Evaluating Healthcare Resource Utilization and Associated Costs for Patients with New-onset Post-operative Atrial Fibrillation

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Abstract

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BACKGROUND: New-onset post-operative atrial fibrillation (POAF) is one of the most common complications following cardiac surgery. Previous studies have found that patients with POAF experience longer hospital lengths of stay and as well as higher morbidity and mortality after discharge. Several studies have assessed the short-term costs associated with POAF. There is a general consensus that POAF is associated with significantly higher costs, but most studies are confined to a single center or a cluster of centers and estimates vary widely between studies. Furthermore, much less is known about the long-term consequences of POAF.

OBJECTIVE: To assess the short-term (30-day) and long-term (1-year) incremental healthcare resource utilization and costs associated with POAF.

METHODS: We conducted a retrospective cohort study using claims data from the IBM Watson MarketScan® national database. A cohort of adults between the ages of 55 and 90 who underwent open-chest cardiac surgery between January 1, 2017 and December 31, 2018 was used to compare patients who experienced POAF to those who did not. The date of surgery served as the index date for each patient and baseline characteristics were assessed during the 12-month pre-index period. The outcomes of interest were healthcare resource utilization (HRU) and total healthcare costs. Outcomes were assessed during the index hospitalization, 30-days post-discharge, and 1-year post-discharge time periods. Inverse probability weighting was used to adjust for confounding baseline characteristics.

RESULTS: A total of 8,020 patients met the study inclusion criteria with 5,765 patients in the control cohort and 2,255 patients in the POAF cohort. The mean age of patients in the control group was 63.4 years, and in the POAF group was 65.8 years. After adjustment, patients with POAF had an index hospitalization that was 1.9 days longer (99%CI 1.3, 2.4 days, $p < 0.001$) and $13,919 more costly (99%CI $2,828, $25,011, $p < 0.001$). POAF patients had significantly higher HRU at 30 days and 1 year, amounting to incremental costs of $4,649 (99%CI $1,479, $7,819, $p < 0.001$) and $10,671 (99%CI $2,407, $18,935, $p < 0.001$) respectively.

CONCLUSION: Among patients who underwent open-chest cardiac surgery, patients who experienced POAF had statistically significantly higher HRU and costs during the index hospitalization, at 30 days, and at 1 year compared to patients who did not experience POAF.

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1. Introduction

Postoperative atrial fibrillation (POAF), defined as new-onset atrial fibrillation (AF) occurring immediately following surgery, is one of the most common complications of open-chest cardiac surgery. Approximately 400,000 patients undergo open-chest cardiac surgery each year in the United States.[1] POAF affects between 20-60% of these patients depending on the type(s) of surgery, with higher prevalence following valvular surgery or a combination of surgeries.[2,3] POAF is characterized by intermittent and often fleeting episodes of AF that typically begins 2 to 4 days following surgery.[4] Almost half of all POAF cases progress to recurring AF, representing an eight-fold increase in risk compared to patients who do not experience POAF.[5,6] Preoperative risk factors for POAF include advanced age, male sex, any history of atrial fibrillation, and congestive heart failure.[4,7,8] Despite progressive advances in cardiac surgery, the prevalence of POAF has largely remained unchanged. Current clinical guidelines recommend the use of off-label therapies like β-blockers, amiodarone or sotalol for the prevention of POAF.[9-11]

A recent meta-analysis of 34 studies showed that patients who experience POAF have 62% higher odds of stroke and 44% higher odds of mortality within 30 days of surgery.[12] Patients with POAF also experience longer post-operative hospital stays ranging from 1 – 4 days and higher hospitalization costs ranging from about $2,000 – $17,000 compared to patients without POAF.[13-21]

Though much has been done to characterize the short-term costs and clinical outcomes of POAF, results vary widely owing to limited patient populations and study centers. Furthermore, much less work has been done to characterize healthcare resource utilization (HRU) and the long-term consequences of POAF. This study aimed to bridge

these gaps by using the national IBM Watson MarketScan® databases to evaluate both the short-term (30 day) and long-term (1 year) HRU and costs in POAF patients compared to patients without POAF.

2. Methods

2.1 Study Design

Our study was a retrospective cohort study comprised of patients between the ages of 55 and 90 who had undergone open-chest cardiac surgery.

2.2 Data Source

The IBM Watson MarketScan® national database is a claims database of US patients with employer sponsored insurance, covering roughly 40 million lives in 2018. It has been used in a wide range of healthcare disciplines and has contributed to more than 2,600 peer-reviewed publications.[22] The specific databases used in this study were the *Commercial Claims and Encounters* and *Medicare Supplemental* databases. The MarketScan® databases contain both medical and pharmacy benefit claims that are linked via unique enrollee identifiers. These data are designed to be compliant to the Health Insurance Portability and Accountability Act (HIPAA) and all data are deidentified. The University of Washington Human Subjects Division Institutional Review Board (IRB) determined that our study did not meet the definition of human subjects research and was therefore exempt from IRB review.

2.3 Inclusion and Exclusion Criteria

The population of interest was patients who experienced new-onset POAF following open-chest cardiac surgery, which included coronary artery bypass graft (CABG) and/or valvular surgery occurring between January 1, 2017 and December 31, 2018 (Figure 1).

New-onset POAF was defined as 1 or more diagnoses of AF or atrial flutter occurring during the index hospitalization or within 30 days of surgery. The date of surgery served as the index date for each patient. The control group was comprised of patients who met all eligibility criteria, underwent cardiac surgery, and did not experience new-onset POAF. In order to be eligible for this study, patients needed to be between 55-90 years old at the time of surgery and continuously enrolled in medical and pharmacy benefits for at least 12 months prior to and after surgery. Patients with a history of permanent/persistent AF or other open-chest cardiac surgery in the 12 months prior to surgery were excluded. Patients with a history of paroxysmal AF or atrial flutter were included in this study. Patients who underwent surgery in 2017 and maintained continuous enrollment for 2 years after their respective index date were included in an exploratory 2-year analysis (Figure 1).

2.4 Baseline Characteristics

Baseline characteristics were assessed for each patient based on the 12 months prior to each respective index date. The demographic characteristics we captured were age, gender, region, and payer (commercial or Medicare). The clinical characteristics of interest included several comorbidities that we determined to be indicators of POAF risk or increased HRU/costs based on review of the medical literature. These included paroxysmal AF, heart failure, hypertension, diabetes and chronic obstructive pulmonary disease (COPD). In addition to these individual comorbidities, we calculated the Quan Charlson Comorbidity Index (CCI) score for each patient at their index date using the diagnosis codes observed in the 12 months prior.[23] CCI scores were stratified by 0, 1, 2, and 3+. Lastly, baseline use of anticoagulants and antiarrhythmic medications (classified by Vaughan-Williams classes I-IV) was recorded.

2.5 Outcomes of Interest

The primary outcome of interest was incremental HRU. We defined HRU as the number (counts) of hospitalizations/readmissions (inpatient), outpatient medical encounters (outpatient), emergency department visits (ED) and outpatient prescription fills (pharmacy) occurring after the index hospitalization. The index hospitalization was isolated from other inpatient claims, and its HRU was uniquely defined as the hospital length of stay (days). Each unit of HRU was further categorized as "AF-related", "other cardiovascular (other CV)", and "non-cardiovasular (non-CV)" based on the primary International Classification of Disease, 10th Revision (ICD-10) diagnosis code recorded on each claim. Outpatient pharmacy claims were categorized as "anticoagulant" (Vitamin K antagonists and novel oral anticoagulants), "antiarrhythmic" (class I-IV antiarrhythmics and digoxin), and "non-cardiovascular" based on National Drug Codes (NDC) and therapeutic class identifiers.

The secondary outcome of interest was incremental cost. We collected cost data for each element of HRU defined above and we delineated costs in the same manner. All costs represented the total amount paid by the payer and patient. All costs were adjusted to 2020 US dollars using the medical care component of the Consumer Price Index.[23] HRU and cost outcomes were captured for the follow time frames: index hospitalization, discharge to 30 days, discharge to 1 year, and discharge to 2 years (exploratory).

