Table S1: Summary of assessed OSA screening tools.

Clinical Screening Tool	**Description**	**Previously Validated Against PSG in an AF Cohort?**
Level 1 Sleep Study (Polysomnography)	Diagnostic montage of biological channels performed overnight in a laboratory setting; includes: EEG, EOG, EMG, ECG, airflow, air pressure, respiratory and abdominal effort, SaO2, HR, limb movement, snore probe, position sensor	Gold standard investigation
Self-reported Snoring	Presence of snoring as reported by the patient or patient's bed partner	No
Obesity	BMI $\geq$ 30 kg/m^2	No
Modified Malampatti Score	Visual assessment of airway crowding performed with the patient sitting directly opposite the examiner, mouth open and tongue maximally protruded. Class 1: Faucial pillars, soft palate and uvula visible; Class II: Faucial pillars and soft palate visible. Uvula obscured by tongue; Class 3: Only the soft palate is visible; Class IV: Soft palate not visible (1).	No
Epworth Sleepiness Scale (ESS)	Validated self-administered questionnaire of 8 questions in which the patient is asked to rank their usual chances of falling asleep or dozing in a series of daytime scenarios. Each question is subjectively scored from 0 -3, for a maximum overall score of 24, minimum of 0 (2). A score $\geq$11 indicates excessive daytime somnolence.	Yes, in on prospective cohort and one retrospective analysis of prospectively collected data. ESS very poorly predicted sleep disordered breathing for all levels of OSA severity (AUC: 0.48-0.56) (3), and moderate OSA only (AUC 0.50) (4).
Stop Bang Score	Validated questionnaire of 8 dichotomous variables related to OSA: snoring, tiredness, observed apnea, high BP, BMI, age, neck circumference and male gender. Score of 0-2 – low risk for moderate to severe OSA (AHI $\geq$ 15/hr), score of 5 – 8 = high risk of moderate to severe OSA (AHI $\geq$ 15/hr) (5).	Yes, with fair diagnostic accuracy for moderate OSA in one study (AUC 0.75, CI 0.66 – 0.86) (4).
Berlin questionnaire	Validated questionnaire assessing three domains: snoring, daytime somnolence or fatigue and obesity or hypertension. Positive responses in 2 out of 3 domains confer a "high risk" score (6).	Yes, with poor diagnostic accuracy for moderate OSA only (AUC 0.64, CI 0.52 – 0.75) (4). Also assessed in small subsets of AF patients in two validation studies: (n=44), Sensitivity 86%, Specificity 89% (7), (n=30), Sensitivity 100%, Specificity 30% (8).
Level 3 sleep study, also known as polygraphy	Portable sleep study device including at least 4 channels, usually airflow, respiratory effort via thoracic band, oximetry and heart rate.	No

Clinical Screening Tool	Description	Previously Validated Against PSG in an AF Cohort?
Level 3 sleep study derived Apnoea Hypopnea Index (AHI)	Number of apneas and hypopneas per hour of recording time. Scoring of events may be via automated software or can be manually scored by a trained technician.	No
Level 3 sleep study derived Oxygen desaturation Index (ODI)	Number of oxygen desaturations from baseline, usually a drop of ≥ 3%.	No, ODI from a home-based test has not previously been assessed. ODI derived from laboratory PSG has previously been assessed in an AF cohort, with a 91% sensitivity and 83% specificity to detect moderate to severe OSA (AHI ≥ 15/hr) using a cut-off value of 4.1/hr, AUC 0.951, 95% CI: 0.929-0.972 (9)

EEG: Electro-encephalogram, EOG: Electro-oculogram, EMG: Electromyogram, ECG: Electrocardiogram, AHI: Apnea Hypopnea Index, ODI: Oxygen Desaturation Index.

Table S2: Baseline characteristics of AF patients by recruitment stream (ER presentations vs PVI waitlist).

