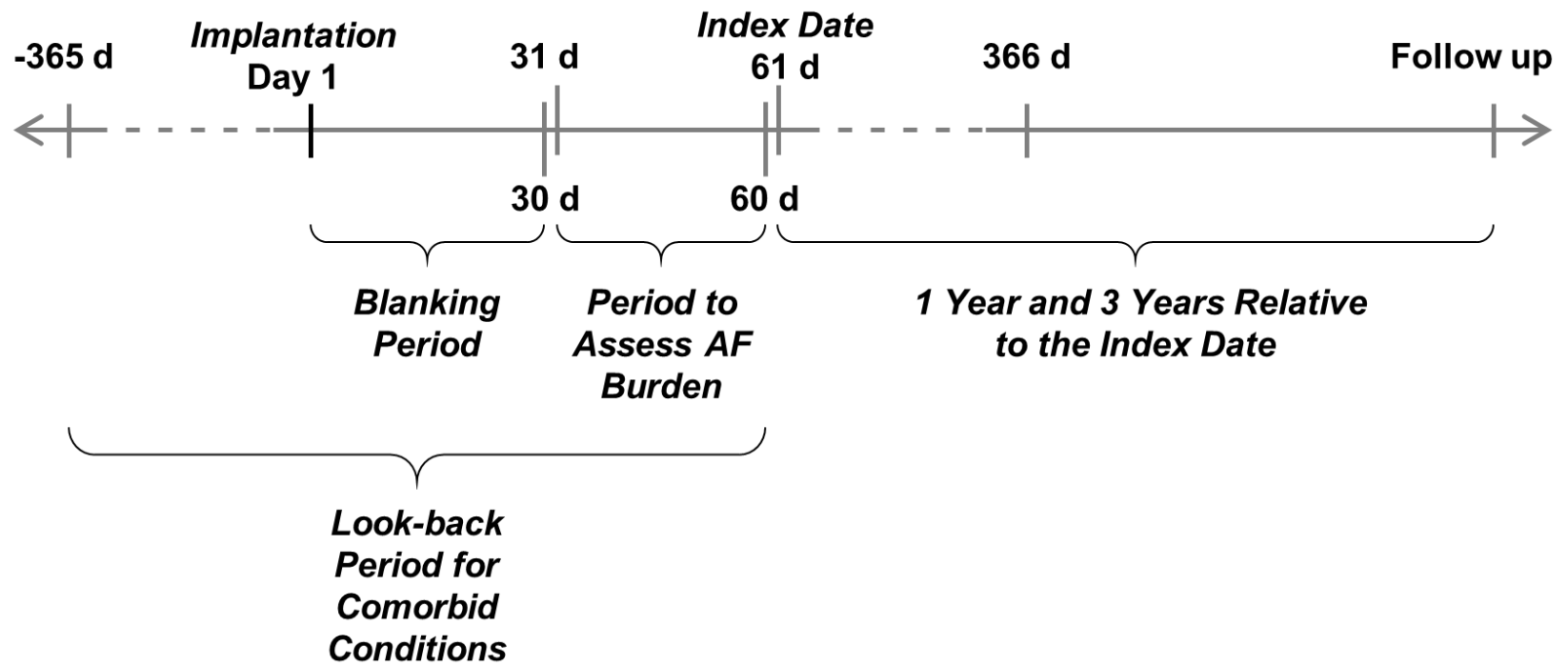


## **Supplemental Material**

Figure S1. Analytic timeline



## Table S1: ICD Database Linkage Methods

1. Subset Medicare data using broadly defined inclusion criteria to match registry entry criteria. For this project, these criteria would include any inpatient or outpatient claim having an associated procedure code indicating an implanted cardiac device (e.g., pacemaker, cardiac resynchronization therapy, implantable cardioverter defibrillator, etc.)
2. Link Medicare hospital identifiers to registry hospital identifiers by examining the number of records linked using exact criteria:
  - a. CMS procedure date = Registry procedure date (in both cases, this is the implant date)
  - b. CMS patient date of birth = Registry patient date of birth
  - c. CMS patient sex = Registry patient sex

Hospital identifiers do not have to be 1:1 between data sources. We often find that registry sites represent multiple hospitals. We use the results of this step to inform the patient-specific record linkage in Step 3.

