## ONLINE APPENDIX

Thacker EL, McKnight B, Psaty BM, et al. Association of body mass index, diabetes, hypertension, and blood pressure levels with risk of permanent atrial fibrillation

- eTable 1. Baseline characteristics of Group Health enrollees followed for recurrent AF
- eTable 2. Distributions of survival times by BMI categories and outcome status
- eTable 3. Hazard ratios of permanent AF for different definitions of permanent AF
- eTable 4. Hazard ratios of recurrent AF
- **eFigure 1.** Examples of participant timelines showing recurrent and permanent AF outcomes

eTable 1. Baseline characteristics of Group Health enrollees followed for recurrent AF

Characteristic*	N = 1,517
Demographic characteristics	,
Age, y, mean (SD)	69.4 (11.1)
Male, N (%)	788 (51.9)
White race, N (%)	1,399 (92.5)
Group Health enrollment, y, mean (SD)	21.7 (13.5)
Location of initial AF diagnosis	,
Outpatient, N (%)	483 (32.2)
Urgent care, N (%)	165 (11.0)
Emergency department, N (%)	610 (40.7)
Inpatient, N (%)	217 (14.5)
Other, N (%)	23 (1.5)
Most severe symptom present at initial AF diagnosis†	,
Loss of consciousness, N (%)	33 (2.3)
Heart failure, N (%)	124 (8. <del>8</del> )
Chest pain, N (%)	304 (21.5)
Shortness of breath, N (%)	240 (17.0)
Mental status change, N (%)	19 (1.3) <sup>′</sup>
Dizziness, N (%)	126 (8.9)
Palpitations, N (%)	289 (20.5)
Other, N (%)	74 (5.2)
No symptoms, N (%)	204 (14.4)
Clinical characteristics	, ,
Body weight, kg, mean (SD)	87.5 (22.5)
	171.4 (10.2)
Height, cm, mean (SD) Body mass index, kg/m <sup>2</sup> , mean (SD)	29.7 (7.1)
18.5 – 24.9 (normal), N (%)	387 (25.5)
25.0 – 29.9 (overweight), N (%)	547 (36.1)
30.0 – 34.9 (obese 1), N (%)	319 (21.0)
35.0 – 39.9 (obese 2), N (%)	135 (8.9)
≥ 40.0 (obese 3), N (%)	129 (8.5)
Diabetes, N (%)	237 (15.6)
Hypertension, N (%)	811 (53.5)
Systolic blood pressure, mm Hg, mean (SD)	136.0 (20.7)
Diastolic blood pressure, mm Hg, mean (SD)	76.4 (11.6)
Coronary heart disease, N (%)	319 (21.0)
Valvular heart disease, N (%)	85 (5.6)
Heart failure, N (%)	111 (7.3)
Prior stroke, N (%)	105 (6.9)
* Five participants had missing values for race, six for years of Group	Health enrollment 19 for lo

<sup>\*</sup> Five participants had missing values for race, six for years of Group Health enrollment, 19 for location of initial AF diagnosis, and 104 for symptoms present at initial AF diagnosis.

† Symptoms are listed in order of severity, with loss of consciousness as most severe.

eTable 2. Distributions of survival times by BMI categories and outcome status\*

	Participants with permanent AF				Censored participants†			
	Survival time percentile				Survival time percent			
Body mass index (kg/m <sup>2</sup> )	n	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	n	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>
18.5 – 24.9 (normal)	65	0.5	1.5	2.6	276	1.9	4.7	5.9
25.0 – 29.9 (overweight)	114	0.3	1.5	2.6	383	2.8	5.0	6.4
30.0 – 34.9 (obese 1)	43	0.4	1.9	3.4	224	3.0	5.1	6.4
35.0 – 39.9 (obese 2)	33	0.3	1.4	2.5	95	4.0	5.2	6.4
≥ 40.0 (obese 3)	31	0.3	1.3	3.3	90	2.3	4.8	6.2
Overall	317	0.4	15	27	1068	26	5.0	6.2

	Partic	Participants with recurrent AF			Censored participants‡			
		Survival time percentile				Surviva	al time pe	rcentile
Body mass index (kg/m²)	n	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	n	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>
18.5 – 24.9 (normal)	245	0.04	0.2	0.9	142	0.6	3.2	6.1
25.0 – 29.9 (overweight)	376	0.06	0.3	1.1	171	1.3	5.0	6.6
30.0 – 34.9 (obese 1)	215	0.05	0.3	1.3	104	1.9	5.2	6.7
35.0 – 39.9 (obese 2)	97	0.04	0.2	1.0	38	2.7	5.2	6.3
≥ 40.0 (obese 3)	91	0.09	0.3	1.0	38	3.6	5.7	6.9
Overall	1,024	0.05	0.3	1.1	493	1.3	5.0	6.5

<sup>\*</sup> Survival times are given in years.

<sup>†</sup> For permanent AF, censored participants reached the end of follow-up, disenrolled from Group Health, had an AF ablation or maze procedure, or died.

