Rivaroxaban versus Warfarin in Patients with Atrial Fibrillation (ROCKET AF Trial)

DUPLICATE-ROCKET AF

September 14, 2021

NCT04593056

1. RCT Details

1.1 Title

Rivaroxaban versus Warfarin in Patients with Atrial Fibrillation (ROCKET AF trial)

1.2 Intended aim(s)

To compare the risk of stroke or systemic embolism in nonvalvular atrial fibrillation (AF) patients at increased risk for stroke with rivaroxaban versus warfarin use.

1.3 Primary endpoint for replication

The primary outcome of the study was composite of stroke (ischemic or hemorrhage) and systemic embolism.

1.3.1 Required power for primary endpoint and noninferiority margin (if applicable)

The test was designed for noninferiority. The most conservative approach was chosen, selecting the lower limit, 1.46 to obtain a 95% power with a 1-sided α equal to 0.025. With expected study duration was 40 months, project event rate of 2.3% per 100 patient years in the warfarin group, and 14% annual attrition rate, 405 events were selected as the prespecified target to ensure a robust statistical result.

1.4 Secondary endpoint for replication (assay sensitivity) and RCT finding

Major bleeding; HR = 1.04 (95% CI 0.90-1.20)

1.5 Trial estimate

HR = 0.79 (95% CI 0.66-0.96) comparing rivaroxaban vs warfarin (Patel et al., 2011)

2. Person responsible for implementation of replication in Aetion

Dureshahwar Jawaid, MPH, Ajinkya Pawar, Ph.D., and Hemin Lee, MD, MPH implemented the study design in the Aetion Evidence Platform. They are not responsible for the validity of the design and analytic choices. All implementation steps are recorded and the implementation history is archived in the platform.

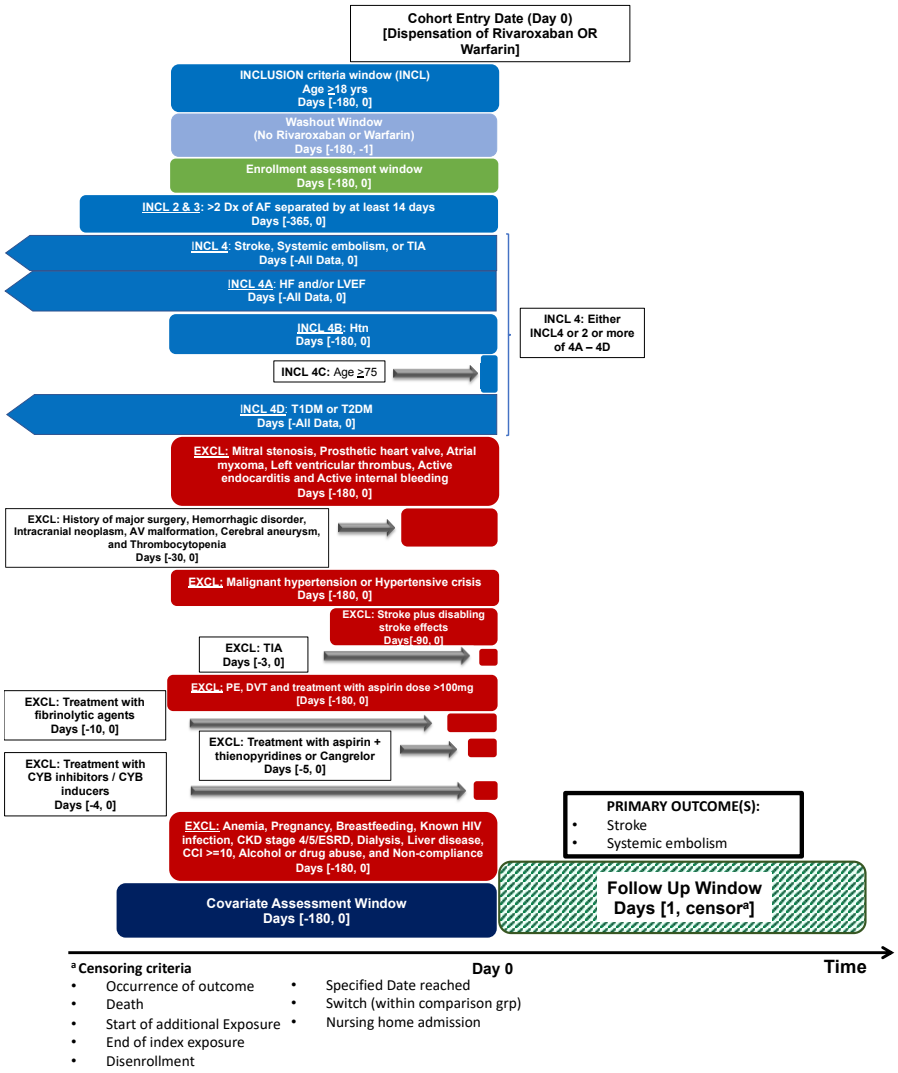
3. Data Source(s)

United/Optum, Truven/MarketScan, Medicare

4. Study Design Diagram

The study design diagram visualizes key aspects of the longitudinal study design for expedited review.

Design Diagram – ROCKET AF TRIAL REPLICATION



5. Cohort Identification

5.1 Cohort Summary

This study will involve a new user, parallel group, propensity score-matched, retrospective cohort study design comparing rivaroxaban (at a daily dose of 20mg or 15 mg) to warfarin users. The patients will be required to have continuous enrollment during baseline period of 180 days before initiation of rivaroxaban or warfarin (index date). We will restrict the analyses to patients with a diagnosis of atrial fibrillation with risk factors for stroke or systemic embolism.

5.2 Important steps for cohort formation

New users (defined as no use in 180 days prior to index date) of an exposure and a comparator drug will be identified.

5.2.1 Eligible cohort entry dates

Rivaroxaban was approved for non-valvular atrial fibrillation on November 4, 2011.

- For Marketscan: November 4, 2011 -December 31, 2018 (end of data availability).
- For Medicare: November 4, 2011 -December 31, 2017 (end of data availability).
- For Optum: November 4, 2011 -December 31, 2019 (end of data availability).

5.2.2 Specify inclusion/exclusion criteria for cohort entry and define the index date

Inclusion and exclusion criteria were adapted from the trial as closely as possible. Definitions for all inclusion/exclusion are provided in **Appendix A** and are summarized in the flowcharts below.

5.3 Flowchart of the study cohort assembly

For rivaroxaban vs. warfarin

	Optum		**Truven**		**Medicare**	
	Less Excluded Patients	**Remaining Patients**	**Less Excluded Patients**	**Remaining Patients**	**Less Excluded Patients**	**Remaining Patients**
All patients		75,894,642		200,203,908		6,886,908
Did not meet cohort entry criteria	-74,960,282	934,360	-199,073,812	1,130,096	-2,028,461	4,858,447
Excluded due to insufficient enrollment	-92,301	842,059	-95,091	1,035,005	-1,551,114	3,307,333

Excluded due to prior use of referent	-482,398	359,661	-622,538	412,467	-2,080,069	1,227,264
Excluded due to prior use of exposure	-205,565	154,096	-204,425	208,042	-660,796	566,468
Excluded because patient qualified in >1 exposure category	-7	154,089	-26	208,016	-81	566,387
Excluded based on Age	-624	153,465	0	208,016	-155	566,232
Excluded based on Gender	0	153,465	0	208,016	0	566,232
Excluded based on Inclusion #1 - Age >=18	-86	153,379	-264	207,752	-65	566,167
Excluded based on Inclusion #2 & 3 - Atrial fibrillation	-83,438	69,941	-129,172	78,580	-348,521	217,646
Excluded based on Inclusion #4	-13,297	56,644	-16,046	62,534	-36,136	181,510
Excluded based on Exclusion #1a - Mitral stenosis	-275	56,369	-154	62,380	-399	181,111
Excluded based on Exclusion #1b - Prosthetic heart valve	-1,238	55,131	-789	61,591	-3,016	178,095
Excluded based on Exclusion #1e - atrial myxoma or left ventricular thrombus	-158	54,973	-35	61,556	-234	177,861
Excluded based on Exclusion #1f - Active infective endocarditis	-279	54,694	-138	61,418	-401	177,460
Excluded based on Exclusion #2a - Active bleeding or bleeding history	-3,413	51,281	-2,716	58,702	-8,256	169,204
Excluded based on Exclusion #2b.1 - Major Surgery	-1,564	49,717	-1,561	57,141	-6,484	162,720
Excluded based on Exclusion #2b.2 - Bleeding diathesis	-1,235	48,482	-885	56,256	-3,832	158,888
Excluded based on Exclusion #2b.3 - Intracranial neoplasm, AV malformation, cerebral aneurysm	-259	48,223	-283	55,973	-422	158,466
Excluded based on Exclusion #2d - Thrombocytopenia	0	48,223	0	55,973	0	158,466
Excluded based on Exclusion #2e - Uncontrolled hypertension	-47	48,176	-105	55,868	-300	158,166
Excluded based on Exclusion #3a.1 - stroke plus disabling stroke effects	-257	47,919	-152	55,716	-847	157,319
Excluded based on Exclusion # 3a.2 - stroke	-103	47,816	-88	55,628	-642	156,677
Excluded based on Exclusion #3b - TIA	-17	47,799	-25	55,603	-123	156,554
Excluded based on Exclusion #3c - DVT & PE	-1,095	46,704	-853	54,750	-3,185	153,369
Excluded based on Exclusion #3d.1 - Use of aspirin > 100 mg, #3d.2 - Use of fibrinolytic agents, #3d.3 - Use of Aspirin + thienopyridines, #3d.4 - Use of cangrelor, #3f – Use of CYP inhibitors, #3g - Use of CYP inducers	-1,020	45,684	-1,024	53,726	-4,503	148,866
Excluded based on Exclusion #3h – Anemia & #3i - Pregnancy	-1,382	44,302	-1,294	52,432	-6,940	141,926
Excluded based on Exclusion #3k - HIV infection	-13	44,289	-7	52,425	-12	141,914

Excluded based on Exclusion #3l - Severe renal impairment	-3,281	41,008	-2,012	50,413	-7,391	134,523
Excluded based on Exclusion #3m - Liver disease	-192	40,816	-170	50,243	-466	134,057
Excluded based on Exclusion #4a - CCI (180 days)- ICD9 and ICD10 v2	-40	40,776	-31	50,212	-400	133,657
Excluded based on Exclusion #4b - drug addiction or alcohol abuse	-157	40,619	-106	50,106	-231	133,426
Excluded based on Exclusion #4f - Non-compliance	-15	40,604	-21	50,085	-196	133,230
Final cohort		**40,604**		**50,085**		**133,230**

Due to CMS cell suppression policy, all values less than 11 are denoted with **

* Medicare database includes all patients using a novel oral anticoagulant and a subset of patients using warfarin during 2011-2017.

6. Variables

6.1 Exposure-related variables:

Study drug:

The study exposure of interest is initiation of rivaroxaban. Initiation will be defined by no use of rivaroxaban or a comparator in the prior 6 months before treatment initiation (washout period).

Comparator agents-

- Initiators of rivaroxaban will be compared to initiators of-
    - Warfarin

6.2 Covariates:

- Age
- Sex
- Combined Comorbidity Index (CCI), measured over the baseline covariate assessment period, defined as 180 days prior to and including index date

Covariates listed above represent only a small subset of covariates that will ultimately be controlled for in the design and analysis. We use the covariates above only for initial feasibility analyses to judge whether there is likely to be sufficient overlap between treatment groups to proceed with the study. Remaining covariates are defined only after the study has passed the initial feasibility analysis and the initial power assessment and are listed in Table 1 (**Appendix B**).

6.3 Outcome variables and study follow-up:

6.3.1 Outcome variables

Primary Effectiveness outcomes of interest (definitions provided in **Appendix A**):

- Primary outcome: stroke (hemorrhagic, ischemic) and systemic embolism
- Secondary outcome: Individual components
    - Hospital admission for stroke (principal diagnosis position)
    - Hospital admission for systemic embolism (principal diagnosis position)

Control outcomes of interest (control outcomes only serve to assess aspects of study validity but are not further interpreted):

1. Major bleeding

6.3.2 Study follow-up

Both as-treated (AT) and intention-to-treat (ITT) analyses will be conducted with treatment defined as the index drug on day of cohort entry. Because adherence in the real-world databases is expected to be much worse than in the trial, the AT analysis is the primary analysis, as it targets the relative hazard of outcomes on treatment.

For the as-treated analyses, the follow-up will start the day after initiation of rivaroxaban and comparator and will continue until the earliest date of the following events:

- The first occurrence of the outcome of interest, unless otherwise specified for selected outcomes,
- The date of end of continuous registration in the database,
- End of the study period,
- Measured death event occurs,
- Nursing home admission
    - Nursing home admissions are considered a censoring event because the data sources utilized typically provide little to no data on a patient, particularly on drug utilization, after admission. We will utilize this as an exclusion reason for cohorts for the same reason.

- The date of drug discontinuation, defined as the date of the last continuous treatment episode of the index drug (rivaroxaban and comparator) plus a defined grace period (i.e., 10 days after the end of the last prescription's days' supply in main analyses).
- The date of augmentation or switching from exposure to comparator or vice versa or augmentation/switching to any other NOAC (e.g. switching from rivaroxaban or warfarin to apixaban would be a censoring event);
    - A dosage change on the index treatment does not fulfill this criterion
    - An added treatment that is not part of the exposure or comparator group does not fulfill this criterion

For the intention-to-treat (ITT) analyses, the censoring based on the augmentation/switching and treatment discontinuation will be replaced with a maximum allowed follow-up time of 365 days.

7. Initial Feasibility Analysis

Aetion report name:

For rivaroxaban vs. warfarin
Optum- https://bwh-dope.aetion.com/projects/details/1310/results/58054/result/0
Truven- https://bwh-dope.aetion.com/projects/details/1313/results/58055/result/0
Medicare- https://bwh-dope.aetion.com/projects/details/1341/results/58058/result/0

Date conducted: 09/02/2020

Complete Aetion feasibility analysis using age, sex, and CCI as the only covariates and the primary endpoint (Section 6.3.1) as the outcome. No measures of association will be computed nor will incidence rates stratified by treatment group.

- Report patient characteristics by treatment group
- Report summary parameters of study population
- Report median follow-up time by treatment group
- Report reasons for censoring in the overall study population

8. Initial Power Assessment

Aetion report name:

For rivaroxaban vs. warfarin
Optum- https://bwh-dope.aetion.com/projects/details/1310/results/58056/result/0
Truven- https://bwh-dope.aetion.com/projects/details/1313/results/58057/result/0
Medicare- https://bwh-dope.aetion.com/projects/details/1341/results/58059/result/0

Date conducted: 09/02/2020

In order to complete the initial power analysis, the dummy outcome of a 90-day gap in database enrollment will be used. This outcome is used to ensure that no information on the comparative risks of the outcomes of interest are available at this stage. Complete a 1:1 PS-matched comparative analysis using this outcome. PS should include only 3 covariates: age, sex, and combined comorbidity index. Power calculations are based on the formulas from Chow et al. (2008).

- Stop analyses until feasibility and power are reviewed by primary investigators and FDA. Reviewers evaluate the results of the analyses described above in Sections 7 and 8, including numbers of patients, patient characteristics, follow-up time, and reasons for censoring by treatment group, as well as overall rates of outcomes and study power. These parameters are re-evaluated and reported in the subsequent sections, after incorporating feedback and refining the protocol.