3. Link Medicare claims to registry records within hospitals using any of the following rules:
  - a. Rule 1: Exact  
CMS hospital identifier = Registry hospital identifier (from Step 2, required) AND  
CMS procedure date = Registry procedure date AND  
CMS patient date of birth (DOB) = Registry patient date of birth AND  
CMS patient sex = Registry patient sex
  - b. Rule 2: Exact, except sex  
CMS hospital identifier = Registry hospital identifier (from Step 2, required) AND  
CMS procedure date = Registry procedure date AND  
CMS patient DOB = Registry patient DOB AND  
CMS patient sex = Registry patient sex
  - c. Rule 3: Exact, except DOB, which is still required to be "close"  
CMS hospital identifier = Registry hospital identifier (from Step 2, required) AND  
CMS procedure date = Registry procedure date AND  
2 of (day, month, year) from CMS patient DOB match w/ Registry patient DOB  
AND  
CMS patient sex = Registry patient sex
  - d. Rule 4: Exact, except procedure date, which is still required to be "close"  
CMS hospital identifier = Registry hospital identifier (from Step 2, required) AND  
CMS procedure date = Registry procedure date  $\pm$  1 day AND  
CMS patient DOB match = Registry patient DOB AND  
CMS patient sex = Registry patient sex

Almost all matches made using these rules will be within Rule 1 (>90%). Based on validation work at Duke,<sup>1</sup> we have confidence that patients identified using the other 3 rules are correct. These links reflect the imperfections of both registry and claims data.

**Table S2. AF burden distribution across all patients (n=39,710) across all follow-up period.**

N of records	AF Percent N=59692417	AF Max Duration (minutes) N=61237588
Mean(SD)	12.54 (31.15)	84.41(850.83)
Min	0	0
Max	100	79184.27
25%	0	0
50%	0	0
75%	0.07	0
90%	94.70	15.8
95%	100	449.33
Missing	2.52%	0%

**Table S3: Co-variate definitions and administrative coding algorithms.**

<b>Characteristic</b>	<b>Definition</b>	
Age, years [mean (std)]	Age at index date (continuous)	
Sex, male	Male (0/1)	
Race/ethnicity	Categorical (white/black/other)	
White		
Black		
Other		
Clinically diagnosed AF	AF (0/1) A diagnosis of AF (ICD-9-CM 427.31 or ICD-10-CM I48.0*-I48.2*, I48.91) in any position on an inpatient, outpatient or carrier claim in the 12 months prior to index date.	
Device voltage type	Low-voltage (0/1)	
Low-voltage device	Ascertained from device database Categorical (PM, CRT-P)	
High-voltage device	Ascertained from device database Categorical (ICD, CRT-D)	
Device type	Categorical: Pacemaker, CRT-P, ICD, CRT-D	
<b>Comorbid conditions</b>	Ascertained from Medicare inpatient, outpatient and carrier claims in the 365 days prior to index date (60 days post-implant).	
	<b>ICD-9-CM Codes</b>	<b>ICD-10-CM Codes</b>
Dementia	Quan: 290.* , 294.1* , 331.2	F01.* , F02.* , F03.9* , G31.1*
Diabetes Mellitus	Birman-Deych: 250.*	E10.*-E13.*
Ischemic heart disease	Birman-Deych: 410.*-414.* , 429.2, V45.81	I20.*-I22.* , I24.* , I25.* , Z95.1*
Peripheral vascular disease	Quan: 093.0* , 437.3, 440.* , 441.* , 443.1, 443.2* , 443.8* , 443.9, 447.1* , 557.1* , 557.9* , V43.4*	A52.01* , E08.51, E08.52, E09.51, E09.52, E10.51, E10.52, E11.51, E11.52, E13.51, E13.52, I67.0* , I67.1* , I70.* , I71.* , I73.1* , I73.8* , I73.9* , I77.7* , I79.* , K55.1* , K55.8* , K55.9* , Z958.2*
Congestive Heart Failure	Birman-Deych: 398.91, 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.*	I09.81, I11.0* , I13.0* , I13.2* , I50.*
Cerebrovascular disease	Quan: 362.34, 430.*-438.*	G45.0, G45.1, G45.2, G45.4, G45.8, G45.9, G46.* , H34.0* , I60.*-I63.* , I65.*-I66.* , I67.1* , I67.2* , I67.4* , I67.5* , I67.6*-I67.7* , I67.81, I67.82, I67.84, I67.89, I67.9* , I68.*-I69.* , I10.*-I13.* , I15.0, I15.2, I15.8, I15.9, I16.* , I67.4*
Hypertension	Birman-Deych: 401.*-405.* , 437.2	I27.2* , I27.81, I27.89, I27.9* , J40.*-J44.* , J45.2*-J45.5* , J45.90, J45.99, J47.* , J60.* , J61.*-J67, J68.4* , J70.1* , J70.2* , J70.3* , J70.4* , J70.8*
COPD	Quan: 416.8, 416.9, 490.* -505.* , 506.4* , 508.1* , 508.8*	I12.0, I13.11, I13.2* , N03.* , N05.2*-N05.5* , N05.9* , N06.2*-N06.5* , N07.2*-N07.5* , N08.* , N17.1* , N17.2* , N18.* , N19.* , N25.0* , Z48.22, Z49.0* , Z49.3* , Z94.0* , Z99.2, Z91.15
Renal disease	Quan: 403.01, 403.11, 403.91, 404.02, 404.03, 404.12, 404.13, 404.92, 404.93, 582.* , 583.0*-583.7* , 585.* , 586.* , 588.0* , V42.0* , V45.1* , V56.*	G45.0, G45.1, G45.2, G45.8, G45.9, G46.0, G46.1, G46.2, I63.* ,
Stroke/TIA	Birman-Deych: 433.x1, 434.x1, 435.* , 436.* , 437.1, 437.9* , 438.*	

