter Steering	n	%
Conventional	2336	99,15
Other	11	0,47
Stereotaxis	9	0,38
Hansen	0	0
Total	2356	

Results	n
All Veins Isolated	2334
Roof Line Block Confirmed	35
Mitral Isthmus Line Block Confirmed	24
Not All Veins Isolated	19
Roof Line Block Not Confirmed	5
Mitral Isthmus Line Block Not Confirmed	2

Sinus Rhythm	n
Spontaneous	1265
With Electrical Cardioversion / Stimulation	667
By Ablation	437
Not Achieved	24
AAD	6

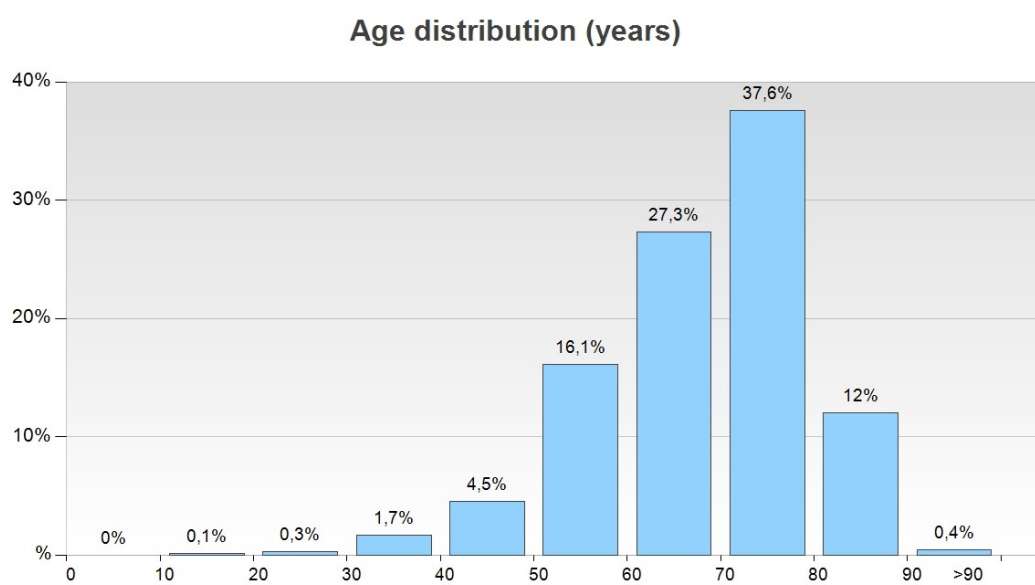
Atrial Fibrillation

Periprocedural Complications	n
No complications	2315
Other	10
Phrenic Nerve Paralysis	9
Inguinal Hematoma	6
Tamponade	5
Pericardial Effusion	5
AV Fistula	2
Pulmonary Oedema	2
Pseudoaneurysm	1
TIA	1
Infection	1
Stroke	1
PV Stenosis	0
Myocardial Infarction	0
Transient AV Block	0
Arterial Occlusion	0
Death	0
Pneumothorax	0
Aortic Dissection	0
Valvular Lesion	0
High Degree or Complete AV Block	0
Pulmonary Embolism	0
Hemothorax	0
Arterial Thrombosis	0

Right Atrial Flutter

Ablation of Right Atrial Flutter (RAFlu)	n
All interventions	1710
RAFlu combined with others	688
RAFlu only	1022

The following statistics include RAFlu only procedures



Age (years)	min.	Ø	max.
Female	19	70	91
Male	26	68	93
All	19	68	93

Number of patients	n	%
Females	210	20,92
Males	794	79,08
Total	1004	

Right Atrial Flutter

Cardiopathy (Underlying heart disease)	n	%
None	500	48,92
Hypertensive Cardiomyopathy	136	13,31
Ischemic	119	11,64
Tachycardiomyopathy	77	7,53
Valvular	66	6,46
Dilated	32	3,13
Congenital	20	1,96
Post Valvular Surgery	19	1,86
Other	18	1,76
H(O)CM	8	0,78
Post Congenital Surgery	8	0,78
CABG	7	0,68
Angioplasty	5	0,49
Infiltrative	3	0,29
Brugada Syndrome	2	0,2
RV Cardiomyopathy	2	0,2
Catecholaminergic Polymorphic VT	0	0
Channelopathy long QT	0	0
Early Repolarization Syndrome	0	0
Channelopathy short QT	0	0
Total	1022	

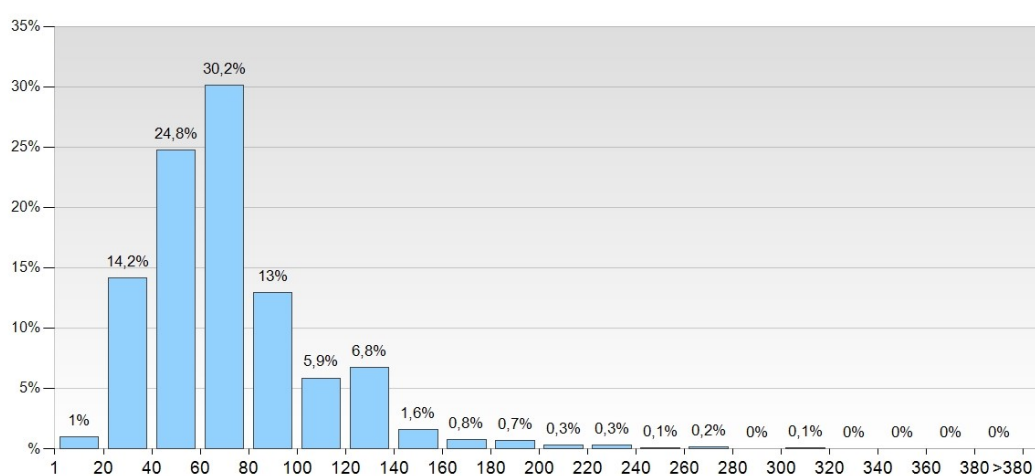
Symptoms	n
Palpitations	734
Dyspnea	334
Fatigue	244
Dizziness	112
None	45
Other	37
Angina Pectoris	28
Syncope	27
SCD	0

Right Atrial Flutter

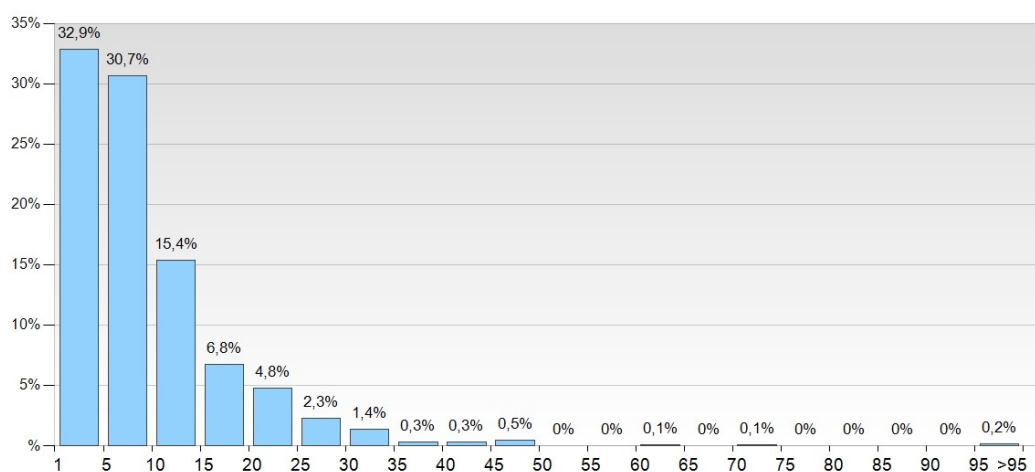
Anesthesia	n	%
Local	938	91,78
General	84	8,22
Total	1022	

Minutes	min.	Ø	max.	n	n ₀ *
Investigation time	1	69	300	1021	1
Fluoroscopy time	1	9,3	230	978	44

Investigation time (minutes)



Fluoroscopy time (minutes)



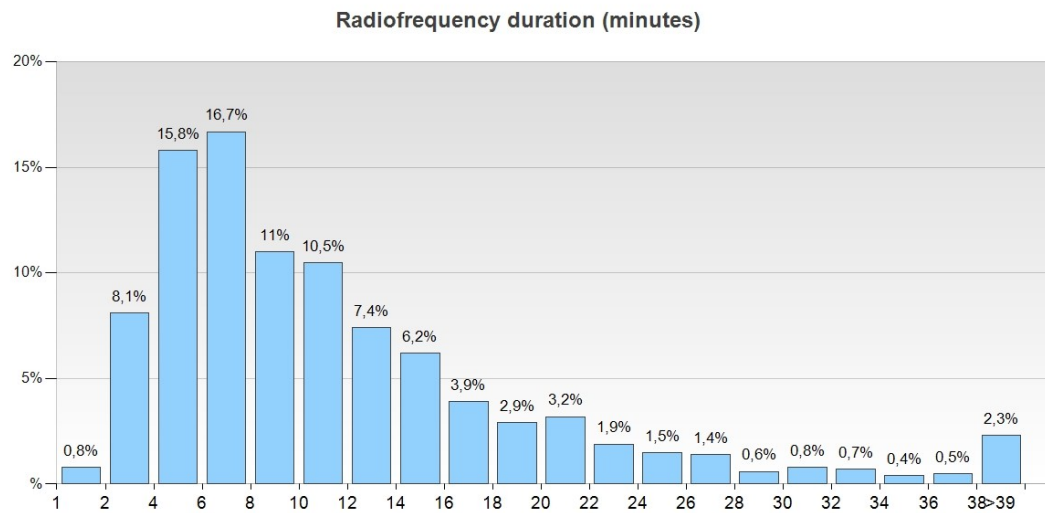
Right Atrial Flutter

Type of Flutter	n
Cavotricuspid	994
Scar related	32
Other	12

Intervention	n	%
Primary Intervention	936	91,59
Redo	86	8,41

Right Atrial Flutter

Radiofrequency	min.	Ø	max.	n	n ₀ *
Duration (minutes)	1	12	695	985	36
Irrigated Technology				773	



Right Atrial Flutter

Cryoablation	min.	Ø	max.	n	n₀*
Total Duration (minutes)	13	13	13	1	0

	n
Additional RF or Cryo Cath Needed	1

Access	n	%
Venous	1021	99,9
Other	1	0,1
Epicardial, Sub-xiphoid	0	0
Epicardial, Thoracotomy	0	0
Trans-septal, PFO	0	0
Arterial	0	0
Trans-septal Puncture+arterial	0	0
Epicardial, Thoracoscopy	0	0
Epicardial, Coronary Sinus	0	0
Trans-septal, Puncture	0	0
Total	1022	

Mapping	n	%
Conventional	588	57,53
3D Mapping	431	42,17
Non Contact	1	0,1
Basket	1	0,1
HD Mesh	1	0,1
Lasso	0	0
Other	0	0
Total	1022	

Catheter Steering	n	%
Conventional	1018	99,61
Stereotaxis	2	0,2
Hansen	1	0,1
Other	1	0,1
Total	1022	

Results	n	%
Block confirmed	998	97,65
Block not confirmed	24	2,35

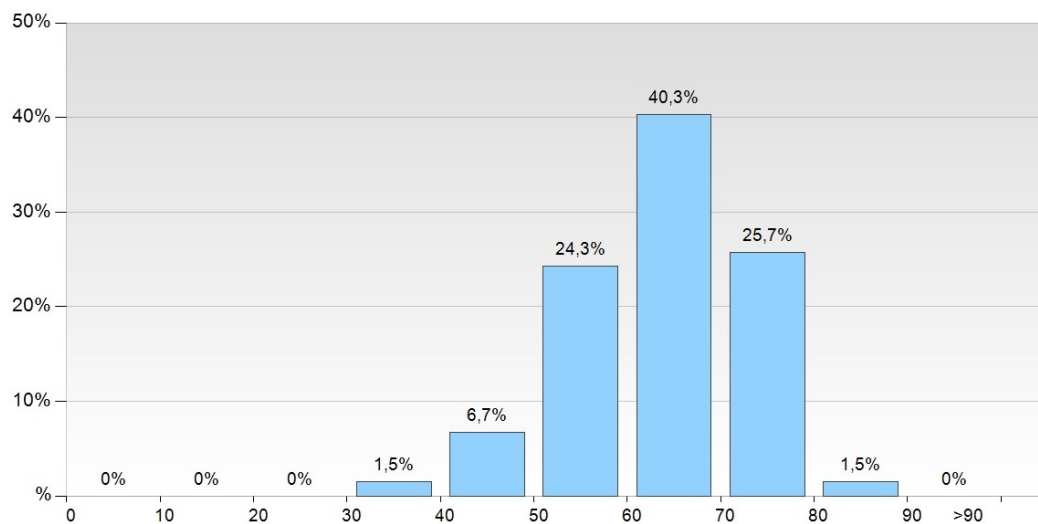
Right Atrial Flutter

Periprocedural Complications	n
No complications	1016
Other	3
Inguinal Hematoma	1
Stroke	1
Pulmonary Oedema	1
Tamponade	0
Pseudoaneurysm	0
PV Stenosis	0
Myocardial Infarction	0
Phrenic Nerve Paralysis	0
TIA	0
Transient AV Block	0
Arterial Occlusion	0
Death	0
Pneumothorax	0
Aortic Dissection	0
Valvular Lesions	0
Pericardial Effusion	0
AV Fistula	0
Infection	0
High Degree or Complete AV Block	0
Pulmonary Embolism	0
Hemothorax	0
Arterial Thrombosis	0