Characteristic	N (%) or Mean ± SD			
	Total n = 107	**ED presentation n = 58**	**PVI waitlist n = 49**	**p Value**
General Demographics				
Age (years)	61.3 ± 11.7	62.7 ± 12.5	59.7 ± 10.4	0.181
Male	70 (65.4)	33 (56.9)	37 (75.5)	0.044*
Ethnicity: Caucasian	99 (92.5)	53 (91.4%)	46 (93.9%)	0.624
Phenotypic Characteristics				
BMI (kg/m^2)	27.2 ± 4.2	26.6 ± 4.0	27.8 ± 4.3	0.142
Neck Circumference (cm), n = 105	40.0 ± 4.7	39.2 ± 4.8	41.0 ± 4.5	0.050*
Modified Malampatti Score (n=106)	2.7 ± 0.9	2.7 ± 0.8	2.7 ± 0.9	0.761
OSA Symptoms				
ESS	6.1 (3.4)	5.6 ± 3.5	6.4 ± 3.3	0.328
Self-reported Snoring	69 (64.5)	35 (60.3)	34 69.4)	0.330
Co-morbidities/AF risk factors				
Alcohol Excess (≥10 standard drinks/week), n = 105	26 (24.2)	12 (20.7)	14 (28.6)	0.295
Thyroid disease	17 (15.9)	11 (19.0)	6 (12.2)	0.366
Family history of AF	33 (30.8)	12 (20.7)	21 (42.9)	0.033*
Mod-severe MS/Prosthetic heart valve	3 (2.8)	2 (3.4)	1 (2.0)	0.660
Hypertension	44 (41.1)	26 (44.8)	18 (36.7)	0.397
Diabetes	5 (4.7)	1 (1.7)	4 (8.2)	0.116
IHD	5 (4.7)	2 (3.4)	3 (6.1)	0.514
CCF	18 (16.8)	11 (19.0)	7 (14.3)	0.519
Cerebrovascular Disease	2 (1.8)	0 (0)	2 (4.1)	0.120
Peripheral Vascular disease	3 (2.8)	2 (3.4)	1 (2.0)	0.660
CHA_2DS_2-Vasc Score	1.6 ± 1.3	1.8 ± 1.3	1.4 ± 1.2	0.044*
AF characteristics				
Paroxysmal (cf persistent/permanent)	102 (95.3)	55 (94.8)	47 (95.9)	0.790
Persistent/Permanent	5 (4.7)	3 (5.2)	2 (4.1)	0.790
High burden (≥ 10 episodes AF in the last 12M)	34 (31.8)	10 (17.2)	24 (49.0)	< 0.001*
Anti-arrhythmic therapy	88 (82.2)	48 (82.8)	40 (81.6)	0.879
Anti-coagulant therapy	87 (81.3)	46 (79.3)	41 (83.7)	0.564
Echocardiographic parameters				
Cardiac Ejection Fraction (%) (n=79)	57.5 ± 8.6	56.6 ± 9.2	58.1 ± 7.9	0.429
Left atrial diameter (cm) (n=57)	4.1 ± 0.6	4.1 ± 0.7	4.1 ± 0.6	0.683
Left atrial area (cm^2) (n=50)	24.3 ± 5.2	23.3 ± 4.1	25.1 ± 5.8	0.236
Questionnaires				
Berlin Questionnaire “high risk” (n=106)	44 (41.5)	27 (46.6)	17 (34.7)	0.282
Stop Bang Questionnaire score	3.5 ± 1.7	3.4 ± 1.7	3.7 ± 1.6	0.345
Sleep Parameters: all derived from PSG				
AHI	13.5 ± 15.5	12.6 ± 13.2	14.4 ± 17.6	0.564

Characteristic	N (%) or Mean ± SD			
	Total n = 107	**ED presentation n = 58**	**PVI waitlist n = 49**	**p Value**
ODI	7.1 ± 10.6	7.1 ± 10.8	7.1 ± 10.6	0.988
CAI	0.6 ± 1.5	0.6 ± 1.5	0.5 ± 1.5	0.656
Moderate to Severe OSA (AHI > 15/hr)	33 (30.8)	18 (31.0)	15 (30.1)	0.962

AHI: Apnea Hypopnea Index, BMI: Body Mass Index, CAI: Central Apnea Index, CCF: Congestive Cardiac Failure, ER: Emergency Room, ESS: Epworth Sleepiness Scale, IHD: Ischemic Heart Disease, MS: Mitral Stenosis, ODI: Oxygen desaturation index, PVI: Pulmonary Vein Isolation procedure waitlist, SD: Standard deviation.