Characteristic	Definition	
Myocardial infarction	Quan: 410.* , 412.*	I67.81, I67.82, I67.84, I67.89, I67.9*, I69.*
Cancer (metastatic or non-metastatic)	Quan Non-metastatic: 140.* , 141.* , 142.* , 143.* , 144.* , 145.* , 146.* , 147.* , 148.* , 149.* , 150.* , 151.* , 152.* , 153.* , 154.* , 155.* , 156.* , 157.* , 158.* , 159.* , 160.* , 161.* , 162.* , 163.* , 164.* , 165.* , 170.* , 171.* , 172.* , 174.* , 175.* , 176.* , 179* , 180.* , 181* , 182.* , 183.* , 184.* , 185* , 186.* , 187.* , 188.* , 189.* , 190.* , 191.* , 192.* , 193* , 194.* , 195.* , 200.* , 201.* , 202.* , 203.* , 204.* , 205.* , 206.* , 207.* , 208.* , 238.6* Quan Metastatic: 196.*-199.*	I21.* , I22.* , I25.2* Quan Non-metastatic C00.*-C26.* , C30.*-C34.* , C37.*-C41.* , C43.* , C45.0*-C45.2* , C45.7* , C45.9 , C46.*-C58.* , C60.* , C61.* , C62.0* , C62.1* , C62.9* , C63.*-C76.* , C81.*-C86.* , C88.2*-C88.4* , C88.8* , C88.9* , C90.*-C93.* , C94.0* , C94.1* , C94.2* , C94.3* , C94.8* , C95.* , C96.0* , C96.2* , C96.4* , C96.9* , C96.A , C96.Z , D03.* , D45.* , D47.Z9 Quan Metastatic: C45.9 , C77.*-C80.*
Valvular heart disease	Birman-Deych: 394.*-397.* , 398.9* , V42.2* , V43.3* , 424.*	I05.*-I08.* , I09.1* , I09.81 , I09.89 , I09.9* , I34.*-I39.* , Z95.2* , Z95.3* , Z95.4*
CHADS2-VASC score, Mean (std)	One point each for age 65 – 74, female, history of heart failure, hypertension, vascular disease (peripheral vascular disease or ischemic heart disease), and diabetes. 2 points each for age ≥75 and history of stroke/TIA.	
Score≤2		
Score=3		
Score≥4		
CHADS2 score, Mean (std)	One point each for history of heart failure, hypertension, age ≥75, or diabetes and 2 points for stroke/TIA.	
Score=0		
Score=1		
Score≥2		

**Table S4. Baseline atrial fibrillation burden, stratified by baseline presence of heart failure**

**(HF).**

Arrhythmia Burden Measure			HF at Baseline	No HF at Baseline
Percent in AF			6.60 (19.32)	6.13 (17.56)
		Mean (SD)	0 (0, 0.39, 98)	0 (0, 1.35, 98)
		Median (25, 75, max)		
Maximum Duration, min			467.72 (3027.64)	291.08 (1484.58)
		Mean (SD)	0 (0, 24.50, 43200.00)	0.17(0, 165.07, 43200.00)
		Median (25, 75, max)		
Percent in AF	0 (ref.)	N (%)	13538 (54.04)	6952 (47.43)
	(0, 5]	N (%)	7750 (30.93)	5255 (35.86)
	(5, 98)	N (%)	3766 (15.03)	2449 (16.71)
Maximum Duration, min	0 (ref.)	N (%)	16827 (67.16)	8763 (59.79)
	(1, 59]	N (%)	2508 (10.01)	1472 (10.04)
	(59, 1410)	N (%)	3302 (13.18)	3109 (21.21)
	≥1410	N (%)	2417 (9.65)	1312 (8.95)