Atrial Fibrillation combined with Right Atrial Flutter

Number of interventions (AF with RAFlu): 536

Age distribution (years)



Age (years)	min.	Ø	max.
Female	34	67	81
Male	31	63	87
All	31	64	87

Number of patients	n	%
Females	144	27,17
Males	386	72,83
Total	530	

Atrial Fibrillation combined with Right Atrial Flutter

Cardiopathy (Underlying heart disease)	n	%
None	309	57,65
Tachycardiomyopathy	43	8,02
Hypertensive Cardiomyopathy	42	7,84
Angioplasty	34	6,34
Ischemic	26	4,85
Valvular	26	4,85
Other	21	3,92
H(O)CM	10	1,87
Dilated	7	1,31
Post Valvular Surgery	7	1,31
Congenital	5	0,93
Post Congenital Surgery	2	0,37
CABG	2	0,37
Brugada Syndrome	2	0,37
Early Repolarization Syndrome	0	0
Channelopathy short QT	0	0
Infiltrative	0	0
Catecholaminergic Polymorphic VT	0	0
Channelopathy long QT	0	0
RV Cardiomyopathy	0	0
Total	536	

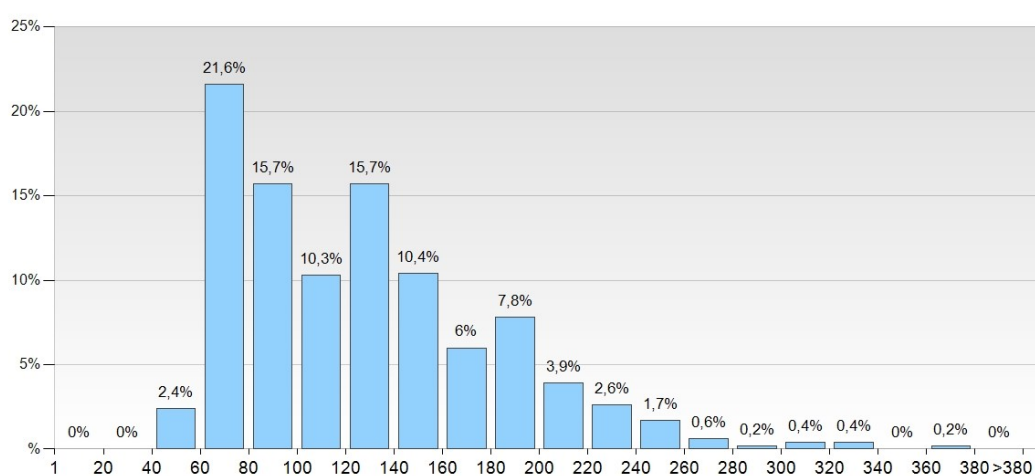
Symptoms	n
Palpitations	464
Fatigue	261
Dyspnea	123
Other	34
Dizziness	33
Angina Pectoris	11
Syncope	11
None	10
SCD	1

Atrial Fibrillation combined with Right Atrial Flutter

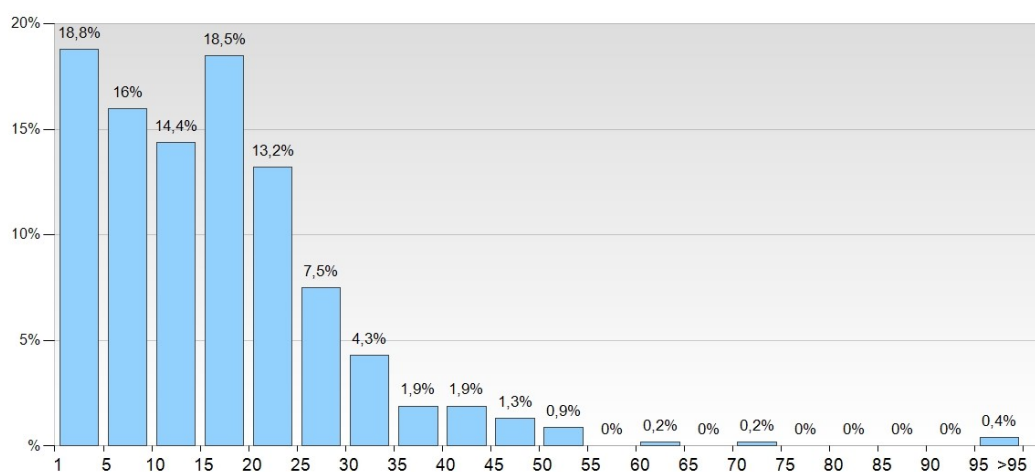
Anesthesia	n	%
Local	162	30,22
General	374	69,78
Total	536	

Minutes	min.	Ø	max.	n	n ₀ *
Investigation time	40	123,4	360	535	1
Fluoroscopy time	1	16,2	232	533	3

Investigation time (minutes)



Fluoroscopy time (minutes)



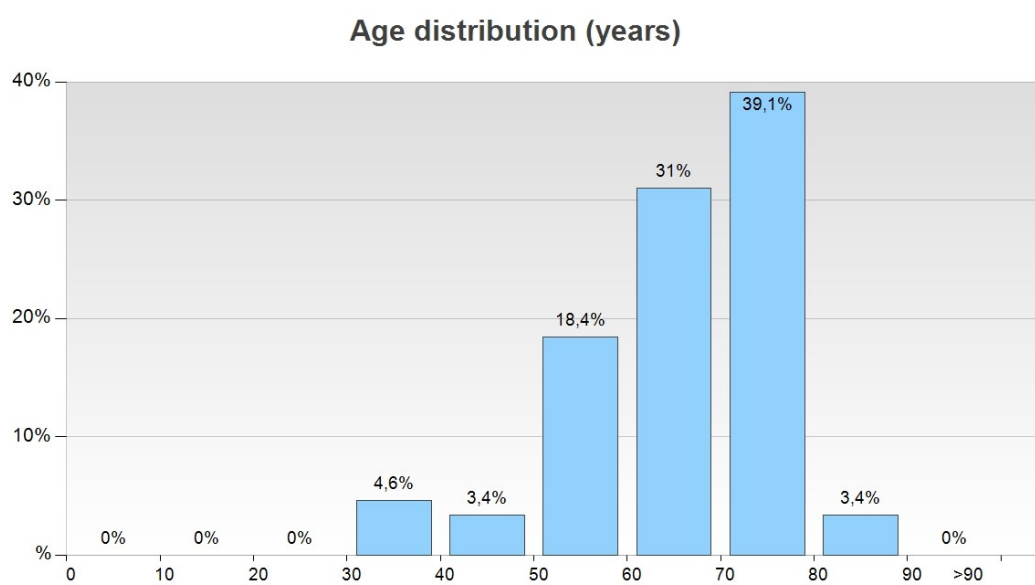
Atrial Fibrillation combined with Right Atrial Flutter

Periprocedural Complications	n
No complications	531
Other	3
Stroke	1
TIA	1
High Degree or Complete AV Block	0
Pulmonary Embolism	0
Hemothorax	0
Arterial Thrombosis	0
Pulmonary Oedema	0
Tamponade	0
Pseudoaneurysm	0
PV Stenosis	0
Myocardial Infarction	0
Inguinal Hematoma	0
Phrenic Nerve Paralysis	0
Transient AV Block	0
Arterial Occlusion	0
Death	0
Pneumothorax	0
Aortic Dissection	0
Valvular Lesions	0
Pericardial Effusion	0
AV Fistula	0
Infection	0

Left Atrial Flutter

Ablation of Left Atrial Flutter (LAFlu)	n
All interventions	200
LAFlu combined with others	113
LAFlu only	87

The following statistics include LAFlu only procedures



Age (years)	min.	Ø	max.
Female	33	67	86
Male	38	65	85
All	33	66	86

Number of patients	n	%
Females	29	35,8
Males	52	64,2
Total	81	

Left Atrial Flutter

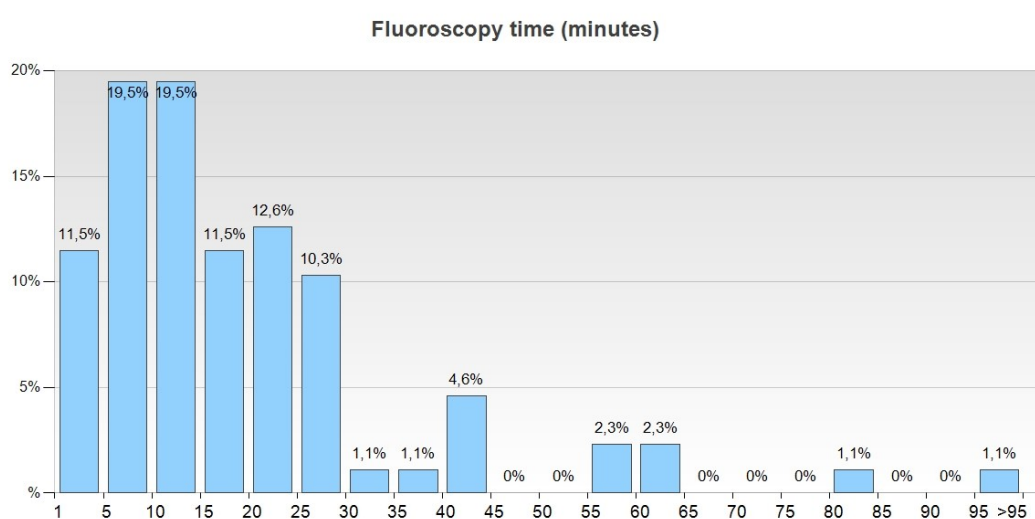
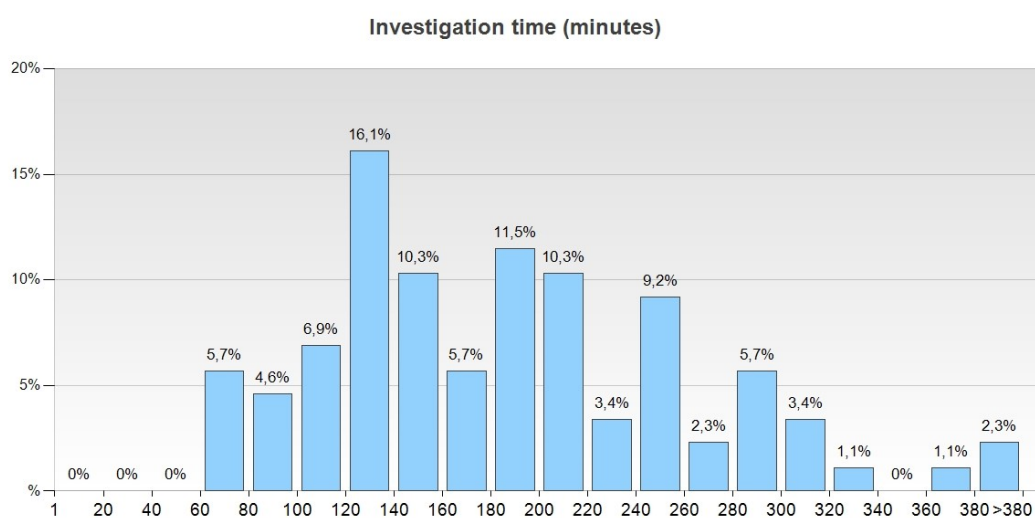
Cardiopathy (Underlying heart disease)	n	%
None	36	41,38
Hypertensive Cardiomyopathy	12	13,79
Other	9	10,34
Tachycardiomyopathy	9	10,34
Valvular	7	8,05
Post Valvular Surgery	4	4,6
Ischemic	3	3,45
Dilated	2	2,3
H(O)CM	2	2,3
Congenital	1	1,15
Infiltrative	1	1,15
Angioplasty	1	1,15
RV Cardiomyopathy	0	0
Early Repolarization Syndrome	0	0
Channelopathy short QT	0	0
Post Congenital Surgery	0	0
CABG	0	0
Catecholaminergic Polymorphic VT	0	0
Brugada Syndrome	0	0
Channelopathy long QT	0	0
Total	87	

