

515 **Supplementary Materials**

517 **Supplementary Table 1: Comparison of Electrogram Voltages and Mapped Surface Area between**

518 **Sinus Rhythm vs Atrial Fibrillation**

Paired Voltages (mV)		Sinus Rhythm	Atrial Fibrillation	P – Value
Left Atrium		0.61 [0.20 – 1.67]	0.31 [0.10 – 0.74]	All < 0.0005
Right Atrium		0.68 [0.19 – 1.88]	0.47 [0.14 – 1.07]	
Mapped Surface Area (%)				
	LVM	7.3 ± 6.9	12.2 ± 9.5	
Left Atrium	IVM	41.0 ± 12.1	50.5 ± 10.0	< 0.0005
	NVM	51.7 ± 17.2	37.3 ± 16.1	
	LVM	6.5 ± 5.3	8.4 ± 8.3	
Right Atrium	IVM	42.0 ± 10.1	44.6 ± 6.9	0.62
	NVM	51.5 ± 13.6	47.0 ± 13.8	

520 Data is mean ± standard deviation or median [lower quartile – upper quartile]. IVM: Intermediate voltage myocardium;
 521 LVM: Low voltage myocardium; mV: Millivolts; NVM: Normal voltage myocardium

525 **Supplementary Table 2: Comparison of Electrogram Voltages and Mapped Surface Area between**

526 **Paroxysmal and Persistent Atrial Fibrillation**

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Global Voltages (mV)		Paroxysmal	Persistent	P – Value
Left Atrium	Bipolar	1.13 [0.39 – 2.93]	0.52 [0.16 – 1.49]	All < 0.0005
Right Atrium	Bipolar	0.93 [0.24 – 2.46]	0.57 [0.17 – 1.69]	
Mapped Surface Area (%)				
	LVM	0.7 ± 0.7	6.6 ± 6.8	
Left Atrium	IVM	32.0 ± 10.6	43.1 ± 11.4	0.01
	NVM	67.3 ± 11.0	50.3 ± 16.4	
	LVM	1.6 ± 1.3	6.5 ± 5.3	
Right Atrium	IVM	35.7 ± 10.1	42.0 ± 10.1	0.04
	NVM	62.7 ± 12.1	51.5 ± 13.6	

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Data is mean ± standard deviation or median [lower quartile – upper quartile]. Maps were taken in sinus rhythm with proximal coronary sinus pacing. IVM: Intermediate voltage myocardium; LVM: Low voltage myocardium; mV: Millivolts; NVM: Normal voltage myocardium

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532 **Supplementary Table 3: Comparisons of Electrogram Voltages between Atria using Generalised**

533 **Linear Mixed Modelling**

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Voltages (mV)		Left Atrium	Right Atrium	LA/RA	95% Confidence Interval	Random Factor P-Value
Paroxysmal	SR Bipolar	0.93 [0.34 – 2.40]	0.93 [0.24 – 2.46]	1.06	1.05 – 1.07	0.06
	SR Bipolar	0.50 [0.15 – 1.40]	0.57 [0.17 – 1.69]	0.78	0.77 – 0.79	0.02
Persistent	AF Bipolar	0.40 [0.14 – 0.90]	0.47 [0.13 – 1.18]	0.70	0.69 – 0.71	0.03

535 Data is median [lower quartile – upper quartile]. Dependent variable = Electrogram amplitude, Fixed Factor = Left atrium
 536 referenced to right atrium; Random factor = Patient. The model used a gamma distribution with logarithmic link function.
 537 LA/RA is calculated from converting unstandardised β co-efficient

538 AF: Atrial Fibrillation; LA: Left Atrium; mV: Millivolts; RA: Right Atrium; SR: Sinus Rhythm.

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541 **Supplementary Table 4: Comparison of Mapped Surface Area between Atria**