**Table S5. Baseline characteristics of study cohort, stratified by baseline AF burden.**

	Overall	Percent in AF: 0	Percent in AF: (0, 5]	Percent in AF: (5,98)	p-value
N	39,710	20,490	13,005	6,215	
<b>Demographics</b>					
Age, years [mean (std)]	77.1 (8.7)	77.0 (8.7)	77.3 (8.8)	77.4 (8.2)	.001
Male	24,119 (60.7)	12,787 (62.4)	7,656 (58.9)	3,676 (59.1)	< .001
<b>Race/ethnicity</b>					
White	36,710 (92.4)	18,935 (92.4)	11,992 (92.2)	5,783 (93.0)	.12
Black	1,997 (5.0)	1,057 (5.2)	677 (5.2)	263 (4.2)	.007
Other	319 (0.8)	156 (0.8)	105 (0.8)	58 (0.9)	.41
<b>Device Voltage</b>					
Low Voltage Device	20,156 (50.8)	9,548 (46.6)	6,785 (52.2)	3,823 (61.5)	< .001
High Voltage Device	19,554 (49.2)	10,942 (53.4)	6,220 (47.8)	2,392 (38.5)	< .001
<b>Device Type</b>					
Dual Chamber ICD	7,750 (19.5)	4,290 (20.9)	2,638 (20.3)	822 (13.2)	< .001
Cardiac Resynchronization Therapy ICD	11,804 (29.7)	6,652 (32.5)	3,582 (27.5)	1,570 (25.3)	< .001
Dual Chamber Pacemaker	17,797 (44.8)	8,481 (41.4)	6,059 (46.6)	3,257 (52.4)	< .001
Cardiac Resynchronization Therapy Pacemaker	2,359 (5.9)	1,067 (5.2)	726 (5.6)	566 (9.1)	< .001
<b>Comorbid conditions</b>					
Dementia	1,328 (3.3)	682 (3.3)	424 (3.3)	222 (3.6)	.52
Diabetes Mellitus	15,366 (38.7)	8,349 (40.7)	4,681 (36.0)	2,336 (37.6)	< .001
Ischemic heart disease	28,654 (72.2)	15,381 (75.1)	9,136 (70.2)	4,137 (66.6)	< .001
Peripheral vascular disease	9,132 (23.0)	4,946 (24.1)	2,824 (21.7)	1,362 (21.9)	< .001
Congestive Heart failure	25,054 (63.1)	13,538 (66.1)	7,750 (59.6)	3,766 (60.6)	< .001
Cerebrovascular disease	7,028 (17.7)	3,758 (18.3)	2,175 (16.7)	1,095 (17.6)	< .001
Hypertension	35,940 (90.5)	18,658 (91.1)	11,724 (90.1)	5,558 (89.4)	< .001
Chronic obstructive pulmonary disease	16,094 (40.5)	8,361 (40.8)	5,174 (39.8)	2,559 (41.2)	.09
Renal disease	13,169 (33.2)	7,199 (35.1)	3,982 (30.6)	1,988 (32.0)	< .001
Stroke/TIA	3,820 (9.6)	1,995 (9.7)	1,213 (9.3)	612 (9.8)	.37



	<b>Overall</b>	<b>Percent in AF: 0</b>	<b>Percent in AF: (0, 5]</b>	<b>Percent in AF: (5,98)</b>	<b>p-value</b>
Myocardial infarction	12,405 (31.2)	6,953 (33.9)	3,869 (29.8)	1,583 (25.5)	< .001
Cancer(metastatic or non-metastatic)	4,167 (10.5)	2,126 (10.4)	1,359 (10.4)	682 (11.0)	.40
Valvular heart disease	16,437 (41.4)	8,674 (42.3)	5,136 (39.5)	2,627 (42.3)	< .001
CHADS2-VASC score, Mean (std)	4.9 (1.3)	4.9 (1.3)	4.8 (1.3)	4.8 (1.4)	< .001
Score<=2	1,356 (3.4)	608 (3.0)	494 (3.8)	254 (4.1)	< .001
Score=3	4,122 (10.4)	1,959 (9.6)	1,455 (11.2)	708 (11.4)	< .001
Score>=4	34,232 (86.2)	17,923 (87.5)	11,056 (85.0)	5,253 (84.5)	< .001
CHADS2 score, Mean (std)	2.7 (1.1)	2.8 (1.1)	2.7 (1.1)	2.7 (1.1)	< .001
Score=0	578 (1.5)	254 (1.2)	212 (1.6)	112 (1.8)	< .001
Score=1	3,949 (9.9)	1,906 (9.3)	1,390 (10.7)	653 (10.5)	< .001
Score>=2	35,183 (88.6)	18,330 (89.5)	11,403 (87.7)	5,450 (87.7)	< .001

Parentheses indicate exclusive borders, brackets indicate inclusive.