Reviewed by PI:	Jessica Franklin	Date reviewed:	6/3/20
Reviewed by FDA:	Ken Quinto	Date reviewed:	6/30/20
Reasons for stopping analysis (if required):			

9. Balance Assessment

Aetion report name:

Optum- https://bwh-dope.aetion.com/projects/details/1310/results/57933/result/0
Marketscan- https://bwh-dope.aetion.com/projects/details/1313/results/57934/result/0
Medicare- https://bwh-dope.aetion.com/projects/details/1341/results/57981/result/0

Date conducted: 8/27/2020 (Medicare 8/30/2020)

After review of initial feasibility and power analyses, complete creation of the remaining covariates (see Table 1 below for list of covariates). Again, using the dummy outcome of a 90-day gap in database enrollment, complete a 1:1 PS-matched analysis. The PS should include the complete list of covariates (excluding laboratory values, which are missing in some patients).

- Provide plot of PS distributions stratified by treatment group.

  Note- Please refer to **Appendix B**.

- Report covariate balance after matching.

  Note- For Table 1, please refer to **Appendix B**.

- Report reasons for censoring by treatment group.

	Overall	**Referent**	**Exposure**
Dummy Outcome	0 (0.00%)	0 (0.00%)	0 (0.00%)
Death	1,879 (1.83%)	946 (1.84%)	933 (1.82%)
Start of an additional exposure	3,238 (3.15%)	1,642 (3.20%)	1,596 (3.11%)
End of index exposure	71,983 (70.13%)	36,022 (70.19%)	35,961 (70.07%)
Specified date reached (Dec 17/Dec 18/Dec 19)	6,822 (6.65%)	3,196 (6.23%)	3,626 (7.07%)
End of patient enrollment	5,237 (5.10%)	2,408 (4.69%)	2,829 (5.51%)
Switch to other NOACs (for censoring) + nursing home admission	13,477 (13.13%)	7,104 (13.84%)	6,373 (12.42%)

- Report follow-up time by treatment group.

Median Follow-Up Time (Days) [IQR]			
Patient Group	**Optum**	**Truven**	**Medicare**
Overall Patient Population	98 [38-209]	98 [44-236]	98 [38-206]
Referent	98 [38-190]	98 [44-192]	98 [38-188]
Exposure	98 [38-231]	119 [44-281]	98 [38-228]

- Report overall risk of the primary outcome.

	Optum	**MarketScan**	**Medicare**	**Pooled**
Risk per 1,000 patients	7.00	7.33	12.05	10.08

10. Final Power Assessment

Date conducted:

- Re-calculate power in the appropriate excel table, using the revised number of matched patients from the PS-match in Section 9. All other parameters in the table should be the same as in Section 8.
    - For rivaroxaban vs. warfarin

- Pooled

Superiority Analysis	
Number of patients matched	102,636
Reference	51,318
Exposed	51,318
Risk per 1,000 patients	10.08
Desired HR from RCT	0.79
Alpha (2-sided)	0.05
Number of events expected	1034.57088
Power	0.966450516

Non-inferiority Analysis	
Number of patients matched	102,636
Reference	51,318
Exposed	51,318
Risk per 1,000 patients	10.08
Assumed HR from RCT	1
Alpha (2-sided)	0.05
Non-inferiority margin	1.46
Number of events expected	1034.57088
Power	0.999981559

- Optum

Superiority Analysis		**Non-inferiority Analysis**	
Number of patients matched	17,900	Number of patients matched	17,900
Reference	8,950	Reference	8,950
Exposed	8,950	Exposed	8,950
Risk per 1,000 patients	7.00	Risk per 1,000 patients	7.00
Desired HR from RCT	0.79	Assumed HR from RCT	1
Alpha (2-sided)	0.05	Alpha (2-sided)	0.05
		Non-inferiority margin	1.46
Number of events expected	125.3	Number of events expected	125.3
Power	0.261393559	Power	0.562809862

- MarketScan

Superiority Analysis	
Number of patients matched	22,600
Reference	11,300
Exposed	11,300
Risk per 1,000 patients	7.33
Desired HR from RCT	0.79
Alpha (2-sided)	0.05
Number of events expected	165.658
Power	0.329138572

Non-inferiority Analysis	
Number of patients matched	22,600
Reference	11,300
Exposed	11,300
Risk per 1,000 patients	7.33
Assumed HR from RCT	1
Alpha (2-sided)	0.05
Non-inferiority margin	1.46
Number of events expected	165.658
Power	0.682759594

- Medicare

Superiority Analysis		**Non-inferiority Analysis**	
Number of patients matched	62,136	Number of patients matched	62,136
Reference	31,068	Reference	31,068
Exposed	31,068	Exposed	31,068
Risk per 1,000 patients	12.05	Risk per 1,000 patients	12.05
Desired HR from RCT	0.79	Assumed HR from RCT	1
Alpha (2-sided)	0.05	Alpha (2-sided)	0.05
		Non-inferiority margin	1.46
Number of events expected	748.7388	Number of events expected	748.7388
Power	0.897079133	Power	0.999353731

- Stop analyses until balance and final power assessment are reviewed by primary investigators, FDA, and assigned members of advisory board.

Reviewed by PI:	Jessica Franklin	Date reviewed:	9/8/20
Reviewed by FDA:	Ken Quinto	Date reviewed:	9/29/20
Reasons for stopping analysis (if required):			

11. Study Confidence and Concerns

Deadline for voting on study confidence and listing concerns:
Date votes and concerns are summarized:

- If final feasibility and power analyses are reviewed and approved, proceed to the remaining protocol steps.

- All study team and advisory board members that review this protocol should at this stage provide their level of confidence for the success of the RWD study in the Google Form. This form also provides space for reviewers to list any concerns that they feel may contribute to a failure to replicate the findings of the RCT, including differences in study populations, poor measurement of study variables, or residual confounding. All responses will be kept confidential and individual-level results will only be shared with the individual respondent.
- After the deadline for voting has passed, provide the distribution of responses and summarize all concerns here.

12. Register study protocol on clinicalTrials.gov

Date conducted:

- Register the study on clinicalTrials.gov and upload this document.

13. Comparative Analyses

Aetion report name:
Date conducted:

13.1 For primary analysis:

13.2 For sensitivity analyses:

14. Requested Results

14.1 Table 1: Baseline characteristics before and after adjustment

Variable	Before adjustment			After adjustment		
	Referent	Exposure	Std. diff.	Referent	Exposure	Std. diff.
Number of patients			-			-
Age categories						
…						

14.2 Table 2: Follow-up time

Patient Group	**Median Follow-Up Time (Days) [IQR]**
Overall Patient Population	
Referent	
Exposure	

14.3 Table 3: Censoring events

	Overall	**Referent**	**Exposure**
Outcome			
Death			
Start of an additional exposure			
End of index exposure			
Specified date reached			
End of patient data			
End of patient enrollment			
…			

14.4 Table 4: Results from primary analyses;

Analysis	**No. exposed events**	**No. referent events**	**Exposed rate**	**Referent rate**	**HR (95% CI)**
Crude					
Analysis 1					
Analysis 2					
...					

HR, Hazard Ratio; CI, Confidence Interval.

14.5 Table 5: Results from secondary analyses;

15. References

Chow S, Shao J, Wang H. 2008. *Sample Size Calculations in Clinical Research*. 2nd Ed. Chapman & Hall/CRC Biostatistics Series. **page 177**

Patel MR, Mahaffey KW, Garg J, Pan G, Singer DE, Hacke W, Breithardt G, Halperin JL, Hankey GJ, Piccini JP, Becker RC. Rivaroxaban versus warfarin in nonvalvular atrial fibrillation. New England Journal of Medicine. 2011; 365(10):883-91.

Appendix A

#	ROCKET-AF trial definitions	Implementation in routine care	References/Rationale	Color coding
	Trial details- Primary indication, 4a- Unintended S with label change HR = 0.79 (95% CI 0.66–0.96)		**Please see the following Google Drive for further details or any missing information:** https://drive.google.com/open?id=1WD618wrywYiEaXxfLTcuK-VCcnb6b-gV	Criteria
	EXPOSURE vs. COMPARISON		**ICD-10 codes are not listed in this document because of excel cell size limitations and excessive number of ICD-10 codes. Full ICD-10 code lists will be available in the above Google Drive Folder (link above). ICD-9 to ICD-10 code conversions were completed using a SAS macro that implements forward/ backward mapping based on the CMS ICD-9 to ICD-10 mapping:** https://www.nber.org/data/icd9-icd-10-cm-and-pcs-crosswalk-general-equivalence-mapping.html	Adequate mapping in claims
	Rivaroxaban vs. Warfarin	Rivaroxaban 20mg OR 15mg daily (if low GFR) vs. adjusted-dose warfarin		Intermediate mapping in claims
	PRIMARY OUTCOME			Poor mapping or cannot be measured in claims
	Primary endpoint of stroke (ischemic or hemorrhagic) and systemic embolism.	**Measured 1 day after drug initiation in primary diagnosis position specified below and inpatient care setting:** Stroke: ICD-9 discharge diagnosis codes: 430.xx Subarachnoid hemorrhage (SAH) 431.xx Intracerebral hemorrhage (ICH) 433.x1 Occlusion and stenosis of precerebral arteries with cerebral infarction 434.xx (excluding 434.x0) Occlusion and stenosis of cerebral arteries with cerebral infarction 436.x Acute, but ill-defined cerebrovascular events Systemic embolism: ICD-9 discharge diagnosis code: 444.xx Arterial embolism ICD-10 discharge diagnosis code: I74.x Arterial embolism and thrombosis	**For stroke:** PPV of 85% or higher for ischemic stroke PPV ranging from 80% to 98% for hemorrhagic stroke ➜[Andrade SE, Harrold LR, Tjia J, et al. A systematic review of validated methods for identifying cerebrovascular accident or transient ischemic attack using administrative data. Pharmacoepidemiology and Drug Safety 2012;21 Suppl 1:100-28.] ➜[Tirschwell DL, Longstreth WT, Jr. Validating administrative data in stroke research. Stroke; a journal of cerebral circulation 2002;33:2465-70.] ➜[Roumie CL, Mitchel E, Gideon PS, Varas-Lorenzo C, Castellsague J, Griffin MR. Validation of ICD-9 codes with a high positive predictive value for incident strokes resulting in hospitalization using Medicaid health data. Pharmacoepidemiology and drug safety 2008;17:20-6.]	Can't be measured in claims but not important for the analysis
	INCLUSION CRITERIA			
1	Men or women aged ≥18 years	**Measured on the day of drug initiation:** Age >=18		
2	**Non-valvular Atrial fibrillation** Atrial fibrillation must be documented by ECG evidence (e.g., 12-lead ECG, rhythm strip, Holter, pacemaker interrogation) within 30 days before randomization. In addition, subjects must have medical evidence of atrial fibrillation within 1 year before and at least one day before the qualifying ECG evidence. This could be obtained from a notation in the subject's record (e.g., medical chart, hospital discharge summary).	**Measured 12 months prior to and including day of drug initiation, with >2 diagnoses separated by at least 14 days, in any diagnosis position and inpatient or outpatient care setting:** Atrial fibrillation: ICD-9 diagnosis: 427.31 ICD-10 diagnosis: I48.0x, I48.1x, I48.2x, I48.9x		
3	Non-valvular Atrial fibrillation Subjects with newly diagnosed atrial fibrillation are eligible provided that: – there is evidence that the atrial fibrillation is non-valvular – cardioversion is not planned – there is ECG evidence on 2 occasions 24 hours apart demonstrating atrial fibrillation			
	For Inclusion Criteria 4 It is either A) History of ischemic stroke or TIA or arterial embolism -OR- B) 2 of the following 4 1) Heart failure 2) Hypertension 3) Age >=75 4) Diabetes			
4	History of prior ischemic stroke, TIA or non-CNS systemic embolism believed to be cardioembolic in origin	**Measured any time prior to and including day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** Ischemic stroke: ICD-9 diagnosis: 433.x, 434. x, 436.xx TIA: ICD-9 diagnosis: 435.xx Systemic embolism: ICD-9 diagnosis: 444.xx	Patorno, Elisabetta et al. "Cardiovascular outcomes associated with canagliflozin versus other non-gliflozin antidiabetic drugs: population based cohort study." BMJ 2018;360:k119 http://dx.doi.org/10.1136/bmj.k119 Patorno, Elisabetta et al. "Empagliflozin and the Risk of Heart Failure Hospitalization in Routine Clinical Care: A First Analysis from the Empagliflozin Comparative Effectiveness and Safety (EMPRISE) Study." Circulation. 2019 Apr 8. doi: 10.1161/CIRCULATIONAHA.118.039177	
	OR 2 or more of the following risk factors			
4a	– Heart failure and/or left ventricular ejection fraction ≤35%	**Measured anytime prior to and including day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** Heart failure: ICD-9 diagnosis: 428.x, 398.91, 402.01, 402.11, 402.91, 404.01, 404.11, 404.91, 404.03, 404.13, 404.93	Patorno, Elisabetta et al. "Cardiovascular outcomes associated with canagliflozin versus other non-gliflozin antidiabetic drugs: population based cohort study." BMJ 2018;360:k119 http://dx.doi.org/10.1136/bmj.k119 Patorno, Elisabetta et al. "Empagliflozin and the Risk of Heart Failure Hospitalization in Routine Clinical Care: A First Analysis from the Empagliflozin Comparative Effectiveness and Safety (EMPRISE) Study." Circulation. 2019 Apr 8. doi: 10.1161/CIRCULATIONAHA.118.039177	