Table S3: Baseline characteristics of AF patients with and without OSA (AHI ≥ 5/hr).

Characteristic	N (%) or Mean ± SD			
	Total (n = 107)	**OSA absent (AHI < 5/h) n = 40 (37.3%)**	**Any OSA (AHI ≥5/h) n = 67 (62.6%)**	**p Value**
General Demographics				
Recruitment stream: ER	58 (54.2)	21 (52.5)	37 (55.2)	0.470
Age (years)	61.3 ± 11.7	58.2 ± 13.0	63.15 ± 10.5	0.047*
Male	70 (65.4)	22 (55.0)	48 (71.6)	0.080
Ethnicity: Caucasian	99 (92.5)	38 (95.0)	61 (91.0)	0.323
Phenotypic Characteristics				
BMI (kg/m^2)	27.2 ± 4.2	25.0 ± 3.5	28.5 ± 4.0	< 0.001*
Neck Circumference (cm), n = 105	40.0 ± 4.7	39.0 ± 4.5	40.7 ± 4.8	0.078
Modified Malampatti Score (n=106)	2.7 ± 0.9	2.4 ± 1.0	2.9 ± 0.8	0.009*
OSA Symptoms				
ESS	6.1 (3.4)	5.5 ± 3.8	6.4 ± 3.2	0.195
Self-reported Snoring	69 (64.5)	18 (45.0)	51 (76.2)	0.002*
Co-morbidities/AF risk factors				
Alcohol Excess (≥10 standard drinks/week), n = 105	26 (24.2)	13 (32.5)	13 (23.6)	0.191
Thyroid disease	17 (15.9)	12 (30.0)	5 (7.5)	0.003*
Family history of AF	33 (30.8)	15 (37.5)	18 (26.9)	0.141
Mod-severe MS/Prosthetic heart valve	3 (2.8)	0 (0)	3 (4.5)	0.337
Hypertension	44 (41.1)	10 (25.0)	34 (50.7)	0.009*
Diabetes	5 (4.7)	2 (5.0)	3 (4.5)	0.901
IHD	5 (4.7)	1 (2.5)	4 (6%)	0.411
CCF	18 (16.8)	5 (12.5)	13 (19%)	0.356
Cerebrovascular Disease	2 (1.8)	0 (0)	2 (3.0)	0.27
Peripheral Vascular disease	3 (2.8)	3 (7.5)	0 (0)	0.023*
CHA_2DS_2-Vasc Score	1.6 ± 1.3	1.4 ± 1.1	1.8 ± 1.4	0.115
AF characteristics				
Paroxysmal	102 (95.3)	40 (100.0)	62 (92.5)	0.091
Persistent/Permanent	5 (4.7)	0 (0)	5 (7.5)	0.091
High burden (≥ 10 episodes AF in the last 12M)	34 (31.8)	9 (22.5)	25 (37.3)	0.111
Anti-arrhythmic therapy	88 (82.2)	34 (85.0)	54 (80.6)	0.564
Anti-coagulant therapy	87 (81.3)	33 (82.5)	54 (80.6)	0.807
Echocardiographic parameters				
Cardiac Ejection Fraction (%) (n=79)	57.5 ± 8.6	59.7 ± 5.7	56.1 ± 9.7	0.075
Left atrial diameter (cm) (n=57)	4.1 ± 0.6	4.0 ± 5.3	4.2 ± 6.8	0.188
Left atrial area (cm^2) (n=50)	24.3 ± 5.2	22.7 ± 4.9	25.6 ± 5.2	0.048*
Questionnaires				
Berlin Questionnaire “high risk” (n=106)	44 (41.5)	8 (20.0)	36 (53.7)	0.002*
Stop Bang Questionnaire	3.5 ± 1.7	2.8 ± 1.7	4.0 ± 1.8	0.001*