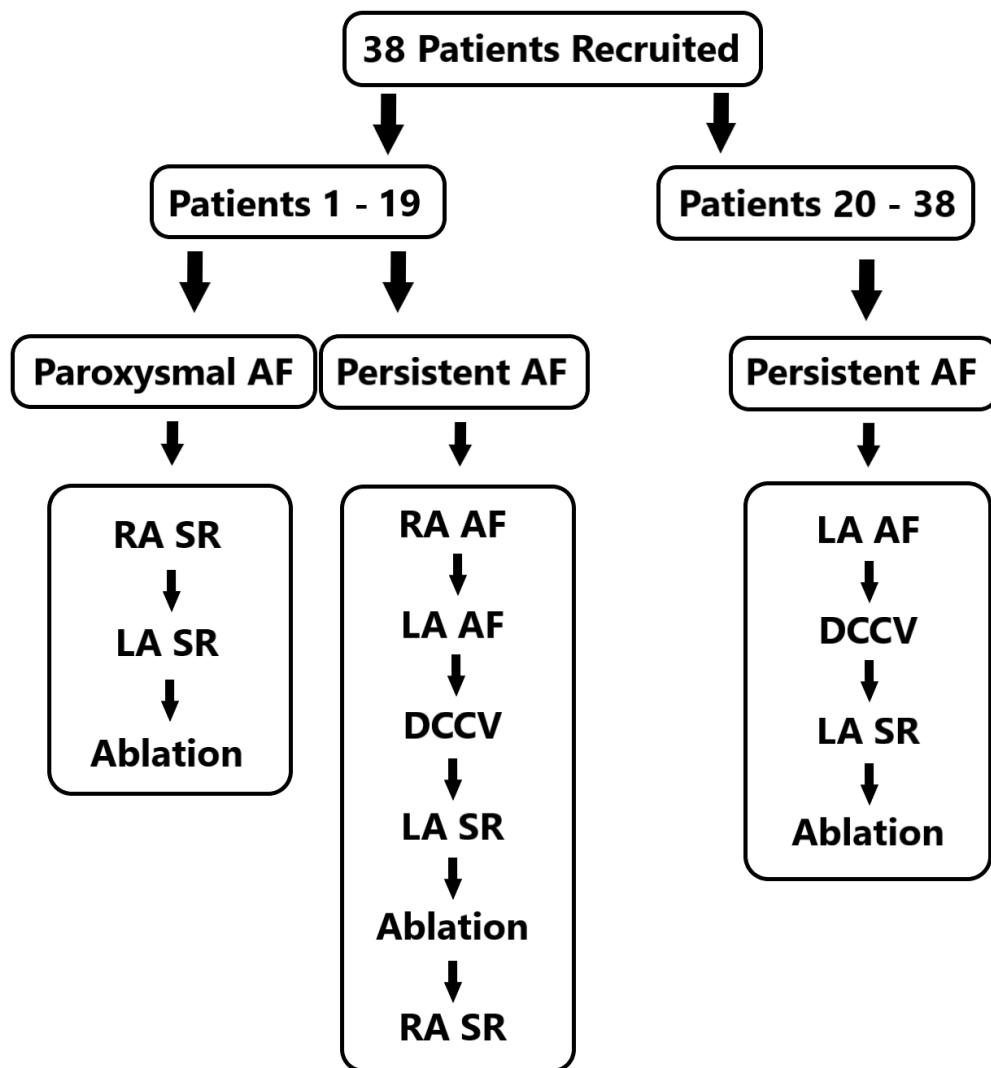
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Mapped Surface Area (%)		Left Atrium	Right Atrium	P-Value
All (n = 17)	LVM	4.0 ± 6.3	5.6 ± 4.6	0.26
	IVM	38.4 ± 14.0	37.6 ± 10.7	
	NVM	57.5 ± 18.4	56.8 ± 13.8	
Paroxysmal (n = 8)	LVM	0.7 ± 0.7	1.6 ± 1.3	0.08
	IVM	32.0 ± 10.6	35.7 ± 10.1	
	NVM	67.3 ± 11.0	62.7 ± 12.1	
Persistent (n = 9)	LVM	7.0 ± 7.6	6.5 ± 5.3	0.91
	IVM	44.1 ± 14.7	42.0 ± 10.1	
	NVM	48.9 ± 19.9	51.5 ± 13.6	

543 Data is mean ± standard deviation. Maps were taken in sinus rhythm with proximal coronary sinus pacing. IVM:
 544 Intermediate voltage myocardium; LVM: Low voltage myocardium; mV: Millivolts; NVM: Normal voltage myocardium