**Table S6. Association between AF burden, by categorical measure, and outcomes among patients with no heart failure at baseline.**

		Unadjusted Model <b>Hazard Ratio (95% CI)</b>	<b>P-value</b>	Adjusted Model <b>Hazard Ratio (95% CI)</b>	<b>P-value</b>
<b>New Onset HF at 1 Year</b>					
Percent	0 (ref.)				
in AF	(0, 5]	1.122 (0.999, 1.261)	0.052	1.184 (1.054, 1.331)	0.005
	(5, 98)	1.445 (1.260, 1.657)	<.001	1.663 (1.447, 1.910)	<.001
Maximum	0 (ref.)				
Duration per	(1, 59]	1.198 (1.009, 1.421)	0.039	1.220 (1.028, 1.449)	0.023
min	(59,1410)	1.158 (1.018, 1.318)	0.026	1.317 (1.155, 1.501)	<.001
	≥1410	1.574 (1.339, 1.851)	<.001	1.783 (1.514, 2.099)	<.001
<b>Mortality at 1 Year</b>					
Percent	0 (ref.)				
in AF	(0, 5]	1.171 (0.982, 1.396)	0.078	1.209 ( 1.013, 1.443)	0.035
	(5, 98)	1.248 (1.003, 1.552)	0.047	1.405 (1.127, 1.752)	0.003
Maximum	0 (ref.)				
Duration per	(1, 59]	1.476 (1.161, 1.876)	0.002	1.544 (1.213, 1.964)	<.001
min	(59,1410)	1.133 (0.929, 1.383)	0.219	1.225 (1.002, 1.498)	0.048
	≥1410	1.146 (0.868, 1.515)	0.337	1.297 (0.980, 1.717)	0.069

AF: atrial fibrillation; HF: heart failure; CI: confidence interval.

**Table S7. Association between AF burden, categorical measure, and outcomes among patients with heart failure at baseline.**

		Unadjusted Model <b>Hazard Ratio (95% CI)</b>	<b>P-value</b>	Adjusted Model <b>Hazard Ratio (95% CI)</b>	<b>P-value</b>
<b>HF Hospitalization at 1 Year</b>					
Percent	0 (ref.)				
in AF	(0, 5]	1.079 (1.028, 1.131)	0.002	1.128 (1.075, 1.138)	<.001
	(5, 98)	1.307 (1.233, 1.386)	<.001	1.376 (1.297, 1.460)	<.001
Maximum	0 (ref.)				
Duration per	(1, 59]	1.071 (0.997, 1.150)	0.059	1.106 (1.030, 1.187)	0.006
min	(59,1410)	1.132 (1.064, 1.205)	<.001	1.191 (1.118, 1.269)	<.001
	≥1410	1.386 (1.296, 1.482)	<.001	1.440 (1.346, 1.541)	<.001
<b>Mortality at 1 Year</b>					
Percent	0 (ref.)				
in AF	(0, 5]	1.093 (1.006, 1.187)	0.036	1.147 (1.055, 1.247)	0.001
	(5, 98)	1.402 (1.272, 1.547)	<.001	1.444 (1.308, 1.594)	<.001
Maximum	0 (ref.)				
Duration per	(1, 59]	1.100 (0.973, 1.243)	0.127	1.163 (1.029, 1.314)	0.016
min	(59,1410)	1.145 (1.028, 1.275)	0.014	1.194 (1.071, 1.330)	0.001
	≥1410	1.449 (1.296, 1.620)	<.001	1.458 (1.303, 1.631)	<.001

AF: atrial fibrillation; HF: heart failure; CI: confidence interval.

**Table S8. Hazard ratios for the association between AF burden and outcomes using time-dependent Cox models with percentage in AF and maximum AF duration as time-varying variables calculated each 30-day period out to 3 years of follow-up. For these models, we additionally censored patients at the end of device data follow-up (last patient device update or 12/31/2017).**