Characteristic	N (%) or Mean ± SD			
	Total (n = 107)	**OSA absent (AHI < 5/h) n = 40 (37.3%)**	**Any OSA (AHI ≥5/h) n = 67 (62.6%)**	**p Value**
Sleep Parameters: all derived from PSG				
AHI	13.5 ± 15.5	1.8 ± 1.4	20.4 ± 15.8	< 0.001*
ODI	7.1 ± 10.6	0.6 ± 0.7	11.0 ± 11.8	< 0.001*
CAI	0.6 ± 1.5	0.1	0.8	0.016*

AHI: Apnea Hypopnea Index, BMI: Body Mass Index, CAI: Central Apnea Index, CCF: Congestive Cardiac Failure, ER: Emergency Room, ESS: Epworth Sleepiness Scale, IHD: Ischemic Heart Disease, MS: Mitral Stenosis, ODI: Oxygen desaturation index, PVI: Pulmonary Vein Isolation procedure waitlist, SD: Standard deviation.

Table S4: Baseline characteristics of AF patients with and without severe OSA (AHI ≥ 30/hr).

Characteristic	N (%) or Mean ± SD			
	Total (n = 107)	**AHI < 30/h n = 94**	**AHI ≥ 30/h n = 13**	**p Value**
General Demographics				
Recruitment stream: ED	58 (54.2)	52 (55.3)	6 (46.1)	0.371
Age (years)	61.3 ± 11.7	61.2 ± 11.6	62.0 ± 12.4	0.823
Male	70 (65.4)	58 (61.7)	12 (92.3)	0.024*
Ethnicity: Caucasian	99 (92.5)	86 (91.5)	13 (100.0)	0.977
Phenotypic Characteristics				
BMI (kg/m^2)	27.2 ± 4.2	26.4 ± 3.6	32.8 ± 4.0	<0.001*
Neck Circumference (cm), n = 105	40.0 ± 4.7	39.3 ± 4.1	45.8 ± 5.5	0.002*
Modified Malampatti Score (n=106)	2.7 ± 0.9	2.6 ± 0.9	3.1 ± 0.6	0.085
OSA Symptoms				
ESS	6.1 (3.4)	6.0 ± 3.5	6.5 ± 2.8	0.528
Self-reported Snoring	69 (64.5)	59 (62.8)	10 (76.9)	0.250
Co-morbidities/AF risk factors				
Alcohol Excess (≥10 standard drinks/week), n = 105	26 (24.2)	23 (25.0)	3 (23.1)	0.859
Thyroid disease	17 (15.9)	16 (17.0)	1 (7.7)	0.634
Family history of AF	33 (30.8)	31 (33.0)	2 (1.5)	0.089
Mod-severe MS/Prosthetic heart valve	3 (2.8)	2 (2.1)	1 (7.7)	0.364
Hypertension	44 (41.1)	35 (37.2)	9 (69.2)	0.028*
Diabetes	5 (4.7)	4 (4.3)	1 (7.7)	0.582
IHD	5 (4.7)	4 (4.3)	1 (7.7)	0.582
CCF	18 (16.8)	13 (13.8)	5 (38.4)	0.042*
Cerebrovascular Disease	2 (1.8)	2 (2.1)	0 (0)	0.771
Peripheral Vascular disease	3 (2.8)	3 (3.2)	0 (0)	0.675
CHA_2DS_2-Vasc Score	1.6 ± 1.3	1.6 ± 1.3	1.9 ± 1.2	0.341
AF characteristics				
Paroxysmal (cf persistent/permanent)	102 (95.3)	92 (97.9)	10 (76.9)	0.012*
Persistent/Permanent	5 (4.7)	2 (2.1)	3 (23.1)	0.012*
High burden (≥ 10 episodes AF in the last 12M)	34 (31.8)	31 (33.0)	3 (23.0)	0.074
Anti-arrhythmic therapy	88 (82.2)	78 (83.0)	10 (76.9)	0.416
Anti-coagulant therapy	87 (81.3)	75 (79.8)	12 (92.3)	0.252
Echocardiographic parameters				
Cardiac Ejection Fraction (%) (n=79)	57.5 ± 8.6	57.9 ± 8.2	54.5 ± 11.2	0.244
Left atrial diameter (cm) (n=57)	4.1 ± 0.6	4.0 ± 0.6	4.6 ± 0.7	0.014*
Left atrial area (cm^2) (n=50)	24.3 ± 5.2	23.9 ± 5.0	28.4 ± 6.1	0.064
Questionnaires				
Berlin Questionnaire “high risk” (n=106)	44 (41.5)	34 (36.2)	10 (76.9)	0.020*
Stop Bang Questionnaire	3.5 ± 1.7	3.8 ± 1.5	5.2 ± 1.6	0.001*
Sleep Parameters: all derived from PSG				
AHI	13.5 ± 15.5	8.7 ± 7.9	47.7 ± 13.2	<0.001*