<sup>‡</sup> For recurrent AF, censored participants reached the end of follow-up, disenrolled from Group Health, or died.

eTable 3. Hazard ratios of permanent AF for different definitions of permanent AF\*

Permanent AF definition: AF present on four separate occasions with the first and fourth occasions 6-36 months apart and no documented sinus trythm	eTable 3. Hazard ratios of permanent AF for different definitions of permanent AF*							
months apart and no documented sinus rhythm           Overall         188         5,694         —           Age, per 10 y         —         —         1.34 (1.14, 1.57)           Female         90         2,791         1.00 (reference)           Male         98         2,903         1.19 (0.88, 1.61)           Body mass index, (kg/m²)‡         18.5 – 24.9 (normal)         33         1,329         1.00 (reference)           25.0 – 29.9 (overweight)         70         2,054         1.54 (1.01, 2.35)         30.0 – 34.9 (obese 1)         41         1,292         1.50 (0.94, 2.41)         35.0 – 39.9 (obese 2)         20         562         1.89 (1.06, 3.40)         ≥ 40.0 (obese 3)         24         457         3.12 (1.76, 5.53)           Diabetes:         No         160         4.863         1.00 (reference)         1.00 (reference)           Yes         28         831         1.00 (oreference)         1.00 (reference)           Yes         101         2,926         0.96 (0.71, 1.32)           Systolic blood pressure, per 10 mm         —         —         0.92 (0.84, 1.01)           Diastolic blood pressure, per 10 mm         —         —         1.10 (0.93, 1.29)           Permanent AF definition: AF present on two	Risk factor	Events	Person-years	Model 3† HR (95% CI)				
Overall         188         5,694         —           Age, per 10 y         —         —         1.34 (1.14, 1.57)           Female Male         90         2,791         1.00 (reference)           Male         98         2,903         1.19 (0.88, 1.61)           Body mass index, (kg/m²)‡         18.5 – 24.9 (normal)         33         1.329         1.00 (reference)           25.0 – 29.9 (overweight)         70         2.054         1.54 (1.01, 2.35)         30.0 – 34.9 (obese 1)         41         1,292         1.50 (0.94, 2.41)         35.0 – 33.9 (obese 2)         20         562         1.89 (1.06, 3.40)         3.12 (1.76, 5.53)           Diabetes:         No         160         4.863         1.00 (reference)         4.67         3.12 (1.76, 5.53)           Hypertension:         No         87         2,768         1.00 (reference)         4.67           Yes         28         831         1.00 (o.65, 1.53)         1.59         1.59           Hypertension:         No         87         2,768         1.00 (reference)         1.67           Yes         101         2,926         0.96 (0.71, 1.32)         1.00 (reference)           Systolic blood pressure, per 10 mm         —         —         0.92 (0.84, 1.01)								
Female 90 2,791 1.00 (reference) Male 98 2,903 1.19 (0.88, 1.61)  Body mass index, (kg/m²)‡ 18.5 – 24.9 (normal) 33 1.329 1.00 (reference) 25.0 – 29.9 (overweight) 70 2,054 1.54 (1.01, 2.35) 30.0 – 34.9 (obese 1) 41 1.292 1.50 (0.94, 2.41) 35.0 – 39.9 (obese 2) 20 562 1.89 (1.06, 3.40) ≥ 40.0 (obese 3) 24 457 3.12 (1.76, 5.53)  Diabetes: No 160 4,863 1.00 (reference) Yes 28 831 1.00 (0.65, 1.53)  Hypertension: No 87 2,768 1.00 (reference) Yes 101 2,926 0.96 (0.71, 1.32)  Systolic blood pressure, per 10 mm Hg  Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus rhythm  Overall 249 4,853 —  Age, per 10 y — 1.34 (1.16, 1.54)  Female 128 2,361 1.00 (reference) Male 121 2,492 1.02 (0.79, 1.33)  Body mass index, (kg/m²)§ 18.5 – 24.9 (normal) 47 1,132 1.00 (reference) Male 129 (0.980, 0.93, 2.07) 35.0 – 39.9 (obese 1) 55 1,094 1.38 (0.93, 2.07) 35.0 – 39.9 (obese 2) 28 483 1.73 (1.06, 2.83) ≥ 40.0 (obese 3) 27 39.4 (2.24 (1.35, 3.74)  Diabetes: No 213 4,140 1.00 (reference) Yes 36 713 1.00 (0.68, 1.45)  Hypertension: No 113 2,379 1.00 (reference) Yes 36 (0.73, 1.25)  Systolic blood pressure, per 10 mm Hg — — 0.98 (0.91, 1.05)				_				
Male       98       2,903       1.19 (0.88, 1.61)         Body mass index, (kg/m²)‡       18.5 – 24.9 (normal)       33       1,329       1.00 (reference)         25.0 – 29.9 (overweight)       70       2,054       1.54 (1.01, 2.35)         30.0 – 34.9 (obese 1)       41       1,292       1.50 (0.94, 2.41)         35.0 – 39.9 (obese 2)       20       562       1.89 (1.06, 3.40)         ≥ 40.0 (obese 3)       24       457       3.12 (1.76, 5.53)         Diabetes:       No       160       4,863       1.00 (reference)         Yes       28       831       1.00 (0.65, 1.53)         Hypertension:       No       87       2,768       1.00 (reference)         Yes       101       2,926       0.96 (0.71, 1.32)         Systolic blood pressure, per 10 mm       —       —       0.92 (0.84, 1.01)         Diastolic blood pressure, per 10 mm       —       —       0.92 (0.84, 1.01)         Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus rhythm       24       4,853       —         Age, per 10 y       —       —       1.34 (1.16, 1.54)       —         Female       128       2,361       1.00 (reference)         Mal	Age, per 10 y	_	_	1.34 (1.14, 1.57)				
