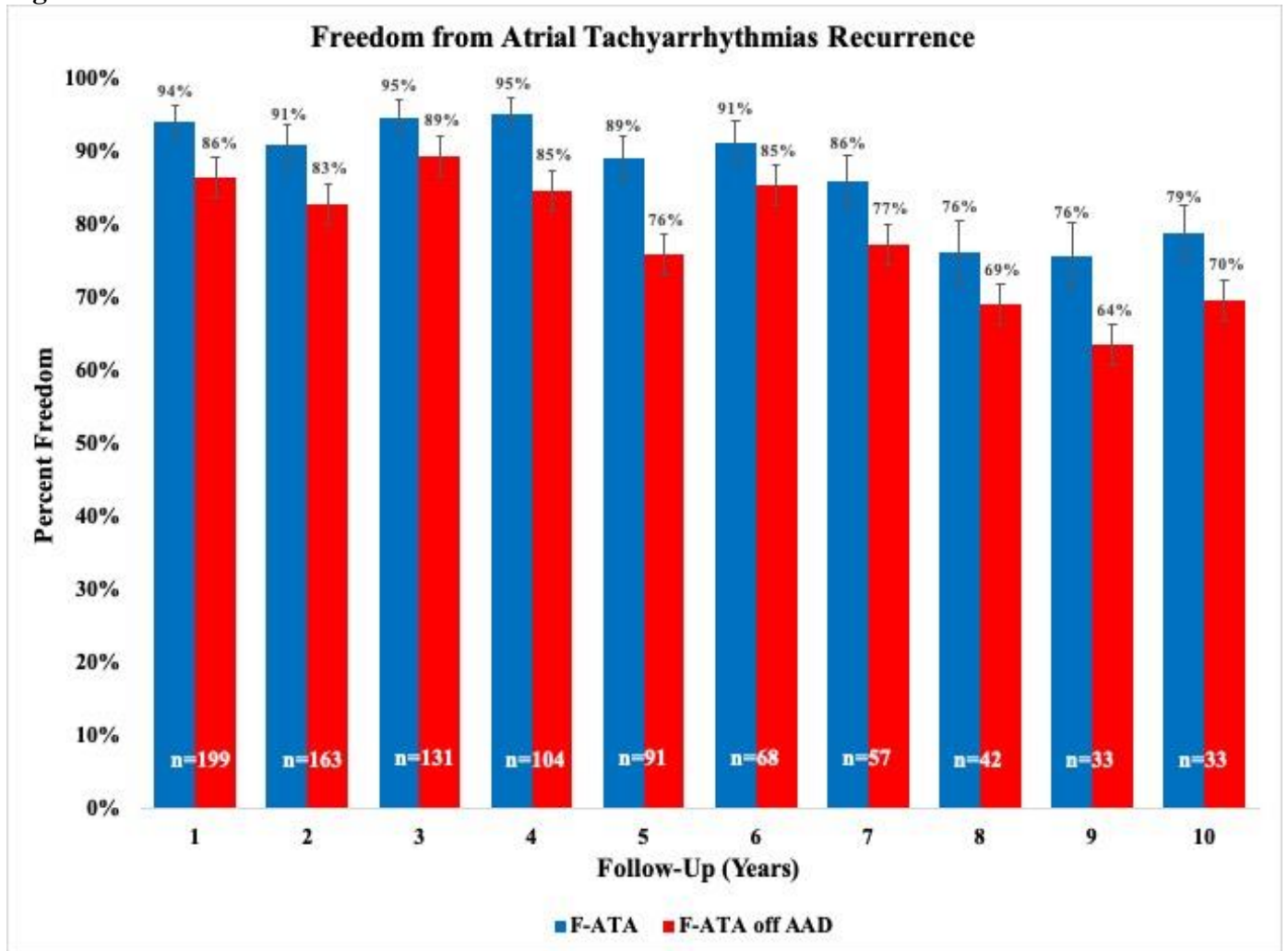


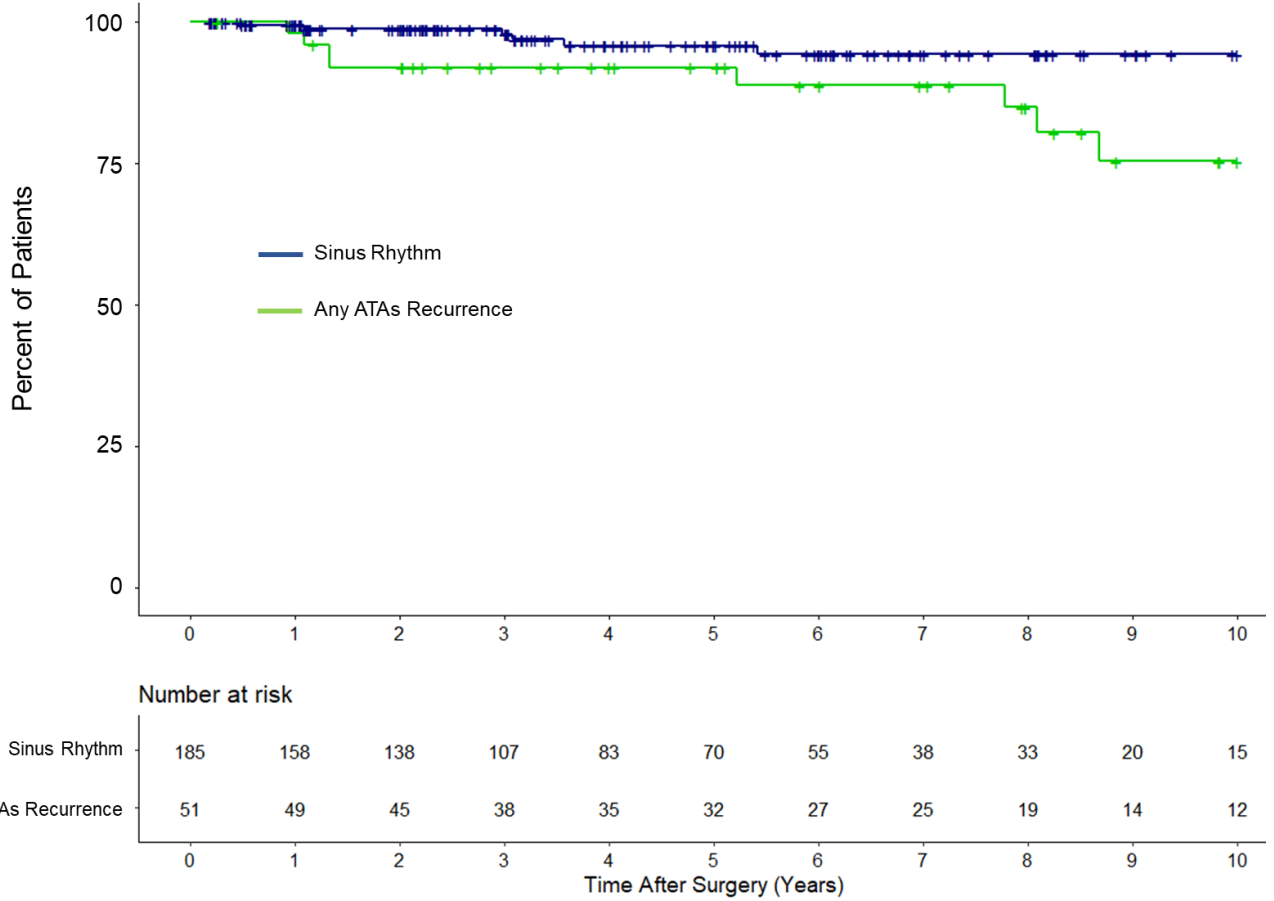
832 Supplementary Material
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834 Figures



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836 **Figure E1.** Complete ten-year follow-up showing freedom from atrial tachyarrhythmia (ATA)
837 recurrence on and off antiarrhythmic drugs (AAD) with 95% confidence intervals following
838 stand-alone CMP-IV.