2.6 Statistical Analysis

2.6.1 Baseline Characteristics

We used descriptive statistics to characterize baseline demographic and clinical characteristics of the POAF patients and controls. Continuous variables were presented

using means and standard deviations and compared between the cohorts using student's t-tests. Categorical variables were presented using counts and percentages and compared between the cohorts using χ^2 tests.

2.6.2 Inverse Probability Weighting

In order to control for confounding baseline characteristics, we used inverse probability weighting (IPW). IPW is an increasingly popular method that weights individuals based on the inverse of their propensity scores. This creates weighted cohorts with similar baseline characteristics, thereby adjusting for confounders and closely emulating the properties of a randomized clinical trial.[25] The advantage of IPW compared to propensity score matching is that IPW allows for use of the entire cohort, whereas propensity score matching would discard unmatched individuals.

To calculate propensity scores, we used a logistic regression model with inclusion in the POAF cohort as the dependent variable and the following independent variables: age (categorized), sex, type of surgery (CABG, valve, CABG + valve), history of paroxysmal AF, history of heart failure, CCI, and preoperative use of β-blockers and class 3 antiarrhythmics. We decided on these particular characteristics a priori based on a literature review of potential POAF risk factors and confounders.[4,7,8] To assess the success of IPW, we calculated the standardized difference in each characteristic before and after weighting. This process was repeated separately for the 2-year exploratory analysis cohort.

2.6.3 Adjustment of Outcome Measures

Weighted regression was used to estimate HRU and cost outcomes measures. The dependent variable was the HRU or cost measure of interest, the independent variable was inclusion in the POAF cohort, and the individual weights were the IPW weights described

above. We used generalized linear models (GLMs) with either a Poisson, normal, or gamma distribution, dependent on the distribution of each outcome measure, and an identity link to examine incremental differences between the POAF and control cohorts. We used Wald tests with robust standard errors to determine the statistical significance of regression coefficients. All tests were 2-sided and used a stringent alpha level of 0.01 to adjust for multiple comparisons.

3. Results

3.1 Patient Characteristics

We identified 2,255 patients who met inclusion criteria for the POAF cohort and 5,765 patients for the control cohort (Figure 2). Baseline characteristics are presented in Table 1. Overall, both cohorts had equally large proportions of males at 76%. The mean age of POAF patients was 65.8 years and the mean age of control patients was 63.4 years. POAF patients were more likely to be covered by Medicare, undergo valvular surgery or a combination of surgeries, and have a history of paroxysmal AF or heart failure. After IPW, all adjusted baseline characteristics standardized differences were < 0.1, which we determined to be indicative of successful weighting (Figure S1).[26] The baseline characteristics for the 2-year continuous enrollment cohort are presented separately in Table 1b and largely reflect the same trends seen in the 1-year cohort.

3.2 Healthcare Resource Utilization

Average short-term HRU (index hospitalization + 30 days) is presented in Table 2. For the index hospitalization, patients in the POAF cohort had a mean length of stay of 9.3 days and patients in the control cohort had a mean length of stay of 7.4 days. The index hospitalization was on average 1.9 days longer in the POAF group compared to the control

group (99% CI 1.3, 2.4 days; $p < 0.001$). Post-discharge, POAF patients experienced almost twice as many 30-day readmissions compared to control patients (0.18 readmissions/patient vs. 0.099 readmissions/patient, respectively, $p < 0.001$). POAF patients also utilized significantly more ED visits (0.14 visits/patient vs. 0.092 visits/patient, $p < 0.001$), outpatient medical visits (5.80 claims/patient vs. 4.72 claims/patient, $p < 0.001$), and pharmacy prescription fills (8.32 fills/patient vs. 7.30 fills/patient, $p < 0.001$). The POAF group also had significantly higher HRU in all subcategories except for non-cardiovascular pharmacy claims (Table 2).

Average long-term HRU (discharge to 1 year) is presented in Table 3 and essentially follows the same trend seen in short term HRU. POAF patients experienced significantly more hospitalizations compared to control patients (0.49 readmissions/patient vs. 0.35 readmissions/patient, respectively, $p < 0.001$). The same was true of ED visits (0.62 visits/patient vs. 0.48 visits/patient, $p < 0.001$), outpatient medical visits (41.40 claims/patient vs. 36.40 claims/patient, $p < 0.001$), and pharmacy prescription fills (51.60 fills/patient vs. 46.60 fills/patient, $p < 0.001$). The POAF group had significantly higher HRU in all subcategories except for non-AF-related cardiovascular ED claims and non-cardiovascular pharmacy claims. The differences between groups were particular pronounced for AF-related claims in proportion to the number of claims in each subcategory (Table 3).

In our 2-year exploratory analysis, statistically significant differences were maintained across all care settings, with POAF patients having more hospitalizations (0.67 readmissions/patient vs. 0.50 readmissions/patient, $p < 0.01$), ED visits (1.03 visits/patient vs. 0.82 visits/patient, $p < 0.01$), outpatient medical claims (65.76 claims/patient vs. 56.23

claims/patient), and pharmacy prescription fills (91.30 fills/patient vs. 83.51 fills/patient, $p < 0.001$) compared to control patients. However, statistically significant differences dropped off for most subcategories with the exception of AF-related and anticoagulant claims (Table 4).

3.3 Direct Healthcare Costs

Average short-term costs (index hospitalization + 30 days) are presented in Table 5. After adjustment, POAF patients had a mean index hospitalization cost of $126,111 compared to a mean cost of $112,192 in the control group. This translated to an incremental cost of $13,919 in the POAF group (99% CI $2,828, $25,011; $p < 0.001$). Total 30-day costs, excluding the index hospitalization, were $12,193 and $7,545 in the POAF and control groups respectively, with an incremental cost of $4,649 (99% CI $1,479, $7,819; $p < 0.001$). POAF patients accrued significantly higher 30-day readmissions costs ($9,266 vs. $5,455, $p < 0.001$), ED costs ($154 vs. $93, $p < 0.001$), outpatient medical costs ($2,243 vs. $1,588, $p < 0.001$) and pharmacy prescriptions costs ($530 vs. $408, $p < 0.001$). 30-day readmissions accounted for approximately 82% of the total post-discharge incremental costs in the POAF group (Table 5).

Average long-term costs (discharge to 1 year) are presented in Table 6. At 1 year, POAF patients accrued on average $52,232 compared to $41,561 in the control group, with an incremental cost of $10,671 (99% CI $2,407, $18,935; $p < 0.001$). 1-year readmission costs were $23,941 and $18,604 in the POAF and control groups respectively. However, the incremental difference of $5,337 was not statistically significant. POAF patients did have significantly higher ED costs ($626 vs. $468, $p < 0.001$), outpatient medical costs ($21,301 vs. $17,380, $p < 0.01$), and pharmacy prescriptions costs ($6,364 vs. $5,108, $p < 0.001$). AF-

related subcategory costs were statistically significant in all care settings. Inpatient readmission costs accounted for approximately 50% of the total 1-year incremental costs, in contrast to 82% within the first 30 days (Table 6).

At 2 years, POAF patients accrued total costs of $70,580 compared to $64,548 in control patients. The total incremental cost associated with POAF narrowed to $6,032, which was not statistically significant. The only incremental costs that reached statistical significance at 2 years were for overall pharmacy costs, anticoagulant costs, and inpatient/outpatient AF-related costs (Table 7).

To illustrate the time trend of total incremental costs associated with POAF, we generated a barplot of the incremental costs for the index hospitalization, 30-day, 1-year, and 2-year time points (Figure 3). The largest incremental cost was for the index hospitalization. From 30 days to 1 year, the incremental costs increased, albeit at a slowing pace, and then subsequently decreased and lost statistical significance at the 2-year mark.