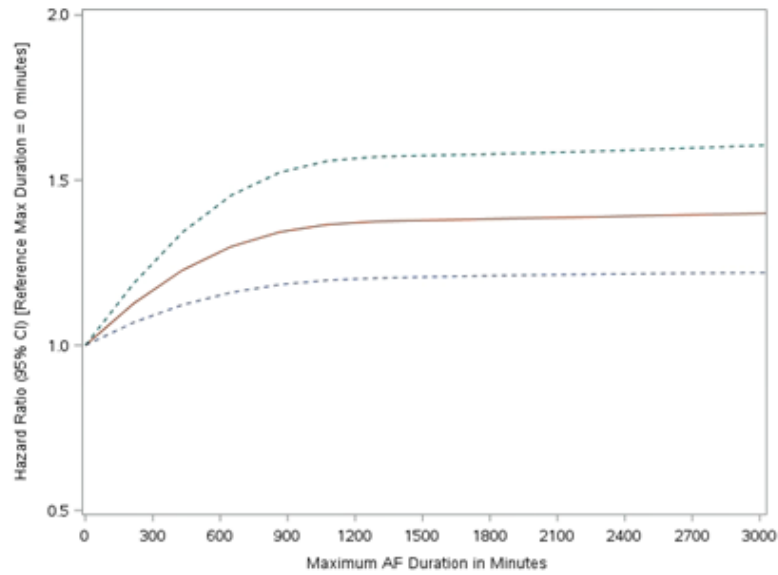
			Unadjusted Model		Adjusted Model			
			Hazard Ratio (95% CI)	P-value	Hazard Ratio (95% CI)	P-value		
<i>New Onset HF among beneficiaries with no prior HF</i>								
1 Year	Continuous Variables	Percent in AF, per 10	1.079 (1.079, 1.079)	<.001	1.078 (1.077, 1.078)	<.001		
		Maximum Duration, per 30 min	1.000 (1.000, 1.000)	<.001	1.000 (1.000, 1.000)	<.001		
		Maximum Duration, per 1 hour	1.000 (1.000, 1.001)	<.001	1.000 (1.000, 1.001)	<.001		
	Categorical Variables	Percent in AF	0 (ref.)					
			(0, 5]	1.033 (1.029, 1.036)	<.001	1.057 (1.054, 1.061)	<.001	
			(5, 98)	1.325 (1.320, 1.331)	<.001	1.451 (1.444, 1.457)	<.001	
		Maximum Duration per min	[98, 100)	2.040 (2.030, 2.050)	<.001	2.013 (2.003, 2.023)	<.001	
			0 min (ref.)					
			1 - 59 min	1.053 (1.051, 1.056)	<.001	1.057 (1.053, 1.060)	<.001	
	Continuous Variables	Percent in AF, per 10	1 - 23 hours	1.050 (1.047, 1.054)	<.001	1.063 (1.060, 1.067)	<.001	
			Maximum Duration, per 30 min	1.056 (1.056, 1.057)	<.001	1.056 (1.056, 1.056)	<.001	
			Maximum Duration, per 1 hour	1.000 (1.000, 1.000)	<.001	1.000 (1.000, 1.000)	<.001	
3 Years	Categorical Variables	>= 24 hours	1.000 (1.000, 1.001)	<.001	1.000 (1.000, 1.001)	<.001		
		Percent in AF	0 (ref.)					
			(0, 5]	1.015 (1.013, 1.017)	<.001	1.030 (1.027, 1.032)	<.001	
	(5, 98)		1.241 (1.237, 1.245)	<.001	1.351 (1.347, 1.355)	<.001		
	Maximum Duration per min	[98, 100)	1.631 (1.625, 1.637)	<.001	1.612 (1.606, 1.618)	<.001		
		0 min (ref.)						
1 - 59 min		1.052 (1.050, 1.054)	<.001	1.057 (1.055, 1.060)	<.001			
Mortality among beneficiaries with no prior HF	1 Year	1 - 23 hours	1.050 (1.047, 1.053)	<.001	1.061 (1.059, 1.064)	<.001		
		>= 24 hours	1.103 (1.101, 1.105)	<.001	1.139 (1.137, 1.141)	<.001		
		Percent in AF, per 10	1.034 (1.032, 1.036)	<.001	1.039 (1.037, 1.041)	<.001		