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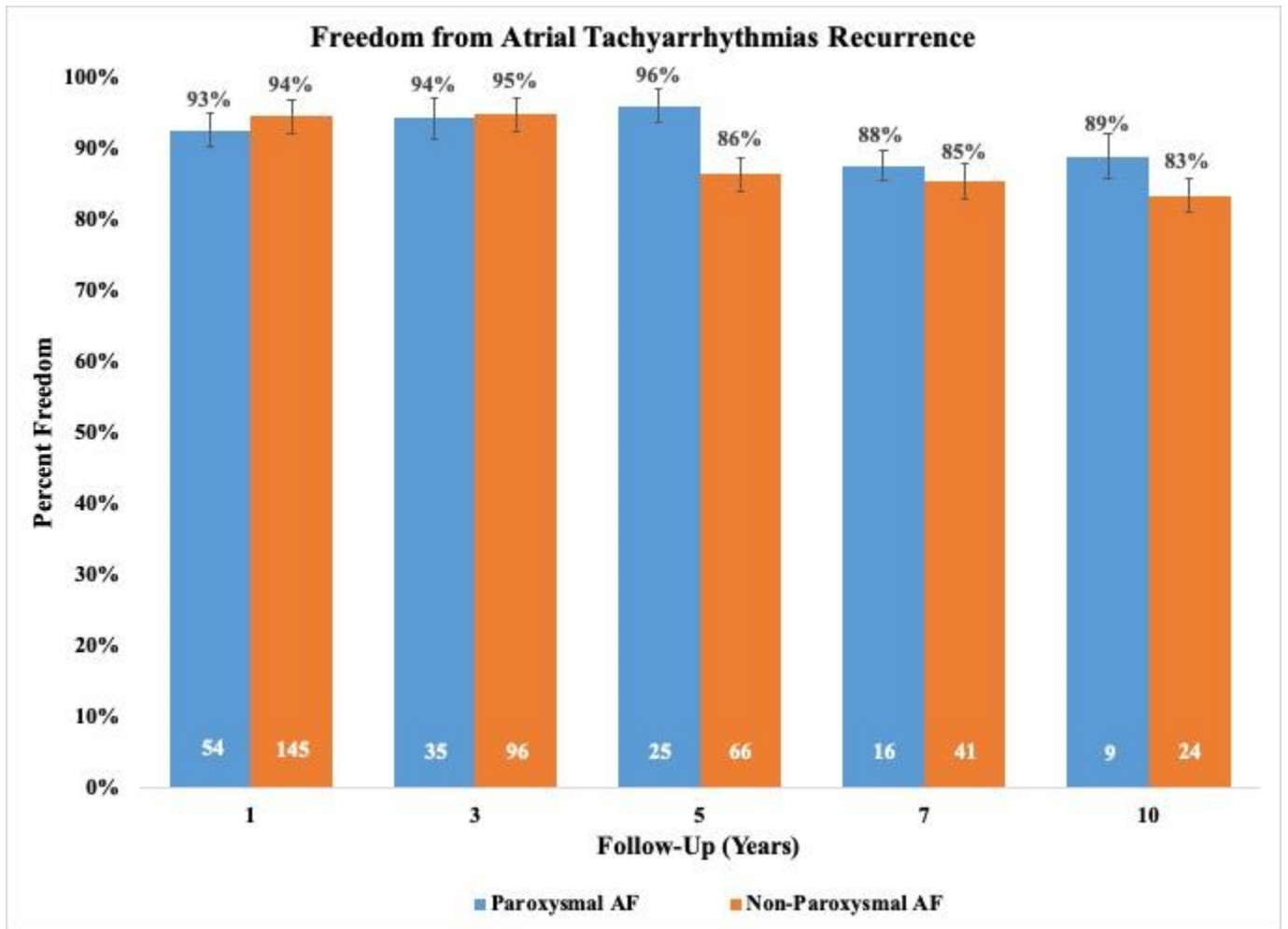
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850 **Figure E2.** Estimated survival of patients who remained in sinus rhythm (blue) and those who
851 experienced any atrial tachyarrhythmias (ATAs) recurrence (green) by Kaplan-Meier analysis
852 (Log-rank test, $P=0.021$).

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867 **Figure E3.** Freedom from atrial tachyarrhythmia (ATA) recurrence on or off antiarrhythmic
 868 drugs (AAD) with 95% confidence intervals of patients with paroxysmal (blue) vs non-
 869 paroxysmal AF (orange) following stand-alone CMP-IV.