Symptoms	n
Palpitations	70
Dyspnea	31
Fatigue	26
Dizziness	12
Other	3
Angina Pectoris	3
None	2
SCD	0
Syncope	0

Left Atrial Flutter

Anesthesia	n	%
Local	47	54,02
General	40	45,98
Total	87	

Minutes	min.	Ø	max.	n	n ₀ *
Investigation time	60	183,3	422	87	0
Fluoroscopy time	1	20,6	240	86	1



Left Atrial Flutter

Type of Flutter	n
Perimitral	34
Other	33
Roof-dependent	32
Peri Ostial Pulmonary Vein	7
Peri-Incisional	2

EHRA-Score	n	%
Score I	4	4,6
Score II	49	56,32
Score III	32	36,78
Score IV	2	2,3

Type of Intervention	n	%
Percutaneous	87	100
Hybrid (Epicardial + Endovascular)	0	0
Surgical Ablation	0	0

Intervention	n	%
Primary Intervention	41	47,13
Redo	46	52,87

Antiarrhythmic Drugs	n
Beta Blocker	59
Amiodarone	22
None	9
Other	6
Flecainide	4
Calcium Antagonist	4
Sotalol	3
Digitalis	1
Propafenone	0
Dronedarone	0

Left Atrial Flutter

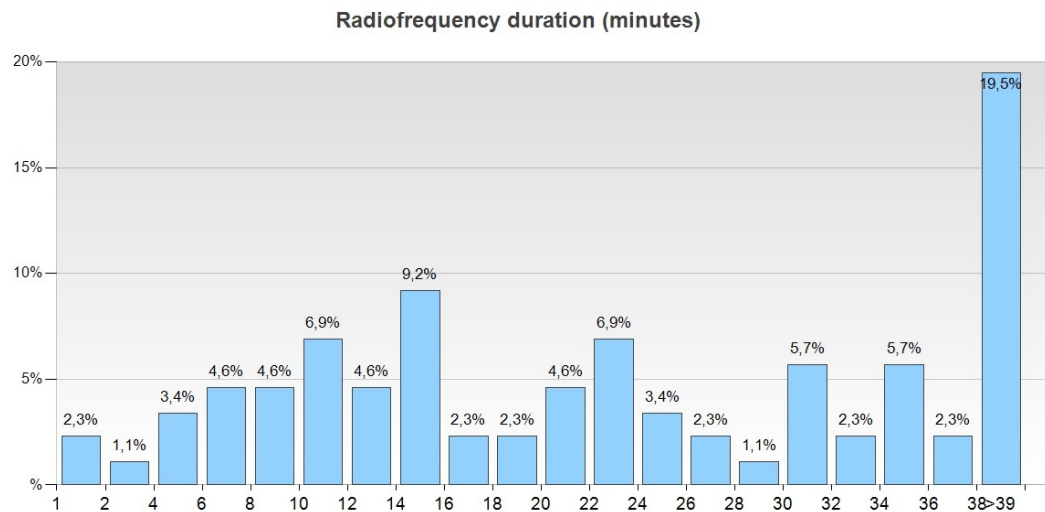
Thromboembolic Risk Factors	n
Hypertension	37
Diabetes	12
Stroke, TIA, Other Embolic Event	7
Congestive Heart Failure, LV dysfunction	5
Prior MI, Per. Artery Disease, Aortic Plaque	3

Anticoagulation, Antiaggregation	n
Factor Xa-Antagonist	68
Vitamin K-Antagonist	8
Other	7
Aspirin	4
Direct Thrombin Inhibitor	3
None	1
Clopidogrel	0
Prasugrel	0
Ticagrelor	0

CHA₂DS₂-VASc Score	n
Score = 0	9
Score = 1	26
Score = 2	27
Score = 3	17
Score = 4	5
Score = 5	3
Score = 6	0
Score = 7	0
Average Score	1,91

Left Atrial Flutter

Radiofrequency	min.	Ø	max.	n	n ₀ *
Duration (minutes)	1	36	941	83	4
Irrigated Technology				80	
RF Duty Cycled				0	



Left Atrial Flutter

Access	n	%
Trans-septal, Puncture	70	80,46
Trans-septal, PFO	14	16,09
Arterial	2	2,3
Other	1	1,15
Epicardial, Thoracotomy	0	0
Trans-septal Puncture+arterial	0	0
Epicardial, Thoracoscopy	0	0
Epicardial, Coronary Sinus	0	0
Venous	0	0
Epicardial, Sub-xiphoid	0	0
Total	87	

Mapping	n	%
3D Mapping	76	87,36
Conventional	4	4,6
Non Contact	3	3,45
Basket	3	3,45
Lasso	1	1,15
Other	0	0
HD Mesh	0	0
Total	87	

Catheter Steering	n	%
Conventional	87	100
Stereotaxis	0	0
Hansen	0	0
Other	0	0
Total	87	

Results	n	%
Block confirmed	70	80,46
Block not confirmed	17	19,54

Left Atrial Flutter

Periprocedural Complications	n
No complications	82
Tamponade	1
Inguinal Hematoma	1
TIA	1
Transient AV Block	1
Other	1
Hemothorax	0
Arterial Thrombosis	0
Pulmonary Oedema	0
Pseudoaneurysm	0
PV Stenosis	0
Myocardial Infarction	0
Phrenic Nerve Paralysis	0
Arterial Occlusion	0
Death	0
Pneumothorax	0
Aortic Dissection	0
Valvular Lesions	0
Pericardial Effusion	0
AV Fistula	0
Infection	0
Stroke	0
High Degree or Complete AV Block	0
Pulmonary Embolism	0

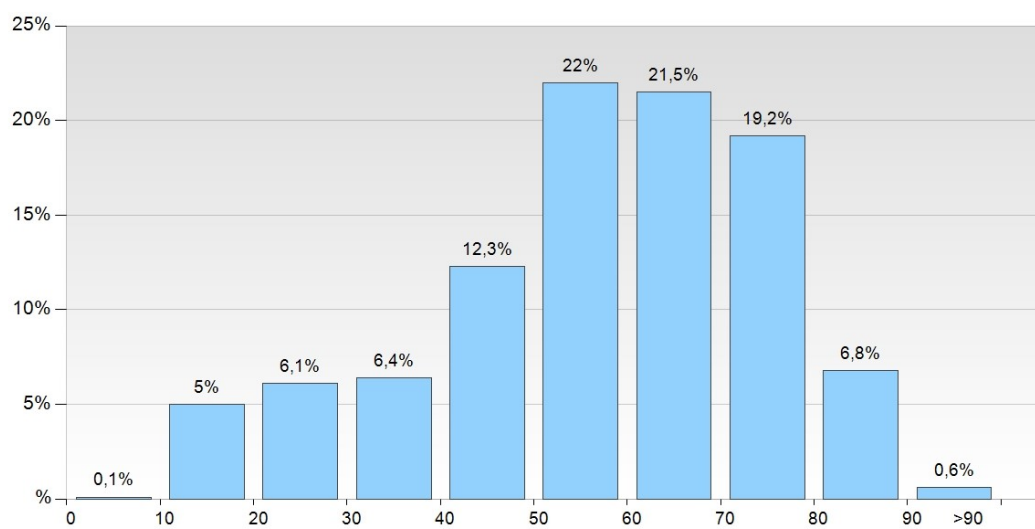
Atrioventricular Nodal Reentry Tachycardia (AVNRT)

Ablation of AVNRT

	n
All interventions	1180
AVNRT combined with others	93
AVNRT only	1087

The following statistics include AVNRT only procedures

Age distribution (years)



Age (years)	min.	Ø	max.
Female	13	56	92
Male	7	59	94
All	7	57	94

Number of patients	n	%
Females	589	55
Males	482	45
Total	1071	

Atrioventricular Nodal Reentry Tachycardia (AVNRT)

Cardiopathy (Underlying heart disease)	n	%
None	930	85,56
Ischemic	54	4,97
Hypertensive Cardiomyopathy	49	4,51
Valvular	24	2,21
Other	9	0,83
Tachycardiomyopathy	7	0,64
Congenital	3	0,28
Dilated	2	0,18
Post Valvular Surgery	2	0,18
H(O)CM	2	0,18
Post Congenital Surgery	1	0,09
Infiltrative	1	0,09
CABG	1	0,09
Brugada Syndrome	1	0,09
Angioplasty	1	0,09
Early Repolarization Syndrome	0	0
Channelopathy short QT	0	0
Catecholaminergic Polymorphic VT	0	0
Channelopathy long QT	0	0
RV Cardiomyopathy	0	0
Total	1087	

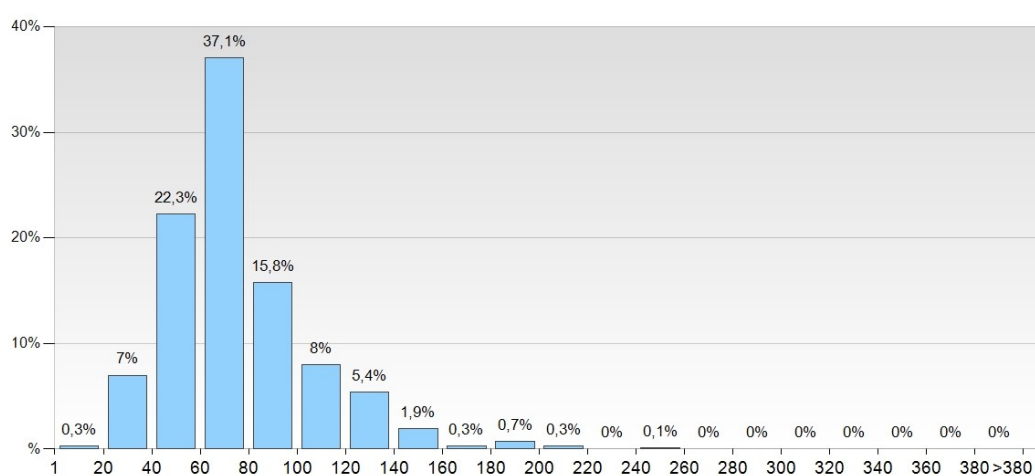
Symptoms	n
Palpitations	1043
Dizziness	133
Dyspnea	85
Fatigue	85
Syncope	51
Angina Pectoris	32
Other	18
None	8
SCD	2

Atrioventricular Nodal Reentry Tachycardia (AVNRT)

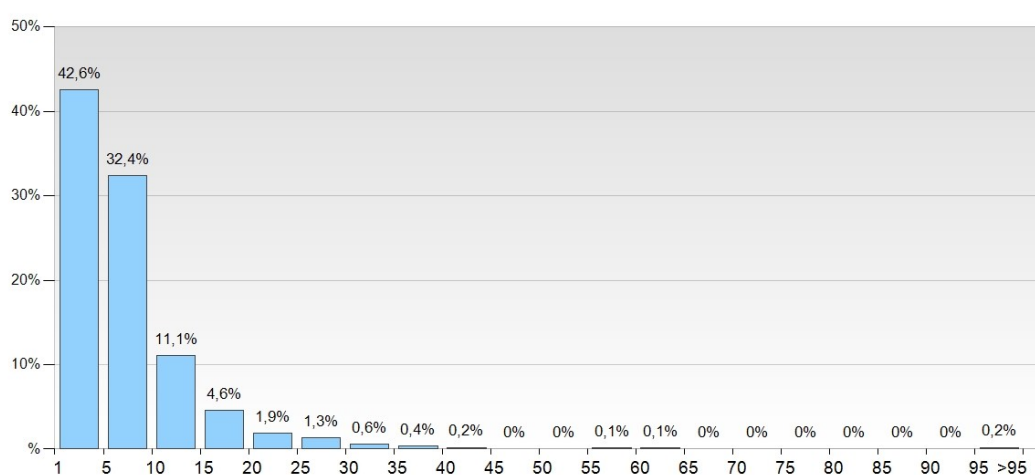
Anesthesia	n	%
Local	1059	97,42
General	28	2,58
Total	1087	

Minutes	min.	Ø	max.	n	n ₀ *
Investigation time	6	71,9	240	1078	9
Fluoroscopy time	1	7,2	205	1038	49

Investigation time (minutes)