Appendix A

4b	– Hypertension (defined as use of antihypertensive medications within 6 months before the screening visit or persistent systolic blood pressure above 140 mmHg or diastolic blood pressure above 90 mmHg)	**Measured 180 days prior to and inlcuding day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** Hypertension: ICD-9 diagnosis: 401.x – 405.x Plus following medication use within 6 months: Refer to the 'Hypertension meds' sheet for list of medications	Patorno, Elisabetta et al. "Cardiovascular outcomes associated with canagliflozin versus other non-gliflozin antidiabetic drugs: population based cohort study." BMJ 2018;360:k119 http://dx.doi.org/10.1136/bmj.k119 Patorno, Elisabetta et al. "Empagliflozin and the Risk of Heart Failure Hospitalization in Routine Clinical Care: A First Analysis from the Empagliflozin Comparative Effectiveness and Safety (EMPRISE) Study." Circulation. 2019 Apr 8. doi: 10.1161/CIRCULATIONAHA.118.039177
4c	– Age ≥75 years	**Measured at the time of drug initiation:** Age ≥75 years	
4d	– Diabetes mellitus (defined as a history of type 1 or type 2 diabetes mellitus or use of antidiabetic medications within 6 months before screening visit)	**Measured any time prior to and including day of drug initiation in diagnosis position and inpatient or outpatient care setting:** DM type 2: ICD-9 diagnosis: 250.x0 or 250.x2 ICD-10 diagnosis: E11.x DM type 1: ICD-9 diagnosis: 250.x1 or 250.x3 ICD-10 diagnosis: E10.x **-OR-** Following drug dispensing within 6 months of drug intiation: Refer to the 'Diabetes meds' sheet for list of DM Drugs	Patorno, Elisabetta et al. "Cardiovascular outcomes associated with canagliflozin versus other non-gliflozin antidiabetic drugs: population based cohort study." BMJ 2018;360:k119 http://dx.doi.org/10.1136/bmj.k119 Patorno, Elisabetta et al. "Empagliflozin and the Risk of Heart Failure Hospitalization in Routine Clinical Care: A First Analysis from the Empagliflozin Comparative Effectiveness and Safety (EMPRISE) Study." Circulation. 2019 Apr 8. doi: 10.1161/CIRCULATIONAHA.118.039177
5	Female subjects must be postmenopausal (for at least 2 years), surgically sterile, abstinent, or, if sexually active, be practicing an effective method of birth control (e.g., prescription oral contraceptives, contraceptive injections, intrauterine device, double-barrier method, contraceptive patch, male partner sterilization) before entry and throughout the study; and, for those of childbearing potential, have a negative serum β-hCG pregnancy test at screening.	N/A	We will incorporate this by excluding 'pregnant' women below.
6	Subjects must have signed an informed consent document indicating that they understand the purpose of and procedures required for the study and are willing to participate in the study	N/A	
7	In order to participate in the optional pharmacogenomic component, subjects must have signed the informed consent for DNA research document indicating willingness to participate in the pharmacogenomics component of the study (where local regulations permit)	N/A	
	EXCLUSION CRITERIA		
1	**Cardiac-Related Conditions**		
1a	Hemodynamically significant mitral valve stenosis	**Measured 180 days prior to and including day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** Mitral stenosis: ICD-9 diagnosis: 396.0x, 396.1x ICD-10 diagnosis: I34.2x, I05.1x, I05.2x	
1b	Prosthetic heart valve (annuloplasty with or without prosthetic ring, commissurotomy and/or valvuloplasty are permitted)	**Measured 180 days prior to and including day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** ICD-9 diagnosis: V43.3x ICD-10 diagnosis: Z95.2x CPT procedure: (TAVR with prosthetic valve) 33361, 33362, 33363, 33364, 33365, 33366, 33367, 33368, 33369, 33477, 0483T, 0484T, 0569T, 0570T	
1c	Planned cardioversion (electrical or pharmacological)	N/A	Will not capture 'planned' procedures
1d	Transient atrial fibrillation caused by a reversible disorder (e.g., thyrotoxicosis, PE, recent surgery, MI)	N/A	Transient AF would not be well captured in claims. Joshi, Kirti K et al. "Postoperative atrial fibrillation in patients undergoing non-cardiac non-thoracic surgery: A practical approach for the hospitalist." Hospital practice (1995) vol. 43,4 (2015): 235-44. doi:10.1080/21548331.2015.1096181
1e	Known presence of atrial myxoma or left ventricular thrombus	**Measured 180 days prior to and including day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** Atrial myxoma: ICD-9 diagnosis: 212.7 (Benign neoplasm of heart) ICD-10 diagnosis: D15.1 (Benign neoplasm of heart) Left ventricular thrombus: ICD-10 diagnosis: I51.3 (Intracardiac thrombosis)	

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1f	Active endocarditis	**Measured 180 days prior to and including day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** Endocarditis: ICD-9 diagnosis: 421.xx , 424.9x ICD-10 diagnosis: I33.xx, I38.xx, I39.xx	Tan, Charlie et al. "Accuracy of administrative data for identification of patients with infective endocarditis." International journal of cardiology vol. 224 (2016): 162-164. doi:10.1016/j.ijcard.2016.09.030
2	**Hemorrhage Risk-Related Criteria**		
2a	Active internal bleeding	**Measured 180 days prior to and including day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** Refer to the 'Bleeding' sheet for detailed codes(includes GI bleeding, intracranial, intra-articular bleeding mentioned in exclusion 2b)	
2b	History of or condition associated with increased bleeding risk including, but not limited to: – Major surgical procedure or trauma within 30 days before the randomization visit – Clinically significant gastrointestinal bleeding within 6 months before the randomization visit – History of intracranial, intraocular, spinal, or atraumatic intra-articular bleeding – Chronic hemorrhagic disorder – Known intracranial neoplasm, arteriovenous malformation, or aneurysm	**Measured 30 days prior to and including day of drug initiation in diagnosis position and inpatient or outpatient care setting:** 1) Major surgery: Major surgery selected from procedure codes range 40.x- 84.x **-OR-** 2) Hemorrhagic disorder (Bleeding diathesis) 286.x Coagulation defects 287.x Purpura and other hemorrhagic conditions **-OR-** 3) Intracranial neoplasm, AV malformation, aneurysm Intracranial neoplasm ICD-9 diagnosis: 225.xx ICD-10 diagnosis: D33.xx AV malformation ICD-9 diagnosis: 747.81 ICD-10 diagnosis: Q28.2x Cerebral aneurysm: ICD-9 diagnosis: 437.3x ICD-10 diagnosis: I67.1	
2c	Planned invasive procedure with potential for uncontrolled bleeding, including major surgery	N/A	
2d	Platelet count < <90,000/μL at the screening visit	**Measured 30 days prior to and including day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** Thrombocytopenia: ICD-9 diagnosis: 287.3x, 287.4x, 287.5x	
2e	Sustained uncontrolled hypertension: systolic blood pressure ≥180 mmHg or diastolic blood pressure ≥100 mmHg	**Measured 180 days prior to and including day of drug initiation in any diagnosis position and Inpatient care or ED setting:** Malignant hypertension: ICD-9 diagnosis: 401.0x Hypertensive urgency/Hypertensive crisis: ICD-10 diagnosis: I16.xx	
3	**Concomitant Conditions and Therapies**		
3a	Severe, disabling stroke (modified Rankin score of 4 to 5, inclusive) within 3 months or any stroke within 14 days before the randomization visit	**1) Measured 90 days prior to and including day of drug initiation in position and care setting specified below:** Stroke(primary diagnosis position, inpatient care setting): ICD-9 diagnosis: 430.xx, 431.xx, 433.xx, 434.xx, 436.xx, **-PLUS-** Disabling stroke effects (any position, any care setting, with 7-83 days between the strokes) ICD-9 diagnosis: 438.xx Late effects of cerebrovascular disease ICD-10 diagnosis: I69.xx Sequelae of cerebrovascular disease (hemiplegia etc); Z73.6x Limitation of activities due to disability **2) Measured 14 days prior to and including day of drug initiation in primary diagnosis position and inpatient care setting:** Stroke: ICD-9 diagnosis: 430.xx, 431.xx, 433.xx, 434.xx, 436.xx	Patorno, Elisabetta et al. "Cardiovascular outcomes associated with canagliflozin versus other non-gliflozin antidiabetic drugs: population based cohort study." BMJ 2018;360:k119 http://dx.doi.org/10.1136/bmj.k119 Patorno, Elisabetta et al. "Empagliflozin and the Risk of Heart Failure Hospitalization in Routine Clinical Care: A First Analysis from the Empagliflozin Comparative Effectiveness and Safety (EMPRISE) Study." Circulation. 2019 Apr 8. doi: 10.1161/CIRCULATIONAHA.118.039177
3b	Transient ischemic attack within 3 days before the randomization visit	**Measured 3 days prior to and including day of drug initiation in primary diagnosis position and inpatient care or ED setting:** TIA: ICD-9 diagnosis: 435.xx	

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3c	Indication for anticoagulant therapy for a condition other than atrial fibrillation (e.g., VTE)	**Measured 180 days prior to and including day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** 1) Pulmonary embolism (PE): ICD-9 diagnosis: 415.xx ICD-10 diagnosis: I26.xx, 2) Deep vein thrombosis (DVT): ICD-9 diagnosis: 451.xx, 453.xx ICD-10 diagnosis: I26.xx, I80.xx, I81.xx, I82.xx, I26.xx	
3d	Treatment with: – Aspirin >100 mg daily – Aspirin in combination with thienopyridines within 5 days before randomization – Intravenous antiplatelets within 5 days before randomization – Fibrinolytics within 10 days before randomization – Note: Aspirin ≤100 mg monotherapy is allowed and thienopyridine monotherapy is allowed.	**Measured 180 days prior to and including day of drug initiation:** Aspirin dose >100mg**:** (Only prescription use is captured.) **Measured 10 days prior to and including day of drug initiation:** Fibrinolytic agents: Alteplase, reteplase, tenecteplase, streptokinase, urokinase **Measured 5 days prior to and including day of drug initiation:** Aspirin (any dose) + thienopyridines (clopidogrel or prasugrel or ticlopidine) **Measured 5 days prior to and including day of drug initiation:** Cangrelor	
3e	Anticipated need for chronic treatment with a non-steroidal anti-inflammatory drug		
3f	Systemic treatment with a strong inhibitor of cytochrome P450 3A4, such as ketoconazole or protease inhibitors, within 4 days before randomization, or planned treatment during the time period of the study	**Measured 4 days prior to and including day of drug initiation as a dispensing of the following:** CYP inhibitors (selected): ketoconazole, metronidazole, amiodarone, cimetidine, omeprazole, fluoxetine, indinavir, ritonavir CYP inducers (selected): carbamazepine, phenytoin, rifampin/rifampicin, phenobarbital	
3g	Treatment with a strong inducer of cytochrome P450 3A4, such as rifampin/rifampicin, within 4 days before randomization, or planned treatment during the time period of the study		
3h	Anemia (hemoglobin <10 g/dL) at the screening visit	**Measured 180 days prior to and including day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** Anemia (non-deficiency/neoplastic/chemotherapy/hemorrhagic assoicated): ICD-9 diagnosis: 282.x, 283.x, 284.x, 285.0, 285.2 (acute posthemorrhagic anemia), 285.22 (anemia of neoplastic disease), 285.3 (antineoplastic chemotherapy induced anemia) ICD-10 diagnosis: D55 - D62, D63.0	
3i	Pregnancy or breast-feeding	**Measured 180 days prior to and including day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** Refer to the 'Pregnancy' sheet.	
3j	Any other contraindication to warfarin	N/A	
3k	Known HIV infection at time of screening	**Following diagnosis or drugs measured 180 days prior to and including day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** HIV Infection: 042 Human immunodeficiency virus [HIV] disease 079.53 Human immunodeficiency virus, type 2 [HIV-2] V08 Asymptomatic human immunodeficiency virus [HIV] infection status **-OR-** Filled prescription for HIV treatment 180 days prior to drug initiation: Refer to the 'HIV treatment' sheet for list of treatments	Patorno, Elisabetta et al. "Cardiovascular outcomes associated with canagliflozin versus other non-gliflozin antidiabetic drugs: population based cohort study." BMJ 2018;360:k119 http://dx.doi.org/10.1136/bmj.k119 Patorno, Elisabetta et al. "Empagliflozin and the Risk of Heart Failure Hospitalization in Routine Clinical Care: A First Analysis from the Empagliflozin Comparative Effectiveness and Safety (EMPRISE) Study." Circulation. 2019 Apr 8. doi: 10.1161/CIRCULATIONAHA.118.039177

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3l	Calculated CLCR <30 mL/min at the screening visit (refer to Attachment 4 for calculating CLCR)	**Measured 180 days prior to and including day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** CKD stage 4/5/ESRD: ICD-9 diagnosis: 585.4x, 585.5x, 585.6x ICD-10 diagnosis: N18.4x, N18.5x, N18.6x **-OR-** Dialysis/ Renal transplant: Refer to the 'Dialysis' sheet for list of codes	
3m	Known significant liver disease (e.g., acute clinical hepatitis, chronic active hepatitis, cirrhosis), or ALT >3x the ULN	**Measured 180 days prior to and including day of drug initiation in any diagnosis/procedure position and inpatient or outpatient care setting:** Liver disease: ICD-9 diagnosis: 070.xx, 570.xx- 573.xx 456.0x-456.2x, 576.8x, 782.4x, 789.5x ICD-9 procedure: 39.1x, 42.91	
4	**Study Participation and Follow-up-Related Criteria**		
4a	Serious concomitant illness associated with a life expectancy of less than 2 years	**Measured 180 days prior to and including day of drug initiation:** CCI>=10	
4b	Drug addiction or alcohol abuse within 3 years before the randomization visit	**Measured 180 days prior to and including day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** Alcohol abuse or dependence: 291.xx, 303.xx, 305.0x, 571.0x, 571.1x, 571.2x, 571.3x, 357.5x, 425.5x, E860.0x, V11.3x Drug abuse or dependence: 292.xx, 304.xx, 305.2x-305.9x, 648.3x	Patorno, Elisabetta et al. "Cardiovascular outcomes associated with canagliflozin versus other non-gliflozin antidiabetic drugs: population based cohort study." BMJ 2018;360:k119 http://dx.doi.org/10.1136/bmj.k119 Patorno, Elisabetta et al. "Empagliflozin and the Risk of Heart Failure Hospitalization in Routine Clinical Care: A First Analysis from the Empagliflozin Comparative Effectiveness and Safety (EMPRISE) Study." Circulation. 2019 Apr 8. doi: 10.1161/CIRCULATIONAHA.118.039177
4c	Have received an experimental drug or used an experimental medical device within 30 days before the planned start of treatment	N/A	
4d	Previous randomization in the present study or other study of rivaroxaban	N/A	
4e	Known allergy or hypersensitivity to any component of rivaroxaban, warfarin or placebo excipients (includes lactose, microcrystalline cellulose, magnesium stearate, hypromellose, macrogol, croscarmellose sodium, sodium lauryl sulfate, titanium oxide/ferric oxide red, titanium dioxide/ferric oxide red, anhydrous lactose, pregelatinized starch, FD&C Red #6 barium lake, FD&C Yellow #10 aluminum lake, FD&C Blue #1 aluminum lake, FD&C Yellow #6 aluminum lake, cornstarch, lactose monohydrate)	N/A	
4f	Inability or unwillingness to comply with study-related procedures	**Measured 180 days hospitalization prior to and including day of drug initiation in any diagnosis position and inpatient or outpatient care setting:** Non-compliance: ICD-9 diagnosis: V15.81 PERSONAL HISTORY OF NONCOMPLIANCE WITH MEDICAL TREATMENT PRESENTING HAZARDS TO HEALTH; V45.12 NONCOMPLIANCE WITH RENAL DIALYSIS	
4g	Employees of the investigator or study center, with direct involvement in the proposed study or other studies under the direction of that investigator or study center, as well as family members of the employees or the investigator.	N/A	

Appendix A

Trial ID	pNDA27
Trial Name (with web links)	ROCKET AF
Trial Name (with pdf links)	ROCKET AF
NCT	NCT00403767
Trial category	Primary indication
Therapeutic Area	Cardiology/Vascular Diseases
Study batch	NOACs
RCT Category	4a- Unintended S with label change
Brand Name	Xarelto
Generic Name	rivaroxaban
Sponsor	Janssen Pharmaceuticals
Year	2011
Measurable endpoint	Primary endpoint of stroke and systemic embolism
Exposure	Rivaroxaban
Comparator	Warfarin
Population	patients with nonvalvular atrial fibrillation who were at increased risk for stroke
Trial finding	HR = 0.79 (95% CI 0.66–0.96)
No. of Patients	14,264
Non-inferiority margin	HR = 1.46
Power	0.95 power of 95% to calculate a noninferiority margin of 1.46 with a one-sided alpha level of 0.025.
Blinding	Double-blinded
Statistical Method	Alternative hypothesis of non-inferiority (NI) by a NI margin of 1.46 in hazard ratio (HR) based on on-treatment data from the per protocol population. The required number of primary efficacy endpoint events was determined based on the following assumptions: NI margin of 1.46, 1-sided alpha of 0.025, power of >95% when true HR is 1, and exponential distributions. The margin was selected based on clinical appropriateness and quantitative analysis of relevant studies in Hart et al.
Approval indication	For the reduction in the risk of stroke and systemic embolism resulting from atrial fibrillation