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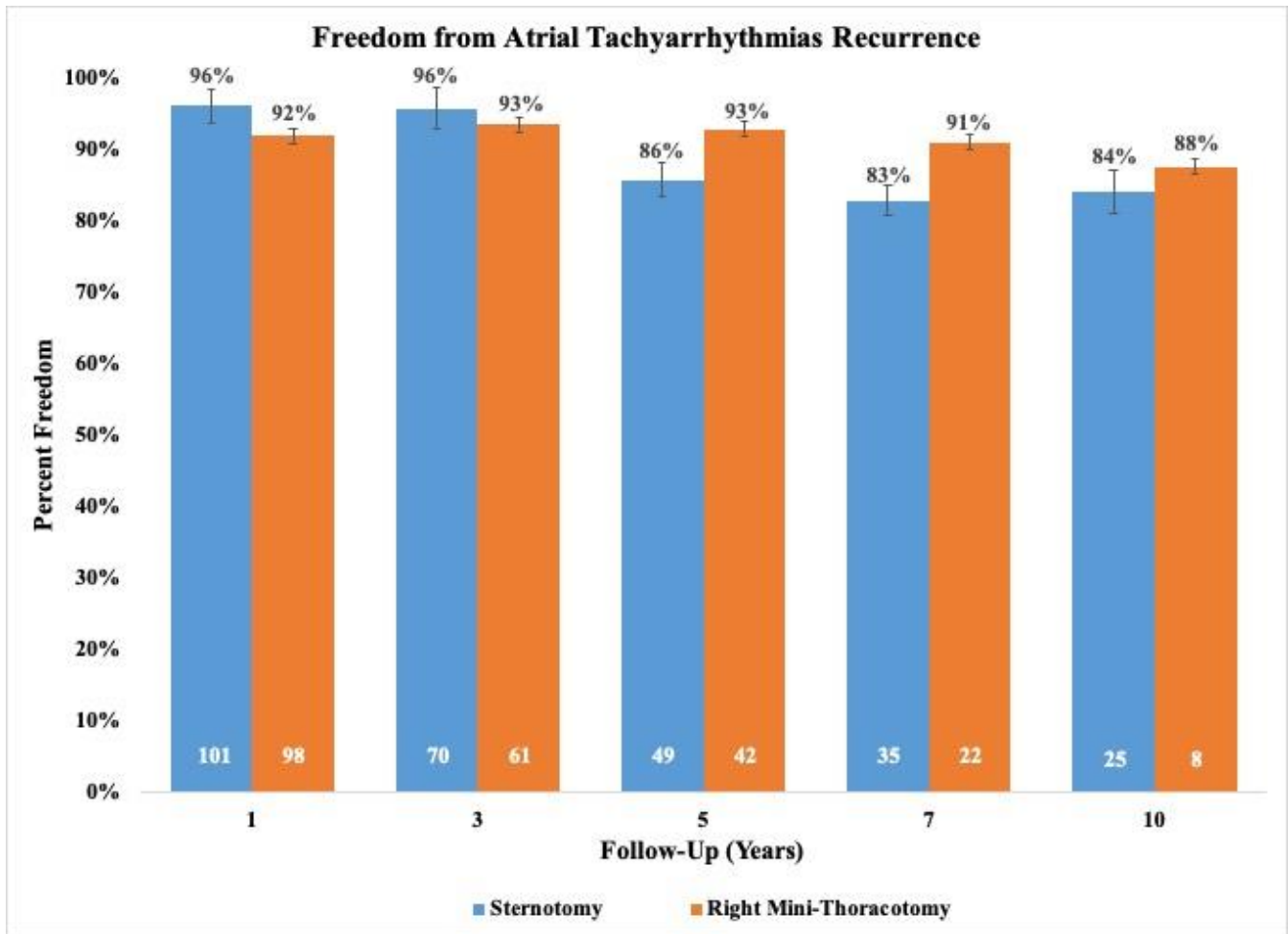
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877 **Figure E4.** Freedom from atrial tachyarrhythmia (ATA) recurrence on or off antiarrhythmic
 878 drugs (AAD) with 95% confidence intervals following stand-alone CMP-IV via median
 879 sternotomy (blue) and right mini-thoracotomy (orange).