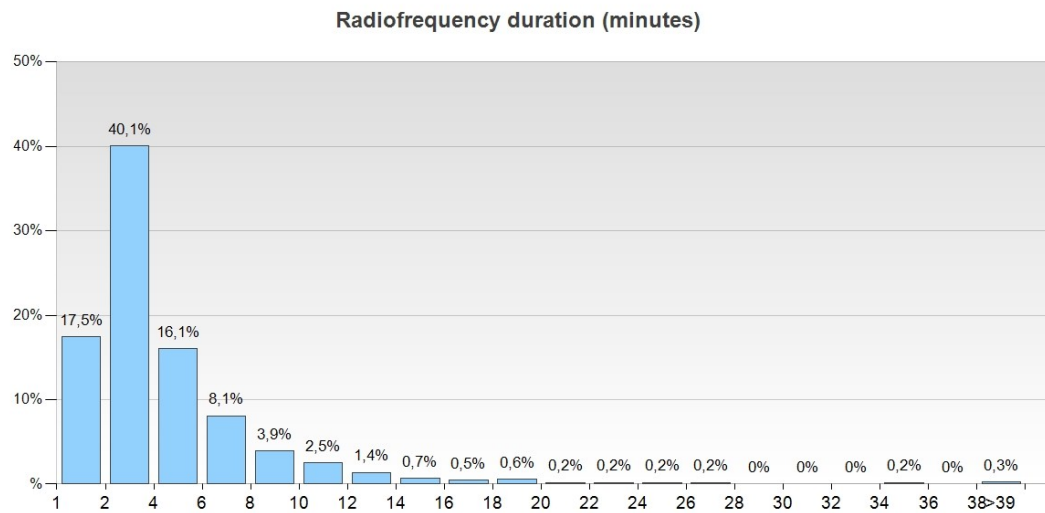


Fluoroscopy time (minutes)



Atrioventricular Nodal Reentry Tachycardia (AVNRT)

Radiofrequency	min.	Ø	max.	n	n ₀ *
Duration (minutes)	1	4	270	999	80
Irrigated Technology				79	



Atrioventricular Nodal Reentry Tachycardia (AVNRT)

Type	n
Slow-Fast	1032
Slow-Slow	39
Fast-Slow	30

Intervention	n	%
Primary Intervention	1019	93,74
Redo	68	6,26

Cryoablation	min.	Ø	max.	n	n ₀ *
Total Duration (minutes)	10	18	34	8	0

Mapping	n	%
Conventional	620	57,04
3D Mapping	466	42,87
Basket	1	0,09
Lasso	0	0
Other	0	0
Non Contact	0	0
HD Mesh	0	0
Total	1087	

Catheter Steering	n	%
Conventional	1083	99,63
Stereotaxis	2	0,18
Hansen	2	0,18
Other	0	0
Total	1087	

Results	n	%
Success	1067	98,16
No success	20	1,84

Atrioventricular Nodal Reentry Tachycardia (AVNRT)

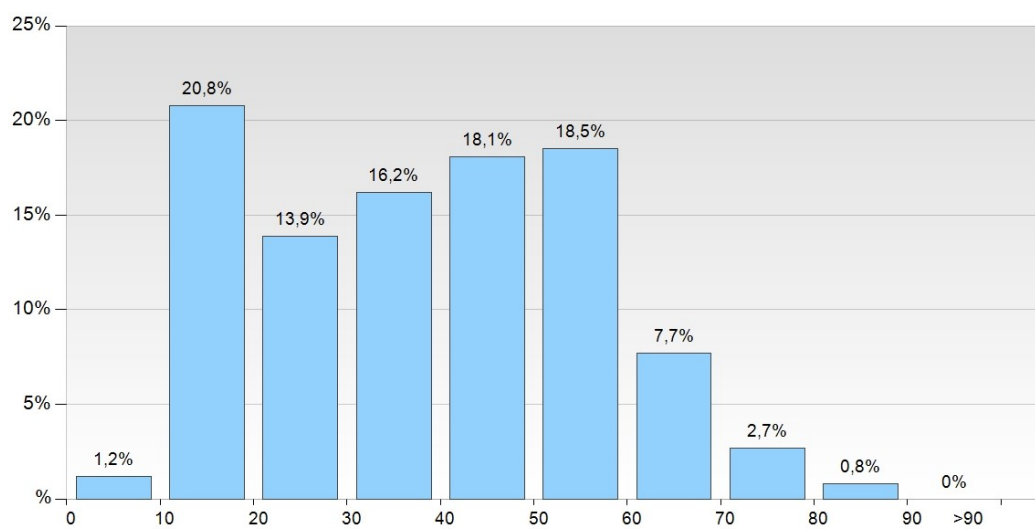
Periprocedural Complications	n
No complications	1077
Inguinal Hematoma	3
Transient AV Block	3
High Degree or Complete AV Block	3
Tamponade	1
Phrenic Nerve Paralysis	0
TIA	0
Arterial Occlusion	0
Death	0
Pneumothorax	0
Aortic Dissection	0
Valvular Lesions	0
Pericardial Effusion	0
AV Fistula	0
Infection	0
Stroke	0
Pulmonary Embolism	0
Other	0
Hemothorax	0
Arterial Thrombosis	0
Pulmonary Oedema	0
Pseudoaneurysm	0
PV Stenosis	0
Myocardial Infarction	0

Accessory Pathway

Ablation of Accessory Pathway (AP)		n
All interventions		275
AP combined with others		16
AP only		259

The following statistics include AP only procedures

Age distribution (years)



Age (years)	min.	Ø	max.
Female	13	40	81
Male	4	38	81
All	4	39	81

Number of patients	n	%
Females	83	33,74
Males	163	66,26
Total	246	

Accessory Pathway

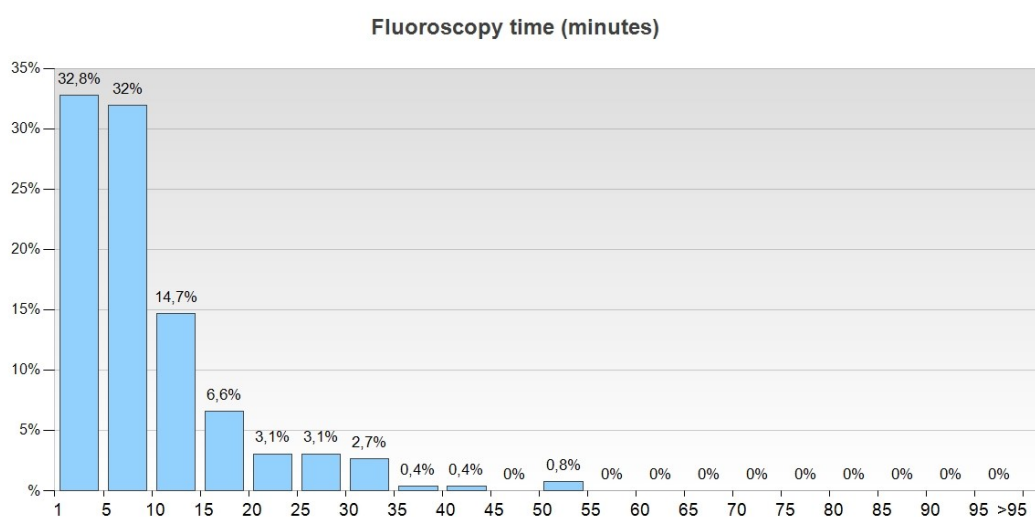
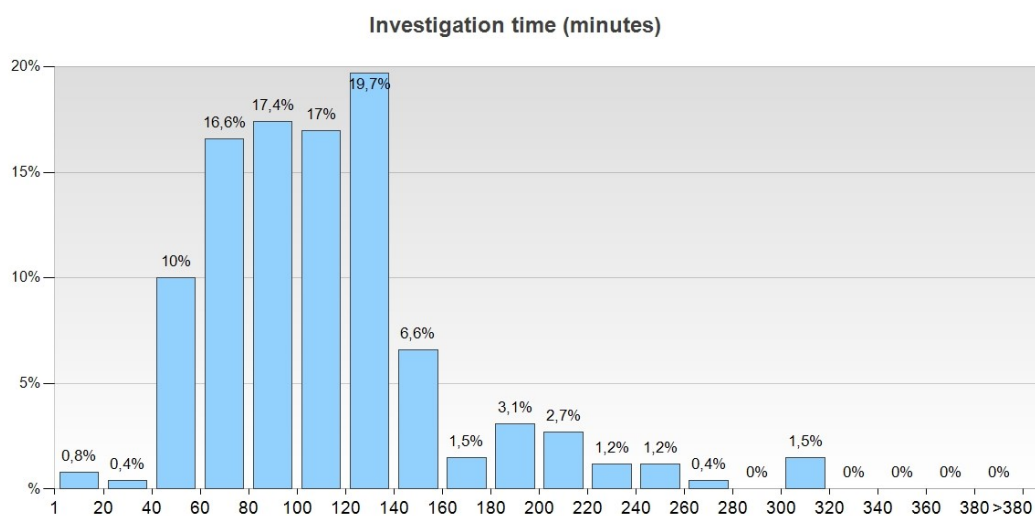
Cardiopathy (Underlying heart disease)	n	%
None	240	92,66
Hypertensive Cardiomyopathy	5	1,93
Ischemic	4	1,54
Tachycardiomyopathy	3	1,16
Valvular	2	0,77
Other	2	0,77
Dilated	2	0,77
Congenital	1	0,39
Catecholaminergic Polymorphic VT	0	0
Brugada Syndrome	0	0
Post Valvular Surgery	0	0
Channelopathy long QT	0	0
Angioplasty	0	0
H(O)CM	0	0
RV Cardiomyopathy	0	0
Early Repolarization Syndrome	0	0
Channelopathy short QT	0	0
Post Congenital Surgery	0	0
Infiltrative	0	0
CABG	0	0
Total	259	

Symptoms	n
Palpitations	219
Dizziness	31
None	25
Dyspnea	23
Syncope	11
Fatigue	10
Angina Pectoris	5
Other	3
SCD	0

Accessory Pathway

Anesthesia	n	%
Local	225	86,87
General	34	13,13
Total	259	

Minutes	min.	Ø	max.	n	n ₀ *
Investigation time	5	108,5	317	259	0
Fluoroscopy time	1	9,2	54	250	9



Accessory Pathway

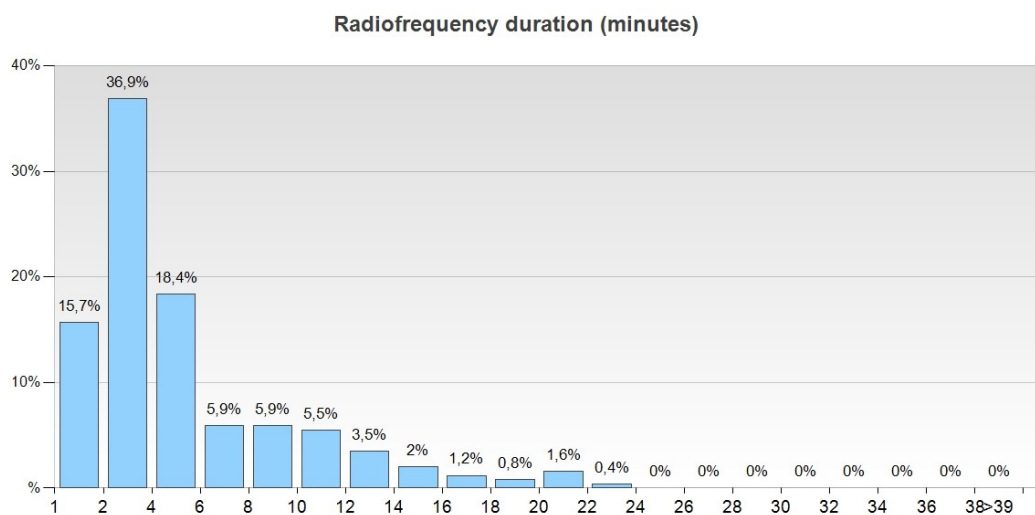
Type	n
WPW	165
Concealed	74
Asymptomatic Preexcitation	13
Mahaim	6
Other	4
Atrio-Fascicular	1
PJRT	0

Intervention	n	%
Primary Intervention	223	86,1
Redo	36	13,9

Site of Ablation	n
left	163
right	101
left: Free Wall	78
left: Posteroseptal	53
right: Posteroseptal	41
left: Posterior	34
right: Anteroseptal	17
right: Free Wall	17
right: Parahisian	12
right: Coronary Sinus Aneurysm	10
right: Posterior	5
right: Midseptal	3

Accessory Pathway

Radiofrequency	min.	Ø	max.	n	n ₀ *
Duration (minutes)	1	5	22	249	6
Irrigated Technology				174	



Accessory Pathway

Cryoablation	min.	Ø	max.	n	n₀*
Total Duration (minutes)	3	6,4	12	5	0

Access	n	%
Venous	120	46,33
Trans-septal, Puncture	112	43,24
Arterial	20	7,72
Trans-septal, PFO	7	2,7
Trans-septal Puncture+arterial	0	0
Epicardial, Thoracoscopy	0	0
Epicardial, Coronary Sinus	0	0
Other	0	0
Epicardial, Sub-xiphoid	0	0
Epicardial, Thoracotomy	0	0
Total	259	

Mapping	n	%
3D Mapping	157	60,62
Conventional	102	39,38
Lasso	0	0
Other	0	0
Non Contact	0	0
Basket	0	0
HD Mesh	0	0
Total	259	