4. Discussion

4.1 Results Summary

In this retrospective claims database analysis, we assessed the incremental HRU and costs associated with POAF following open-chest cardiac surgery. The differences we observed in baseline characteristics between the POAF and non-POAF cohorts were consistent with what was expected from review of the medical literature. POAF patients were generally older, underwent more complex surgeries, and had more POAF risk factors such as a history of paroxysmal AF or heart failure. After controlling for these potential confounders, we found that compared to control patients, POAF patients had significantly longer index hospitalizations and utilized more healthcare resources across all care

settings at 30 days, 1 year, and 2 years after discharge. The difference between the cohorts was most pronounced for AF-related claims and proximal to the index hospitalization, gradually decreasing by 2 years. POAF patients also incurred significantly higher costs at all time points and across all care settings. Like HRU, the difference was most pronounced for AF-related costs and at the earlier time points, particularly for the index hospitalization. It is important to note that while long-term HRU and costs encompassed 12 months of post-discharge data, compared to only 1 month in short-term outcomes, the incremental differences in the long-term were not 12 times larger than in the short-term. This trend is corroborated by the exploratory 2-year data, which indicates that while the POAF group did have higher HRU and costs, the incremental differences did not grow in proportion to the time elapsed—total incremental costs at 2 years actually decreased compared to 1 year. Overall, these results suggest that the HRU and cost burden is greatest for POAF patients during and soon after the index hospitalization.

The results of our study were consistent with what is published in the medical literature. Previous studies cite a wide range of incremental post-operative hospital lengths of stay ranging from 1 to 4 days and incremental index hospitalization costs ranging from $2,000 to $17,000 in association with POAF.[13-21] Our short-term results were within those ranges, with our incremental index hospitalization costs being in the higher end of the range. Our study corroborates the increased economic-burden associated with POAF in the short-term with the added accuracy of representing a nationwide sample of patients.

4.2 Strengths and Limitations

To our knowledge, our study is the first to utilize a nationwide claims database to assess the economic burden of POAF. The use of MarketScan® allowed us to obtain a patient

sample more representative of the entire US, rather than a sample from a single center or a cluster of centers. Furthermore, the delineation of our outcomes into categories and subcategories allowed us to closely examine the composition of the incremental HRU and costs in POAF patients. Our evaluation of 1-year and 2-year outcomes also helped elucidate the long-term burden of POAF, which has not been well characterized by previous studies.

Our study has several limitations. First, we were limited to claims data that used ICD-10 codes (2016 and onward) due to our decision to include patients with a history of paroxysmal AF. This is because ICD-9 codes do not provide enough specificity to distinguish between persistent/permanent and paroxysmal types of AF. This limitation also restricted our pre-index analysis to 1 year prior to surgery, which may not have captured all baseline comorbidities and medication usage, especially for patients with relatively few claims. Furthermore, our requirement of at least 1 year of continuous enrollment post-index may have introduced survivor bias into our study. This criterion effectively removed any patients who exited the database, either due to death or loss of coverage, and restricted the study cohort to patients who were healthy enough to survive and maintain coverage for at least a year after surgery. It is difficult to determine in which direction this could have biased our results, as POAF patients do experience higher morbidity, which would contribute to higher HRU/costs, but also experience higher mortality, after which they would cease to accrue HRU/costs. Unfortunately, MarketScan® does not provide data on death for patient privacy reasons, so we were limited in our ability to distinguish between right censoring and death to address this bias.

4.3 Study Implications

To date, there is no FDA approved medication or procedure for the prevention of POAF. Off-label β-blockers are frequently used preoperatively for prophylaxis. Several small-scale randomized trials suggest that they do carry some benefit, leading to formal guideline recommendations for their use.[9-11] However, the incidence of POAF remains undeniably high. In our study, the prevalence of POAF among open-chest cardiac surgery patients with 1 year of continuous enrollment was 28%, representing a significant portion of cardiac surgery patients. Furthermore, the use of β-blockers was remarkably similar between POAF and control cohorts (roughly 52%), suggesting that although careful evaluation of risk factors and use of prophylactic therapies may mitigate some risk, they merely act as an anticipatory signal for POAF at best. It is evident that there is an unmet need for more effective treatments to prevent POAF and that the high prevalence of POAF places a significant economic burden on patients and payers. Perhaps our study will help provide impetus for further research and development of novel prevention and treatment modalities for POAF.

5. Conclusion

This retrospective claims analysis found that among patients who underwent open-chest cardiac surgery, patients who experienced POAF had significantly higher HRU and costs during the index hospitalization, at 30 days, and at 1 year compared to patients who did not experience POAF. These effects were particularly pronounced for AF-related claims and at earlier time points, gradually decreasing over time and losing statistical significance at 2 years.

6. Tables

Table 1. Baseline Demographic and Clinical Characteristics, 1-Year Continuous Enrollment

Characteristic	Control (N=5765)	POAF (N=2255)	p-value
Age, mean (SD)*	63.4 (7.1)	65.8 (8.0)	<0.001
Sex, n (%)*			
Male	4381 (76.0%)	1714 (76.0%)	1
Female	1384 (24.0%)	541 (24.0%)	
Geographic region, n (%)			
North central	1269 (22.0%)	448 (19.9%)	<0.001
Northeast	1433 (24.9%)	719 (31.9%)	
South	2481 (43.0%)	862 (38.2%)	
West	572 (9.9%)	221 (9.8%)	
Unknown	10 (0.2%)	5 (0.2%)	
Payer, n (%)			
Commercial	4076 (70.7%)	1283 (56.9%)	<0.001
Medicare	1689 (29.3%)	972 (43.1%)	
Surgery type, n (%)*			
CABG only	4124 (71.5%)	1240 (55.0%)	<0.001
Valve only	1353 (23.5%)	836 (37.1%)	
CABG + valve	288 (5.0%)	179 (7.9%)	
Comorbidities, n (%)			
Paroxysmal AF*	53 (0.9%)	415 (18.4%)	<0.001
HF*	1601 (27.8%)	762 (33.8%)	<0.001
Diabetes	2428 (42.1%)	852(37.8%)	<0.001
Hypertension	4881 (84.7%)	1921 (85.2%)	0.556
COPD	630 (10.9%)	263 (11.7%)	0.353
CCI, n (%)*			
0	2313 (40.1%)	865 (38.4%)	<0.001
1	973 (16.9%)	312 (13.8%)	
2	1226 (21.3%)	536 (23.8%)	
3+	1253 (21.7%)	542 (24.0%)	
Preoperative medications, n (%)			
Anticoagulant			
VKA	118 (2.0%)	94 (4.2%)	<0.001
DOAC	32 (0.6%)	51 (2.3%)	<0.001
Antiarrhythmic			
Class 1	67 (1.2%)	26 (1.2%)	0.972
Class 2 (β-blocker)*	3046 (52.8%)	1174 (52.1%)	0.533
Class 3*	42 (0.7%)	16 (0.7%)	0.928
Class 4 (CCB)	155 (2.7%)	86 (3.8%)	0.0137

*Baseline characteristic used in inverse probability weighting (IPW)

SD: standard deviation; CABG: coronary artery bypass graft; AF: atrial fibrillation; HF: heart failure; COPD: chronic obstructive pulmonary disease; CCI: Charlson comorbidity index; VKA: vitamin K antagonist; DOAC: direct acting oral anticoagulant; CCB: calcium channel blocker

Table 1b. Baseline Demographic and Clinical Characteristics, 2-Year Continuous Enrollment