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Dialysis codes
ESRD, defined as 2 codes (either inpatient or outpatient), separated by at least 30 days
Codes include:
- ICD9 prox codes:
39.95, Hemodialysis
54.98, Peritoneal dialysis
- ICD9 dx codes:
585.5x, Chronic kidney disease, Stage V (for ESRD with no mention of dialysis)
585.6x, End stage renal disease (for ESRD with dialysis)
V56.0x, encounter for dialysis NOS
V56.8x, encounter for peritoneal dialysis
V45.1x, renal dialysis status
- CPT4 codes:
90957, 90960, ESRD related services monthly, for patients 12-19 and 20 years of age and older; with 4 or more face-to-face physician visits per month
90958, 90961, ESRD related services monthly, for patients 12-19 and 20 years of age and older; with 2-3 face-to-face physician visits per month
90959, 90962, ESRD related services monthly, for patients 12-19 and 20 years of age and older; with 1 face-to-face physician visit per month
90920, 90921, ESRD related services per full month; for patients 12-19 and twenty years of age and over
90924, 90925, ESRD related services (less than full month), per day; for patients 12-19 and twenty years of age and over
90935, Hemodialysis procedure with single physician evaluation
90937, Hemodialysis procedure requiring repeated evaluation(s) with or without substantial revision of dialysis prescription
90945, Dialysis procedure other than hemodialysis (eg, peritoneal dialysis, hemofiltration, or other continuous renal replacement therapies), with single physician evaluation
90947, Dialysis procedure other than hemodialysis (eg, peritoneal dialysis, hemofiltration, or other continuous renal replacement therapies) requiring repeated physician evaluations, with or without substantial revision of dialysis prescription
90965, 90966, ESRD related services for home dialysis per full month, for patients 12-19 and 20 years of age and older
90969, 90970, ESRD related services for dialysis less than a full month of service, per day; for patients 12-19 and 20 years of age and older
90989, Dialysis training, patient, including helper where applicable, any mode, completed course
90993, Dialysis training, patient, including helper where applicable, any mode, course not completed, per training session
90999, Unlisted dialysis procedure, inpatient or outpatient
99512, Home visit for hemodialysis
- HCPCS codes:
G0257, Unscheduled or emergency dialysis treatment for ESRD patient in a hospital outpatient dept. that is not certified as an ESRD facility
G0314, G0317, ESRD related services during the course of treatment, for patients 12-19 and 20 yrs of age an over to include monitoring for the adequacy of nutrition, etc. w/4 or more physician visit per month
G0315, G0318, ESRD related services during the course of treatment, for patients 12-19 and 20yrs of age and over to include monitoring for the adequacy of nutrition, etc. w/2 or 3 physician visit per month

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adequacy of nutrition, etc. w/2 or 3 physician visit per month
G0316, G0319, ESRD related services during the course of treatment, for patients 12-19 and 20 yrs of age and over to include monitoring for the adequacy of nutrition, etc. w/1 physician visit per month
G0322, G0323, ESRD related services for home dialysis patients per full month: for patients 12-19 and 20 yrs of age and over to include monitoring for adequacy of nutrition and etc.
G0326, G0327, ESRD related services for home dialysis (less than full month), per day; for patients 12-19 and 20 yrs of age and over
S9335, Home therapy, hemodialysis; administrative services, professional pharmacy services, care coordination, and all necessary supplies and equipment (drugs and nursing services coded separately), per diem
S9339, Home therapy, peritoneal dialysis, administrative services, care coordination and all necessary supplies and equipment, per diem

OR

Kidney transplant, defined as either 1 inpatient or 1 outpatient code
Codes include:
-ICD9 dx codes:
V42.0x, Kidney transplant status
996.81 Complications of transplanted kidney
-ICD9 prox codes:
55.6x, Transplant of kidney (Exclude 55.61)
- CPT4 codes:
50360, Renal allotransplantation, implantation, graft, w/o donor & recipient nephrectomy

Appendix A

Bleeding Codes
423.0 - (ICD9) HEMOPERICARDIUM
430 - (ICD9) SUBARACHNOID HEMORRHAGE
431 - (ICD9) INTRACEREBRAL HEMORRHAGE
432.0 - (ICD9) NONTRAUMATIC EXTRADURAL HEMORRHAGE
432.1 - (ICD9) SUBDURAL HEMORRHAGE
432.9 - (ICD9) UNSPECIFIED INTRACRANIAL HEMORRHAGE
459.0 - (ICD9) HEMORRHAGE UNSPECIFIED
531.0 - (ICD9) ACUTE GASTRIC ULCER WITH HEMORRHAGE
531.00 - (ICD9) ACUTE GASTRIC ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION
531.01 - (ICD9) ACUTE GASTRIC ULCER WITH HEMORRHAGE WITH OBSTRUCTION
531.2 - (ICD9) ACUTE GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION
531.20 - (ICD9) ACUTE GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
531.21 - (ICD9) ACUTE GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
531.4 - (ICD9) CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE
531.40 - (ICD9) CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION
531.41 - (ICD9) CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE WITH OBSTRUCTION
531.6 - (ICD9) CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION
531.60 - (ICD9) CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
531.61 - (ICD9) CHRONIC OR UNSPECIFIED GASTRIC ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
532.0 - (ICD9) ACUTE DUODENAL ULCER WITH HEMORRHAGE
532.00 - (ICD9) ACUTE DUODENAL ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION
532.01 - (ICD9) ACUTE DUODENAL ULCER WITH HEMORRHAGE WITH OBSTRUCTION
532.2 - (ICD9) ACUTE DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION
532.20 - (ICD9) ACUTE DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
532.21 - (ICD9) ACUTE DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
532.4 - (ICD9) CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE
532.40 - (ICD9) CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION
532.41 - (ICD9) CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE WITH OBSTRUCTION
532.6 - (ICD9) CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION
532.60 - (ICD9) CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
532.61 - (ICD9) CHRONIC OR UNSPECIFIED DUODENAL ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
533.0 - (ICD9) ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE
533.00 - (ICD9) ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE WITHOUT OBSTRUCTION
533.01 - (ICD9) ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE WITH OBSTRUCTION
533.2 - (ICD9) ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION
533.20 - (ICD9) ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
533.21 - (ICD9) ACUTE PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
533.4 - (ICD9) CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE
533.40 - (ICD9) CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE WITHOUT OBSTRUCTION

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533.41 - (ICD9) CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE WITH OBSTRUCTION
533.6 - (ICD9) CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION
533.60 - (ICD9) CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
533.61 - (ICD9) CHRONIC OR UNSPECIFIED PEPTIC ULCER OF UNSPECIFIED SITE WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
534.0 - (ICD9) ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE
534.00 - (ICD9) ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION
534.01 - (ICD9) ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE WITH OBSTRUCTION
534.2 - (ICD9) ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION
534.20 - (ICD9) ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
534.21 - (ICD9) ACUTE GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
534.4 - (ICD9) CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE
534.40 - (ICD9) CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE WITHOUT OBSTRUCTION
534.41 - (ICD9) CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE WITH OBSTRUCTION
534.6 - (ICD9) CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION
534.60 - (ICD9) CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION WITHOUT OBSTRUCTION
534.61 - (ICD9) CHRONIC OR UNSPECIFIED GASTROJEJUNAL ULCER WITH HEMORRHAGE AND PERFORATION WITH OBSTRUCTION
562.02 - (ICD9) DIVERTICULOSIS OF SMALL INTESTINE WITH HEMORRHAGE
562.03 - (ICD9) DIVERTICULITIS OF SMALL INTESTINE WITH HEMORRHAGE
562.12 - (ICD9) DIVERTICULOSIS OF COLON WITH HEMORRHAGE
562.13 - (ICD9) DIVERTICULITIS OF COLON WITH HEMORRHAGE
568.81 - (ICD9) HEMOPERITONEUM (NONTRAUMATIC)
569.3 - (ICD9) HEMORRHAGE OF RECTUM AND ANUS
569.83 - (ICD9) PERFORATION OF INTESTINE
569.85 - (ICD9) ANGIODYSPLASIA OF INTESTINE WITH HEMORRHAGE
569.86 - (ICD9) DIEULAFOY LESION (HEMORRHAGIC) OF INTESTINE
578.0 - (ICD9) HEMATEMESIS
578.1 - (ICD9) BLOOD IN STOOL
578.9 - (ICD9) HEMORRHAGE OF GASTROINTESTINAL TRACT UNSPECIFIED
719.1 - (ICD9) HEMARTHROSIS
719.10 - (ICD9) HEMARTHROSIS SITE UNSPECIFIED
719.11 - (ICD9) HERARTHROSIS INVOLVING SHOULDER REGION
719.12 - (ICD9) HEMARTHORSIS INVOLVING UPPER ARM
719.13 - (ICD9) HEMARTHROSIS INVOLVING FOREARM
719.14 - (ICD9) HEMARTHROSIS INVOLVING HAND
719.15 - (ICD9) HEMARTHROSIS INVOLVING PELVIC REGION AND THIGH
719.16 - (ICD9) HEMARTHROSIS INVOLVING LOWER LEG
719.17 - (ICD9) HEMARTHROSIS INVOLVING ANKLE AND FOOT

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719.18 - (ICD9) HEMARTHROSIS INVOLVING OTHER SPECIFIED SITES
719.19 - (ICD9) HEMARTHROSIS INVOLVING MULTIPLE SITES
I31.2 - (ICD10) Hemopericardium, not elsewhere classified
I60.00 - (ICD10) Nontraumatic subarachnoid hemorrhage from unspecified carotid siphon and bifurcation
I60.01 - (ICD10) Nontraumatic subarachnoid hemorrhage from right carotid siphon and bifurcation
I60.02 - (ICD10) Nontraumatic subarachnoid hemorrhage from left carotid siphon and bifurcation
I60.10 - (ICD10) Nontraumatic subarachnoid hemorrhage from unspecified middle cerebral artery
I60.11 - (ICD10) Nontraumatic subarachnoid hemorrhage from right middle cerebral artery
I60.12 - (ICD10) Nontraumatic subarachnoid hemorrhage from left middle cerebral artery
I60.2 - (ICD10) Nontraumatic subarachnoid hemorrhage from anterior communicating artery
I60.30 - (ICD10) Nontraumatic subarachnoid hemorrhage from unspecified posterior communicating artery
I60.31 - (ICD10) Nontraumatic subarachnoid hemorrhage from right posterior communicating artery
I60.32 - (ICD10) Nontraumatic subarachnoid hemorrhage from left posterior communicating artery
I60.4 - (ICD10) Nontraumatic subarachnoid hemorrhage from basilar artery
I60.50 - (ICD10) Nontraumatic subarachnoid hemorrhage from unspecified vertebral artery
I60.51 - (ICD10) Nontraumatic subarachnoid hemorrhage from right vertebral artery
I60.52 - (ICD10) Nontraumatic subarachnoid hemorrhage from left vertebral artery
I60.6 - (ICD10) Nontraumatic subarachnoid hemorrhage from other intracranial arteries
I60.7 - (ICD10) Nontraumatic subarachnoid hemorrhage from unspecified intracranial artery
I60.8 - (ICD10) Other nontraumatic subarachnoid hemorrhage
I60.9 - (ICD10) Nontraumatic subarachnoid hemorrhage, unspecified
I61.0 - (ICD10) Nontraumatic intracerebral hemorrhage in hemisphere, subcortical
I61.1 - (ICD10) Nontraumatic intracerebral hemorrhage in hemisphere, cortical
I61.2 - (ICD10) Nontraumatic intracerebral hemorrhage in hemisphere, unspecified
I61.3 - (ICD10) Nontraumatic intracerebral hemorrhage in brain stem
I61.4 - (ICD10) Nontraumatic intracerebral hemorrhage in cerebellum
I61.5 - (ICD10) Nontraumatic intracerebral hemorrhage, intraventricular
I61.6 - (ICD10) Nontraumatic intracerebral hemorrhage, multiple localized
I61.8 - (ICD10) Other nontraumatic intracerebral hemorrhage
I61.9 - (ICD10) Nontraumatic intracerebral hemorrhage, unspecified
I62.00 - (ICD10) Nontraumatic subdural hemorrhage, unspecified
I62.01 - (ICD10) Nontraumatic acute subdural hemorrhage
I62.02 - (ICD10) Nontraumatic subacute subdural hemorrhage
I62.03 - (ICD10) Nontraumatic chronic subdural hemorrhage
I62.1 - (ICD10) Nontraumatic extradural hemorrhage
I62.9 - (ICD10) Nontraumatic intracranial hemorrhage, unspecified
K25.0 - (ICD10) Acute gastric ulcer with hemorrhage
K25.2 - (ICD10) Acute gastric ulcer with both hemorrhage and perforation
K25.4 - (ICD10) Chronic or unspecified gastric ulcer with hemorrhage

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K25.6 - (ICD10) Chronic or unspecified gastric ulcer with both hemorrhage and perforation
K26.0 - (ICD10) Acute duodenal ulcer with hemorrhage
K26.2 - (ICD10) Acute duodenal ulcer with both hemorrhage and perforation
K26.4 - (ICD10) Chronic or unspecified duodenal ulcer with hemorrhage
K26.6 - (ICD10) Chronic or unspecified duodenal ulcer with both hemorrhage and perforation
K27.0 - (ICD10) Acute peptic ulcer, site unspecified, with hemorrhage
K27.2 - (ICD10) Acute peptic ulcer, site unspecified, with both hemorrhage and perforation
K27.4 - (ICD10) Chronic or unspecified peptic ulcer, site unspecified, with hemorrhage
K27.6 - (ICD10) Chronic or unspecified peptic ulcer, site unspecified, with both hemorrhage and perforation
K28.0 - (ICD10) Acute gastrojejunal ulcer with hemorrhage
K28.2 - (ICD10) Acute gastrojejunal ulcer with both hemorrhage and perforation
K28.4 - (ICD10) Chronic or unspecified gastrojejunal ulcer with hemorrhage
K28.6 - (ICD10) Chronic or unspecified gastrojejunal ulcer with both hemorrhage and perforation
K55.21 - (ICD10) Angiodysplasia of colon with hemorrhage
K56.60 - (ICD10) Unspecified intestinal obstruction
K57.01 - (ICD10) Diverticulitis of small intestine with perforation and abscess with bleeding
K57.11 - (ICD10) Diverticulosis of small intestine without perforation or abscess with bleeding
K57.13 - (ICD10) Diverticulitis of small intestine without perforation or abscess with bleeding
K57.21 - (ICD10) Diverticulitis of large intestine with perforation and abscess with bleeding
K57.31 - (ICD10) Diverticulosis of large intestine without perforation or abscess with bleeding
K57.33 - (ICD10) Diverticulitis of large intestine without perforation or abscess with bleeding
K57.41 - (ICD10) Diverticulitis of both small and large intestine with perforation and abscess with bleeding
K57.51 - (ICD10) Diverticulosis of both small and large intestine without perforation or abscess with bleeding
K57.53 - (ICD10) Diverticulitis of both small and large intestine without perforation or abscess with bleeding
K57.81 - (ICD10) Diverticulitis of intestine, part unspecified, with perforation and abscess with bleeding
K57.91 - (ICD10) Diverticulosis of intestine, part unspecified, without perforation or abscess with bleeding
K57.93 - (ICD10) Diverticulitis of intestine, part unspecified, without perforation or abscess with bleeding
K62.5 - (ICD10) Hemorrhage of anus and rectum
K63.1 - (ICD10) Perforation of intestine (nontraumatic)