Catheter Steering	n	%
Conventional	257	99,23
Other	2	0,77
Stereotaxis	0	0
Hansen	0	0
Total	259	

Results	n	%
Success	235	90,73
No success	24	9,27

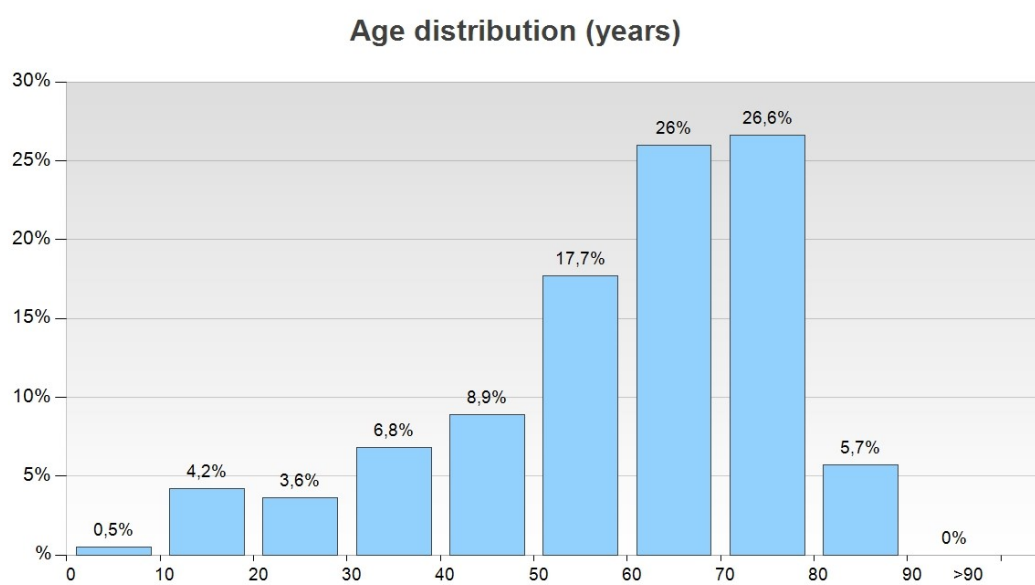
Accessory Pathway

Periprocedural Complications	n
No complications	252
Other	3
Pericardial Effusion	2
High Degree or Complete AV Block	2
Arterial Thrombosis	0
Pulmonary Oedema	0
Tamponade	0
Pseudoaneurysm	0
PV Stenosis	0
Myocardial Infarction	0
Inguinal Hematoma	0
Phrenic Nerve Paralysis	0
TIA	0
Transient AV Block	0
Arterial Occlusion	0
Death	0
Pneumothorax	0
Aortic Dissection	0
Valvular Lesions	0
AV Fistula	0
Infection	0
Stroke	0
Pulmonary Embolism	0
Hemothorax	0

Atrial Tachycardia

Ablation of Atrial Tachycardia (AT)		n
All interventions		300
AT combined with others		108
AT only		192

The following statistics include AT only procedures



Age (years)	min.	Ø	max.
Female	11	60	86
Male	10	60	85
All	10	60	86

Number of patients	n	%
Females	101	54,01
Males	86	45,99
Total	187	

Atrial Tachycardia

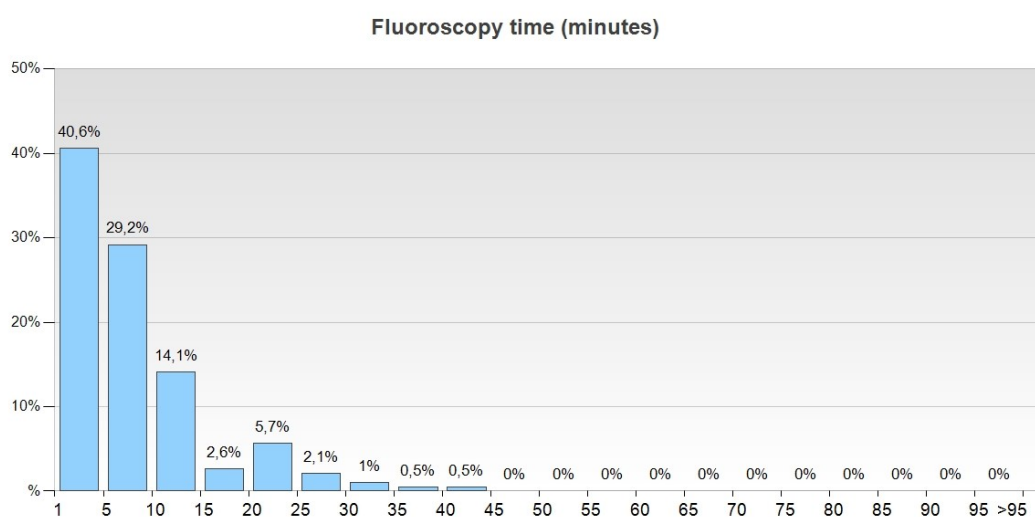
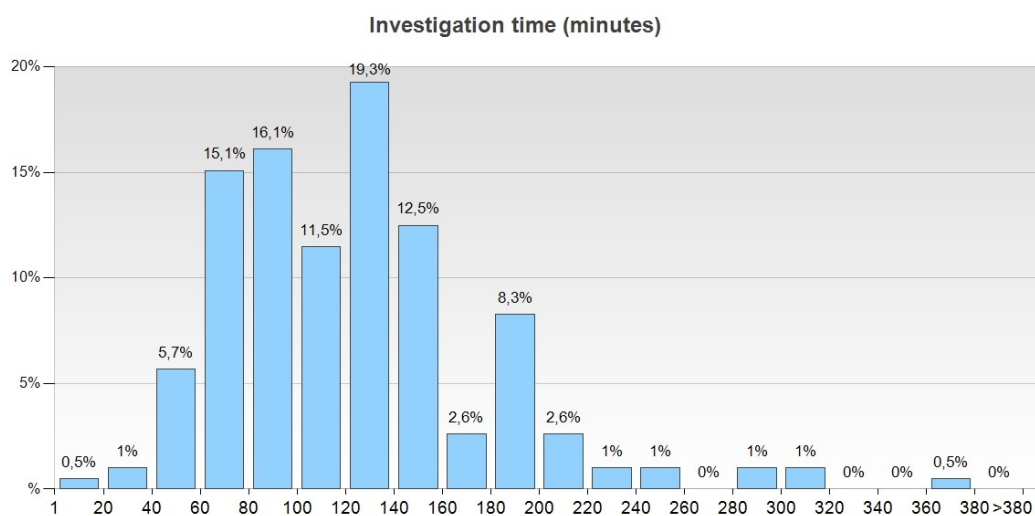
Cardiopathy (Underlying heart disease)	n	%
None	122	63,54
Hypertensive Cardiomyopathy	22	11,46
Ischemic	13	6,77
Congenital	7	3,65
Other	7	3,65
Tachycardiomyopathy	5	2,6
Dilated	5	2,6
Valvular	4	2,08
Post Valvular Surgery	2	1,04
Angioplasty	2	1,04
Infiltrative	1	0,52
Channelopathy long QT	1	0,52
H(O)CM	1	0,52
Early Repolarization Syndrome	0	0
Channelopathy short QT	0	0
Post Congenital Surgery	0	0
CABG	0	0
Catecholaminergic Polymorphic VT	0	0
Brugada Syndrome	0	0
RV Cardiomyopathy	0	0
Total	192	

Symptoms	n
Palpitations	180
Dyspnea	29
Fatigue	27
Dizziness	19
Angina Pectoris	5
Other	4
None	3
Syncope	3
SCD	1

Atrial Tachycardia

Anesthesia	n	%
Local	161	83,85
General	31	16,15
Total	192	

Minutes	min.	Ø	max.	n	n ₀ *
Investigation time	16	119,5	360	192	0
Fluoroscopy time	1	7,8	40	185	7



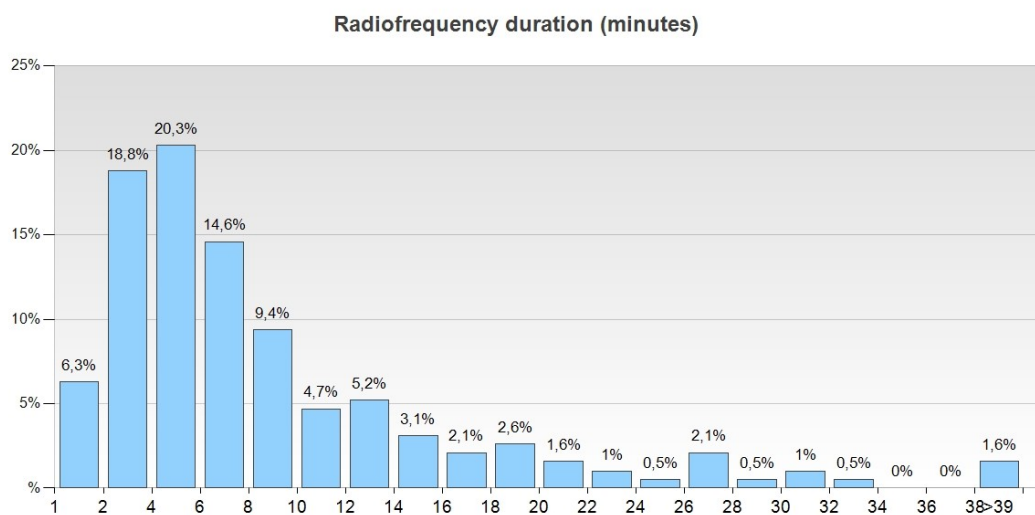
Atrial Tachycardia

Intervention	n	%
Primary Intervention	167	86,98
Redo	25	13,02

Site of Ablation	n
right	154
left	53
right: Other Right	49
right: Crista Terminalis	42
right: Septal Right	39
right: Peritricuspid	33
left: Other Left	22
left: Septal Left	12
right: Right Appendage	10
left: Perimitral	9
left: Periostial PV	9
left: Left Atrial Appendage	5

Atrial Tachycardia

Radiofrequency	min.	Ø	max.	n	n ₀ *
Duration (minutes)	1	11	331	184	8
Irrigated Technology				156	



Atrial Tachycardia

Access	n	%
Venous	142	73,96
Trans-septal, Puncture	33	17,19
Trans-septal, PFO	11	5,73
Arterial	4	2,08
Other	1	0,52
Epicardial, Coronary Sinus	1	0,52
Epicardial, Sub-xiphoid	0	0
Epicardial, Thoracotomy	0	0
Trans-septal Puncture+arterial	0	0
Epicardial, Thoracoscopy	0	0
Total	192	

Mapping	n	%
3D Mapping	161	83,85
Conventional	26	13,54
Non Contact	4	2,08
Lasso	1	0,52
Basket	0	0
HD Mesh	0	0
Other	0	0
Total	192	

Catheter Steering	n	%
Conventional	191	99,48
Stereotaxis	1	0,52
Other	0	0
Hansen	0	0
Total	192	

Results	n	%
Success	177	92,19
No success	15	7,81

Atrial Tachycardia

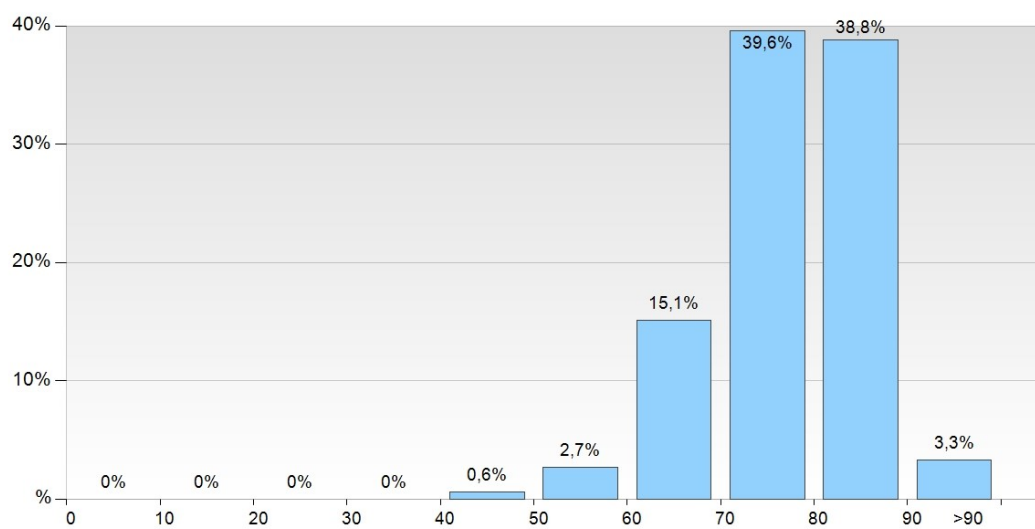
Periprocedural Complications	n
No complications	188
Inguinal Hematoma	2
Transient AV Block	1
High Degree or Complete AV Block	1
Myocardial Infarction	0
Phrenic Nerve Paralysis	0
TIA	0
Arterial Occlusion	0
Death	0
Pneumothorax	0
Aortic Dissection	0
Valvular Lesions	0
Pericardial Effusion	0
AV Fistula	0
Infection	0
Stroke	0
Pulmonary Embolism	0
Other	0
Hemothorax	0
Arterial Thrombosis	0
Pulmonary Oedema	0
Tamponade	0
Pseudoaneurysm	0
PV Stenosis	0