Body mass index, (kg/m²)‡  18.5 – 24.9 (normal)  25.0 – 29.9 (overweight)  70  2.054  1.54 (1.01, 2.35)  30.0 – 34.9 (obese 1)  41  1.292  1.50 (0.94, 2.41)  35.0 – 39.9 (obese 2)  20  562  1.89 (1.06, 3.40)  ≥ 40.0 (obese 3)  24  457  3.12 (1.76, 5.53)  Diabetes:  No  160  4.863  1.00 (reference)  Yes  28  831  1.00 (0.65, 1.53)  Hypertension:  No  87  2.768  1.00 (reference)  Yes  101  2.926  0.96 (0.71, 1.32)  Systolic blood pressure, per 10 mm  Hg  Diastolic blood pressure, per 10 mm  Hg  Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus rhythm  Overall  Age, per 10 y  —  1.34 (1.16, 1.54)  Female  128  2.361  1.00 (reference)  Male  128  2.361  1.00 (reference)  Male  128  2.361  1.00 (reference)  1.10 (0.93, 1.29)  Body mass index, (kg/m²)§  18.5 – 24.9 (normal)  47  1.132  1.00 (reference)  Male  128  2.361  1.00 (reference)  30.0 – 34.9 (obese 1)  55  1.34 (1.16, 1.54)  Female  128  2.39 (0.00, 1.10)  Body mass index, (kg/m²)§  18.5 – 24.9 (normal)  47  1.132  1.00 (reference)  25.0 – 29.9 (overweight)  92  1.750  1.41 (0.98, 2.02)  30.0 – 34.9 (obese 1)  55  1.094  3.8 (0.93, 2.07)  35.0 – 39.9 (obese 2)  28  483  1.73 (1.06, 2.83)  ≥ 40.0 (obese 3)  27  394  2.24 (1.35, 3.74)  Diabetes:  No  213  4,140  1.00 (reference)  Yes  36  713  1.00 (reference)			•					
18.5 – 24.9 (normal) 25.0 – 29.9 (overweight) 70 2.054 1.54 (1.01, 2.35) 30.0 – 34.9 (obese 1) 41 1,292 1.50 (0.94, 2.41) 35.0 – 39.9 (obese 2) 20 562 1.89 (1.06, 3.40) ≥ 40.0 (obese 3) 24 457 3.12 (1.76, 5.53)  Diabetes: No 160 4.863 1.00 (reference) Yes 28 831 1.00 (o.65, 1.53)  Hypertension: No 87 2,768 1.00 (reference) Yes 101 2,926 0.96 (0.71, 1.32)  Systolic blood pressure, per 10 mm Hg Diastolic blood pressure, per 10 mm Hg Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus rhythm Overall 249 4,853 —  Age, per 10 y — 1.34 (1.16, 1.54)  Female 128 2,361 1.00 (reference) Male 121 2,492 1.02 (0.79, 1.33)  Body mass index, (kg/m²)§ 18.5 – 24.9 (normal) 47 1,132 1.00 (reference) 25.0 – 29.9 (overweight) 92 1,750 30.0 – 34.9 (obese 1) 35.0 – 39.9 (obese 2) 28 483 1,73 (1.06, 2.83) ≥ 40.0 (obese 3) 27 394 2.24 (1.35, 3.74)  Diabetes: No 213 4,140 1.00 (reference) Yes 36 713 1.00 (reference) Yes 36 713 1.00 (reference) Yes 36 373 1.00 (reference) Yes 36 3747 1.00 (reference) Yes 36 773 1.00 (reference) Yes 36 3744 0.96 (0.73, 1.25)	Male	98	2,903	1.19 (0.88, 1.61)				
18.5 – 24.9 (normal) 25.0 – 29.9 (overweight) 70 2.054 1.54 (1.01, 2.35) 30.0 – 34.9 (obese 1) 41 1,292 1.50 (0.94, 2.41) 35.0 – 39.9 (obese 2) 20 562 1.89 (1.06, 3.40) ≥ 40.0 (obese 3) 24 457 3.12 (1.76, 5.53)  Diabetes: No 160 4.863 1.00 (reference) Yes 28 831 1.00 (o.65, 1.53)  Hypertension: No 87 2,768 1.00 (reference) Yes 101 2,926 0.96 (0.71, 1.32)  Systolic blood pressure, per 10 mm Hg Diastolic blood pressure, per 10 mm Hg Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus rhythm Overall 249 4,853 —  Age, per 10 y — 1.34 (1.16, 1.54)  Female 128 2,361 1.00 (reference) Male 121 2,492 1.02 (0.79, 1.33)  Body mass index, (kg/m²)§ 18.5 – 24.9 (normal) 47 1,132 1.00 (reference) 25.0 – 29.9 (overweight) 92 1,750 30.0 – 34.9 (obese 1) 35.0 – 39.9 (obese 2) 28 483 1,73 (1.06, 2.83) ≥ 40.0 (obese 3) 27 394 2.24 (1.35, 3.74)  Diabetes: No 213 4,140 1.00 (reference) Yes 36 713 1.00 (reference) Yes 36 713 1.00 (reference) Yes 36 373 1.00 (reference) Yes 36 3747 1.00 (reference) Yes 36 773 1.00 (reference) Yes 36 3744 0.96 (0.73, 1.25)	Body mass index, (kg/m²)‡							
30.0 – 34.9 (obese 1) 31.0 – 34.9 (obese 2) 32.0 562 3.18 (1.06, 3.40) 35.0 – 39.9 (obese 2) 20 562 3.18 (1.06, 3.40) 3.12 (1.76, 5.53)  Diabetes: No Yes 28 831 1.00 (reference) Yes 28 831 1.00 (reference) Yes 101 2.926 0.96 (0.71, 1.32)  Systolic blood pressure, per 10 mm Hg Diastolic blood pressure, per 10 mm Hg  Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus thythm Overall 249 4,853 —  Age, per 10 y — 1.34 (1.16, 1.54)  Female 128 2,361 1.00 (reference) Male 129 2,492 1.02 (0.79, 1.33)  Body mass index, (kg/m²)§ 18.5 – 24.9 (normal) 25.0 – 29.9 (overweight) 25.0 – 29.9 (overweight) 30.0 – 34.9 (obese 1) 35.0 – 39.9 (obese 2) 28 483 1.73 (1.06, 2.83) 240.0 (obese 3) 27 394 2.24 (1.35, 3.74)  Diabetes: No 213 4,140 1.00 (reference) Yes 136 713 1.00 (reference) Yes 136 2,474 0.96 (0.73, 1.25)		33	1,329	1.00 (reference)				
30.0 – 34.9 (obese 1) 35.0 – 39.9 (obese 2) 20 562 1.89 (1.06, 3.40) 240.0 (obese 3) 244 457 3.12 (1.76, 5.53)  Diabetes: No Yes 28 831 1.00 (reference) Yes 28 831 1.00 (reference) Yes 101 2,926 0.96 (0.71, 1.32)  Systolic blood pressure, per 10 mm Hg Diastolic blood pressure, per 10 mm Hg  Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus rhythm Overall 249 4,853 —  Age, per 10 y — 1.34 (1.16, 1.54)  Female 128 2,361 1.00 (reference) Male 129 2,492 1.02 (0.79, 1.33)  Body mass index, (kg/m²)§ 18.5 – 24.9 (normal) 25.0 – 29.9 (overweight) 25.0 – 29.9 (overweight) 25.0 – 39.9 (obese 2) 28 483 1.73 (1.06, 2.83) 240.0 (obese 3) 27 394 2.24 (1.35, 3.74)  Diabetes: No 213 4,140 1.00 (reference) Yes 136 713 1.00 (reference) Yes 136 2,474 0.96 (0.73, 1.25)		70						
35.0 − 39.9 (obese 2) 20 562 1.89 (1.06, 3.40) ≥ 40.0 (obese 3) 24 457 3.12 (1.76, 5.53)  Diabetes: No 160 4.863 1.00 (reference) Yes 28 831 1.00 (o.65, 1.53)  Hypertension: No 87 2.768 1.00 (reference) Yes 101 2.926 0.96 (0.71, 1.32)  Systolic blood pressure, per 10 mm								
≥ 40.0 (obese 3)  24  457  3.12 (1.76, 5.53)  Diabetes: No Yes 28  831  1.00 (reference) Yes 28  831  1.00 (reference) Yes 28  Hypertension: No 87  2.768 1.00 (reference) Yes 101  2.926  0.96 (0.71, 1.32)  Systolic blood pressure, per 10 mm Hg Diastolic blood pressure, per 10 mm Hg  Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus rhythm  Overall  249  4,853  Age, per 10 y  Age, per 10 y			•	,				