Characteristic	Control (N=2220)	POAF (N=889)	p-value
Age, mean (SD)*	63.6 (7.5)	66.4 (8.3)	<0.001
Sex, n (%)*			
Male	1692 (76.2%)	667 (76.2%)	1
Female	528 (23.8%)	212 (23.8%)	
Geographic region, n (%)			
North central	438 (19.7%)	157 (17.7%)	<0.001
Northeast	624 (28.1%)	324 (36.4%)	
South	949 (42.7%)	326 (36.7%)	
West	203 (9.1%)	78 (8.8%)	
Unknown	6 (0.3%)	4 (0.4%)	
Payer, n (%)			
Commercial	1495 (67.3%)	451 (50.7%)	<0.001
Medicare	725 (32.7%)	438 (49.3%)	
Surgery type, n (%)*			
CABG only	1574 (70.9%)	497 (55.9%)	<0.001
Valve only	527 (23.7%)	314 (35.3%)	
CABG + valve	119 (5.4%)	78 (8.8%)	
Comorbidities, n (%)			
Paroxysmal AF*	28 (1.3%)	159 (17.9%)	<0.001
HF*	584 (26.3%)	300 (33.7%)	<0.001
Diabetes	906 (40.8%)	332 (37.3%)	0.0727
Hypertension	1885 (84.9%)	754 (84.8%)	0.972
COPD	242 (10.9%)	112 (12.6%)	0.19
CCI, n (%)*			
0	903 (40.7%)	348 (39.1%)	<0.001
1	387 (17.4%)	107 (12.0%)	
2	456 (20.5%)	219 (24.6%)	
3+	474 (21.4%)	215 (24.2%)	
Preoperative medications, n (%)			
Anticoagulant			
VKA	61 (2.8%)	35 (3.9%)	0.108
DOAC	11 (0.5%)	9 (1.0%)	0.16
Antiarrhythmic			
Class 1	12 (0.6%)	6 (0.7%)	0.779
Class 2 (β-blocker)*	1190 (53.6%)	453 (51.0%)	0.19
Class 3*	18 (0.8%)	8 (0.9%)	0.81
Class 4 (CCB)	56 (2.5%)	40 (4.5%)	0.0105

*Baseline characteristic used in inverse probability weighting (IPW)
SD: standard deviation; CABG: coronary artery bypass graft; AF: atrial fibrillation; HF: heart failure; COPD: chronic obstructive pulmonary disease; CCI: Charlson comorbidity index; VKA: vitamin K antagonist; DOAC: direct acting oral anticoagulant; CCB: calcium channel blocker

Table 2. 30-Day Healthcare Resource Utilization

Short-term Healthcare Resource Utilization (IPW) *Index hospitalization + 30 days*				
	Control (n=5765)	**POAF (n=2255)**	**Incremental**	**99% CI**
Index hospitalizationɣ	7.38 days	9.25 days	1.87 days**	(1.33, 2.39 days)
Inpatient¶ (avg claims/pt)	0.099	0.18	0.082**	(0.052, 0.11)
AF	0	0.027	0.027†	-
Other CV	0.048	0.080	0.031**	(0.011, 0.052)
Non-CV	0.051	0.071	0.021*	(0.0014, 0.040)
ED Visits¶ (avg claims/pt)	0.092	0.14	0.052**	(0.024, 0.079)
AF¶	0	0.019	0.019†	-
Other CV¶	0.015	0.020	0.0048	(-0.0041, 0.014)
Non-CV¶	0.077	0.10	0.027*	(0.0028, 0.051)
Outpatientɣ (avg claims/pt)	4.72	5.80	1.08**	(0.80, 1.35)
AF	0	0.48	0.48†	-
Other CV	1.70	2.02	0.32**	(0.17, 0.48)
Non-CV	3.03	3.34	0.31**	(0.085, 0.54)
Pharmacyɣ (avg claims/pt)	7.30	8.23	0.93**	(0.62, 1.24)
Anticoagulant	0.16	0.53	0.38**	(0.32, 0.43)
Antiarrhythmic	3.40	3.99	0.59**	(0.28, 0.90)
Non-CV	3.74	3.71	-0.033	(-0.35 0.29)
*p<0.01; **p<0.001 (Wald test) ɣGLM, gamma distribution, identity link; ¶GLM, Poisson distribution, identity link †Statistical significance not evaluated; inclusion criteria for POAF group IPW: inverse probability weighting; AF: atrial fibrillation related; CV: cardiovascular; pt: patient				

Table 3. 1-Year Healthcare Resource Utilization

Long-term Healthcare Resource Utilization (average claims per patient, IPW) *Discharge to 1 year*				
	Control (n=5765)	**POAF (n=2255)**	**Incremental**	**99% CI**
Inpatient¶	0.35	0.49	0.14**	(0.071, 0.21)
AF	0.0047	0.048	0.044**	(0.029, 0.058)
Other CV	0.13	0.17	0.045**	(0.010, 0.079)
Non-CV	0.22	0.27	0.053*	(0.0014, 0.10)
ED Visits¶	0.48	0.62	0.14**	(0.064, 0.22)
AF	0.0023	0.031	0.029**	(0.018, 0.040)
Other CV	0.069	0.084	0.015	(-0.0056, 0.036)
Non-CV	0.41	0.50	0.096**	(0.028, 0.16)
Outpatient§	36.40	41.40	5.00**	(3.16, 6.84)
AF	0.18	2.18	2.00**	(1.74, 2.26)
Other CV	9.31	10.20	0.85**	(0.17, 1.54)
Non-CV	26.90	29.04	2.14**	(0.52, 3.77)
Pharmacy§	46.60	51.60	5.00**	(3.00, 7.01)
Anticoagulant	0.81	2.75	1.95**	(1.69, 2.20)
Antiarrhythmic	19.68	22.53	2.85**	(0.90, 4.81)
Non-CV	26.14	26.35	0.21	(-2.10, 2.51)
*p<0.01; **p<0.001 (Wald test) ¶GLM, Poisson distribution, identity link; §GLM, Gaussian distribution, identity link IPW: inverse probability weighting; AF: atrial fibrillation related; CV: cardiovascular				

Table 4. 2-Year Healthcare Resource Utilization

Long-term healthcare resource utilization (average claims per patient, IPW) *Discharge to 2 years*				
	Control (n=2220)	**POAF (n=889)**	**Incremental**	**99% CI**
Inpatient¶	0.50	0.67	0.17*	(0.027, 0.31)
AF	0.0079	0.058	0.050**	(0.025, 0.075)
Other CV	0.17	0.21	0.045	(-0.021, 0.11)
Non-CV	0.33	0.40	0.073	(-0.029, 0.17)
ED Visits¶	0.82	1.03	0.22*	(0.013, 0.42)
AF	0.0062	0.038	0.031**	(0.010, 0.052)
Other CV	0.10	0.13	0.029	(-0.022, 0.079)
Non-CV	0.71	0.86	0.16	(-0.019, 0.33)
Outpatient§	56.23	65.76	9.53**	(4.76, 14.30)
AF	0.30	3.28	2.99**	(2.40, 3.57)
Other CV	12.84	14.52	1.68*	(0.23, 3.13)
Non-CV	43.12	47.98	4.86*	(0.71, 9.01)
Pharmacy§	83.51	91.30	7.79**	(1.93, 13.65)
Anticoagulant	1.17	3.94	2.78**	(2.11, 3.44)
Antiarrhythmic	35.03	38.26	3.23	(-2.35, 8.81)
Non-CV	47.32	49.10	1.78	(-4.96, 8.53)

*p<0.01; **p<0.001 (Wald test)
¶GLM, Poisson distribution, identity link; §GLM, Gaussian distribution, identity link
IPW: inverse probability weighting; AF: atrial fibrillation related; CV: cardiovascular

Table 5. 30-Day Costs

Short-term costs (average per patient, IPW) *Index hospitalization + 30 days*				
	Control (n=5765)	**POAF (n=2255)**	**Incremental**	**99% CI**
Total *(exc. index hospitalization)*	$7,545	$12,193	$4,649**	($1,479, $7,819)
Index hospitalization	$112,192	$126,111	$13,919**	($2,828, $25,011)
Inpatient	$5,455	$9,266	$3,811**	($731, $6,891)
AF	$0	$637	$637†	-
Other CV	$3,704	$5,226	$1,522	(-$259, $3,303)
Non-CV	$1,751	$3,389	$1,638	(-$865, $4,140)
ED Visits	$93	$154	$61**	($15, $107)
AF	$0	$17	$17†	-
Other CV	$15	$23	$8	(-$4, $21)
Non-CV	$78	$113	$35	(-$8, $77)
Outpatient	$1,588	$2,243	$654**	($309, $1000)
AF	$0	$187	$187†	-
Other CV	$702	$1,016	$314*	($31, $598)
Non-CV	$887	$1,044	$157	(-$23, $338)
Pharmacy	$408	$530	$122**	($25, $219)
Anticoagulant	$13	$82	$69**	($55, $83)
Antiarrhythmic	$184	$207	$23	(-$37, $82)
Non-CV	$211	$241	$31	(-$47, $108)