Atrioventricular Node (Rate Control in Atr. Fibrillation)

Ablation of AVN(R)	n
All interventions	348
AVN(R) combined with others	10
AVN(R) only	338

The following statistics include AVN(R) only procedures

Age distribution (years)



Age (years)	min.	Ø	max.
Female	50	79	98
Male	49	76	96
All	49	78	98

Number of patients	n	%
Females	204	61,08
Males	130	38,92
Total	334	

Atrioventricular Node (Rate Control in Atr. Fibrillation)

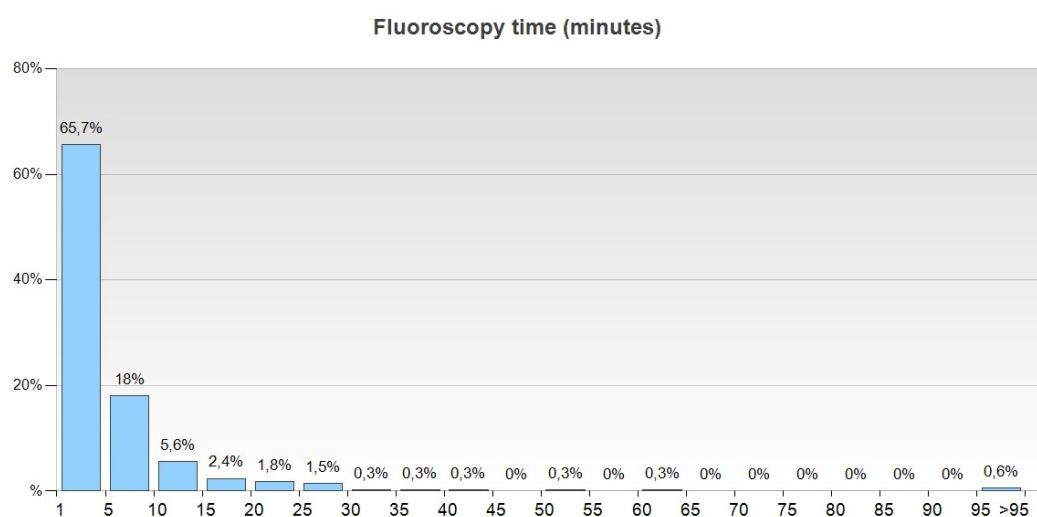
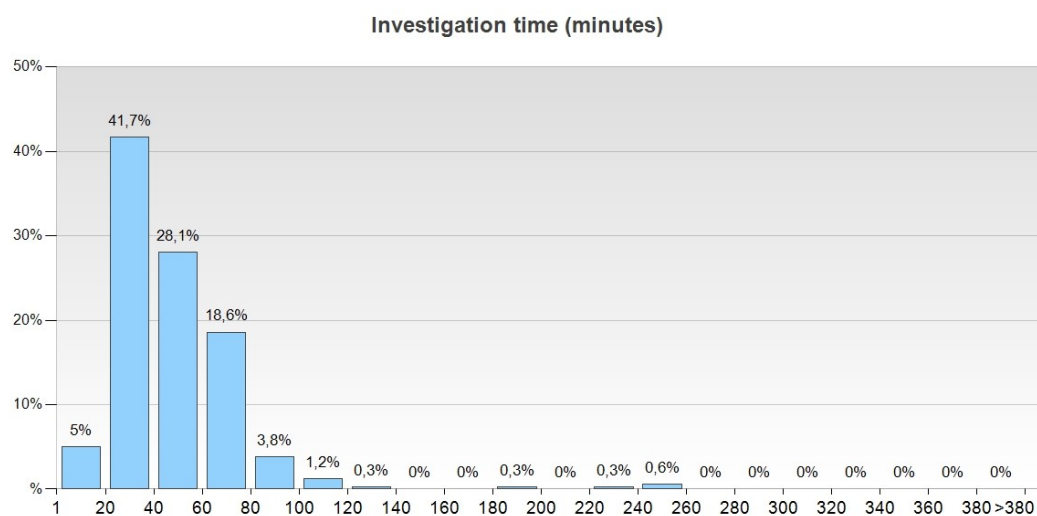
Cardiopathy (Underlying heart disease)	n	%
None	103	30,47
Hypertensive Cardiomyopathy	65	19,23
Tachycardiomyopathy	58	17,16
Ischemic	36	10,65
Valvular	27	7,99
Dilated	21	6,21
Other	15	4,44
Post Valvular Surgery	6	1,78
H(O)CM	3	0,89
Infiltrative	2	0,59
Angioplasty	2	0,59
Channelopathy short QT	0	0
Post Congenital Surgery	0	0
CABG	0	0
Catecholaminergic Polymorphic VT	0	0
Brugada Syndrome	0	0
Channelopathy long QT	0	0
RV Cardiomyopathy	0	0
Congenital	0	0
Early Repolarization Syndrome	0	0
Total	338	

Symptoms	n
Palpitations	267
Dyspnea	138
Fatigue	100
Dizziness	27
Other	14
Syncope	5
Angina Pectoris	4
None	1
SCD	1

Atrioventricular Node (Rate Control in Atr. Fibrillation)

Anesthesia	n	%
Local	334	98,82
General	4	1,18
Total	338	

Minutes	min.	Ø	max.	n	n ₀ *
Investigation time	7	44,6	253	338	0
Fluoroscopy time	1	6,8	388	328	10



Atrioventricular Node (Rate Control in Atr. Fibrillation)

Type of Fibrillation	n	%
Paroxysmal	96	28,4
Persistent	156	46,15
Long-standing Persistent (>1 Year)	86	25,44

EHRA-Score	n	%
Score I	3	0,89
Score II	121	35,8
Score III	189	55,92
Score IV	25	7,4

Intervention	n	%
Primary Intervention	300	88,76
Redo	28	8,28
Previous AF Abl. Procedure	10	2,96

Antiarrhythmic Drugs	n
Beta Blocker	230
Amiodarone	91
None	46
Calcium Antagonist	38
Digitalis	28
Other	17
Sotalol	7
Flecainide	5
Propafenone	3
Dronedarone	1

Atrioventricular Node (Rate Control in Atr. Fibrillation)

Thromboembolic Risk Factors	n
Hypertension	184
Congestive Heart Failure, LV dysfunction	52
Prior MI, Per. Artery Disease, Aortic Plaque	36
Diabetes	34
Stroke, TIA, Pther Embolic Event	15

Anticoagulation, Antiaggregation	n
Factor Xa-Antagonist	212
Vitamin K-Antagonist	67
None	18
Other	17
Direct Thrombin Inhibitor	16
Aspirin	11
Clopidogrel	4
Prasugrel	0
Ticagrelor	0

CHA₂DS₂-VASc Score	n
Score = 0	6
Score = 1	21
Score = 2	66
Score = 3	114
Score = 4	82
Score = 5	34
Score = 6	12
Score = 7	3
Average Score	3,21

Atrioventricular Node (Rate Control in Atr. Fibrillation)

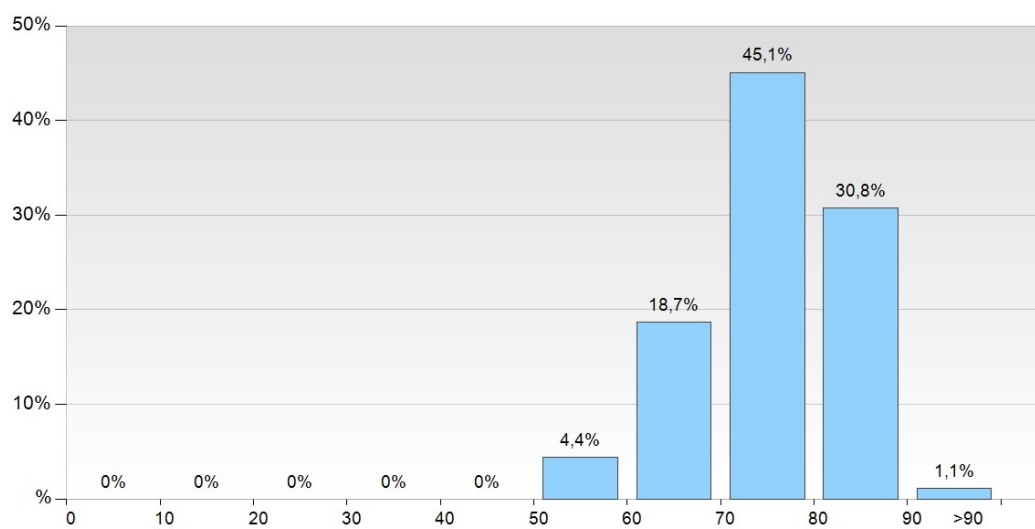
Periprocedural Complications	n
No complications	338
Pericardial Effusion	0
AV Fistula	0
Infection	0
Stroke	0
High Degree or Complete AV Block	0
Pulmonary Embolism	0
Other	0
Hemothorax	0
Arterial Thrombosis	0
Pulmonary Oedema	0
Tamponade	0
Pseudoaneurysm	0
PV Stenosis	0
Myocardial Infarction	0
Inguinal Hematoma	0
Phrenic Nerve Paralysis	0
TIA	0
Transient AV Block	0
Arterial Occlusion	0
Death	0
Pneumothorax	0
Aortic Dissection	0
Valvular Lesions	0

Atrioventricular Node (to resynchronisation)

Ablation of AVN	n
All interventions	101
AVN combined with others	10
AVN only	91

The following statistics include AVN only procedures

Age distribution (years)



Age (years)	min.	Ø	max.
Female	62	79	91
Male	51	74	89
All	51	76	91

Number of patients	n	%
Females	37	41,11
Males	53	58,89
Total	90	

Atrioventricular Node (to resynchronisation)

Cardiopathy (Underlying heart disease)	n	%
Tachycardiomyopathy	23	25,27
Ischemic	20	21,98
None	18	19,78
Dilated	13	14,29
Hypertensive Cardiomyopathy	7	7,69
Valvular	4	4,4
CABG	2	2,2
Post Valvular Surgery	2	2,2
Congenital	2	2,2
Catecholaminergic Polymorphic VT	0	0
Brugada Syndrome	0	0
Channelopathy long QT	0	0
Angioplasty	0	0
H(O)CM	0	0
RV Cardiomyopathy	0	0
Other	0	0
Early Repolarization Syndrome	0	0
Channelopathy short QT	0	0
Post Congenital Surgery	0	0
Infiltrative	0	0
Total	91	

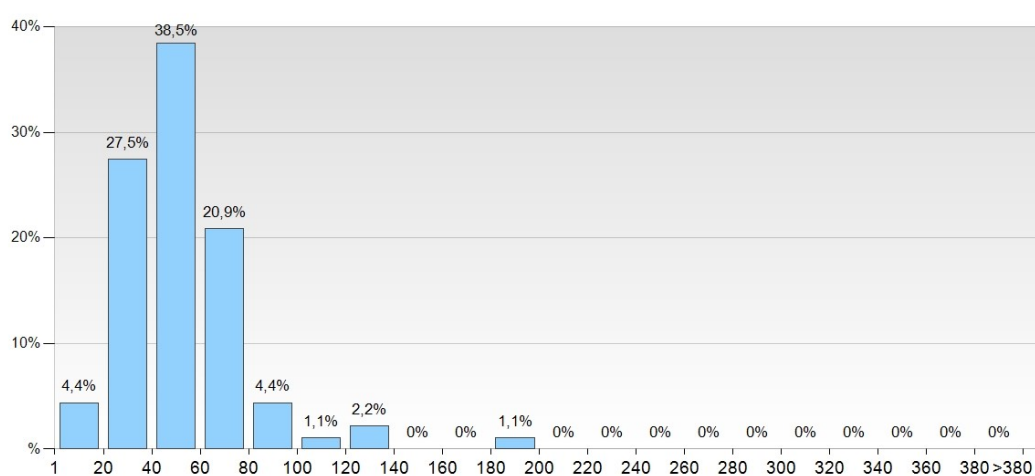
Symptoms	n
Dyspnea	59
Palpitations	57
Fatigue	34
Dizziness	9
Other	3
None	3
Angina Pectoris	1
SCD	1
Syncope	0

Atrioventricular Node (to resynchronisation)