Diabetes:         No         160         4,863         1.00 (reference)           Yes         28         831         1.00 (0.65, 1.53)           Hypertension:         No         87         2,768         1.00 (reference)           Yes         101         2,926         0.96 (0.71, 1.32)           Systolic blood pressure, per 10 mm           Hg         —         —         0.92 (0.84, 1.01)           Diastolic blood pressure, per 10 mm           Hg         —         —         1.10 (0.93, 1.29)           Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus rhythm           Overall         249         4,853         —           Age, per 10 y         —         —         1.34 (1.16, 1.54)           Female         128         2,361         1.00 (reference)           Male         121         2,492         1.02 (0.79, 1.33)           Body mass index, (kg/m²)§         18.5 – 24.9 (normal)         47         1,132         1.00 (reference)           25.0 – 29.9 (overweight)         92         1,750         1.41 (0.98, 2.02)           30.0 – 34.9 (obese 1)         55         1,094         1.38 (0.93, 2.07)           35.0 – 39.9 (obes								
Yes       28       831       1.00 (0.65, 1.53)         Hypertension:       No Yes       87       2,768       1.00 (reference)         Yes       101       2,926       0.96 (0.71, 1.32)         Systolic blood pressure, per 10 mm       —       —       0.92 (0.84, 1.01)         Diastolic blood pressure, per 10 mm       —       —       1.10 (0.93, 1.29)         Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus rhythm         Overall       249       4,853       —         Age, per 10 y       —       —       1.34 (1.16, 1.54)         Female       128       2,361       1.00 (reference)         Male       121       2,492       1.02 (0.79, 1.33)         Body mass index, (kg/m²)§         18.5 = 24.9 (normal)       47       1,132       1.00 (reference)         25.0 = 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 = 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 = 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes: No 213 4,140 1.00	2 40.0 (obese 3)	24	457	3.12 (1.76, 5.53)				
Yes       28       831       1.00 (0.65, 1.53)         Hypertension:       No Yes       87       2,768       1.00 (reference)         Yes       101       2,926       0.96 (0.71, 1.32)         Systolic blood pressure, per 10 mm Hg       —       —       0.92 (0.84, 1.01)         Diastolic blood pressure, per 10 mm Hg       —       —       1.10 (0.93, 1.29)         Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus rhythm         Overall       249       4,853       —         Age, per 10 y       —       —       1.34 (1.16, 1.54)         Female       128       2,361       1.00 (reference)         Male       121       2,492       1.02 (0.79, 1.33)         Body mass index, (kg/m²)§         18.5 = 24.9 (normal)       47       1,132       1.00 (reference)         25.0 = 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 = 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 = 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes: No 213 4,14	Diabetes: No	160	4.863	1.00 (reference)				
Yes       101       2,926       0.96 (0.71, 1.32)         Systolic blood pressure, per 10 mm Hg       —       —       0.92 (0.84, 1.01)         Diastolic blood pressure, per 10 mm Hg       —       —       1.10 (0.93, 1.29)         Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus rhythm         Overall       249       4,853       —         Age, per 10 y       —       —       1.34 (1.16, 1.54)         Female       128       2,361       1.00 (reference)         Male       121       2,492       1.02 (0.79, 1.33)         Body mass index, (kg/m²)§       18.5 – 24.9 (normal)       47       1,132       1.00 (reference)         25.0 – 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 – 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 – 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes:       No       213       4,140       1.00 (reference)         Yes       36       713       1.00 (0.68, 1.45)         Hypertension:       No       113       2,379								
Yes       101       2,926       0.96 (0.71, 1.32)         Systolic blood pressure, per 10 mm Hg       —       —       0.92 (0.84, 1.01)         Diastolic blood pressure, per 10 mm Hg       —       —       1.10 (0.93, 1.29)         Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus rhythm         Overall       249       4,853       —         Age, per 10 y       —       —       1.34 (1.16, 1.54)         Female       128       2,361       1.00 (reference)         Male       121       2,492       1.02 (0.79, 1.33)         Body mass index, (kg/m²)§       18.5 – 24.9 (normal)       47       1,132       1.00 (reference)         25.0 – 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 – 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 – 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes:       No       213       4,140       1.00 (reference)         Yes       36       713       1.00 (0.68, 1.45)         Hypertension:       No       113       2,379								
Systolic blood pressure, per 10 mm       —       —       0.92 (0.84, 1.01)         Hg       —       —       0.92 (0.84, 1.01)         Diastolic blood pressure, per 10 mm       —       —       1.10 (0.93, 1.29)         Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus rhythm         Overall       249       4,853       —         Age, per 10 y       —       —       1.34 (1.16, 1.54)         Female       128       2,361       1.00 (reference)         Male       121       2,492       1.02 (0.79, 1.33)         Body mass index, (kg/m²)§       18.5 – 24.9 (normal)       47       1,132       1.00 (reference)         25.0 – 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 – 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 – 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes:       No       213       4,140       1.00 (reference)         Yes       36       713       1.00 (0.68, 1.45)         Hypertension:       No       113       2,379       1.00 (reference)								