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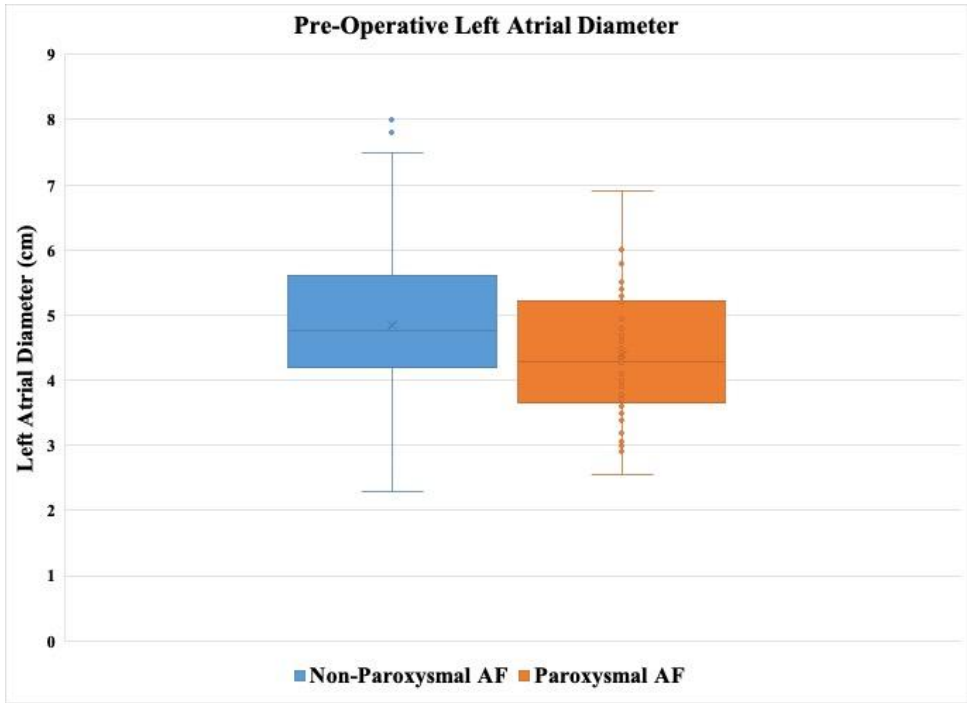
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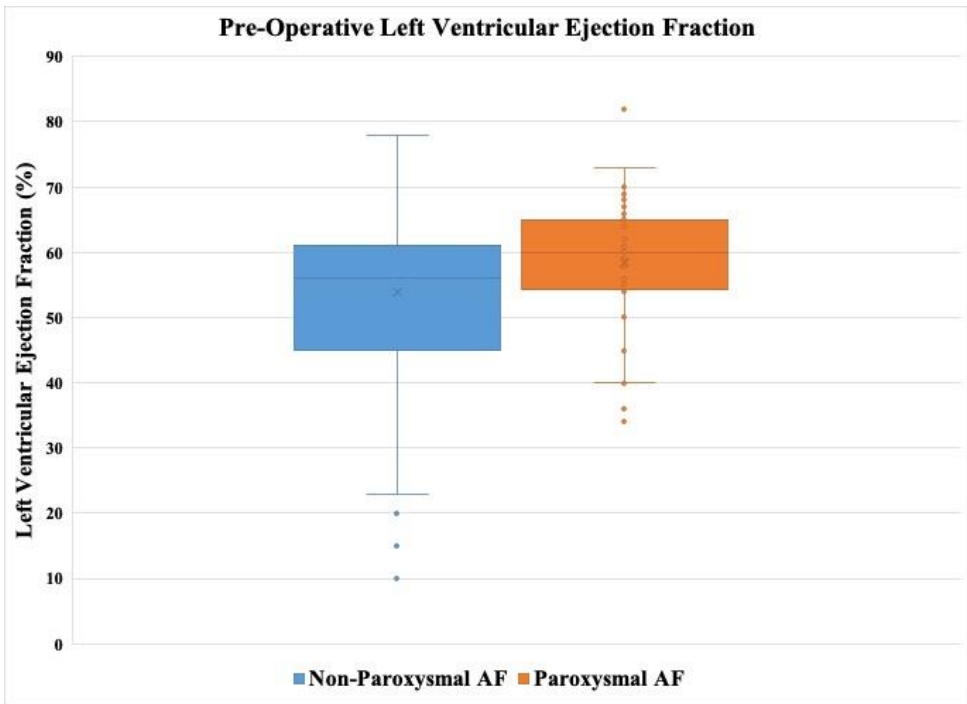
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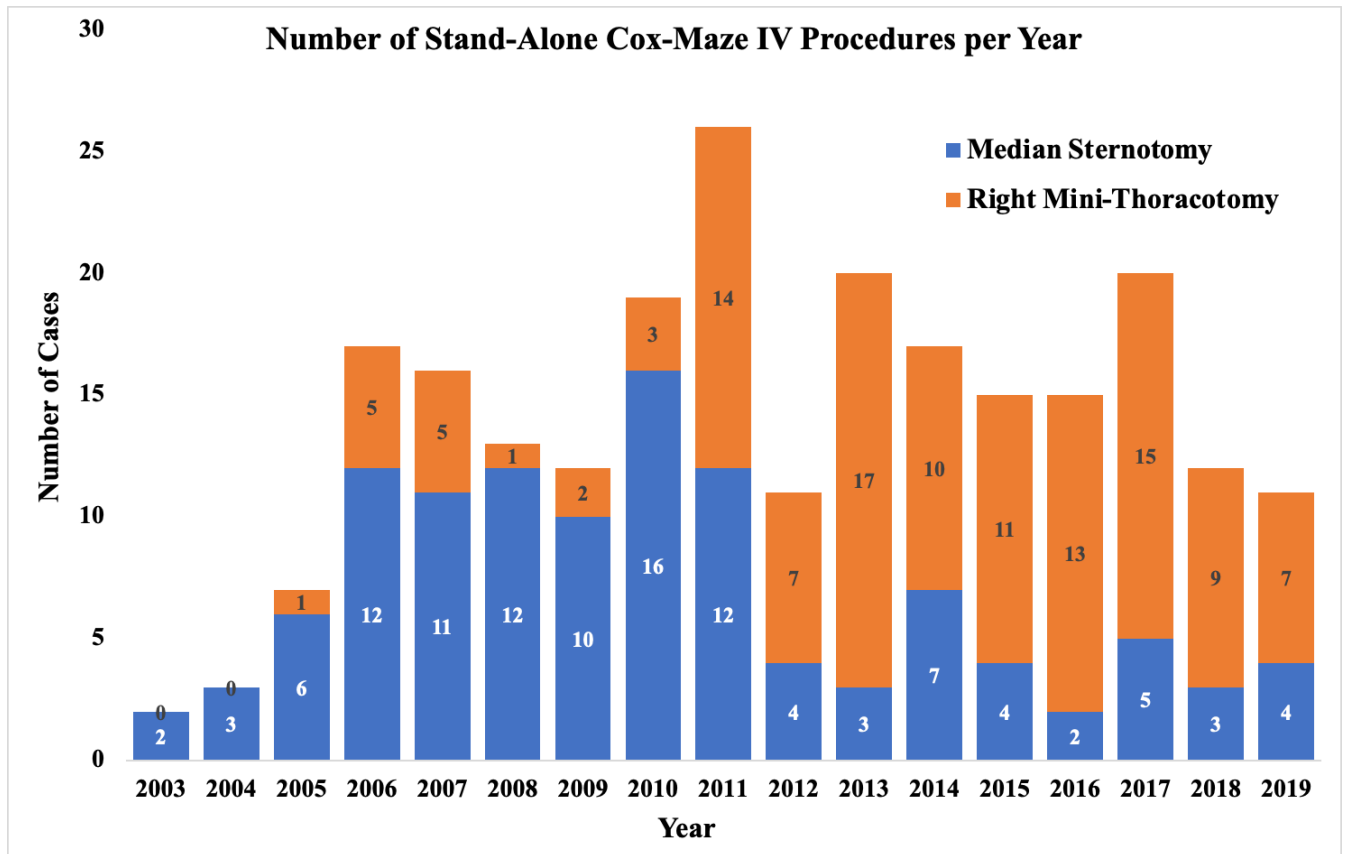
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913 **Figure E5.** Box and Whisker plots showing greater proportion of patients with larger left atrial
914 diameters ($P=0.004$) and lower left ventricular ejection fractions ($P=0.018$) in patients with non-
915 paroxysmal AF vs paroxysmal AF.