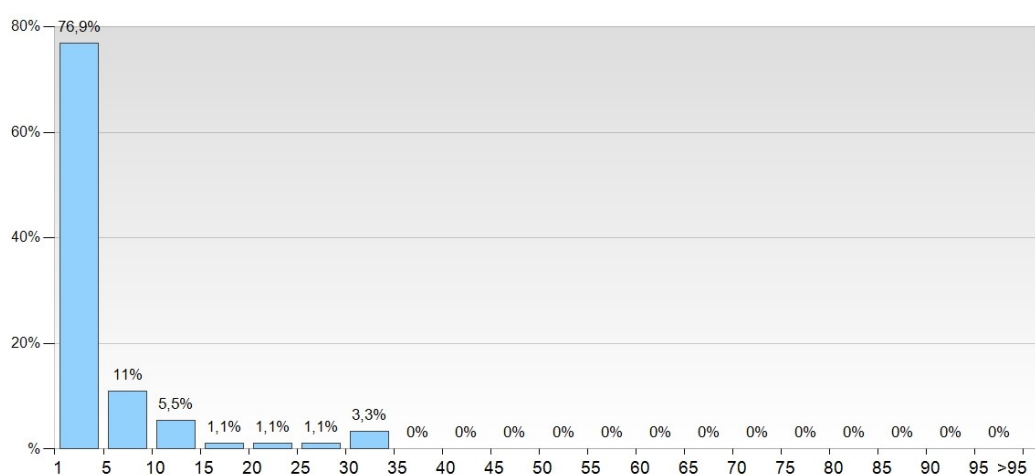
Anesthesia	n	%
Local	89	97,8
General	2	2,2
Total	91	

Minutes	min.	Ø	max.	n	n ₀ *
Investigation time	5	49,3	180	91	0
Fluoroscopy time	1	4,5	33	91	0

Investigation time (minutes)



Fluoroscopy time (minutes)



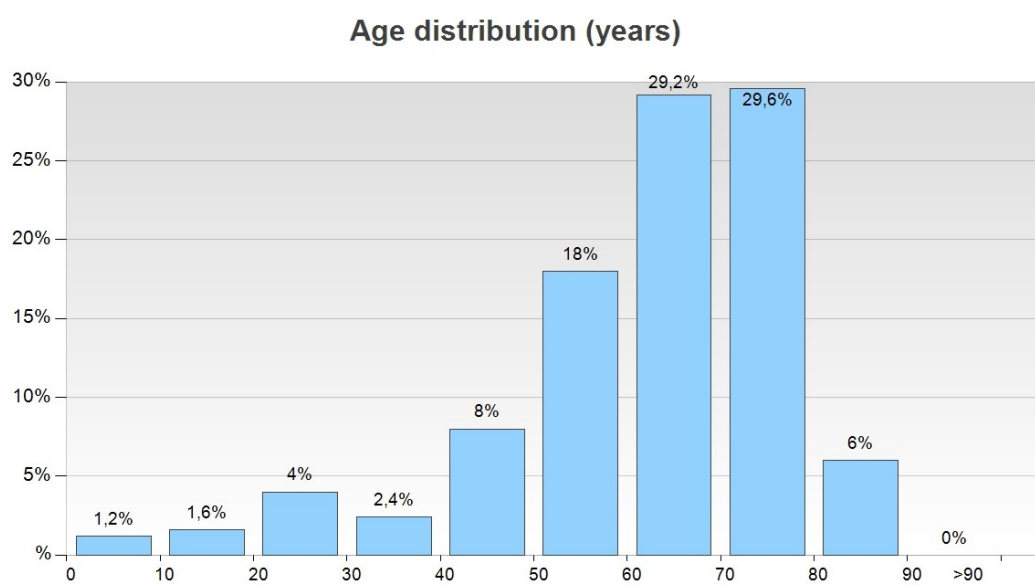
Atrioventricular Node (to resynchronisation)

Periprocedural Complications	n
No complications	91
Myocardial Infarction	0
Inguinal Hematoma	0
Phrenic Nerve Paralysis	0
TIA	0
Transient AV Block	0
Arterial Occlusion	0
Death	0
Pneumothorax	0
Aortic Dissection	0
Valvular Lesions	0
Pericardial Effusion	0
AV Fistula	0
Infection	0
Stroke	0
High Degree or Complete AV Block	0
Pulmonary Embolism	0
Other	0
Hemothorax	0
Arterial Thrombosis	0
Pulmonary Oedema	0
Tamponade	0
Pseudoaneurysm	0
PV Stenosis	0

Ventricular Tachycardia

Ablation of Ventricular Tachycardia (VT)		n
All interventions		261
VT combined with others		11
VT only		250

The following statistics include VT only procedures



Age (years)	min.	Ø	max.
Female	2	56	88
Male	0	64	88
All	0	63	88

Number of patients	n	%
Females	55	23,71
Males	177	76,29
Total	232	

Ventricular Tachycardia

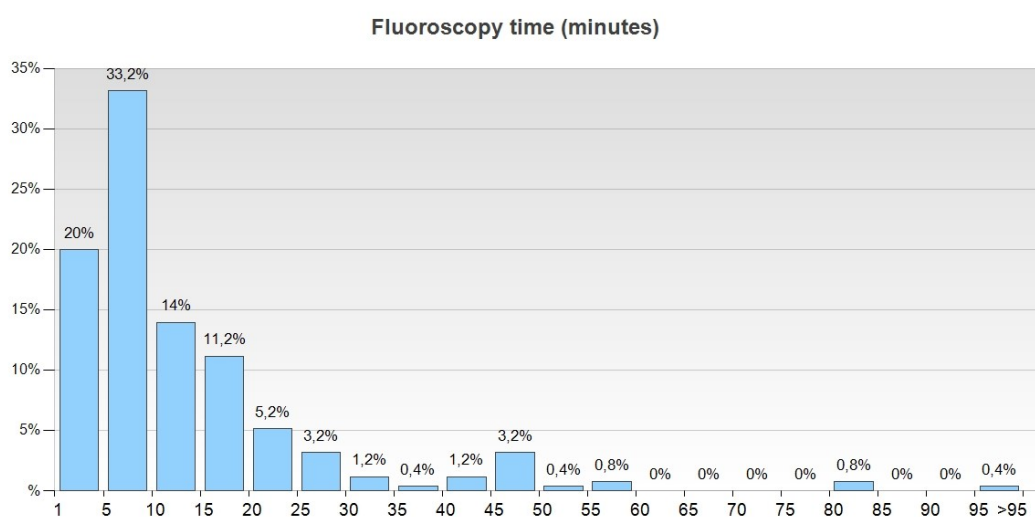
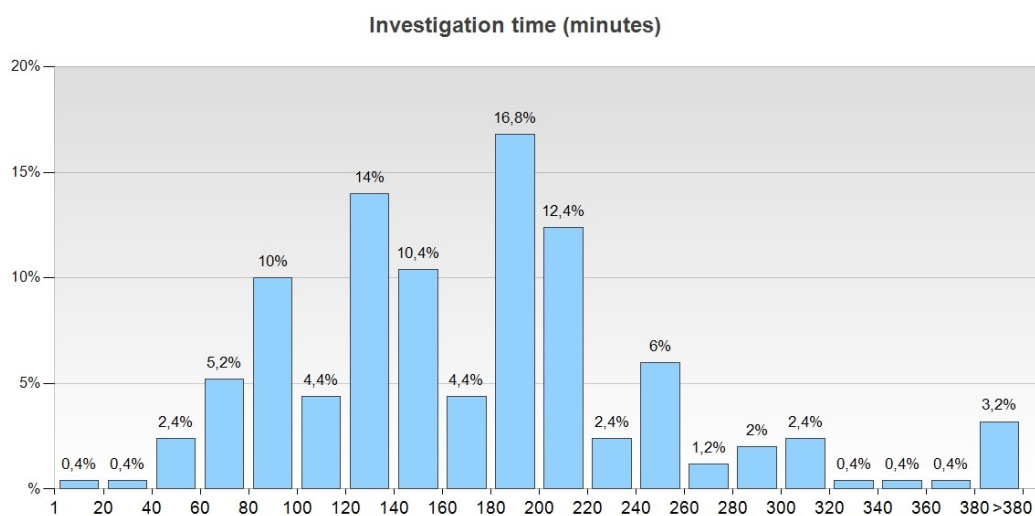
Cardiopathy (Underlying heart disease)	n	%
Ischemic	112	44,8
None	73	29,2
Dilated	28	11,2
Other	9	3,6
Valvular	7	2,8
Hypertensive Cardiomyopathy	7	2,8
RV Cardiomyopathy	6	2,4
Tachycardiomyopathy	2	0,8
Post Congenital Surgery	2	0,8
Angioplasty	2	0,8
H(O)CM	1	0,4
CABG	1	0,4
Congenital	0	0
Early Repolarization Syndrome	0	0
Channelopathy short QT	0	0
Infiltrative	0	0
Catecholaminergic Polymorphic VT	0	0
Brugada Syndrome	0	0
Post Valvular Surgery	0	0
Channelopathy long QT	0	0
Total	250	

Symptoms	n
Palpitations	194
Dyspnea	56
Dizziness	44
Syncope	29
Fatigue	29
SCD	16
Other	14
Angina Pectoris	11
None	8

Ventricular Tachycardia

Anesthesia	n	%
Local	173	69,2
General	77	30,8
Total	250	

Minutes	min.	Ø	max.	n	n ₀ *
Investigation time	6	170,4	480	248	2
Fluoroscopy time	1	13,4	130	238	12



Ventricular Tachycardia

Type	n
Monomorphic	220
Polymorphic	34

Location	n
Other	123
LVOT / Cusp	41
RVOT / Cusp / PA	38
Mitral Annulus	30
Fascicular	21
Left Pap Muscle	15
Epicardial LV / RV	13
Tricuspid Annulus	9
Right Pap Muscle	4
BB Reentry	3
Parahisian	2

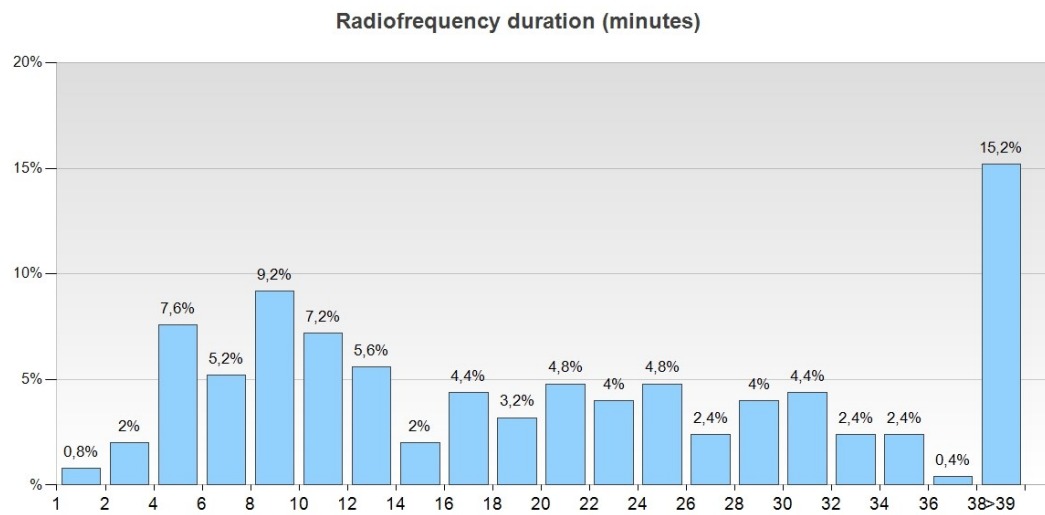
Intervention	n	%
Primary Intervention	178	71,2
Redo	72	28,8

Antiarrhythmic Drugs	n
Beta Blocker	147
Amiodarone	111
None	27
Other	15
Sotalol	13
Calcium Antagonist	11
Flecainide	9
Propafenone	1

Ventricular Tachycardia

Radiofrequency	min.	Ø	max.	n	n ₀ *
Duration (minutes)	1	25	680	232	18
Irrigated Technology				217	

Number of Induced VT: 310



Ventricular Tachycardia

Access	n	%
Trans-septal, Puncture	119	47,6
Venous	58	23,2
Arterial	48	19,2
Epicardial, Sub-xiphoid	7	2,8
Trans-septal, PFO	7	2,8
Trans-septal Puncture+arterial	5	2
Other	4	1,6
Epicardial, Thoracotomy	2	0,8
Epicardial, Thoracoscopy	0	0
Epicardial, Coronary Sinus	0	0
Total	250	

Mapping	n	%
3D Mapping	229	91,6
Conventional	13	5,2
Other	5	2
HD Mesh	2	0,8
Non Contact	1	0,4
Basket	0	0
Lasso	0	0
Total	250	

Catheter Steering	n	%
Conventional	245	98
Other	5	2
Hansen	0	0
Stereotaxis	0	0
Total	250	