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K63.81 - (ICD10) Dieulafoy lesion of intestine
K66.1 - (ICD10) Hemoperitoneum
K92.0 - (ICD10) Hematemesis
K92.1 - (ICD10) Melena
K92.2 - (ICD10) Gastrointestinal hemorrhage, unspecified
M25.00 - (ICD10) Hemarthrosis, unspecified joint
M25.011 - (ICD10) Hemarthrosis, right shoulder
M25.012 - (ICD10) Hemarthrosis, left shoulder
M25.019 - (ICD10) Hemarthrosis, unspecified shoulder
M25.021 - (ICD10) Hemarthrosis, right elbow
M25.022 - (ICD10) Hemarthrosis, left elbow
M25.029 - (ICD10) Hemarthrosis, unspecified elbow
M25.031 - (ICD10) Hemarthrosis, right wrist
M25.032 - (ICD10) Hemarthrosis, left wrist
M25.039 - (ICD10) Hemarthrosis, unspecified wrist
M25.041 - (ICD10) Hemarthrosis, right hand
M25.042 - (ICD10) Hemarthrosis, left hand
M25.049 - (ICD10) Hemarthrosis, unspecified hand
M25.051 - (ICD10) Hemarthrosis, right hip
M25.052 - (ICD10) Hemarthrosis, left hip
M25.059 - (ICD10) Hemarthrosis, unspecified hip

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M25.061 - (ICD10) Hemarthrosis, right knee
M25.062 - (ICD10) Hemarthrosis, left knee
M25.069 - (ICD10) Hemarthrosis, unspecified knee
M25.071 - (ICD10) Hemarthrosis, right ankle
M25.072 - (ICD10) Hemarthrosis, left ankle
M25.073 - (ICD10) Hemarthrosis, unspecified ankle
M25.074 - (ICD10) Hemarthrosis, right foot
M25.075 - (ICD10) Hemarthrosis, left foot
M25.076 - (ICD10) Hemarthrosis, unspecified foot
M25.08 - (ICD10) Hemarthrosis, other specified site
R58 - (ICD10) Hemorrhage, not elsewhere classified

Legacy Attribute - Procedure Code (Any Confinement Position):
0W.3P8ZZ - (ICD10) 0W3P8ZZ, Control Bleeding in Gastrointestinal Tract, Via Natural or Artificial Opening Endoscopic
44.43 - (ICD9) ENDOSCOPIC CONTROL OF GASTRIC OR DUODENAL BLEEDING

Appendix A

HIV Treatment
Abacavir
Amprenavir
Atazanavir
Darunavir
Delavirdine
Didanosine
Efavirenz
Emtricitabine
Enfuvirtide
Etravirine
Fosamprenavir
Indinavir
Lamivudine-Zidovudine
Maraviroc
Nelfinavir
Nevirapine
Raltegravir
Rilpivirine
Ritonavir
Ritonavir-Lopinavir
Saquinavir
Stavudine
Tipranavir
Zalcitabine
Zidovudine

Appendix A

Diabetes Medications
ALOGLIPTIN BENZOATE/PIOGLITAZONE HCL
DAPAGLIFLOZIN PROPANEDIOL
DAPAGLIFLOZIN PROPANEDIOL/SAXAGLIPTIN HCL
ERTUGLIFLOZIN PIDOLATE
EXENATIDE MICROSPHERES
INSULIN ASPART PROTAMINE HUMAN/INSULIN ASPART
INSULIN DETEMIR
INSULIN GLARGINE,HUMAN RECOMBINANT ANALOG/LIXISENATIDE
INSULIN NPH HUMAN AND INSULIN REGULAR HUMAN SEMI-SYNTHETIC
INSULIN ZINC HUMAN RECOMBINANT
LIXISENATIDE
PIOGLITAZONE HCL/GLIMEPIRIDE
REPAGLINIDE/METFORMIN HCL
ALOGLIPTIN BENZOATE
CANAGLIFLOZIN
CANAGLIFLOZIN/METFORMIN HCL
DULAGLUTIDE
INSULIN DEGLUDEC
INSULIN,PORK PURIFIED
LINAGLIPTIN
ROSIGLITAZONE MALEATE/GLIMEPIRIDE
SAXAGLIPTIN HCL/METFORMIN HCL
ALBIGLUTIDE
DAPAGLIFLOZIN PROPANEDIOL/METFORMIN HCL
ERTUGLIFLOZIN PIDOLATE/METFORMIN HCL
EXENATIDE
INSULIN ASPART

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MIGLITOL
PRAMLINTIDE ACETATE
SEMAGLUTIDE
EMPAGLIFLOZIN
INSULIN LISPRO PROTAMINE AND INSULIN LISPRO
INSULIN ZINC EXTENDED HUMAN RECOMBINANT
SAXAGLIPTIN HCL
EMPAGLIFLOZIN/LINAGLIPTIN
ERTUGLIFLOZIN PIDOLATE/SITAGLIPTIN PHOSPHATE
INSULIN DEGLUDEC/LIRAGLUTIDE
LIRAGLUTIDE
ALOGLIPTIN BENZOATE/METFORMIN HCL
INSULIN LISPRO
EMPAGLIFLOZIN/METFORMIN HCL
LINAGLIPTIN/METFORMIN HCL
INSULIN GLARGINE,HUMAN RECOMBINANT ANALOG
NATEGLINIDE
SITAGLIPTIN PHOSPHATE
INSULIN GLULISINE
ROSIGLITAZONE MALEATE/METFORMIN HCL
SITAGLIPTIN PHOSPHATE/METFORMIN HCL
INSULIN NPH HUMAN ISOPHANE/INSULIN REGULAR, HUMAN
INSULIN REGULAR, HUMAN
GLIPIZIDE/METFORMIN HCL
PIOGLITAZONE HCL/METFORMIN HCL
REPAGLINIDE
ACETOHEXAMIDE

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ROSIGLITAZONE MALEATE
ACARBOSE
GLYBURIDE,MICRONIZED
TOLBUTAMIDE
GLYBURIDE/METFORMIN HCL
GLIMEPIRIDE
PIOGLITAZONE HCL
TOLAZAMIDE
CHLORPROPAMIDE
GLYBURIDE
GLIPIZIDE
METFORMIN HCL

Appendix A

Hypertension medications	
ACE inhibitor	Benazepril, captopril, enalapril, fosinopril, lisinopril, moexipril, perindopril, quinapril, ramipril, trandolapril
ARB	Azilsartan, candesartan, eprosartan, irbesartan, losartan, olmesartan, telmisartan, valsartan
Beta blocker	Acebutolol, atenolol, betaxolol, bisoprolol, carteolol, carvedilol, esmolol, labetalol, metoprolol tartrate, metoprolol succinate, propranolol, penbutolol, pindolol, nadolol, nebivolol, sotalol, timolol
Calcium channel blocker	Diltiazem, mibefradil, verapamil, amlodipine, clevidipine, bepridil, felodipine, isradipine, nicardipine, nifedipine, nimodipine, nisoldipine
Other hypertension drugs	Doxazosin, eplerenone, prazosin, terazosin, clonidine, guanabenz, guanadrel, guanethidine, guanfacine, hydralazine, methyldopa, metyrosine, reserpine, minoxidil, aliskiren
Thiazides	Benzthiazide, chlorothiazide, chlorthalidone, cyclothiazide, hydrochlorothiazide, hydroflumethiazide, indapamide, methyclothiazide, metolazone, polythiazide, quinethazone, trichlormethiazide, bendroflumethiazide
Loop diuretics	Furosemide, bumetanide, torsemide, ethacrynic acid
Other diuretics	Amiloride, eplerenone, spironolactone, triamterene

Appendix A

Pregnancy
Diagnosis codes
650 NORMAL DELIVERY
660 OBSTRUCTED LABOR
661 ABNORMALITY OF FORCES OF LABOR
662 LONG LABOR
663 UMBILICAL CORD COMPLICATIONS DURING LABOR AND DELIVERY
664 TRAUMA TO PERINEUM AND VULVA DURING DELIVERY
665 OTHER OBSTETRICAL TRAUMA
667 RETAINED PLACENTA OR MEMBRANES WITHOUT HEMORRHAGE
668 COMPLICATIONS OF THE ADMINISTRATION OF ANESTHETIC OR OTHER SEDATION IN LABOR AND DELIVERY
669.94 UNSPECIFIED COMPLICATION OF LABOR AND DELIVERY POSTPARTUM CONDITION OR COMPLICATION
V24 POSTPARTUM CARE AND EXAMINATION
V24.0 POSTPARTUM CARE AND EXAMINATION IMMEDIATELY AFTER DELIVERY
V24.1 POSTPARTUM CARE AND EXAMINATION OF LACTATING MOTHER
V24.2 ROUTINE POSTPARTUM FOLLOW
V27 OUTCOME OF DELIVERY
V27.0 MOTHER WITH SINGLE LIVEBORN
V27.1 MOTHER WITH SINGLE STILLBORN+A2:J81
V27.2 MOTHER WITH TWINS BOTH LIVEBORN
V27.3 MOTHER WITH TWINS ONE LIVEBORN AND ONE STILLBORN
V27.4 MOTHER WITH TWINS BOTH STILLBORN
V27.5 MOTHER WITH OTHER MULTIPLE BIRTH ALL LIVEBORN
V27.6 MOTHER WITH OTHER MULTIPLE BIRTH SOME LIVEBORN
V27.7 MOTHER WITH OTHER MULTIPLE BIRTH ALL STILLBORN
V27.9 MOTHER WITH UNSPECIFIED OUTCOME OF DELIVERY
Procedure codes
72.0 LOW FORCEPS OPERATION
72.1 LOW FORCEPS OPERATION WITH EPISIOTOMY
72.2 MID FORCEPS OPERATION
72.21 MID FORCEPS OPERATION WITH EPISIOTOMY
72.29 OTHER MID FORCEPS OPERATION
72.3 HIGH FORCEPS OPERATION

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72.31 HIGH FORCEPS OPERATION WITH EPISIOTOMY
72.39 OTHER HIGH FORCEPS OPERATION
72.4 FORCEPS ROTATION OF FETAL HEAD
72.5 BREECH EXTRACTION
72.51 PARTIAL BREECH EXTRACTION WITH FORCEPS TO AFTERCOMING HEAD
72.52 OTHER PARTIAL BREECH EXTRACTION
72.53 TOTAL BREECH EXTRACTION WITH FORCEPS TO AFTERCOMING HEAD
72.54 OTHER TOTAL BREECH EXTRACTION
72.6 FORCEPS APPLICATION TO AFTERCOMING HEAD
72.7 VACUUM EXTRACTION
72.71 VACUUM EXTRACTION WITH EPISIOTOMY
72.79 OTHER VACUUM EXTRACTION
72.8 OTHER SPECIFIED INSTRUMENTAL DELIVERY
72.9 UNSPECIFIED INSTRUMENTAL DELIVERY
73.0 ARTIFICIAL RUPTURE OF MEMBRANES
73.01 INDUCTION OF LABOR BY ARTIFICIAL RUPTURE OF MEMBRANES
73.09 OTHER ARTIFICIAL RUPTURE OF MEMBRANES
73.1 OTHER SURGICAL INDUCTION OF LABOR
73.2 INTERNAL AND COMBINED VERSION AND EXTRACTION
73.21 INTERNAL AND COMBINED VERSION WITHOUT EXTRACTION
73.22 INTERNAL AND COMBINED VERSION WITH EXTRACTION
73.3 FAILED FORCEPS
73.4 MEDICAL INDUCTION OF LABOR
73.5 MANUALLY ASSISTED DELIVERY
73.51 MANUAL ROTATION OF FETAL HEAD
73.59 OTHER MANUALLY ASSISTED DELIVERY
73.6 EPISIOTOMY
73.8 OPERATIONS ON FETUS TO FACILITATE DELIVERY
73.9 OTHER OPERATIONS ASSISTING DELIVERY
73.91 EXTERNAL VERSION ASSISTING DELIVERY
73.92 REPLACEMENT OF PROLAPSED UMBILICAL CORD
73.93 INCISION OF CERVIX TO ASSIST DELIVERY
73.94 PUBIOTOMY TO ASSIST DELIVERY
73.99 OTHER OPERATIONS ASSISTING DELIVERY
74.0 CLASSICAL CESAREAN SECTION

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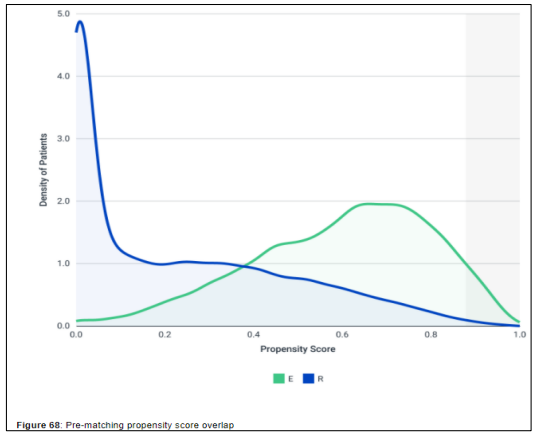
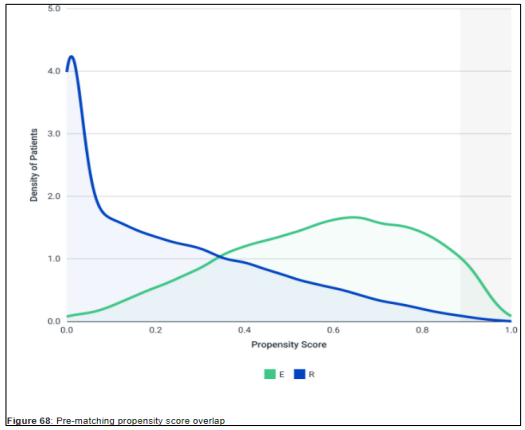
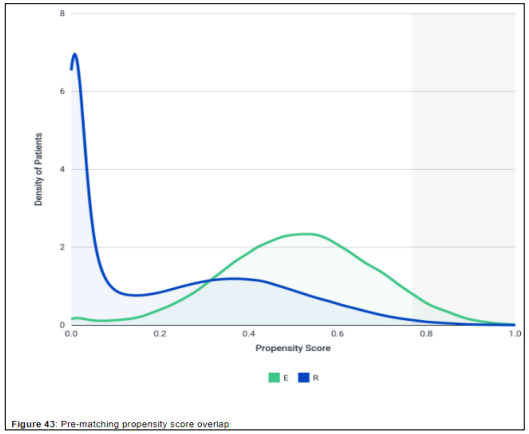
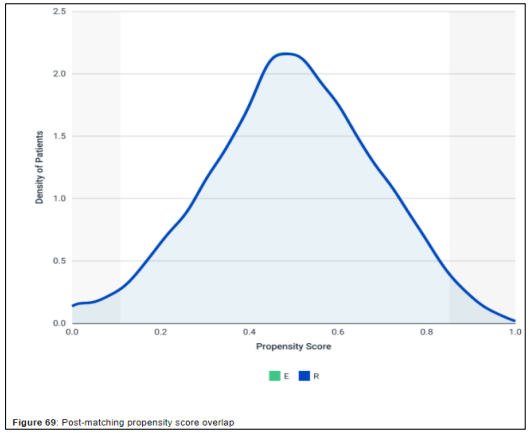
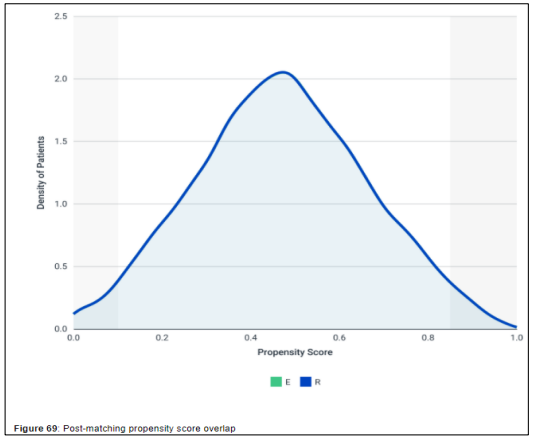
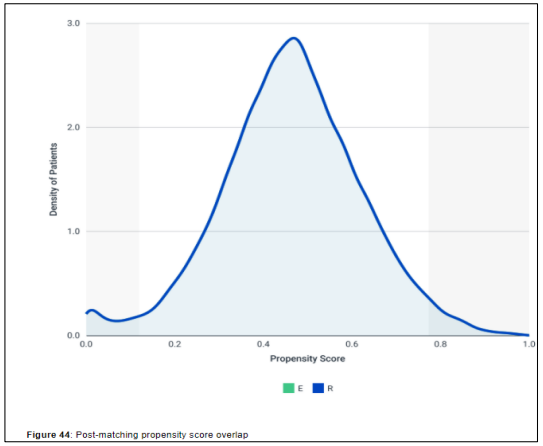
74.1 LOW CERVICAL CESAREAN SECTION
74.2 EXTRAPERITONEAL CESAREAN SECTION
74.3 REMOVAL OF EXTRATUBAL ECTOPIC PREGNANCY
74.4 CESAREAN SECTION OF OTHER SPECIFIED TYPE
74.9 CESAREAN SECTION OF UNSPECIFIED TYPE
74.91 HYSTEROTOMY TO TERMINATE PREGNANCY
74.99 OTHER CESAREAN SECTION OF UNSPECIFIED TYPE
75.4 MANUAL REMOVAL OF RETAINED PLACENTA
75.5 REPAIR OF CURRENT OBSTETRIC LACERATION OF UTERUS
75.6 REPAIR OF OTHER CURRENT OBSTETRIC LACERATION
75.7 MANUAL EXPLORATION OF UTERINE CAVITY, POSTPARTUM
75.9 OTHER OBSTETRIC OPERATIONS