Hg       —       0.92 (0.84, 1.01)         Diastolic blood pressure, per 10 mm       —       0.92 (0.84, 1.01)         Hg       —       0.92 (0.84, 1.01)         Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus rhythm         Overall       249       4,853       —         Age, per 10 y       —       —       1.34 (1.16, 1.54)         Female       128       2,361       1.00 (reference)         Male       121       2,492       1.02 (0.79, 1.33)         Body mass index, (kg/m²)§         18.5 – 24.9 (normal)       47       1,132       1.00 (reference)         25.0 – 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 – 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 – 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes: No       213       4,140       1.00 (reference)         Yes       36       713       1.00 (reference)         Yes       136       2,474       <	Yes	101	2,926	0.96 (0.71, 1.32)				
Diastolic blood pressure, per 10 mm       —       —       1.10 (0.93, 1.29)         Permanent AF definition: AF present on two separate occasions 12-36 months apart without any documented sinus rhythm         Overall       249       4,853       —         Age, per 10 y       —       —       1.34 (1.16, 1.54)         Female       128       2,361       1.00 (reference)         Male       121       2,492       1.02 (0.79, 1.33)         Body mass index, (kg/m²)§       18.5 – 24.9 (normal)       47       1,132       1.00 (reference)         25.0 – 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 – 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 – 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes:       No       213       4,140       1.00 (reference)         Yes       36       713       1.00 (0.68, 1.45)         Hypertension:       No       113       2,379       1.00 (reference)         Yes       136       2,474       0.96 (0.73, 1.25)         Systolic blood pressure, per 10 mm       —       —       0.98 (0.91, 1.0		_	_	0 92 (0 84 -1 01)				
Hg       — — — — — — — — — — — — — — — — — — —				0.92 (0.04, 1.01)				
documented sinus rhythm         249       4,853       —         Age, per 10 y       —       —       1.34 (1.16, 1.54)         Female       128       2,361       1.00 (reference)         Male       121       2,492       1.02 (0.79, 1.33)         Body mass index, (kg/m²)§       18.5 – 24.9 (normal)       47       1,132       1.00 (reference)         25.0 – 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 – 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 – 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes:       No       213       4,140       1.00 (reference)         Yes       36       713       1.00 (0.68, 1.45)         Hypertension:       No       113       2,379       1.00 (reference)         Yes       136       2,474       0.96 (0.73, 1.25)         Systolic blood pressure, per 10 mm         Hg       —       —       0.98 (0.91, 1.05)	·	_	_	1.10 (0.93, 1.29)				
Overall       249       4,853       —         Age, per 10 y       —       —       1.34 (1.16, 1.54)         Female       128       2,361       1.00 (reference)         Male       121       2,492       1.02 (0.79, 1.33)         Body mass index, (kg/m²)§       47       1,132       1.00 (reference)         25.0 - 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 - 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 - 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes:       No       213       4,140       1.00 (reference)         Yes       36       713       1.00 (0.68, 1.45)         Hypertension:       No       113       2,379       1.00 (reference)         Yes       136       2,474       0.96 (0.73, 1.25)         Systolic blood pressure, per 10 mm         Hg       —       0.98 (0.91, 1.05)	Permanent AF definition: AF pres			nonths apart without any				
Age, per 10 y       —       —       1.34 (1.16, 1.54)         Female Male       128       2,361       1.00 (reference)         Male       121       2,492       1.02 (0.79, 1.33)         Body mass index, (kg/m²)§       18.5 – 24.9 (normal)       47       1,132       1.00 (reference)         25.0 – 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 – 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 – 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes:       No       213       4,140       1.00 (reference)         Yes       36       713       1.00 (0.68, 1.45)         Hypertension:       No       113       2,379       1.00 (reference)         Yes       136       2,474       0.96 (0.73, 1.25)         Systolic blood pressure, per 10 mm         Hg       —       —       0.98 (0.91, 1.05)								
Female Male       128       2,361       1.00 (reference)         Male       121       2,492       1.02 (0.79, 1.33)         Body mass index, (kg/m²)§       47       1,132       1.00 (reference)         18.5 – 24.9 (normal)       47       1,132       1.00 (reference)         25.0 – 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 – 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 – 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes:       No       213       4,140       1.00 (reference)         Yes       36       713       1.00 (0.68, 1.45)         Hypertension:       No       113       2,379       1.00 (reference)         Yes       136       2,474       0.96 (0.73, 1.25)         Systolic blood pressure, per 10 mm         Hg       —       —       0.98 (0.91, 1.05)	Overall	249	4,853	_				