Results	n	%
All Induces VT Ablated	137	54,8
Target VT Ablated	86	34,4
Failure	27	10,8

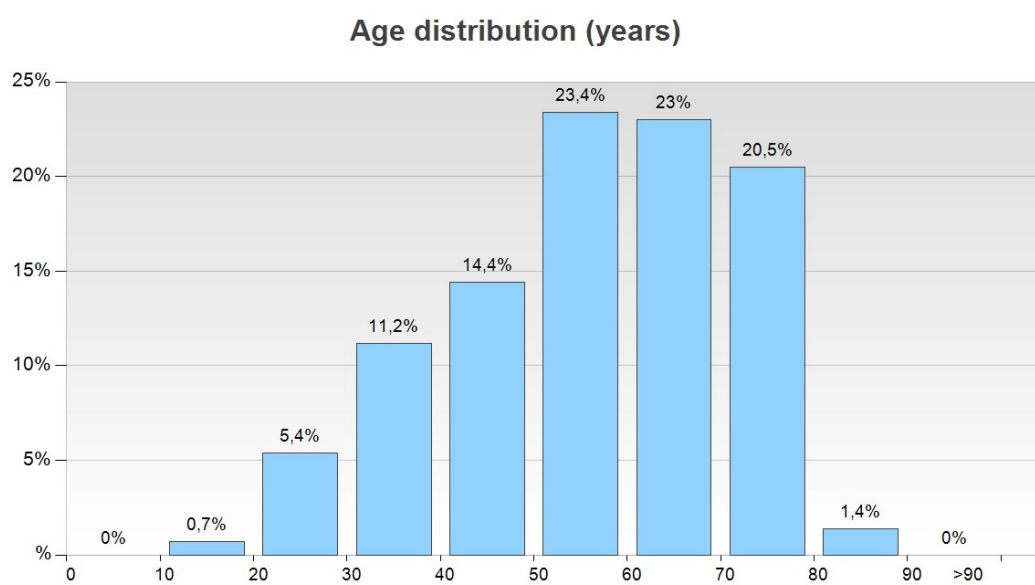
Ventricular Tachycardia

Periprocedural Complications	n
No complications	241
Inguinal Hematoma	2
High Degree or Complete AV Block	2
Other	2
Tamponade	2
Pericardial Effusion	1
Pseudoaneurysm	1
Myocardial Infarction	0
Phrenic Nerve Paralysis	0
TIA	0
Transient AV Block	0
Arterial Occlusion	0
Death	0
Pneumothorax	0
Aortic Dissection	0
Valvular Lesions	0
AV Fistula	0
Infection	0
Stroke	0
Pulmonary Embolism	0
Hemothorax	0
Arterial Thrombosis	0
Pulmonary Oedema	0
PV Stenosis	0

Premature Ventricular Contraction

Ablation of PVC		n
All interventions		284
PVC combined with others		6
PVC only		278

The following statistics include PVC only procedures



Age (years)	min.	Ø	max.
Female	22	54	80
Male	12	59	84
All	12	57	84

Number of patients	n	%
Females	111	41,57
Males	156	58,43
Total	267	

Premature Ventricular Contraction

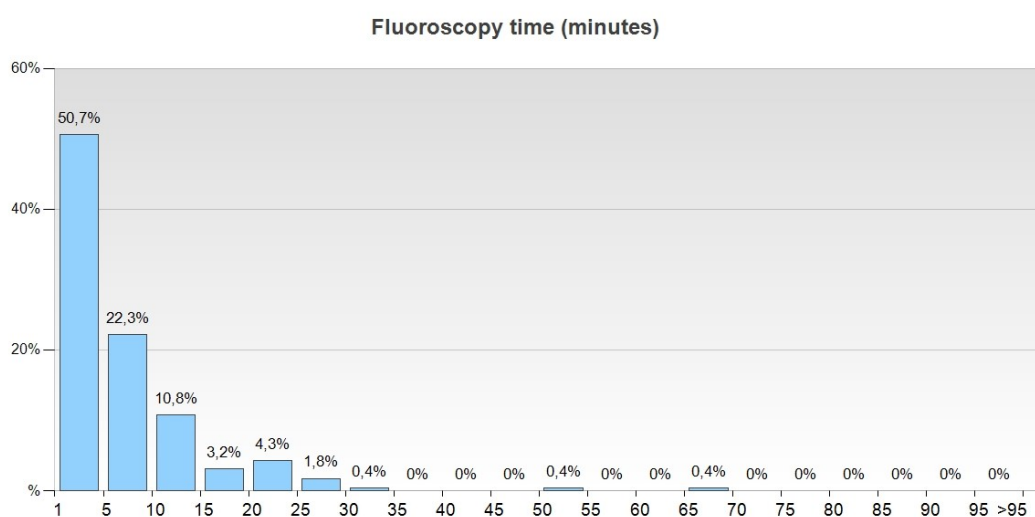
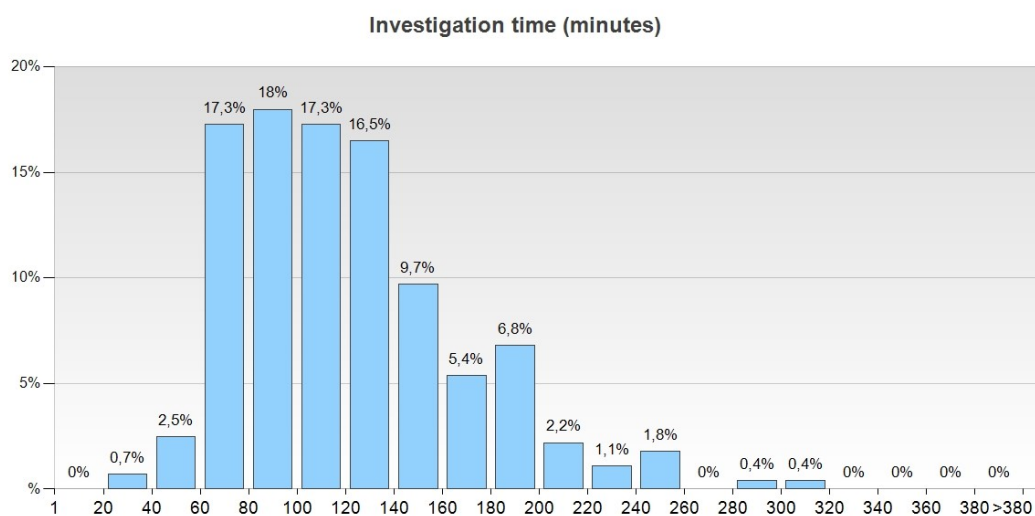
Cardiopathy (Underlying heart disease)	n	%
None	168	60,43
Ischemic	31	11,15
Dilated	18	6,47
Other	14	5,04
Valvular	13	4,68
Tachycardiomyopathy	11	3,96
Hypertensive Cardiomyopathy	10	3,6
H(O)CM	5	1,8
Angioplasty	5	1,8
Congenital	3	1,08
RV Cardiomyopathy	0	0
Early Repolarization Syndrome	0	0
Channelopathy short QT	0	0
Post Congenital Surgery	0	0
Infiltrative	0	0
CABG	0	0
Catecholaminergic Polymorphic VT	0	0
Brugada Syndrome	0	0
Post Valvular Surgery	0	0
Channelopathy long QT	0	0
Total	278	

Symptoms	n
Palpitations	218
Dyspnea	52
Fatigue	46
Dizziness	32
None	17
Syncope	12
Other	11
Angina Pectoris	6
SCD	4

Premature Ventricular Contraction

Anesthesia	n	%
Local	260	93,53
General	18	6,47
Total	278	

Minutes	min.	Ø	max.	n	n ₀ *
Investigation time	30	116,6	300	278	0
Fluoroscopy time	1	6,8	65	262	16



Premature Ventricular Contraction

Type	n
Monomorphic	248
Polymorphic	29
Ischemic	2

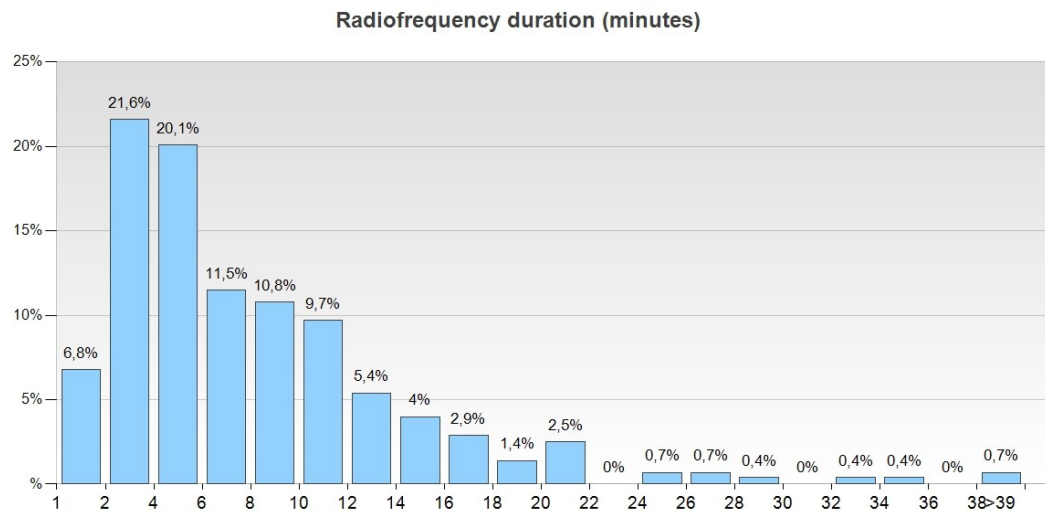
Location	n
RVOT	122
LVOT / Aortic Cusp	96
Other	61
HP System	14
Left Fascicular PVC	6

Site of Ablation	n
Right Ventricle	156
Left Ventricle	148

Intervention	n	%
Primary Intervention	241	86,69
Redo	37	13,31

Premature Ventricular Contraction

Radiofrequency	min.	Ø	max.	n	n ₀ *
Duration (minutes)	1	8	71	278	0
Irrigated Technology				257	



Premature Ventricular Contraction

Access	n	%
Venous	144	51,8
Arterial	105	37,77
Trans-septal, Puncture	26	9,35
Other	2	0,72
Trans-septal, PFO	1	0,36
Epicardial, Sub-xiphoid	0	0
Epicardial, Thoracotomy	0	0
Trans-septal Puncture+arterial	0	0
Epicardial, Thoracoscopy	0	0
Epicardial, Coronary Sinus	0	0
Total	278	

Mapping	n	%
3D Mapping	270	97,12
Conventional	8	2,88
Basket	0	0
HD Mesh	0	0
Lasso	0	0
Other	0	0
Non Contact	0	0
Total	278	

Catheter Steering	n	%
Conventional	276	99,28
Other	2	0,72
Stereotaxis	0	0
Hansen	0	0
Total	278	

Results	n	%
Success	247	88,85
No Success	31	11,15

Premature Ventricular Contraction

Periprocedural Complications	n
No complications	270
Inguinal Hematoma	5
Tamponade	1
Transient AV Block	1
Death	1
Hemothorax	0
Arterial Thrombosis	0
Pulmonary Oedema	0
Pseudoaneurysm	0
PV Stenosis	0
Myocardial Infarction	0
Phrenic Nerve Paralysis	0
TIA	0
Arterial Occlusion	0
Pneumothorax	0
Aortic Dissection	0
Valvular Lesions	0
Pericardial Effusion	0
AV Fistula	0
Infection	0
Stroke	0
High Degree or Complete AV Block	0
Pulmonary Embolism	0
Other	0

Completion

Completion



Cause of completion	n	%
Not codified	0	0
Death	0	0
Regular End of Follow-Up	0	0
Change from Rhythm Control to Rate Control	0	0
Lost to Follow-Up	0	0
Total	0	

The statistics are based on the data from CHPACE WEB from 01.01.2019 to 31.12.2019. Its completeness and correctness depends on the complete and correct data entry in the respective hospital. EPS are counted as interventions.

0,0% incomplete records are not included in these statistics.

n₀*: Investigations were reported with 0 minutes and are not included in these statistics.

Ø depicts the arithmetic mean.

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Abbreviations

AF = Atrial Fibrillation
RAFlu = Right Atrial Flutter
LAFlu = Left Atrial Flutter
AT = Atrial Tachycardia
AP = Accessory Pathway
AVNRT = Atrioventricular Nodal Reentry Tachycardia
VT = Ventricular Tachycardia
PVC = Premature Ventricular Contraction
AVN = Atrioventricular Node (to resynchronisation)
AVN(R) = Atrioventricular Node (Rate Control in Atr. Fibrillation)
Other = Other Arrhythmia

The cover picture shows a steerable ablation catheter from the late 90s