All costs in 2020 USD; *p<0.01; **p<0.001 (Wald test)
All adjustments made using GLM, gamma distribution, identity link
†Statistical significance not evaluated; inclusion criteria for POAF group
IPW: inverse probability weighting; AF: atrial fibrillation related; CV: cardiovascular

Table 6. 1-Year Costs

Long-term costs (average per patient, IPW) *Discharge to 1 year*				
	Control (n=5765)	**POAF (n=2255)**	**Incremental**	**99% CI**
Total	$41,561	$52,232	$10,671**	($2,407 $18,935)
Inpatient	$18,604	$23,941	$5,337	(-$1,520, $12,195)
AF	$125	$1,262	$1,137**	($567, $1,707)
Other CV	$7,190	$9,837	$2,648*	($39, $5,256)
Non-CV	$11,290	$12,842	$1,553	(-$4,600, $7,705)
ED Visits	$468	$626	$157**	($59, $256)
AF	$4	$29	$25**	($11, $39)
Other CV	$73	$95	$22	(-$7, $52)
Non-CV	$391	$501	$110**	($22, $198)
Outpatient	$17,380	$21,301	$3,921*	($460, $7,381)
AF	$197	$1,121	$924**	($558, $1,290)
Other CV	$5,425	$6,780	$1,355*	($175, $2,535)
Non-CV	$11,758	$13,399	$1,641	(-$1,413, $4,696)
Pharmacy	$5,108	$6,364	$1,256**	($440, $2,072)
Anticoagulant	$158	$711	$553**	($457, $648)
Antiarrhythmic	$2,056	$2,399	$344	(-$204, $892)
Non-CV	$2,895	$3,254	$359	(-$283, $1,001)
All costs in 2020 USD; *p<0.01; **p<0.001 All adjustments made using GLM, gamma distribution, identity link IPW: inverse probability weighting; AF: atrial fibrillation related; CV: cardiovascular				

Table 7. 2-Year Costs

Long-term costs (average per patient, IPW) *Discharge to 2 years*				
	Control (n=2220)	**POAF (n=889)**	**Incremental**	**99% CI**
Total	$64,548	$70,580	$6,032	(-$3,443, $15,506)
Inpatient	$25,306	$25,278	-$28	(-$8,842, $8,786)
AF	$164	$1,400	$1,237**	($302, $2,171)
Other CV	$9,060	$10,322	$1,262	(-$2,990, $5,513)
Non-CV	$16,082	$13,556	-$2,526	(-$9,671, $4,618)
ED Visits	$735	$946	$212	(-$15, $438)
AF	$11	$36	$25	(-$3, $53)
Other CV	$104	$146	$42	(-$25, $108)
Non-CV	$620	$764	$145	(-$44, $334)
Outpatient	$28,863	$31,799	$2,936	(-$2,478, $8,351)
AF	$354	$2,018	$1,664**	($805, $2,522)
Other CV	$8,178	$8,946	$768	(-$1,441, $2,977)
Non-CV	$20,331	$20,836	$501	(-$3,980, $4,989)
Pharmacy	$9,644	$12,556	$2,912*	($282, $5,542)
Anticoagulant	$257	$1,084	$827**	($581, $1,073)
Antiarrhythmic	$4,153	$4,705	$553	(-$1,089, $2,914)
Non-CV	$5,234	$6,767	$1,533	(-$649, $3,716)
All costs in 2020 USD; *p<0.01; **p<0.001 All adjustments made using GLM, gamma distribution, identity link IPW: inverse probability weighting; AF: atrial fibrillation related; CV: cardiovascular				