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917 **Figure E6.** Number of stand-alone Cox-Maze IV procedures performed per year over the course
 918 of the study period from 2003 to 2019. Number of cases performed by median sternotomy (blue)
 919 and right mini-thoracotomy (orange) are also included.

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928 Tables

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930 Table E1. Late Follow-Up following Stand-Alone CMP-IV

Variable	Paroxysmal AF (n = 60)	Non-Paroxysmal AF (n = 176)	P value
Follow-up (years), mean ± std	5.0 ± 3.1	4.5 ± 3.2	0.255
1 Year Follow-Up			
Variable	Paroxysmal AF (n = 54)	Non-Paroxysmal AF (n = 145)	P value
Late Stroke (> 30 days), n (%)	0 (0.0)	0 (0.0)	1.000
Freedom from Coumadin, n (%)	39 (72.2)	108 (74.4)	0.747
Additional Catheter Ablation, n (%)	0 (0.0)	0 (0.0)	1.000
5 Year Follow-Up			
Variable	Paroxysmal AF (n = 25)	Non-Paroxysmal AF (n = 66)	P value
Late Stroke (> 30 days), n (%)	0 (0.0)	0 (0.0)	1.000
Freedom from Coumadin, n (%)	19 (76.0)	43 (65.2)	0.322
Additional Catheter Ablation, n (%)	1 (4.0)	0 (0.0)	0.984
10 Year Follow-Up			
Variable	Paroxysmal AF (n = 9)	Non-Paroxysmal AF (n = 24)	P value
Late Stroke (> 30 days), n (%)	0 (0.0)	0 (0.0)	1.000
Freedom from Coumadin, n (%)	6 (66.7)	21 (87.5)	0.167
Additional Catheter Ablation, n (%)	0 (0.0)	3 (12.5)	0.849