Characteristic	N (%) or Mean ± SD			
	Total (n = 107)	AHI < 30/h n = 94	AHI ≥ 30/h n = 13	p Value
ODI	7.1 ± 10.6	3.6 ± 4.2	32.3 ± 8.9	<0.001*
CAI	0.6 ± 1.5	0.3 ± 0.9	2.3 ± 3.2	<0.001*

AHI: Apnea Hypopnea Index, BMI: Body Mass Index, CAI: Central Apnea Index, CCF: Congestive Cardiac Failure, ER: Emergency Department, ESS: Epworth Sleepiness Scale, IHD: Ischemic Heart Disease, MS: Mitral Stenosis, ODI: Oxygen desaturation index, PVI: Pulmonary Vein Isolation procedure waitlist, SD: Standard deviation

Figure S1: Patient-centered paired Visual Analogue Scales were used to evaluate the patient's subjective assessment of In-laboratory Polysomnography Vs a Level 3 Portable Sleep Study Device.

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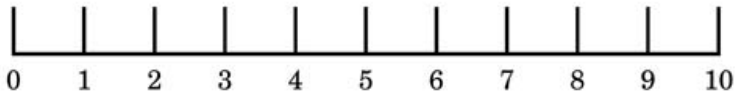
Patient Feedback Form

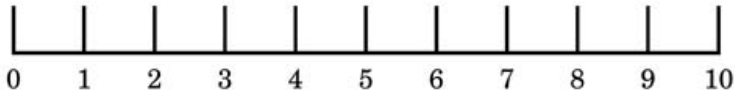
Please answer the following questions with regards to your in-hospital Sleep Study (Polysomnography):

On a scale from 1 to 10, how **comfortable** did you find the in-hospital sleep study?



Not comfortable Neutral Very comfortable

On a scale from 1 to 10, how **convenient** did you find the in-hospital sleep study?

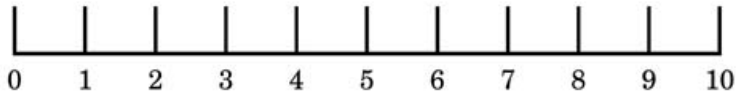


Not convenient Neutral Very convenient

On a scale from 1 to 10, how **closely** did your sleep pattern on the in-hospital study night match your normal sleep pattern at home?

Not close to normal sleep Neutral Very close to normal sleep

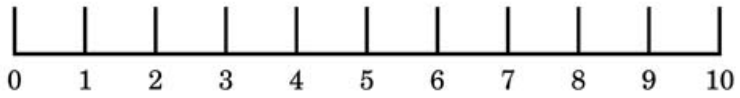
On a scale from 1 to 10, how **confident** were you in the results from the in-hospital sleep study?