7. Figures

Figure 1. Study Timeline

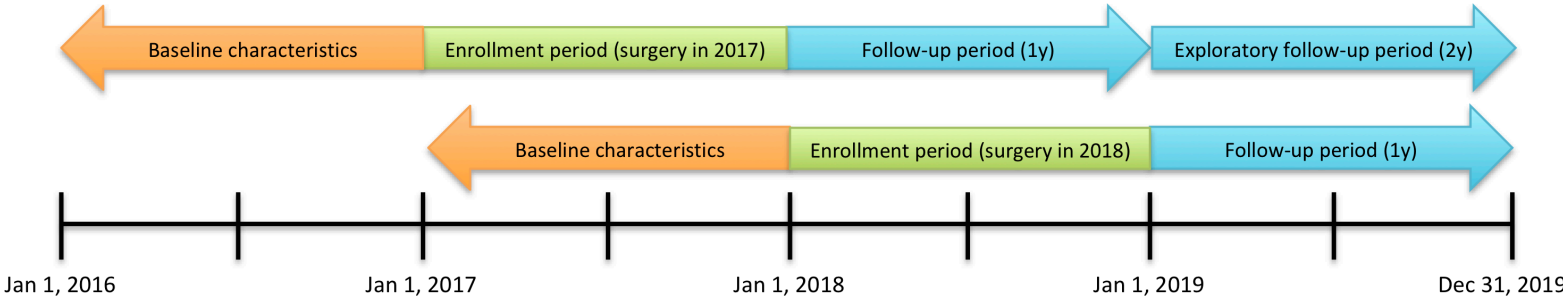


Figure 2. Attrition Diagram

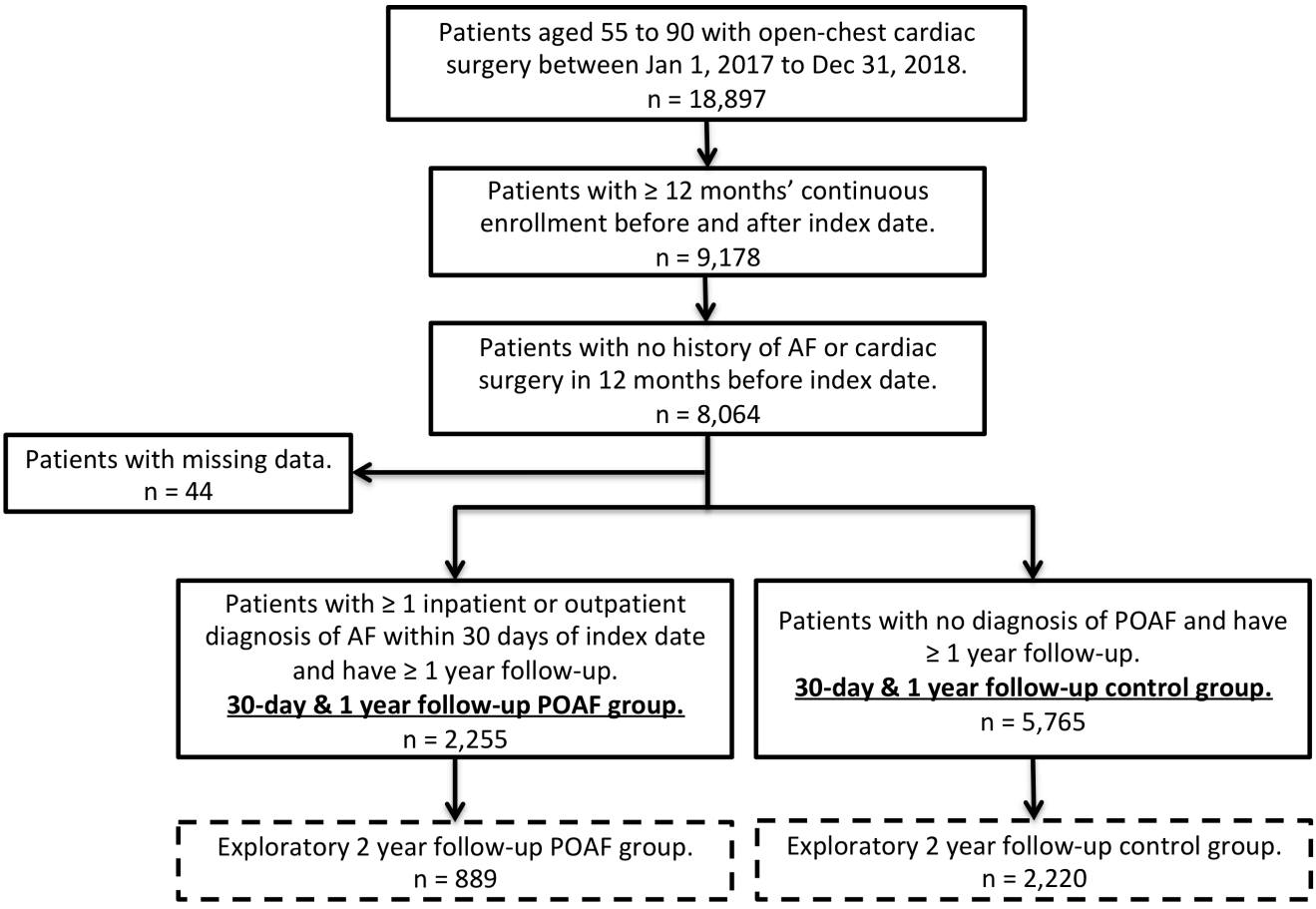
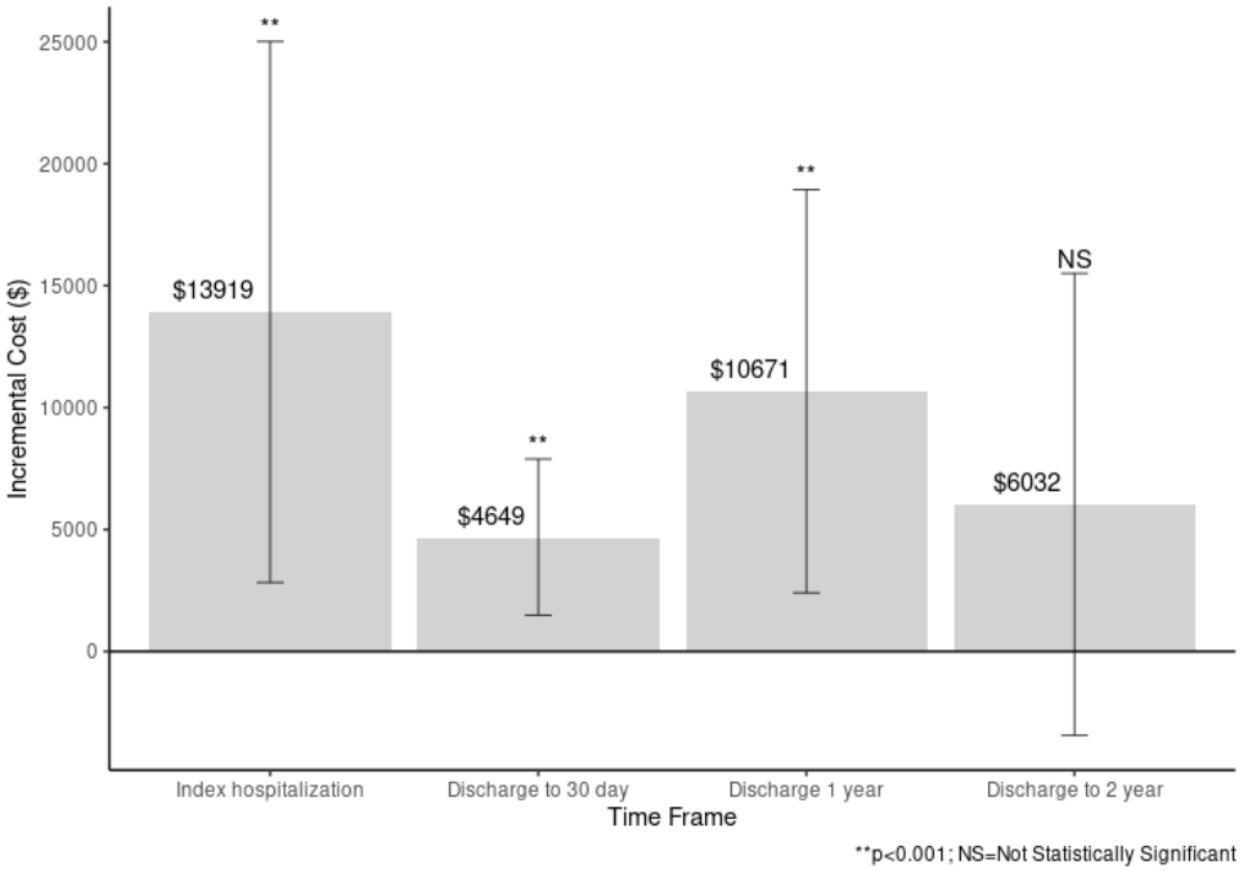


Figure 3. Incremental Total Healthcare Costs Over Time



8. Supplementary Appendix

Figure S1. Baseline Characteristics Used in IPW Before and After Weighting

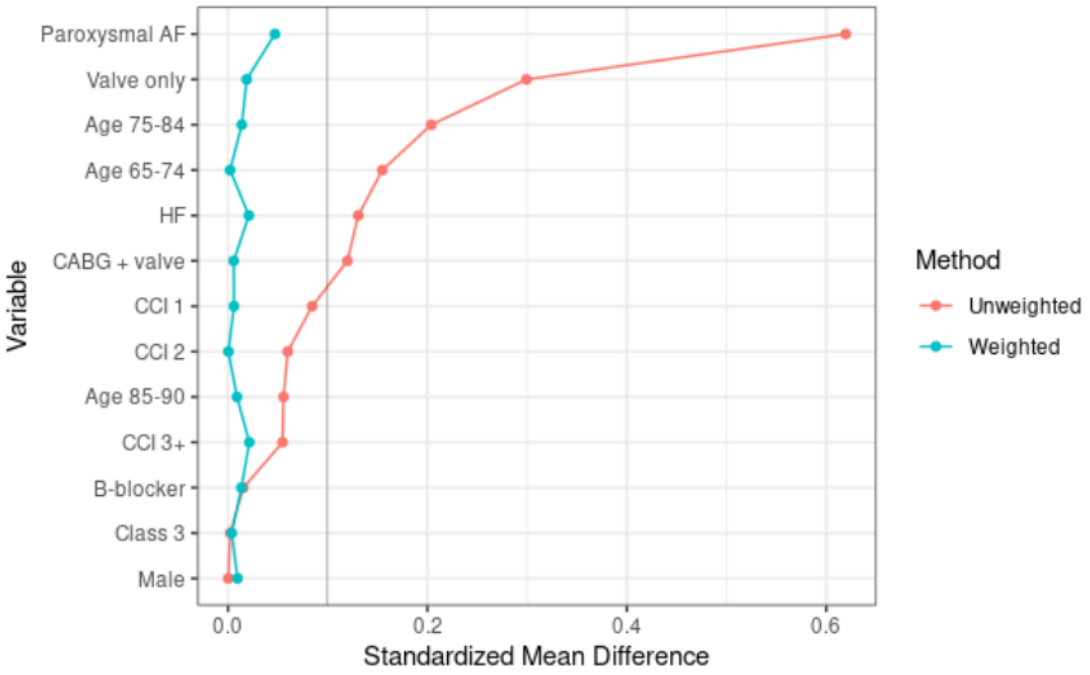


Table S1. Unadjusted 30-Day Healthcare Resource Utilization

Short-term healthcare resource utilization (unadjusted) *Index hospitalization + 30 days*			
	Control (n=5765)	**POAF (n=2255)**	**Incremental**
Index hospitalization	7.19 days	9.27 days	2.08 days**
Inpatient (avg claims/pt)	0.10	0.16	0.06**
AF	0	0.027	0.027†
Other CV	0.049	0.069	0.020**
Non-CV	0.052	0.065	0.013
ED Visits (avg claims/pt)	0.095	0.15	0.050**
AF	0	0.019	0.019†
Other CV	0.016	0.023	0.0065
Non-CV	0.079	0.10	0.025**
Outpatient (avg claims/pt)	4.78	5.83	1.05**
AF	0	0.48	0.48†
Other CV	1.72	2.03	0.31**
Non-CV	3.06	3.32	0.26**
Pharmacy (avg claims/pt)	7.46	8.14	0.68**
Anticoagulant	0.14	0.58	0.44**
Antiarrhythmic	3.51	3.99	0.48**
Non-CV	3.81	3.57	(0.24)
*p<0.01; **p<0.001 †Statistical significance not evaluated; inclusion criteria for POAF group AF: atrial fibrillation related; CV: cardiovascular			