931 AF = atrial fibrillation; STD = standard deviation

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949 **Table E2. Univariable and Multivariable Factors Associated with First ATAs Recurrence**
 950 **up to 10 Years after Stand-Alone CMP-IV (Fine-Gray Regression)**
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Variable	Univariable Analysis		Multivariable Analysis	
	P-Value	Subdistribution Hazard Ratio (95% CI)	P-Value	Subdistribution Hazard Ratio (95% CI)
Age (years)	0.279	1.02 (0.99, 1.05)	0.205	1.03 (0.99, 1.07)
Gender	0.761	0.92 (0.53, 1.59)	0.859	0.95 (0.52, 1.72)
BMI (kg/m ²)	0.325	1.02 (0.98, 1.06)	0.336	1.03 (0.98, 1.08)
Dyslipidemia	0.231	1.41 (0.81, 2.46)	0.772	1.09 (0.60, 1.97)
Hypertension	0.307	1.37 (0.75, 2.51)	0.553	1.24 (0.64, 2.39)
NYHA (Class III or IV)	0.165	1.47 (0.85, 2.55)	0.341	1.33 (0.74, 2.37)
LVEF (%)	0.997	1.00 (0.98, 1.02)	0.990	1.00 (0.98, 1.02)
Smoker	0.241	1.40 (0.80, 2.47)	0.111	1.58 (0.90, 2.77)
Non-Paroxysmal AF	0.359	0.74 (0.38, 1.42)	0.810	0.92 (0.44, 1.89)
Pre-operative Creatinine	0.872	1.10 (0.34, 3.61)	0.922	1.07 (0.26, 4.42)
LA Size (cm)	0.039	1.30 (1.01, 1.66)	0.040	1.33 (1.01, 1.76)
Number of Catheter Ablations	0.009	1.29 (1.07, 1.55)	<0.001	1.44 (1.18, 1.76)
Perfusion Time (min)	0.294	1.00 (1.00, 1.01)	0.406	1.01 (0.99, 1.02)
Sternotomy	0.669	0.89 (0.51, 1.55)	0.788	0.89 (0.35, 2.03)
Era	0.731	1.11 (0.60, 2.06)	0.419	0.75 (0.37, 1.52)

952 AF = atrial fibrillation; BMI = body mass index; CI = confidence interval; LA = left atrial; LVEF
 953 = left ventricular ejection fraction; NYHA = New York Heart Association

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976 **Table E3. Perioperative Outcomes of Patients Who Received Sternotomy vs**
 977 **Right Mini-thoracotomy**

Variable	Sternotomy (n = 116)	Right Mini- Thoracotomy (n = 120)	P value
Hospital length of stay (days), median [IQR]	10.0 [8.0,12.0]	9.0 [8.0,11.0]	0.162
ICU length of stay (hours), median [IQR]	51.5 [26.1,97.5]	44.5 [24.0,75.9]	0.317
CPB time (min), mean ± std	124.3 ± 28.3	168.4 ± 26.8	<0.001
Cross-clamp time (min), mean ± std	41.0 ± 14.9	66.9 ± 15.1	<0.001
Post-operative creatinine, mean ± std	1.59 ± 0.90	1.31 ± 0.47	0.005
Overall major complications, n (%)	7 (6.0)	6 (5.0)	0.782
Cerebrovascular accident, n (%)	2 (1.7)	1 (0.8)	
Pneumonia, n (%)	3 (2.6)	3 (2.5)	
Mediastinitis, n (%)	1 (0.9)	0 (0.0)	
Renal failure requiring dialysis, n (%)	1 (0.9)	1 (0.8)	
Intra-aortic balloon pump, n (%)	1 (0.9)	0 (0.0)	
Reoperation for bleeding, n (%)	0 (0.0)	1 (0.8)	
Post op PM, n (%)	8 (6.9)	7 (5.8)	0.794
30 Day Mortality, n (%)	0 (0.0)	0 (0.0)	1.000

978 Overall major complication rate includes pneumonia, cerebrovascular accident, mediastinitis,
 979 intra-aortic balloon pump, renal failure requiring dialysis, reoperation for bleeding. CPB =
 980 cardiopulmonary bypass; ICU = intensive care unit; IQR = interquartile range; PM = pacemaker;
 981 STD = standard deviation

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1003 **Table E4.** Percentage of patients estimated to be in each state at each year after stand-alone
 1004 CMP-IV. Patients were assumed to be in one of three distinct states: alive and free from ATAs
 1005 recurrence (composite endpoint), alive and having experienced first ATAs recurrence (CIF), or
 1006 dead before ATAs recurrence (CIF).
 1007

Year	Number at Risk	Alive and free of ATAs recurrence (composite endpoint)	First Documented ATAs recurrence (CIF)	Death (CIF)
1	187	90%	10%	0%
2	160	86%	13%	1%
3	124	82%	16%	2%
4	99	80%	17%	3%
5	85	79%	18%	3%
6	68	76%	20%	4%
7	49	73%	23%	4%
8	42	70%	26%	4%
9	26	64%	32%	4%
10	17	54%	42%	4%

1008 ATA = atrial tachyarrhythmia; CIF = cumulative incidence function
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1035 **Table E5.** Percentage of patients with paroxysmal vs non-paroxysmal AF estimated to be in each
 1036 state at each year after stand-alone CMP-IV. Patients were assumed to be in one of three distinct
 1037 states: alive and free from ATAs recurrence (composite endpoint), alive and having experienced
 1038 first ATAs recurrence (CIF), or dead before ATAs recurrence (CIF).
 1039