Male       121       2,492       1.02 (0.79, 1.33)         Body mass index, (kg/m²)§       18.5 - 24.9 (normal)       47       1,132       1.00 (reference)         25.0 - 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 - 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 - 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes:       No       213       4,140       1.00 (reference)         Yes       36       713       1.00 (0.68, 1.45)         Hypertension:       No       113       2,379       1.00 (reference)         Yes       136       2,474       0.96 (0.73, 1.25)         Systolic blood pressure, per 10 mm         Hg       —       0.98 (0.91, 1.05)	Age, per 10 y	_	_	1.34 (1.16, 1.54)				
Body mass index, (kg/m²)§         18.5 – 24.9 (normal)       47       1,132       1.00 (reference)         25.0 – 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 – 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 – 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes:       No       213       4,140       1.00 (reference)         Yes       36       713       1.00 (0.68, 1.45)         Hypertension:       No       113       2,379       1.00 (reference)         Yes       136       2,474       0.96 (0.73, 1.25)         Systolic blood pressure, per 10 mm         Hg       —       0.98 (0.91, 1.05)	Female	128	2,361	1.00 (reference)				
18.5 - 24.9 (normal)       47       1,132       1.00 (reference)         25.0 - 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 - 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 - 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes:       No       213       4,140       1.00 (reference)         Yes       36       713       1.00 (0.68, 1.45)         Hypertension:       No       113       2,379       1.00 (reference)         Yes       136       2,474       0.96 (0.73, 1.25)         Systolic blood pressure, per 10 mm         Hg       —       0.98 (0.91, 1.05)	Male	121	2,492	1.02 (0.79, 1.33)				
18.5 - 24.9 (normal)       47       1,132       1.00 (reference)         25.0 - 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 - 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 - 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes:       No       213       4,140       1.00 (reference)         Yes       36       713       1.00 (0.68, 1.45)         Hypertension:       No       113       2,379       1.00 (reference)         Yes       136       2,474       0.96 (0.73, 1.25)         Systolic blood pressure, per 10 mm         Hg       —       0.98 (0.91, 1.05)	Rody mass index (kg/m²)8							
25.0 - 29.9 (overweight)       92       1,750       1.41 (0.98, 2.02)         30.0 - 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 - 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes:       No       213       4,140       1.00 (reference)         Yes       36       713       1.00 (0.68, 1.45)         Hypertension:       No       113       2,379       1.00 (reference)         Yes       136       2,474       0.96 (0.73, 1.25)         Systolic blood pressure, per 10 mm       —       0.98 (0.91, 1.05)		47	1 122	1.00 (reference)				
30.0 - 34.9 (obese 1)       55       1,094       1.38 (0.93, 2.07)         35.0 - 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes:       No Yes       36       713       1.00 (reference)         Hypertension:       No Yes       113       2,379       1.00 (reference)         Yes       136       2,474       0.96 (0.73, 1.25)         Systolic blood pressure, per 10 mm Hg				,				
35.0 - 39.9 (obese 2)       28       483       1.73 (1.06, 2.83)         ≥ 40.0 (obese 3)       27       394       2.24 (1.35, 3.74)         Diabetes:       No       213       4,140       1.00 (reference)         Yes       36       713       1.00 (0.68, 1.45)         Hypertension:       No       113       2,379       1.00 (reference)         Yes       136       2,474       0.96 (0.73, 1.25)         Systolic blood pressure, per 10 mm         Hg       —       0.98 (0.91, 1.05)								
≥ 40.0 (obese 3)  27  394  2.24 (1.35, 3.74)  Diabetes: No Yes  36  4,140  713  1.00 (reference) 1.00 (reference) 2,379  1.00 (reference) 2,474  0.96 (0.73, 1.25)  Systolic blood pressure, per 10 mm Hg  —  0.98 (0.91, 1.05)								
Diabetes:         No Yes         213 36         4,140 1.00 (reference) 1.00 (0.68, 1.45)           Hypertension:         No Yes         113 2,379 1.00 (reference) 2,474 0.96 (0.73, 1.25)           Systolic blood pressure, per 10 mm Hg         —         —         0.98 (0.91, 1.05)	35.0 – 39.9 (obese 2)	28	483	1.73 (1.06, 2.83)				
Yes       36       713       1.00 (0.68, 1.45)         Hypertension: No Yes       113       2,379       1.00 (reference)         Yes       136       2,474       0.96 (0.73, 1.25)         Systolic blood pressure, per 10 mm Hg            —       0.98 (0.91, 1.05)	≥ 40.0 (obese 3)	27	394	2.24 (1.35, 3.74)				
Yes       36       713       1.00 (0.68, 1.45)         Hypertension: No Yes       113       2,379       1.00 (reference)         Yes       136       2,474       0.96 (0.73, 1.25)         Systolic blood pressure, per 10 mm Hg            —       0.98 (0.91, 1.05)	Diabotos: No	212	4 140	1.00 (reference)				
Hypertension:       No Yes       113 2,379 1.00 (reference) 2,474 0.96 (0.73, 1.25)         Systolic blood pressure, per 10 mm Hg       —       —       0.98 (0.91, 1.05)								
Yes 136 2,474 0.96 (0.73, 1.25)  Systolic blood pressure, per 10 mm  Hg — 0.98 (0.91, 1.05)	100	50	7 10	1.00 (0.00, 1. <del>4</del> 0)				
Yes 136 2,474 0.96 (0.73, 1.25)  Systolic blood pressure, per 10 mm  Hg — 0.98 (0.91, 1.05)	Hypertension: No	113	2,379	1.00 (reference)				
Hg — 0.96 (0.91, 1.05)								
Hg — 0.96 (0.91, 1.05)	Custolia bland processes and 40 miles							
		_	_	0.98 (0.91, 1.05)				
p	Diastolic blood pressure, per 10 mm	_	_	1.08 (0.95, 1.24)				