Table S2. Unadjusted 1-Year Healthcare Resource Utilization

Long-term healthcare resource utilization (average claims per patient, unadjusted) *Discharge to 1 year*			
	Control (n=5765)	**POAF (n=2255)**	**Incremental**
Inpatient	0.35	0.46	0.11**
AF	0.0050	0.047	0.042**
Other CV	0.13	0.16	0.031*
Non-CV	0.21	0.25	0.034*
ED Visits	0.49	0.62	0.13**
AF	0.0024	0.032	0.029**
Other CV	0.073	0.091	0.018
Non-CV	0.41	0.50	0.089**
Outpatient	36.34	41.91	5.57**
AF	0.014	2.50	2.49**
Other CV	9.39	10.24	0.85**
Non-CV	26.82	29.17	2.35**
Pharmacy	47.27	50.92	3.65**
Anticoagulant	0.73	2.98	2.25**
Antiarrhythmic	20.45	22.54	2.09*
Non-CV	26.08	25.40	-0.68
*p<0.01; **p<0.001 AF: atrial fibrillation related; CV: cardiovascular			

Table S3. Unadjusted 2-Year Healthcare Resource Utilization

Long-term healthcare resource utilization (average claims per patient, unadjusted) *Discharge to 2 years*			
	Control (n=2220)	**POAF (n=889)**	**Incremental**
Inpatient	0.51	0.64	0.13**
AF	0.0081	0.056	0.048**
Other CV	0.17	0.20	0.032
Non-CV	0.33	0.38	0.049
ED Visits	0.84	1.02	0.18**
AF	0.0050	0.039	0.034**
Other CV	0.11	0.14	0.027
Non-CV	0.72	0.84	0.12**
Outpatient	56.25	66.36	10.11**
AF	0.24	3.73	3.49**
Other CV	12.83	14.62	1.79**
Non-CV	43.17	48.01	4.84*
Pharmacy	84.75	89.96	5.21
Anticoagulant	1.11	4.29	3.19**
Antiarrhythmic	35.96	39.20	3.24
Non-CV	47.68	46.47	-1.21
*p<0.01; **p<0.001 AF: atrial fibrillation related; CV: cardiovascular			

Table S4. Unadjusted 30-Day Costs

Short-term costs (average per patient, unadjusted) *Index hospitalization + 30 days*			
	Control (n=5765)	**POAF (n=2255)**	**Incremental**
Total *(exc. index hospitalization)*	$7,875	$10,877	$3,002*
Index hospitalization	$105,964	$131,138	$25,174**
Inpatient	$5772	$8,025	$2,253
AF	$0	$637	$637†
Other CV	$3,937	$4,595	$658
Non-CV	$1,836	$2,794	$958
ED Visits	$97	$145	$48**
AF	$0	$17	$17†
Other CV	$16	$24	$8
Non-CV	$81	$104	$23
Outpatient	$1,585	$2,194	$609**
AF	$0	$187	$187†
Other CV	$674	$1,003	$329**
Non-CV	$911	$1,004	$93
Pharmacy	$421	$514	$93*
Anticoagulant	$13	$81	$68**
Antiarrhythmic	$190	$209	$19
Non-CV	$218	$225	$7
All costs in 2020 USD; *p<0.01; **p<0.001 †Statistical significance not evaluated; inclusion criteria for POAF group AF: atrial fibrillation related; CV: cardiovascular			

Table S5. Unadjusted 1-Year Costs

Long-term costs (average per patient, unadjusted) *Discharge to 1 year*			
	Control (n=5765)	**POAF (n=2255)**	**Incremental**
Total	$40,385	$50,209	$9,824**
Inpatient	$17,212	$22,394	$5,182*
AF	$137	$1431	$1,294**
Other CV	$7,566	$9,218	$1,652
Non-CV	$9509	$11,745	$2,236
ED Visits	$488	$608	$120**
AF	$5	$30	$25**
Other CV	$78	$101	$23
Non-CV	$405	$476	$71
Outpatient	$17,432	$20,920	$3,488*
AF	$108	$1352	$1,244**
Other CV	$5,586	$6,825	$1,239*
Non-CV	$11,738	$12,743	$1,005
Pharmacy	$5,253	$6,287	$1,034**
Anticoagulant	$140	$704	$564**
Antiarrhythmic	$2,153	$2,474	$321
Non-CV	$2,960	$3,109	$149
All costs in 2020 USD; *p<0.01; **p<0.001 AF: atrial fibrillation related; CV: cardiovascular			

Table S6. Unadjusted 2-Year Costs

Long-term costs (average per patient, unadjusted) *Discharge to 2 years*			
	Control (n=2220)	**POAF (n=889)**	**Incremental**
Total	$64,645	$70,079	$5,434
Inpatient	$24,667	$25,049	$382
AF	$117	$1,519	$1,402**
Other CV	$9,383	$9,705	$322
Non-CV	$15,118	$13,825	-$1,293
ED Visits	$771	$916	$145
AF	$9	$39	$30*
Other CV	$112	$148	$36
Non-CV	$650	$729	$79
Outpatient	$29,283	$31,837	$2,554
AF	$275	$2,374	$2,099**
Other CV	$8,398	$9,102	$703
Non-CV	$20,610	$20,361	-$249
Pharmacy	$9,924	$12,277	$2,353
Anticoagulant	$244	$1,119	$875**
Antiarrhythmic	$4,300	$4,988	$688
Non-CV	$5,379	$6,170	$791
All costs in 2020 USD; *p<0.01; **p<0.001 AF: atrial fibrillation related; CV: cardiovascular			

Table S7. 30-Day Healthcare Resource Utilization By Payer

Short-term healthcare resource utilization by payer (average claims per patient, unadjusted) *Index hospitalization + 30 days*						
	Control (n=5765)		**POAF (n=2255)**		**Incremental Commercial**	**Incremental Medicare**
	Commercial (n=4076)	**Medicare (n=1689)**	**Commercial (n=1283)**	**Medicare (n=972)**		
Index hospitalization	6.97 days	7.72 days	8.84 days	9.85 days	2.05 days**	2.13 days**
Inpatient	0.12	0.063	0.21	0.096	0.090**	0.033*
AF	0	0	0.041	0.0093	0.041	0.0093
Other CV	0.059	0.025	0.092	0.039	0.033**	0.014
Non-CV	0.058	0.038	0.078	0.047	0.020	0.0090
ED Visits	0.093	0.099	0.13	0.16	0.037*	0.061**
AF	0	0	0.023	0.013	0.023**	0.013
Other CV	0.014	0.020	0.019	0.027	0.0050	0.0070
Non-CV	0.078	0.079	0.089	0.12	0.011	0.041*
Outpatient	4.85	4.61	5.96	5.66	1.11**	1.05**
AF	0	0	0.49	0.46	0.49	0.46
Other CV	1.67	1.84	1.84	2.28	0.17*	0.44**
Non-CV	3.18	2.78	3.63	2.92	0.45**	0.14
Pharmacy	7.66	6.97	8.48	7.70	0.82**	0.73**
Anticoagulant	0.14	0.13	0.58	0.58	0.44**	0.45**
Antiarrhythmic	3.61	3.26	4.17	3.75	0.56**	0.49*
Non-CV	3.91	3.58	3.72	3.37	-0.19	-0.21
*p<0.01; **p<0.001 AF: atrial fibrillation related; CV: cardiovascular						

Table S8. 1-Year Healthcare Resource Utilization By Payer

Long-term healthcare resource utilization by payer (average claims per patient, unadjusted)
Discharge to 1 year