Year	Paroxysmal AF (n = 60)				Non-Paroxysmal AF (n = 176)			
	Number at Risk	Alive and free of ATAs recurrence (composite endpoint)	First Documented ATAs recurrence (CIF)	Death (CIF)	Number at Risk	Alive and free of ATAs recurrence (composite endpoint)	First Documented ATAs recurrence (CIF)	Death (CIF)
1	52	93%	7%	0%	135	88%	11%	1%
2	42	88%	12%	0%	118	85%	14%	1%
3	37	88%	12%	0%	87	80%	18%	2%
4	29	85%	12%	3%	70	78%	19%	3%
5	23	83%	14%	3%	62	78%	19%	3%
6	18	82%	14%	4%	50	74%	21%	5%
7	15	77%	18%	5%	34	72%	23%	5%
8	13	77%	18%	5%	29	68%	27%	5%
9	7	77%	18%	5%	19	60%	35%	5%
10	5	66%	29%	5%	12	50%	45%	5%

1040 AF = atrial fibrillation; ATA = atrial tachyarrhythmia; CIF = cumulative incidence function

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1064 **Table E6.** Percentage of patients estimated to be in each state at each year after stand-alone
 1065 CMP-IV via sternotomy vs right mini-thoracotomy. Patients were assumed to be in one of three
 1066 distinct states: alive and free from ATAs recurrence (composite endpoint), alive and having
 1067 experienced first ATAs recurrence (CIF), or dead before ATAs recurrence (CIF).
 1068

Year	Sternotomy (n = 116)				Right Mini-Thoracotomy (n = 120)			
	Number at Risk	Alive and free of ATAs recurrence (composite endpoint)	First Documented ATAs recurrence (CIF)	Death (CIF)	Number at Risk	Alive and free of ATAs recurrence (composite endpoint)	First Documented ATAs recurrence (CIF)	Death (CIF)
1	94	88%	11%	1%	93	91%	9%	0%
2	88	86%	13%	1%	72	85%	14%	1%
3	70	82%	16%	2%	54	82%	17%	1%
4	55	78%	17%	5%	44	82%	17%	1%
5	49	78%	17%	5%	36	80%	19%	1%
6	39	75%	19%	6%	29	77%	22%	1%
7	33	73%	21%	6%	16	74%	25%	1%
8	29	71%	23%	6%	13	70%	29%	1%
9	20	62%	32%	6%	6	70%	29%	1%
10	14	56%	38%	6%	3	46%	53%	1%

1069 ATA = atrial tachyarrhythmia; CIF = cumulative incidence function

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1093 **Table E7.** Patients available for follow-up during study period. Initial cohort was comprised of
 1094 236 patients who underwent stand-alone Cox-Maze IV procedure for refractory atrial
 1095 fibrillation. Patients available for follow-up include all patients available at time of data
 1096 collection (regardless of recurrence status) for each discrete timepoint. The number of deceased
 1097 patients refers to the cumulative mortality at each timepoint. Patients not available for follow-up
 1098 and not known to be deceased are displayed as censored.

Year Follow-Up	Total Patients	Patients Available	Deceased Patients	Censored Patients
1	227	191	2	34
2	201	163	6	32
3	164	131	7	26
4	140	104	9	27
5	129	91	9	29
6	98	68	11	19
7	84	57	11	16
8	70	42	12	16
9	65	33	14	18
10	60	33	14	13

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1126 **Table E8.** Freedom from tachyarrhythmias recurrence following stand-alone Cox-Maze IV
 1127 procedure derived from rhythm data collected by all monitoring modalities compared to those
 1128 only collected by prolonged monitoring. Freedom from tachyarrhythmias recurrence compared
 1129 up to 10-year follow-up.

Year	Freedom from ATAs		
	Rhythm Analysis from All Monitoring Modalities	Rhythm Analysis from Only Prolonged Monitoring	<i>P value</i>
1	94% (187/199)	94% (142/151)	0.978
2	91% (148/163)	90% (95/105)	0.930
3	95% (124/131)	97% (77/79)	0.330
4	95% (99/104)	95% (63/66)	0.937
5	89% (81/91)	88% (46/52)	0.920
6	91% (62/68)	92% (35/38)	0.709
7	86% (49/57)	79% (22/28)	0.388
8	76% (32/42)	65% (13/20)	0.356
9	76% (25/33)	68% (13/19)	0.566
10	79% (26/33)	75% (12/16)	0.766

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