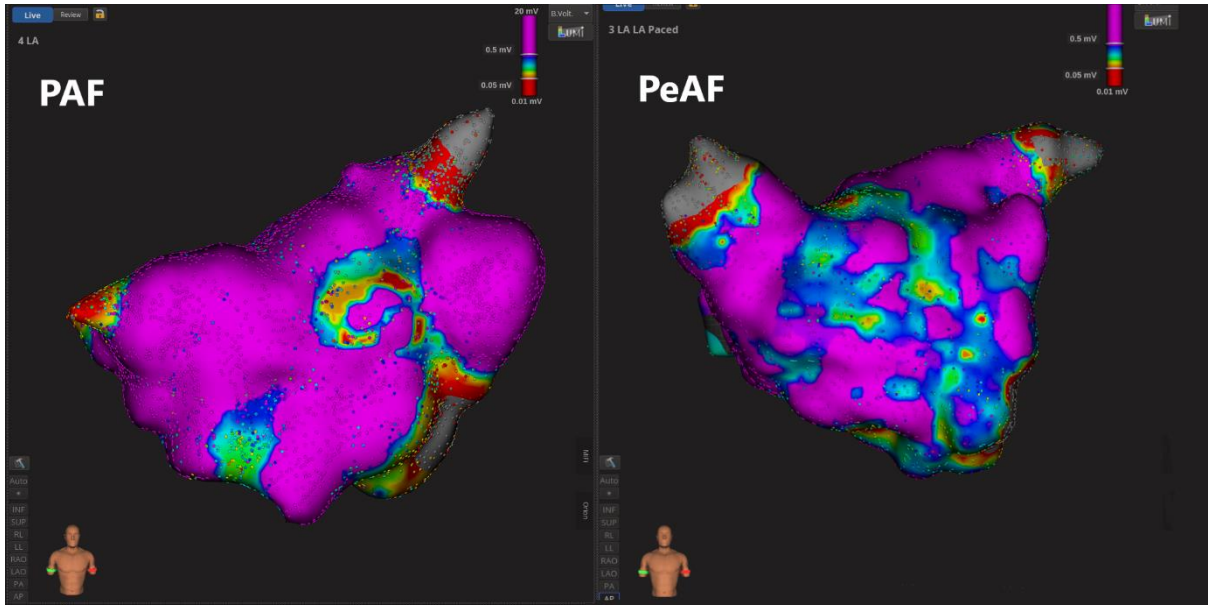
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Supplementary Materials Figure 1.

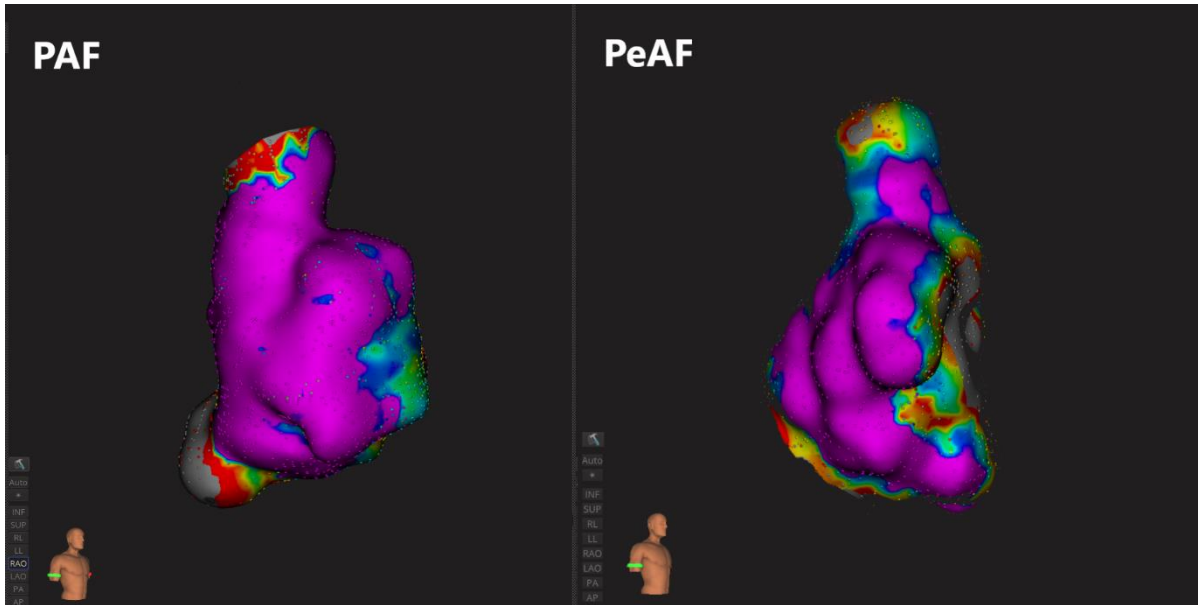
Study mapping protocol. AF = Atrial fibrillation; DCCV = Direct current cardioversion; LA = Left atrium; SR = Sinus rhythm; RA = Right atrium.



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Supplementary Materials Figure 2.

An example of 3D electroanatomical maps of the left atrium in patients with paroxysmal (PAF) and persistent atrial fibrillation (PeAF)



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Supplementary Materials Figure 3.

An example of 3D electroanatomical maps of the right atrium in patients with paroxysmal (PAF) and persistent atrial fibrillation (PeAF)