	Control (n=5765)		POAF (n=2255)		Incremental Commercial	Incremental Medicare
	Commercial (n=4076)	Medicare (n=1689)	Commercial (n=1283)	Medicare (n=972)		
Inpatient	0.37	0.31	0.55	0.34	0.18**	0.030
AF	0.0054	0.0021	0.062	0.028	0.057**	0.026**
Other CV	0.14	0.11	0.19	0.13	0.050*	0.020
Non-CV	0.22	0.20	0.30	0.18	0.080*	-0.020
ED Visits	0.47	0.54	0.57	0.70	0.10*	0.16*
AF	0.0022	0.0030	0.035	0.028	0.033**	0.025**
Other CV	0.067	0.086	0.092	0.088	0.025	0.0020
Non-CV	0.40	0.45	0.44	0.59	0.040	0.14*
Outpatient	35.64	38.02	41.64	42.26	6.00**	4.24**
AF	0.10	0.21	2.54	2.44	2.44**	2.23**
Other CV	9.18	9.89	9.63	11.04	0.45	1.15*
Non-CV	26.36	27.92	29.46	28.78	3.10**	0.86
Pharmacy	47.92	45.69	51.76	49.80	3.84**	4.11**
Anticoagulant	0.76	0.68	3.02	2.93	2.26**	2.25**
Antiarrhythmic	20.88	19.41	22.83	22.16	1.95	2.75
Non-CV	26.28	25.60	25.92	24.71	-0.36	-0.89

*p<0.01; **p<0.001
AF: atrial fibrillation related; CV: cardiovascular

Table S9. 2-Year Healthcare Resource Utilization By Payer

Long-term healthcare resource utilization by payer (average claims per patient, unadjusted)
Discharge to 2 years

	Control (n=)		POAF (n=)		Incremental Commercial	Incremental Medicare
	Commercial (n=1495)	Medicare (n=725)	Commercial (n=451)	Medicare (n=438)		
Inpatient	0.52	0.49	0.68	0.59	0.16	0.10
AF	0.0087	0.0069	0.078	0.034	0.069**	0.027*
Other CV	0.18	0.14	0.22	0.17	0.040	0.030
Non-CV	0.33	0.34	0.38	0.38	0.050	0.040
ED Visits	0.81	0.90	0.93	1.10	0.12	0.20
AF	0.0060	0.0028	0.049	0.030	0.043**	0.027*
Other CV	0.10	0.13	0.15	0.12	0.050	-0.010
Non-CV	0.70	0.77	0.74	0.95	0.040	0.18
Outpatient	53.90	61.10	64.19	68.60	10.29**	7.50*
AF	0.20	0.33	4.14	3.30	3.94**	2.97**
Other CV	12.04	14.46	13.30	15.98	1.26	1.52
Non-CV	41.65	46.32	46.75	49.32	5.10	3.00
Pharmacy	86.11	81.96	91.21	88.46	5.10	6.50
Anticoagulant	1.21	0.91	4.43	4.14	3.22**	3.23**
Antiarrhythmic	36.63	34.58	40.85	37.50	4.22	2.92
Non-CV	48.27	46.47	46.12	46.82	-2.15	0.35

*p<0.01; **p<0.001
AF: atrial fibrillation related; CV: cardiovascular

Table S10. 30-Day Costs By Payer

Short-term costs by payer (average per patient, unadjusted) *Index hospitalization + 30 days*						
	Control (n=5765)		**POAF (n=2255)**		**Incremental Commercial**	**Incremental Medicare**
	Commercial (n=4076)	**Medicare (n=1689)**	**Commercial (n=1283)**	**Medicare (n=972)**		
Total *(exc. index hospitalization)*	$9,416	$4,157	$14,308	$6,348	$4,892**	$2,191*
Index hospitalization	$94,576	$133,448	$117,790	$148,758	$23,314**	$15,310*
Inpatient	$7,222	$2,274	$11,300	$3,702	$4,078*	$1,428*
AF	$0	$0	$1,043	$100	$1,043	$100
Other CV	$5,067	$1,210	$6,217	$2,454	$1,150	$1,244
Non-CV	$2,155	$1,063	$4,040	$1,149	$1,885	$86
ED Visits	$105	$78	$162	$122	$57*	$44*
AF	$0	$0	$22	$10	$22	$10
Other CV	$16	$16	$25	$22	$9	$6
Non-CV	$89	$63	$115	$89	$26	$26
Outpatient	$1,667	$1,386	$2,307	$2,045	$640**	$659**
AF	$0	$0	$191	$182	$191	$182
Other CV	$693	$627	$1,016	$986	$323	$359**
Non-CV	$974	$759	$1,100	$876	$126	$117
Pharmacy	$422	$419	$540	$479	$118	$60
Anticoagulant	$10	$20	$76	$86	$66**	$66**
Antiarrhythmic	$181	$213	$214	$212	$33	-$1
Non-CV	$231	$186	$250	$191	$19	$5
All costs in 2020 USD; *p<0.01; **p<0.001 AF: atrial fibrillation related; CV: cardiovascular						

Table S11. Long-term Costs By Payer

Long-term costs by payer (average per patient, unadjusted) *Discharge to 1 year*						
	Control (n=5765)		**POAF (n=2255)**		**Incremental Commercial**	**Incremental Medicare**
	Commercial (n=4076)	**Medicare (n=1689)**	**Commercial (n=1283)**	**Medicare (n=972)**		
Total	$41,025	$38,840	$55,606	$43,084	$14,581**	$4,244
Inpatient	$18,228	$14,760	$27,159	$16,105	$8,931*	$1,345
AF	$153	$97	$1,624	$1,175	$1,471**	$1,078*
Other CV	$8,692	$4,849	$10,565	$7,441	$1,873	$2,592
Non-CV	$9,383	$9,814	$14,970	$7,488	$5,587	-$2,326
ED Visits	$513	$427	$652	$549	$139*	$122
AF	$5	$5	$41	$16	$36**	$11
Other CV	$78	$77	$114	$85	$36	$8
Non-CV	$430	$346	$497	$448	$67	$102
Outpatient	$17,082	$18,277	$21,540	$20,102	$4,458*	$1,825
AF	$60	$225	$1,346	$1,360	$1,286**	$1,135**
Other CV	$5,476	$5,850	$6,541	$7,198	$1,065	$1,348
Non-CV	$11,545	$12,202	$13,652	$11,544	$2,107	-$658
Pharmacy	$5202	$5,377	$6,255	$6,329	$1,053*	$952
Anticoagulant	$107	$219	$624	$810	$517**	$591**
Antiarrhythmic	$2,064	$2,368	$2,319	$2,679	$255	$311
Non-CV	$3,031	$2,790	$3,313	$2,840	$282	$50
All costs in 2020 USD; *p<0.01; **p<0.001						

Table S12. Long-term Costs By Payer (2-year)

Long-term costs by payer (average per patient, unadjusted) *Discharge to 2 years*						
	Control (n=)		**POAF (n=)**		**Incremental Commercial**	**Incremental Medicare**
	Commercial (n=1495)	**Medicare (n=725)**	**Commercial (n=451)**	**Medicare (n=438)**		
Total	$63,087	$67,858	$66,178	$74,096	$3,091	$6,238
Inpatient	$24,837	$24,318	$24,460	$25,655	-$377	$1337
AF	$163	$175	$1,705	$1,327	$1,542*	$1,152
Other CV	$10,611	$6,850	$9,985	$9,417	-$626	$2,567
Non-CV	$14,063	$17,293	$12,770	$14,911	-$1,293	-$2,382
ED Visits	$836	$637	$1,023	$806	$187	$169
AF	$12	$4	$59	$18	$47	$14
Other CV	$115	$105	$183	$113	$68	$8
Non-CV	$709	$529	$781	$675	$72	$146
Outpatient	$27,532	$32,893	$28,937	$34,822	$1,405	$1,929
AF	$278	$268	$2,386	$2,362	$2,108**	$2,094*
Other CV	$7,872	$9,484	$8,000	$10,236	$128	$752
Non-CV	$19,383	$23,141	$18,551	$22,224	-$832	-$917
Pharmacy	$9,882	$10,011	$11,757	$12,813	$1,875	$2,802
Anticoagulant	$178	$380	$864	$1,382	$686**	$1,002**
Antiarrhythmic	$4,183	$4,542	$4,804	$5,176	$621	$634
Non-CV	$5,520	$5,089	$6,089	$6,255	$569	$1,136
All costs in 2020 USD; *p<0.01; **p<0.001						

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