Risk factor	Events	Person-years	Model 3† HR (95% CI)
Hg		, , <u>,</u>	1,00.00
Permanent AF definition: AF pres	sent on two sep documented s		onths apart without any
Overall	266	5,492	_
Age, per 10 y	_	_	1.27 (1.11, 1.46)
Female Male	140 126	2,660 2,832	1.00 (reference) 0.95 (0.73, 1.22)
Body mass index, (kg/m²)    18.5 – 24.9 (normal) 25.0 – 29.9 (overweight) 30.0 – 34.9 (obese 1) 35.0 – 39.9 (obese 2) ≥ 40.0 (obese 3)	58 94 60 26 28	1,270 1,986 1,241 544 450	1.00 (reference) 1.16 (0.83, 1.62) 1.19 (0.82, 1.73) 1.24 (0.76, 2.01) 1.71 (1.05, 2.80)
Diabetes: No Yes	224 42	4,686 806	1.00 (reference) 1.10 (0.77, 1.56)
Hypertension: No Yes	117 149	2,682 2,810	1.00 (reference) 1.04 (0.80, 1.36)
Systolic blood pressure, per 10 mm Hg	_	_	0.97 (0.90, 1.04)
Diastolic blood pressure, per 10 mm	_	_	1.07 (0.94, 1.22)