			Unadjusted Model		Adjusted Model		
			Hazard Ratio (95% CI)	P-value	Hazard Ratio (95% CI)	P-value	
	Continuous Variables	Maximum Duration, per 30 min	1.000 (1.000, 1.000)	<.001	1.000 (1.000, 1.000)	<.001	
		Maximum Duration, per 1 hour	1.000 (1.000, 1.001)	<.001	1.000 (1.000, 1.001)	<.001	
	Categorical Variables	0 (ref.)					
		Percent in AF	(0, 5]	1.126 (1.114, 1.138)	<.001	1.158 (1.146, 1.171)	<.001
			(5, 98)	1.286 (1.268, 1.303)	<.001	1.439 (1.420, 1.459)	<.001
			[98, 100)	1.449 (1.411, 1.488)	<.001	1.426 (1.389, 1.464)	<.001
		Maximum Duration per min	0 min (ref.)				
			1 - 59 min	1.230 (1.213, 1.247)	<.001	1.262 (1.245, 1.279)	<.001
			1 - 23 hours	1.024 (1.012, 1.036)	<.001	1.108 (1.096, 1.121)	<.001
			>= 24 hours	1.394 (1.375, 1.413)	<.001	1.528 (1.508, 1.549)	<.001
		Percent in AF, per 10	1.048 (1.047, 1.048)	<.001	1.046 (1.045, 1.047)	<.001	
		Continuous Variables	Maximum Duration, per 30 min	1.000 (1.000, 1.000)	<.001	1.000 (1.000, 1.000)	<.001
Maximum Duration, per 1 hour	1.000 (1.000, 1.001)		<.001	1.000 (1.000, 1.001)	<.001		
0 (ref.)							
3 Years	Categorical Variables	Percent in AF	(0, 5]	0.995 (0.990, 0.999)	0.016	1.016 (1.011, 1.020)	<.001
			(5, 98)	1.145 (1.138, 1.152)	<.001	1.282 (1.275, 1.290)	<.001
			[98, 100)	1.555 (1.543, 1.567)	<.001	1.477 (1.466, 1.489)	<.001
		Maximum Duration per min	0 min (ref.)				
1 - 59 min	1.138 (1.131, 1.144)		<.001	1.143 (1.136, 1.149)	<.001		
1 - 23 hours	0.935 (0.931, 0.940)		<.001	1.035 (1.030, 1.040)	<.001		
		>= 24 hours	1.219 (1.212, 1.225)	<.001	1.288 (1.281, 1.295)	<.001	
<i>Mortality among beneficiaries with baseline HF</i>							
	Continuous Variables	Percent in AF, per 10	1.062 (1.061, 1.062)	<.001	1.060 (1.060, 1.061)	<.001	
		Maximum Duration, per 30 min	1.000 (1.000, 1.000)	<.001	1.000 (1.000, 1.000)	<.001	
		Maximum Duration, per 1 hour	1.000 (1.000, 1.001)	<.001	1.000 (1.000, 1.001)	<.001	
1 Year	Categorical Variables	0 (ref.)					
		Percent in AF	(0, 5]	1.131 (1.125, 1.137)	<.001	1.174 (1.167, 1.180)	<.001
			(5, 98)	1.431 (1.421, 1.850)	<.001	1.469 (1.459, 1.479)	<.001
			[98, 100]	1.869 (1.850, 1.890)	<.001	1.782 (1.763, 1.802)	<.001
		Maximum Duration per min	0 min (ref.)				
			1 - 59 min	1.174 (1.167, 1.181)	<.001	1.208 (1.200, 1.215)	<.001
1 - 23 hours	1.218 (1.210, 1.226)		<.001	1.241 (1.232, 1.249)	<.001		
		>= 24 hours	1.488 (1.478, 1.497)	<.001	1.453 (1.444, 1.462)	<.001	
3 Years		Percent in AF, per 10	1.031 (1.031, 1.031)	<.001	1.028 (1.028, 1.028)	<.001	