Appendix B: Rivaroxaban vs Warfarin

Optum	MarketScan	Medicare
BEFORE PS MATCHING		
 **Figure 68**: Pre-matching propensity score overlap	 **Figure 68**: Pre-matching propensity score overlap	 **Figure 43**: Pre-matching propensity score overlap
The c-statistics for the propensity score model, pre-matching was 0.861. The post-matching c-statistic was 0.536.	**The c-statistics for the propensity score model, pre-matching was 0.85. The post-matching c-statistic was 0.537.**	**The c-statistics for the propensity score model, pre-matching was 0.839. The post-matching c-statistic was 0.524.**
AFTER PS MATCHING		
 **Figure 69**: Post-matching propensity score overlap	 **Figure 69**: Post-matching propensity score overlap	 **Figure 44**: Post-matching propensity score overlap

Appendix B: Rivaroxaban vs Warfarin

Unmatched												
	Optum			MarketScan			Medicare			POOLED		
Variable	Reference- warfarin	Exposure - rivaroxaban (15 or 20 mg)	St. Diff.	Reference- warfarin	Exposure - rivaroxaban (15 or 20 mg)	St. Diff.	Reference- warfarin	Exposure - rivaroxaban (15 or	St. Diff.	Reference- warfarin	Exposure - rivaroxaban (15 or 20 mg)	St. Diff.
Number of patients	**25,701**	**14,869**		**32,295**	**17,748**		**92,403**	**40,652**		**150,399**	**73,269**	
Age												
...mean (sd)	76.81 (7.78)	74.48 (9.36)	0.27	76.99 (10.15)	72.74 (11.18)	0.40	79.76 (7.99)	78.49 (8.07)	0.16	78.66 (8.47)	76.28 (9.18)	0.27
...median [IQR]	78.00 [73.00, 82.00]	76.00 [69.00, 82.00]	0.23	79.00 [72.00, 84.00]	75.00 [64.00, 81.00]	0.37	80.00 [76.00, 85.00]	3.00 [74.00, 84.00]	0.12	79.44 (8.47)	77.42 (9.18)	0.23
Age categories without zero category												
...18 - 54; n (%)	395 (1.5%)	556 (3.7%)	-0.14	906 (2.8%)	1,010 (5.7%)	-0.14	738 (0.8%)	423 (1.0%)	-0.02	2,039 (1.4%)	1989 (2.7%)	-0.09
...55 - 64; n (%)	1,596 (6.2%)	1,657 (11.1%)	-0.17	3,653 (11.3%)	3,754 (21.2%)	-0.27	2,322 (2.5%)	1,256 (3.1%)	-0.04	7,571 (5.0%)	6,667 (9.1%)	-0.16
...65 - 74; n (%)	5,501 (21.4%)	3,823 (25.7%)	-0.10	5,619 (17.4%)	3,840 (21.6%)	-0.11	16,731 (18.1%)	9,029 (22.2%)	-0.10	27,851 (18.5%)	16,692 (22.8%)	-0.11
...>= 75; n (%)	18,209 (70.8%)	8,833 (59.4%)	0.24	22,117 (68.5%)	9,144 (51.5%)	0.35	72,612 (78.6%)	29,944 (73.7%)	0.12	112,938 (75.1%)	47,921 (65.4%)	0.21
Gender without zero category- United												
...Males; n (%)	13,338 (51.9%)	7,726 (52.0%)	0.00	17,422 (53.9%)	9,827 (55.4%)	-0.03	39,860 (43.1%)	16,739 (41.2%)	0.04	70,620 (47.0%)	34,292 (46.8%)	0.00
...Females; n (%)	12,363 (48.1%)	7,143 (48.0%)	0.00	14,873 (46.1%)	7,921 (44.6%)	0.03	52,543 (56.9%)	23,913 (58.8%)	-0.04	79,779 (53.0%)	38,977 (53.2%)	0.00
Race												
...White; n (%)							85,842 (92.9%)	36,882 (90.7%)		85,842 (92.9%)	36,882 (90.7%)	0.00
...Black; n (%)							3,514 (3.8%)	1,923 (4.7%)		3,514 (3.8%)	1,923 (4.7%)	0.00
...Asian; n (%)							767 (0.8%)	513 (1.3%)		767 (0.8%)	513 (1.3%)	0.00
...Hispanic; n (%)							998 (1.1%)	596 (1.5%)		998 (1.1%)	596 (1.5%)	0.00
...North American Native; n (%)							339 (0.4%)	159 (0.4%)		339 (0.4%)	159 (0.4%)	0.00
...Other/Unknown; n (%)							943 (1.0%)	579 (1.4%)		943 (1.0%)	579 (1.4%)	0.00
Region without zero category- United v3 (lumping missing&other category with West)												
...Northeast; n (%)	3,626 (14.1%)	2,178 (14.6%)	-0.01	7,778 (24.1%)	4,155 (23.4%)	0.02	21,665 (23.4%)	8,259 (20.3%)	0.08	33,069 (22.0%)	14,592 (19.9%)	0.05
...South; n (%)	8,341 (32.5%)	6,178 (41.5%)	-0.19	10,408 (32.2%)	4,919 (27.7%)	0.10	28,585 (30.9%)	16,109 (39.6%)	-0.18	47,334 (31.5%)	27,206 (37.1%)	-0.12
...Midwest; n (%)	5,845 (22.7%)	2,875 (19.3%)	0.08	8,928 (27.6%)	6,242 (35.2%)	-0.16	27,907 (30.2%)	10,396 (25.6%)	0.10	42,680 (28.4%)	19,513 (26.6%)	0.04
...West; n (%)	7,889 (30.7%)	3,638 (24.5%)	0.14	5,055 (15.7%)	2,317 (13.1%)	0.07	14,246 (15.4%)	5,888 (14.5%)	0.03	27,190 (18.1%)	11,843 (16.2%)	0.05
...Unknown+missing; n (%)	N/A	N/A	#VALUE!	126 (0.4%)	115 (0.6%)	-0.03	N/A	N/A	#VALUE!	126 (0.4%)	115 (0.6%)	-0.03
CV Covariates												
Ischemic heart disease; n (%)	9,344 (36.4%)	5,576 (37.5%)	-0.02	11,325 (35.1%)	6,317 (35.6%)	-0.01	37,684 (40.8%)	17,950 (44.2%)	-0.07	58,353 (38.8%)	29,843 (40.7%)	-0.04
Acute MI; n (%)	682 (2.7%)	450 (3.0%)	-0.02	729 (2.3%)	476 (2.7%)	-0.03	2,949 (3.2%)	1,572 (3.9%)	-0.04	4360 (2.9%)	2498 (3.4%)	-0.03
ACS/unstable angina; n (%)	582 (2.3%)	465 (3.1%)	-0.05	680 (2.1%)	509 (2.9%)	-0.05	2,657 (2.9%)	1,599 (3.9%)	-0.06	3919 (2.6%)	2573 (3.5%)	-0.05
Old MI; n (%)	1,268 (4.9%)	859 (5.8%)	-0.04	949 (2.9%)	543 (3.1%)	-0.01	6,575 (7.1%)	3,525 (8.7%)	-0.06	8792 (5.8%)	4927 (6.7%)	-0.04
Stable angina; n (%)	1,103 (4.3%)	862 (5.8%)	-0.07	1,016 (3.1%)	756 (4.3%)	-0.06	3,424 (3.7%)	2,051 (5.0%)	-0.06	5,543 (3.7%)	3,669 (5.0%)	-0.06
Coronary atherosclerosis and other forms of chronic ischemic heart disease; n (%)	8,620 (33.5%)	5,100 (34.3%)	-0.02	10,565 (32.7%)	5,774 (32.5%)	0.00	35,060 (37.9%)	16,501 (40.6%)	-0.06	54,245 (36.1%)	27,375 (37.4%)	-0.03
Other atherosclerosis with ICD10 v2 Copy; n (%)	459 (1.8%)	229 (1.5%)	0.02	612 (1.9%)	282 (1.6%)	0.02	1,748 (1.9%)	698 (1.7%)	0.02	2819 (1.9%)	1209 (1.7%)	0.02
Previous cardiac procedure (CABG or PTCA or Stent) v4; n (%)	210 (0.8%)	147 (1.0%)	-0.02	294 (0.9%)	131 (0.7%)	0.02	1,098 (1.2%)	509 (1.3%)	-0.01	1602 (1.1%)	787 (1.1%)	0.00
History of CABG or PTCA; n (%)	2,059 (8.0%)	1,491 (10.0%)	-0.07	1,375 (4.3%)	879 (5.0%)	-0.03	12,032 (13.0%)	6,338 (15.6%)	-0.07	15,466 (10.3%)	8,708 (11.9%)	-0.05
Any stroke; n (%)	4,563 (17.8%)	3,218 (21.6%)	-0.10	5,295 (16.4%)	3,292 (18.5%)	-0.06	18,172 (19.7%)	9,000 (22.1%)	-0.06	28,030 (18.6%)	15,510 (21.2%)	-0.07
Ischemic stroke (w and w/o mention of cerebral infarction); n (%)	4,563 (17.8%)	3,218 (21.6%)	-0.10	5,295 (16.4%)	3,292 (18.5%)	-0.06	18,114 (19.6%)	8,981 (22.1%)	-0.06	27,972 (18.6%)	15,491 (21.1%)	-0.06
Hemorrhagic stroke; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	226 (0.2%)	97 (0.2%)	0.00	226 (0.2%)	97 (0.1%)	0.03
TIA; n (%)	1,646 (6.4%)	1,300 (8.7%)	-0.09	1,863 (5.8%)	1,452 (8.2%)	-0.09	5,231 (5.7%)	2,791 (6.9%)	-0.05	8740 (5.8%)	5543 (7.6%)	-0.07
Other cerebrovascular disease; n (%)	887 (3.5%)	674 (4.5%)	-0.05	944 (2.9%)	581 (3.3%)	-0.02	4,120 (4.5%)	2,059 (5.1%)	-0.03	5951 (4.0%)	3314 (4.5%)	-0.02
Late effects of cerebrovascular disease; n (%)	992 (3.9%)	563 (3.8%)	0.01	948 (2.9%)	445 (2.5%)	0.02	5,242 (5.7%)	2,344 (5.8%)	0.00	7182 (4.8%)	3352 (4.6%)	0.01
Cerebrovascular procedure; n (%)	36 (0.1%)	24 (0.2%)	-0.03	56 (0.2%)	32 (0.2%)	0.00	255 (0.3%)	138 (0.3%)	0.00	347 (0.2%)	194 (0.3%)	-0.02
Heart failure (CHF); n (%)	6,985 (27.2%)	3,669 (24.7%)	0.06	8,000 (24.8%)	3,790 (21.4%)	0.08	33,361 (36.1%)	15,107 (37.2%)	-0.02	48,346 (32.1%)	22,566 (30.8%)	0.03
Peripheral Vascular Disease (PVD) or PVD Surgery v2; n (%)	2,542 (9.9%)	1,530 (10.3%)	-0.01	2,939 (9.1%)	1,390 (7.8%)	0.05	10,824 (11.7%)	4,854 (11.9%)	-0.01	16,305 (10.8%)	7,774 (10.6%)	0.01
Atrial fibrillation; n (%)	24,905 (96.9%)	14,554 (97.9%)	-0.06	30,559 (94.6%)	17,422 (98.2%)	-0.19	89,565 (96.9%)	39,491 (97.1%)	-0.01	145,029 (96.4%)	71,467 (97.5%)	-0.06
Other cardiac dysrhythmia; n (%)	13,569 (52.8%)	10,907 (73.4%)	-0.44	10,549 (32.7%)	8,843 (49.8%)	-0.35	44,238 (47.9%)	24,562 (60.4%)	-0.25	68,356 (45.4%)	44,312 (60.5%)	-0.31
Cardiac conduction disorders; n (%)	2,156 (8.4%)	1,560 (10.5%)	-0.07	2,075 (6.4%)	1,362 (7.7%)	-0.05	8,105 (8.8%)	4,354 (10.7%)	-0.06	12336 (8.2%)	7276 (9.9%)	-0.06
Other CVD; n (%)	8,898 (34.6%)	5,631 (37.9%)	-0.07	10,301 (31.9%)	6,111 (34.4%)	-0.05	32,880 (35.6%)	15,926 (39.2%)	-0.07	52,079 (34.6%)	27,668 (37.8%)	-0.07
Diabetes-related complications												
Diabetic retinopathy; n (%)	509 (2.0%)	251 (1.7%)	0.02	567 (1.8%)	234 (1.3%)	0.04	1,748 (1.9%)	714 (1.8%)	0.01	2,824 (1.9%)	1,199 (1.6%)	0.02
Diabetes with other ophthalmic manifestations; n (%)	38 (0.1%)	37 (0.2%)	-0.03	433 (1.3%)	168 (0.9%)	0.04	1,127 (1.2%)	458 (1.1%)	0.01	1598 (1.1%)	663 (0.9%)	0.02
Retinal detachment, vitreous hemorrhage, vitrectomy; n (%)	48 (0.2%)	35 (0.2%)	0.00	81 (0.3%)	35 (0.2%)	0.02	175 (0.2%)	76 (0.2%)	0.00	304 (0.2%)	146 (0.2%)	0.00
Retinal laser coagulation therapy; n (%)	33 (0.1%)	14 (0.1%)	0.00	84 (0.3%)	27 (0.2%)	0.02	179 (0.2%)	76 (0.2%)	0.00	296 (0.2%)	117 (0.2%)	0.00
Occurrence of Diabetic Neuropathy v2 Copy; n (%)	1,737 (6.8%)	892 (6.0%)	0.03	1,633 (5.1%)	840 (4.7%)	0.02	6,290 (6.8%)	2,868 (7.1%)	-0.01	9660 (6.4%)	4600 (6.3%)	0.00