<sup>\*</sup> The definition of permanent AF used in primary analyses (see Table 2) was AF present on two separate occasions 6-36 months apart without any documented sinus rhythm.

1.07 (0.94, 1.22)

<sup>†</sup> Models 1 & 2 not shown. Model 3: Adjusted for age, sex, all risk factors shown in the table, and baseline coronary heart disease, valvular heart disease, heart failure, and prior stroke.

† The HR per 5-kg/m² increment of continuous BMI was 1.21 (95% CI: 1.09, 1.34).

§ The HR per 5-kg/m² increment of continuous BMI was 1.16 (95% CI: 1.05, 1.27).

|| The HR per 5-kg/m² increment of continuous BMI was 1.09 (95% CI: 0.99, 1.20).

eTable 4. Hazard ratios of recurrent AF

		Person-	Model 1*	Model 2†	Model 3‡
Risk factor	Events	years	HR (95% CI)	HR (95% CI)	HR (95% CI)
Overall	1,204	2,827	_	_	_
Age, per 10 y	_	_	1.07 (1.01, 1.13)	1.09 (1.02, 1.16)	1.09 (1.03, 1.16)
Female	484	1,412	1.00 (reference)	1.00 (reference)	1.00 (reference)
Male	540	1,415	1.12 (0.99, 1.27)	1.14 (1.00, 1.29)	1.16 (1.02, 1.32)
Body mass index (	ka/m²)&				
18.5 – 24.9 (norm	0 ,0	666	1.00 (reference)	1.00 (reference)	1.00 (reference)
25.0 - 29.9 (overv		998	1.10 (0.94, 1.30)	1.13 (0.96, 1.33)	1.14 (0.97, 1.35)
30.0 - 34.9 (obese		657	1.01 (0.84, 1.22)	1.07 (0.88, 1.29)	1.08 (0.89, 1.30)
35.0 - 39.9 (obese	e 2) 97	251	1.23 (0.97, 1.56)	1.29 (1.01, 1.64)	1.32 (1.03, 1.69)
≥ 40.0 (obese 3)	91	254	1.25 (0.98, 1.61)	1.34 (1.04, 1.74)	1.34 (1.04, 1.74)
Diabetes: No	872	2,358	1.00 (reference)	1.00 (reference)	1.00 (reference)
Ye		469	0.92 (0.78, 1.10)	0.88 (0.74, 1.06)	0.88 (0.73, 1.06)
Hypertension: No	475	1,333	1.00 (reference)	1.00 (reference)	1.00 (reference)
Ye		1,494	1.00 (0.88, 1.14)	1.01 (0.89, 1.15)	1.02 (0.89, 1.16)
Systolic blood pres	ssure, —	_	0.97 (0.94, 1.00)	0.97 (0.93, 1.01)	0.97 (0.93, 1.01)
Diastolic blood pre per 10 mm Hg	ssure, —	_	0.96 (0.90, 1.01)	0.97 (0.91, 1.04)	0.98 (0.91, 1.05)

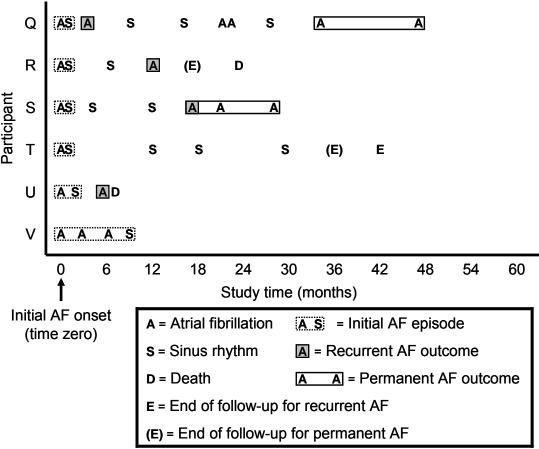
<sup>\*</sup> Model 1: Adjusted for age and sex.
† Model 2: Adjusted for age, sex, and all risk factors shown in the table.

<sup>†</sup> Model 3: Adjusted for age, sex, and air risk factors shown in the table.

† Model 3: Adjusted for age, sex, all risk factors shown in the table, and baseline coronary heart disease, valvular heart disease, heart failure, and prior stroke.

§ The HRs per 5-kg/m² increment of continuous BMI were 1.04 (95% CI: 1.00, 1.09) in model 1; 1.06 (95% CI: 1.01, 1.11) in model 2; and 1.06 (95% CI: 1.01, 1.11) in model 3.





Examples of participant timelines showing recurrent and permanent AF outcomes:

**Participant Q:** Sinus rhythm was observed one day after initial AF onset, indicating the initial AF episode had terminated, and the participant entered follow-up for outcomes. Recurrent AF was observed in month 4. Permanent AF was observed in months 34-47, where AF was present on two separate occasions at least six months apart without any documented sinus rhythm.

Participant R: Sinus rhythm was observed one day after initial ÁF onset. Recurrent AF was observed in month 12. Permanent AF was not observed. Follow-up for permanent AF ended in month 17, six months prior to the participant's death in month 23.

**Participant S:** Sinus rhythm was observed one day after initial AF onset. Recurrent AF was observed in month 18. Permanent AF was observed in months 18-28.

**Participant T:** Sinus rhythm was observed one week after initial AF onset. Recurrent AF was not observed. Follow-up for recurrent AF ended in month 42, when the study ended. Permanent AF was not observed. Follow-up for permanent AF ended in month 36, six months prior to the study end in month 42.

**Participant U:** Sinus rhythm was observed two months after initial AF onset. Recurrent AF was observed in month 6. The participant died in month 7 and was therefore excluded from the analysis of permanent AF because less than six months of follow-up time were available after termination of the initial AF episode.

**Participant V:** Sinus rhythm was observed nine months after initial AF onset. Because the initial AF episode did not terminate within six months the participant was excluded from the study and did not enter follow-up for outcomes.