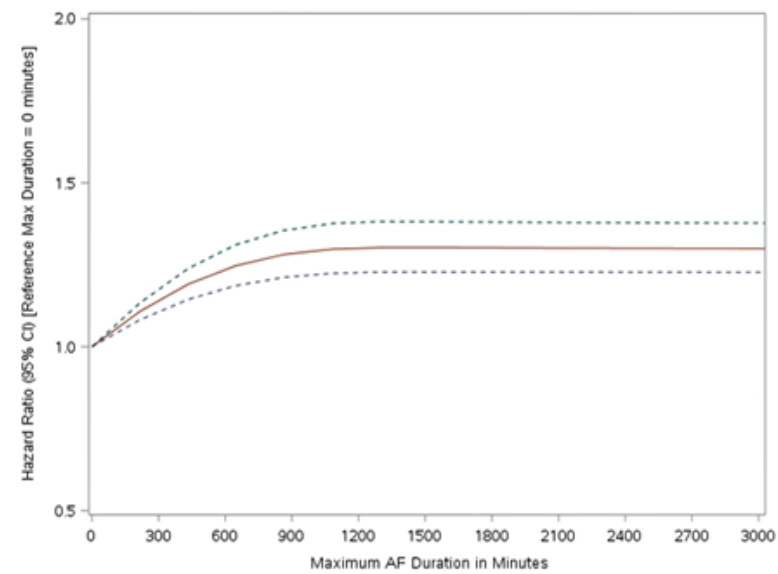
			Unadjusted Model		Adjusted Model		
			Hazard Ratio (95% CI)	P-value	Hazard Ratio (95% CI)	P-value	
	Continuous Variables	Maximum Duration, per 30 min	1.000 (1.000, 1.000)	<.001	1.000 (1.000, 1.000)	<.001	
		Maximum Duration, per 1 hour	1.000 (1.000, 1.001)	<.001	1.000 (1.000, 1.001)	<.001	
	Categorical Variables	0 (ref.)					
		Percent in AF	(0, 5]	1.001 (0.999, 1.003)	<.001	1.039 (1.037, 1.042)	<.001
			(5, 98)	1.157 (1.153, 1.161)	<.001	1.226 (1.222, 1.230)	<.001
			[98,100]	1.325 (1.320, 1.330)	<.001	1.279 (1.273, 1.284)	<.001
		Maximum Duration per min	0 min (ref.)				
			1 - 59 min	1.019 (1.016, 1.022)	<.001	1.093 (1.090, 1.096)	<.001
<i>HF hospitalization among beneficiaries with baseline HF</i>	Continuous Variables	1 - 23 hours	1.090 (1.087, 1.093)	<.001	1.103 (1.100, 1.106)	<.001	
		>= 24 hours	1.198 (1.195, 1.202)	<.001	1.203 (1.199, 1.206)	<.001	
		Percent in AF, per 10	1.028 (1.028, 1.028)	<.001	1.028 (1.028, 1.028)	<.001	
1 Year	Continuous Variables	Maximum Duration, per 30 min	1.000 (1.000, 1.000)	<.001	1.000 (1.000, 1.000)	<.001	
		Maximum Duration, per 1 hour	1.000 (1.000, 1.001)	<.001	1.000 (1.000, 1.001)	<.001	
		0 (ref.)					
	Categorical Variables	Percent in AF	(0, 5]	1.028 (1.027, 1.030)	<.001	1.052 (1.051, 1.054)	<.001
			(5, 98)	1.152 (1.150, 1.155)	<.001	1.188 (1.188, 1.191)	<.001
			[98,100]	1.308 (1.305, 1.310)	<.001	1.309 (1.306, 1.312)	<.001
	Continuous Variables	Maximum Duration per min	0 min (ref.)				
			1 - 59 min	1.001 (0.995, 1.005)	<.001	1.008 (1.006, 1.010)	<.001
			1 - 23 hours	1.050 (1.047, 1.054)	<.001	1.063 (1.060, 1.067)	<.001
			>= 24 hours	1.151 (1.149, 1.154)	<.001	1.182 (1.179, 1.184)	<.001
		Percent in AF, per 10	1.024 (1.024, 1.024)	<.001	1.024 (1.024, 1.024)	<.001	
		Maximum Duration, per 30 min	1.000 (1.000, 1.000)	<.001	1.000 (1.000, 1.000)	<.001	
3 Years	Continuous Variables	Maximum Duration, per 1 hour	1.000 (1.000, 1.001)	<.001	1.000 (1.000, 1.001)	<.001	
		0 (ref.)					
		Percent in AF	(0, 5]	1.041 (1.040, 1.042)	<.001	1.061 (1.060, 1.062)	<.001
	Categorical Variables		(5, 98)	1.135 (1.133, 1.137)	<.001	1.180 (1.178, 1.182)	<.001
			[98, 100]	1.272 (1.270, 1.274)	<.001	1.268 (1.266, 1.270)	<.001
		Maximum Duration per min	0 min (ref.)				
		1 - 59 min	1.003 (1.000, 1.005)	<.001	1.011 (1.009, 1.014)	<.001	
		1 - 23 hours	1.056 (1.053, 1.058)	<.001	1.061 (1.059, 1.064)	<.001	
		>= 24 hours	1.103 (1.101, 1.105)	<.001	1.139 (1.137, 1.141)	<.001	

**Figure S2. Hazard ratios based on restricted cubic splines analyses of maximum AF episode duration for endpoints that appeared to show non-linearity: (A) new-onset HF among patients without HF at baseline, and (B) HF hospitalization and (C) all-cause mortality among patients with HF at baseline.**

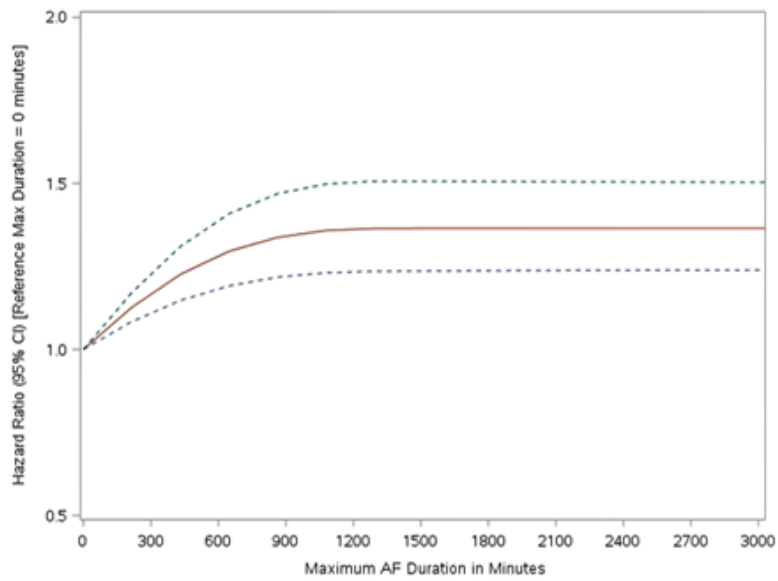
A.



B.



C.



1. Hammill BG, Hernandez AF, Peterson ED, et al. Linking inpatient clinical registry data to Medicare claims data using indirect identifiers. *Am Heart J* 2009;157:995-1000.