Appendix B: Rivaroxaban vs Warfarin

Occurrence of diabetic nephropathy V3 with ICD10 Copy; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	1,264 (1.4%)	565 (1.4%)	0.00	1,264 (0.8%)	565 (0.8%)	0.00
Hypoglycemia v2; n (%)	267 (1.0%)	118 (0.8%)	0.02	460 (1.4%)	194 (1.1%)	0.03	2,229 (2.4%)	1,198 (2.9%)	-0.03	2956 (2.0%)	1510 (2.1%)	-0.01
Hyperglycemia; n (%)	1,205 (4.7%)	912 (6.1%)	-0.06	701 (2.2%)	569 (3.2%)	-0.06	4,983 (5.4%)	2,695 (6.6%)	-0.05	6889 (4.6%)	4176 (5.7%)	-0.05
Disorders of fluid electrolyte and acid-base balance; n (%)	2,379 (9.3%)	1,624 (10.9%)	-0.05	2,276 (7.0%)	1,498 (8.4%)	-0.05	11,714 (12.7%)	5,125 (12.6%)	0.00	16369 (10.9%)	8247 (11.3%)	-0.01
Diabetic ketoacidosis; n (%)	28 (0.1%)	24 (0.2%)	-0.03	35 (0.1%)	24 (0.1%)	0.00	168 (0.2%)	81 (0.2%)	0.00	231 (0.2%)	129 (0.2%)	0.00
Hyperosmolar hyperglycemic nonketotic syndrome (HONK); n (%)	26 (0.1%)	23 (0.2%)	-0.03	25 (0.1%)	19 (0.1%)	0.00	147 (0.2%)	86 (0.2%)	0.00	198 (0.1%)	128 (0.2%)	-0.03
Diabetes with peripheral circulatory disorders with ICD-10 v2 Copy; n (%)	863 (3.4%)	413 (2.8%)	0.03	810 (2.5%)	339 (1.9%)	0.04	4,632 (5.0%)	1,893 (4.7%)	0.01	6305 (4.2%)	2645 (3.6%)	0.03
Diabetic Foot; n (%)	641 (2.5%)	259 (1.7%)	0.06	864 (2.7%)	329 (1.9%)	0.05	4,161 (4.5%)	1,511 (3.7%)	0.04	5666 (3.8%)	2099 (2.9%)	0.05
Gangrene v2; n (%)	32 (0.1%)	25 (0.2%)	-0.03	53 (0.2%)	14 (0.1%)	0.03	251 (0.3%)	80 (0.2%)	0.02	336 (0.2%)	119 (0.2%)	0.00
Lower extremity amputation; n (%)	103 (0.4%)	47 (0.3%)	0.02	66 (0.2%)	33 (0.2%)	0.00	577 (0.6%)	221 (0.5%)	0.01	746 (0.5%)	301 (0.4%)	0.01
Osteomyelitis; n (%)	89 (0.3%)	43 (0.3%)	0.00	130 (0.4%)	65 (0.4%)	0.00	642 (0.7%)	264 (0.6%)	0.01	861 (0.6%)	372 (0.5%)	0.01
Skin infections v2; n (%)	1,508 (5.9%)	777 (5.2%)	0.03	2,170 (6.7%)	1,006 (5.7%)	0.04	7,041 (7.6%)	2,925 (7.2%)	0.02	10719 (7.1%)	4708 (6.4%)	0.03
Erectile dysfunction; n (%)	400 (1.6%)	301 (2.0%)	-0.03	363 (1.1%)	327 (1.8%)	-0.06	577 (0.6%)	320 (0.8%)	-0.02	1340 (0.9%)	948 (1.3%)	-0.04
Diabetes with unspecified complication; n (%)	345 (1.3%)	282 (1.9%)	-0.05	355 (1.1%)	254 (1.4%)	-0.03	1,374 (1.5%)	754 (1.9%)	-0.03	2074 (1.4%)	1290 (1.8%)	-0.03
Diabetes mellitus without mention of complications; n (%)	9,288 (36.1%)	5,120 (34.4%)	0.04	10,733 (33.2%)	6,006 (33.8%)	-0.01	40,275 (43.6%)	18,008 (44.3%)	-0.01	60,296 (40.1%)	29,134 (39.8%)	0.01
Hypertension: 1 inpatient or 2 outpatient claims within 365 days; n (%)	21,744 (84.6%)	12,927 (86.9%)	-0.07	23,292 (72.1%)	14,059 (79.2%)	-0.17	85,616 (92.7%)	38,411 (94.5%)	-0.07	130,652 (86.9%)	65,397 (89.3%)	-0.07
Hyperlipidemia v2; n (%)	15,725 (61.2%)	9,844 (66.2%)	-0.10	14,454 (44.8%)	9,966 (56.2%)	-0.23	53,237 (57.6%)	26,192 (64.4%)	-0.14	83,416 (55.5%)	46,002 (62.8%)	-0.15
Edema; n (%)	2,694 (10.5%)	1,703 (11.5%)	-0.03	2,678 (8.3%)	1,441 (8.1%)	0.01	10,081 (10.9%)	4,546 (11.2%)	-0.01	15453 (10.3%)	7690 (10.5%)	-0.01
Renal Dysfunction (non-diabetic) v2; n (%)	17 (0.1%)	7 (0.0%)	0.04	19 (0.1%)	12 (0.1%)	0.00	4,118 (4.5%)	1,550 (3.8%)	0.04	4,154 (2.8%)	1,569 (2.1%)	0.05
Occurrence of acute renal disease v2; n (%)	13 (0.1%)	6 (0.0%)	0.04	19 (0.1%)	12 (0.1%)	0.00	466 (0.5%)	199 (0.5%)	0.00	498 (0.3%)	217 (0.3%)	0.00
Occurrence of chronic renal insufficiency; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	2,595 (2.8%)	832 (2.0%)	0.05	2,595 (1.7%)	832 (1.1%)	0.05
Chronic kidney disease v2; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	2,451 (2.7%)	775 (1.9%)	0.05	2,451 (1.6%)	775 (1.1%)	0.04
CKD Stage 3-4; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	1,885 (2.0%)	538 (1.3%)	0.05	1,885 (1.3%)	538 (0.7%)	0.06
Occurrence of hypertensive nephropathy; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	530 (0.6%)	239 (0.6%)	0.00	#VALUE!	239 (0.3%)	#VALUE!
Occurrence of miscellaneous renal insufficiency v2; n (%)	1 (0.0%)	1 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	1,435 (1.6%)	642 (1.6%)	0.00	1,436 (1.0%)	643 (0.9%)	0.01
Glaucoma or cataracts v2; n (%)	5,562 (21.6%)	3,146 (21.2%)	0.01	7,173 (22.2%)	3,770 (21.2%)	0.02	1,558 (1.7%)	741 (1.8%)	-0.01	14,293 (9.5%)	7,657 (10.5%)	-0.03
Cellulitis or abscess of toe; n (%)	337 (1.3%)	241 (1.6%)	-0.03	280 (0.9%)	179 (1.0%)	-0.01	3,729 (4.0%)	1,328 (3.3%)	0.04	4346 (2.9%)	1748 (2.4%)	0.03
Foot ulcer; n (%)	650 (2.5%)	262 (1.8%)	0.05	891 (2.8%)	336 (1.9%)	0.06	78 (0.1%)	47 (0.1%)	0.00	1619 (1.1%)	645 (0.9%)	0.02
Bladder stones; n (%)	23 (0.1%)	12 (0.1%)	0.00	28 (0.1%)	15 (0.1%)	0.00	1,249 (1.4%)	656 (1.6%)	-0.02	1300 (0.9%)	683 (0.9%)	0.00
Kidney stones; n (%)	197 (0.8%)	170 (1.1%)	-0.03	297 (0.9%)	201 (1.1%)	-0.02	14,547 (15.7%)	6,671 (16.4%)	-0.02	15041 (10.0%)	7042 (9.6%)	0.01
Urinary tract infections (UTIs); n (%)	2,316 (9.0%)	1,299 (8.7%)	0.01	2,410 (7.5%)	1,240 (7.0%)	0.02	33,456 (36.2%)	16,172 (39.8%)	-0.07	38,182 (25.4%)	18,711 (25.5%)	0.00
Dipstick urinalysis; n (%)	6,881 (26.8%)	4,590 (30.9%)	-0.09	6,443 (20.0%)	4,127 (23.3%)	-0.08	14,331 (15.5%)	6,373 (15.7%)	-0.01	27,655 (18.4%)	15,090 (20.6%)	-0.06
Non-dipstick urinalysis; n (%)	3,469 (13.5%)	2,020 (13.6%)	0.00	1,948 (6.0%)	1,256 (7.1%)	-0.04	3,642 (3.9%)	1,643 (4.0%)	-0.01	9,059 (6.0%)	4,919 (6.7%)	-0.03
Urine function test; n (%)	661 (2.6%)	362 (2.4%)	0.01	1,148 (3.6%)	580 (3.3%)	0.02	1,909 (2.1%)	900 (2.2%)	-0.01	3718 (2.5%)	1842 (2.5%)	0.00
Cytology; n (%)	219 (0.9%)	155 (1.0%)	-0.01	382 (1.2%)	167 (0.9%)	0.03	1,916 (2.1%)	842 (2.1%)	0.00	2517 (1.7%)	1164 (1.6%)	0.01
Cystoscopy; n (%)	257 (1.0%)	131 (0.9%)	0.01	504 (1.6%)	210 (1.2%)	0.03	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Other Covariates												
Liver disease; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	938 (1.0%)	501 (1.2%)	-0.02	938 (0.6%)	501 (0.7%)	-0.01
Osteoarthritis; n (%)	4,861 (18.9%)	3,135 (21.1%)	-0.06	5,140 (15.9%)	3,000 (16.9%)	-0.03	20,522 (22.2%)	10,442 (25.7%)	-0.08	30523 (20.3%)	16577 (22.6%)	-0.06
Other arthritis, arthropathies and musculoskeletal pain; n (%)	9,456 (36.8%)	6,010 (40.4%)	-0.07	11,557 (35.8%)	6,608 (37.2%)	-0.03	37,694 (40.8%)	17,578 (43.2%)	-0.05	58707 (39.0%)	30196 (41.2%)	-0.04
Dorsopathies; n (%)	5,242 (20.4%)	3,469 (23.3%)	-0.07	5,958 (18.4%)	3,826 (21.6%)	-0.08	20,625 (22.3%)	10,095 (24.8%)	-0.06	31825 (21.2%)	17390 (23.7%)	-0.06
Fractures; n (%)	1,067 (4.2%)	569 (3.8%)	0.02	1,475 (4.6%)	655 (3.7%)	0.05	5,670 (6.1%)	2,346 (5.8%)	0.01	8212 (5.5%)	3570 (4.9%)	0.03
Falls v2; n (%)	1,290 (5.0%)	750 (5.0%)	0.00	625 (1.9%)	333 (1.9%)	0.00	2,916 (3.2%)	1,273 (3.1%)	0.01	4831 (3.2%)	2356 (3.2%)	0.00
Osteoporosis; n (%)	2,120 (8.2%)	1,174 (7.9%)	0.01	2,196 (6.8%)	977 (5.5%)	0.05	9,398 (10.2%)	4,284 (10.5%)	-0.01	13714 (9.1%)	6435 (8.8%)	0.01
Hyperthyroidism; n (%)	301 (1.2%)	190 (1.3%)	-0.01	262 (0.8%)	192 (1.1%)	-0.03	1,116 (1.2%)	562 (1.4%)	-0.02	1679 (1.1%)	944 (1.3%)	-0.02
Hypothyroidism v2; n (%)	4,578 (17.8%)	2,866 (19.3%)	-0.04	3,919 (12.1%)	2,552 (14.4%)	-0.07	14,603 (15.8%)	5,985 (14.7%)	0.03	23100 (15.4%)	11403 (15.6%)	-0.01
Other disorders of thyroid gland V2; n (%)	785 (3.1%)	608 (4.1%)	-0.05	861 (2.7%)	677 (3.8%)	-0.06	3,132 (3.4%)	1,569 (3.9%)	-0.03	4778 (3.2%)	2854 (3.9%)	-0.04
Depression; n (%)	1,966 (7.6%)	1,253 (8.4%)	-0.03	1,876 (5.8%)	1,092 (6.2%)	-0.02	9,551 (10.3%)	4,998 (12.3%)	-0.06	13393 (8.9%)	7343 (10.0%)	-0.04
Anxiety; n (%)	1,921 (7.5%)	1,548 (10.4%)	-0.10	1,417 (4.4%)	1,206 (6.8%)	-0.10	7,883 (8.5%)	4,932 (12.1%)	-0.12	11221 (7.5%)	7686 (10.5%)	-0.10
Sleep_Disorder; n (%)	2,242 (8.7%)	1,139 (7.7%)	0.04	3,395 (10.5%)	2,017 (11.4%)	-0.03	8,029 (8.7%)	3,474 (8.5%)	0.01	13666 (9.1%)	6630 (9.0%)	0.00
Dementia; n (%)	1,801 (7.0%)	1,125 (7.6%)	-0.02	1,911 (5.9%)	830 (4.7%)	0.05	8,977 (9.7%)	4,265 (10.5%)	-0.03	12689 (8.4%)	6220 (8.5%)	0.00
Delirium; n (%)	416 (1.6%)	261 (1.8%)	-0.02	521 (1.6%)	228 (1.3%)	0.03	2,706 (2.9%)	1,367 (3.4%)	-0.03	3643 (2.4%)	1856 (2.5%)	-0.01
Psychosis; n (%)	319 (1.2%)	176 (1.2%)	0.00	441 (1.4%)	190 (1.1%)	0.03	2,089 (2.3%)	961 (2.4%)	-0.01	2849 (1.9%)	1327 (1.8%)	0.01
Obesity; n (%)	2,962 (11.5%)	2,712 (18.2%)	-0.19	2,363 (7.3%)	2,324 (13.1%)	-0.19	11,623 (12.6%)	6,894 (17.0%)	-0.12	16948 (11.3%)	11930 (16.3%)	-0.15
Overweight; n (%)	887 (3.5%)	894 (6.0%)	-0.12	356 (1.1%)	426 (2.4%)	-0.10	2,338 (2.5%)	1,512 (3.7%)	-0.07	3581 (2.4%)	2832 (3.9%)	-0.09
Smoking; n (%)	3,155 (12.3%)	2,794 (18.8%)	-0.18	1,598 (4.9%)	1,423 (8.0%)	-0.13	19,504 (21.1%)	11,882 (29.2%)	-0.19	24257 (16.1%)	16099 (22.0%)	-0.15
Alcohol abuse or dependence; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	51 (0.1%)	32 (0.1%)	0.00	51 (0.0%)	32 (0.0%)	#DIV/0!
Drug abuse or dependence; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	123 (0.1%)	108 (0.3%)	-0.04	123 (0.1%)	108 (0.1%)	0.00