Not confident Neutral Very confident

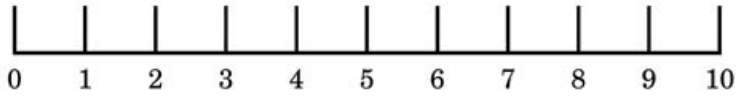
Please answer the following questions with regards to your at-home Sleep Study (ApneaLink):

On a scale from 1 to 10, how **comfortable** did you find the at-home sleep study?



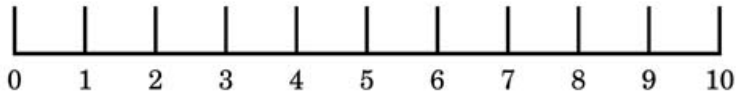
Not comfortable Neutral Very comfortable

On a scale from 1 to 10, how **convenient** did you find the at-home sleep study?



Not convenient Neutral Very convenient

On a scale from 1 to 10, how **closely** did your sleep pattern on the at-home study night match your normal sleep pattern at home?



Not close to normal sleep Neutral Very close to normal sleep

On a scale from 1 to 10, how **confident** were you in the results from the at- home sleep study?

Not confident Neutral Very confident

Overall, which sleep test did you prefer?

☐ In-hospital study (Polysomnography)

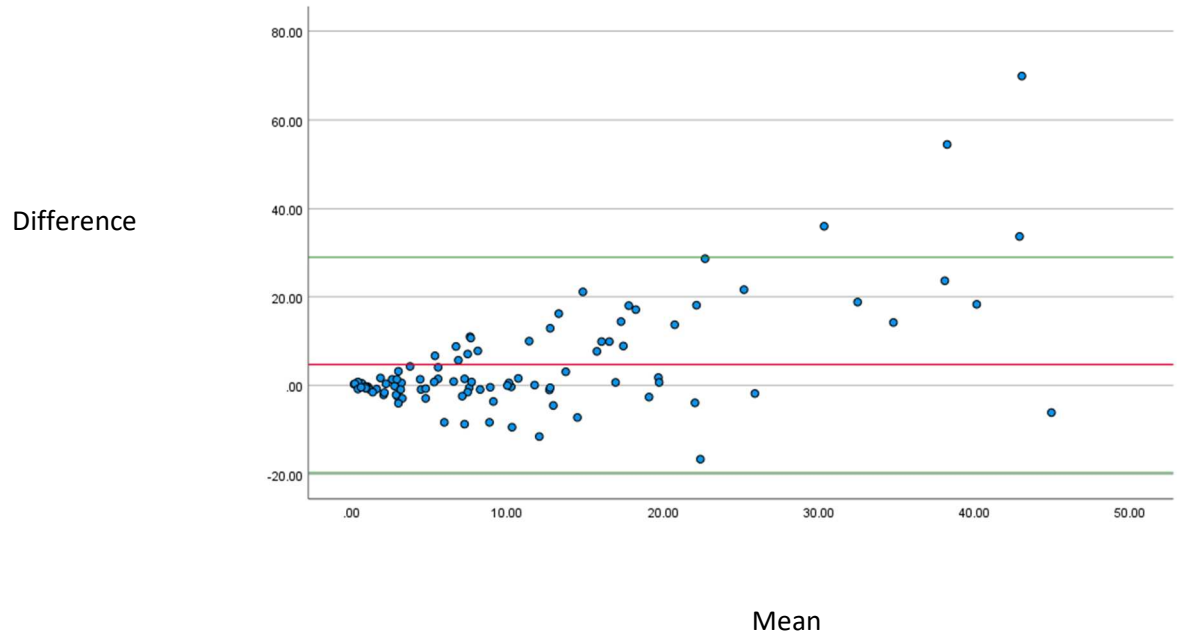
☐ At-home study (ApneaLink)

☐ Neither

☐ Either

Why?
Do you have any other comments?

Figure S2: Bland Altman plot comparing PSG derived AHI with ApneaLink derived AHI.



Red reference line: mean difference, Green reference lines: 95% confidence interval of mean difference upper and lower bounds. AHI: Apnea Hypopnea Index, PSG: polysomnography.

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