Appendix B: Rivaroxaban vs Warfarin

COPD; n (%)	4,309 (16.8%)	2,430 (16.3%)	0.01	4,571 (14.2%)	2,352 (13.3%)	0.03	18,074 (19.6%)	8,952 (22.0%)	-0.06	26954 (17.9%)	13734 (18.7%)	-0.02
Asthma; n (%)	1,542 (6.0%)	1,081 (7.3%)	-0.05	1,625 (5.0%)	1,171 (6.6%)	-0.07	6,360 (6.9%)	3,495 (8.6%)	-0.06	9527 (6.3%)	5747 (7.8%)	-0.06
Obstructive sleep apnea; n (%)	2,457 (9.6%)	1,923 (12.9%)	-0.10	2,936 (9.1%)	2,260 (12.7%)	-0.12	7,564 (8.2%)	4,077 (10.0%)	-0.06	12957 (8.6%)	8260 (11.3%)	-0.09
Pneumonia; n (%)	1,531 (6.0%)	901 (6.1%)	0.00	1,914 (5.9%)	1,034 (5.8%)	0.00	8,764 (9.5%)	4,313 (10.6%)	-0.04	12209 (8.1%)	6248 (8.5%)	-0.01
Imaging; n (%)	36 (0.1%)	27 (0.2%)	-0.03	44 (0.1%)	15 (0.1%)	0.00	3,729 (4.0%)	1,328 (3.3%)	0.04	3809 (2.5%)	1370 (1.9%)	0.04
Other Medications												
Use of ACE inhibitors; n (%)	9,773 (38.0%)	5,230 (35.2%)	0.06	11,540 (35.7%)	6,215 (35.0%)	0.01	35,261 (38.2%)	15,477 (38.1%)	0.00	56574 (37.6%)	26922 (36.7%)	0.02
Use of ARBs; n (%)	5,359 (20.9%)	3,889 (26.2%)	-0.13	7,683 (23.8%)	4,892 (27.6%)	-0.09	20,854 (22.6%)	10,920 (26.9%)	-0.10	33896 (22.5%)	19701 (26.9%)	-0.10
Use of Loop Diuretics - United; n (%)	7,760 (30.2%)	3,674 (24.7%)	0.12	10,702 (33.1%)	3,963 (22.3%)	0.24	40,069 (43.4%)	15,255 (37.5%)	0.12	58531 (38.9%)	22892 (31.2%)	0.16
Use of other diuretics- United; n (%)	1,535 (6.0%)	731 (4.9%)	0.05	2,341 (7.2%)	878 (4.9%)	0.10	7,877 (8.5%)	2,806 (6.9%)	0.06	11753 (7.8%)	4415 (6.0%)	0.07
Use of nitrates-United; n (%)	2,055 (8.0%)	1,038 (7.0%)	0.04	3,094 (9.6%)	1,354 (7.6%)	0.07	10,921 (11.8%)	4,642 (11.4%)	0.01	16070 (10.7%)	7034 (9.6%)	0.04
Use of other hypertension drugs; n (%)	2,028 (7.9%)	1,125 (7.6%)	0.01	2,574 (8.0%)	1,303 (7.3%)	0.03	7,958 (8.6%)	3,455 (8.5%)	0.00	12560 (8.4%)	5883 (8.0%)	0.01
Use of digoxin- United; n (%)	4,005 (15.6%)	1,311 (8.8%)	0.21	6,378 (19.7%)	1,975 (11.1%)	0.24	17,796 (19.3%)	5,477 (13.5%)	0.16	28179 (18.7%)	8763 (12.0%)	0.19
Use of Anti-arrhythmics; n (%)	2,453 (9.5%)	2,071 (13.9%)	-0.14	3,881 (12.0%)	2,847 (16.0%)	-0.12	10,257 (11.1%)	6,110 (15.0%)	-0.12	16591 (11.0%)	11028 (15.1%)	-0.12
Use of COPD/asthma meds- United; n (%)	4,206 (16.4%)	2,858 (19.2%)	-0.07	5,916 (18.3%)	3,513 (19.8%)	-0.04	18,597 (20.1%)	9,406 (23.1%)	-0.07	28719 (19.1%)	15777 (21.5%)	-0.06
Use of statins; n (%)	15,187 (59.1%)	9,008 (60.6%)	-0.03	19,252 (59.6%)	10,616 (59.8%)	0.00	56,100 (60.7%)	25,111 (61.8%)	-0.02	90539 (60.2%)	44735 (61.1%)	-0.02
Use of other lipid-lowering drugs; n (%)	1,698 (6.6%)	959 (6.4%)	0.01	3,164 (9.8%)	1,658 (9.3%)	0.02	6,803 (7.4%)	2,989 (7.4%)	0.00	11665 (7.8%)	5606 (7.7%)	0.00
Use of antiplatelet agents; n (%)	2,667 (10.4%)	2,234 (15.0%)	-0.14	4,187 (13.0%)	2,985 (16.8%)	-0.11	12,151 (13.2%)	7,088 (17.4%)	-0.12	19005 (12.6%)	12307 (16.8%)	-0.12
Use of heparin and other low-molecular weight heparins; n (%)	1,027 (4.0%)	48 (0.3%)	0.26	13 (0.0%)	2 (0.0%)	#DIV/0!	5,378 (5.8%)	271 (0.7%)	0.29	6418 (4.3%)	321 (0.4%)	0.26
Use of NSAIDs; n (%)	2,211 (8.6%)	1,854 (12.5%)	-0.13	2,679 (8.3%)	2,192 (12.4%)	-0.13	8,445 (9.1%)	5,496 (13.5%)	-0.14	13335 (8.9%)	9542 (13.0%)	-0.13
Use of oral corticosteroids; n (%)	4,525 (17.6%)	3,114 (20.9%)	-0.08	5,871 (18.2%)	3,585 (20.2%)	-0.05	20,413 (22.1%)	10,417 (25.6%)	-0.08	30809 (20.5%)	17116 (23.4%)	-0.07
Use of bisphosphonate (United); n (%)	1,032 (4.0%)	504 (3.4%)	0.03	1,328 (4.1%)	488 (2.7%)	0.08	3,634 (3.9%)	1,530 (3.8%)	0.01	5994 (4.0%)	2522 (3.4%)	0.03
Use of opioids- United; n (%)	5,799 (22.6%)	3,261 (21.9%)	0.02	7,739 (24.0%)	4,176 (23.5%)	0.01	25,851 (28.0%)	11,903 (29.3%)	-0.03	39389 (26.2%)	19340 (26.4%)	0.00
Use of antidepressants; n (%)	4,895 (19.0%)	3,065 (20.6%)	-0.04	6,023 (18.6%)	3,323 (18.7%)	0.00	22,801 (24.7%)	10,978 (27.0%)	-0.05	33719 (22.4%)	17366 (23.7%)	-0.03
Use of antipsychotics; n (%)	375 (1.5%)	238 (1.6%)	-0.01	504 (1.6%)	250 (1.4%)	0.02	2,418 (2.6%)	1,335 (3.3%)	-0.04	3297 (2.2%)	1823 (2.5%)	-0.02
Use of anticonvulsants; n (%)	2,989 (11.6%)	1,777 (12.0%)	-0.01	3,445 (10.7%)	1,742 (9.8%)	0.03	13,599 (14.7%)	6,653 (16.4%)	-0.05	20033 (13.3%)	10172 (13.9%)	-0.02
Use of lithium- United; n (%)	13 (0.1%)	12 (0.1%)	0.00	23 (0.1%)	18 (0.1%)	0.00	29 (0.0%)	30 (0.1%)	-0.04	65 (0.0%)	60 (0.1%)	-0.04
Use of Benzos- United; n (%)	2,295 (8.9%)	1,810 (12.2%)	-0.11	4,007 (12.4%)	2,389 (13.5%)	-0.03	10,742 (11.6%)	6,233 (15.3%)	-0.11	17044 (11.3%)	10432 (14.2%)	-0.09
Use of anxiolytics/hypnotics- United; n (%)	1,231 (4.8%)	865 (5.8%)	-0.04	2,019 (6.3%)	1,221 (6.9%)	-0.02	5,918 (6.4%)	3,005 (7.4%)	-0.04	9168 (6.1%)	5091 (6.9%)	-0.03
Use of dementia meds- United; n (%)	988 (3.8%)	571 (3.8%)	0.00	1,481 (4.6%)	546 (3.1%)	0.08	5,159 (5.6%)	2,315 (5.7%)	0.00	7628 (5.1%)	3432 (4.7%)	0.02
Use of antiparkinsonian meds- United; n (%)	695 (2.7%)	399 (2.7%)	0.00	923 (2.9%)	441 (2.5%)	0.02	3,529 (3.8%)	1,659 (4.1%)	-0.02	5147 (3.4%)	2499 (3.4%)	0.00
Any use of pramlintide; n (%)	3 (0.0%)	3 (0.0%)	#DIV/0!	4 (0.0%)	2 (0.0%)	#DIV/0!	**	**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Any use of 1st generation sulfonylureas; n (%)	1 (0.0%)	0 (0.0%)	#DIV/0!	14 (0.0%)	1 (0.0%)	#DIV/0!	**	**	#VALUE!	#VALUE!	#VALUE!	0.00
Entresto (sacubitril/valsartan); n (%)	64 (0.2%)	67 (0.5%)	-0.05	18 (0.1%)	29 (0.2%)	-0.03	87 (0.1%)	88 (0.2%)	-0.03	169 (0.1%)	184 (0.3%)	0.00
Labs										57,996	32,617	
Lab values- HbA1c (%) v3; n (%)	3,444 (13.4%)	2,695 (18.1%)	-0.13	456 (1.4%)	242 (1.4%)	0.00	N/A	N/A	#VALUE!	3,900 (6.7%)	2,937 (9.0%)	-0.09
Lab values- HbA1c (%) (within 3 months) v3; n (%)	2,217 (8.6%)	1,747 (11.7%)	-0.10	321 (1.0%)	170 (1.0%)	0.00	N/A	N/A	#VALUE!	2,538 (4.4%)	1,917 (5.9%)	-0.07
Lab values- HbA1c (%) (within 6 months) v3; n (%)	3,444 (13.4%)	2,695 (18.1%)	-0.13	456 (1.4%)	242 (1.4%)	0.00	N/A	N/A	#VALUE!	3,900 (6.7%)	2,937 (9.0%)	-0.09
Lab values- BNP; n (%)	401 (1.6%)	281 (1.9%)	-0.02	35 (0.1%)	28 (0.2%)	-0.03	N/A	N/A	#VALUE!	436 (0.8%)	309 (0.9%)	-0.01
Lab values- BNP (within 3 months); n (%)	281 (1.1%)	224 (1.5%)	-0.04	28 (0.1%)	18 (0.1%)	0.00	N/A	N/A	#VALUE!	309 (0.5%)	242 (0.7%)	-0.03
Lab values- BNP (within 6 months); n (%)	401 (1.6%)	281 (1.9%)	-0.02	35 (0.1%)	28 (0.2%)	-0.03	N/A	N/A	#VALUE!	436 (0.8%)	309 (0.9%)	-0.01
Lab values- BUN (mg/dl); n (%)	6,014 (23.4%)	4,675 (31.4%)	-0.18	409 (1.3%)	390 (2.2%)	-0.07	N/A	N/A	#VALUE!	6,423 (11.1%)	5,065 (15.5%)	-0.13
Lab values- BUN (mg/dl) (within 3 months); n (%)	4,107 (16.0%)	3,320 (22.3%)	-0.16	282 (0.9%)	290 (1.6%)	-0.06	N/A	N/A	#VALUE!	4,389 (7.6%)	3,610 (11.1%)	-0.12
Lab values- BUN (mg/dl) (within 6 months); n (%)	6,014 (23.4%)	4,675 (31.4%)	-0.18	409 (1.3%)	390 (2.2%)	-0.07	N/A	N/A	#VALUE!	6,423 (11.1%)	5,065 (15.5%)	-0.13
Lab values- Creatinine (mg/dl) v2; n (%)	6,112 (23.8%)	4,840 (32.6%)	-0.20	423 (1.3%)	412 (2.3%)	-0.08	N/A	N/A	#VALUE!	6,535 (11.3%)	5,252 (16.1%)	-0.14
Lab values- Creatinine (mg/dl) (within 3 months) v2; n (%)	4,168 (16.2%)	3,454 (23.2%)	-0.18	293 (0.9%)	308 (1.7%)	-0.07	N/A	N/A	#VALUE!	4,461 (7.7%)	3,762 (11.5%)	-0.13
Lab values- Creatinine (mg/dl) (within 6 months) v2; n (%)	6,112 (23.8%)	4,840 (32.6%)	-0.20	423 (1.3%)	412 (2.3%)	-0.08	N/A	N/A	#VALUE!	6,535 (11.3%)	5,252 (16.1%)	-0.14
Lab values- HDL level (mg/dl); n (%)	4,306 (16.8%)	3,409 (22.9%)	-0.15	373 (1.2%)	270 (1.5%)	-0.03	N/A	N/A	#VALUE!	4,679 (8.1%)	3,679 (11.3%)	-0.11
Lab values- HDL level (mg/dl) (within 3 months); n (%)	2,689 (10.5%)	2,126 (14.3%)	-0.12	251 (0.8%)	181 (1.0%)	-0.02	N/A	N/A	#VALUE!	2,940 (5.1%)	2,307 (7.1%)	-0.08
Lab values- HDL level (mg/dl) (within 6 months); n (%)	4,306 (16.8%)	3,409 (22.9%)	-0.15	373 (1.2%)	270 (1.5%)	-0.03	N/A	N/A	#VALUE!	4,679 (8.1%)	3,679 (11.3%)	-0.11
Lab values- LDL level (mg/dl) v2; n (%)	4,523 (17.6%)	3,538 (23.8%)	-0.15	452 (1.4%)	279 (1.6%)	-0.02	N/A	N/A	#VALUE!	4,975 (8.6%)	3,817 (11.7%)	-0.10
Lab values- LDL level (mg/dl) (within 3 months) v2; n (%)	2,835 (11.0%)	2,212 (14.9%)	-0.12	296 (0.9%)	185 (1.0%)	-0.01	N/A	N/A	#VALUE!	3,131 (5.4%)	2,397 (7.3%)	-0.08
Lab values- LDL level (mg/dl) (within 6 months) v2; n (%)	4,523 (17.6%)	3,538 (23.8%)	-0.15	452 (1.4%)	279 (1.6%)	-0.02	N/A	N/A	#VALUE!	4,975 (8.6%)	3,817 (11.7%)	-0.10
Lab values- NT-proBNP; n (%)	48 (0.2%)	41 (0.3%)	-0.02	5 (0.0%)	4 (0.0%)	#DIV/0!	N/A	N/A	#VALUE!	53 (0.1%)	45 (0.1%)	0.00
Lab values- NT-proBNP (within 3 months); n (%)	37 (0.1%)	34 (0.2%)	-0.03	2 (0.0%)	3 (0.0%)	#DIV/0!	N/A	N/A	#VALUE!	39 (0.1%)	37 (0.1%)	-
Lab values- NT-proBNP (within 6 months); n (%)	48 (0.2%)	41 (0.3%)	-0.02	5 (0.0%)	4 (0.0%)	#DIV/0!	N/A	N/A	#VALUE!	53 (0.1%)	45 (0.1%)	-
Lab values- Total cholesterol (mg/dl) v2; n (%)	4,382 (17.0%)	3,446 (23.2%)	-0.16	372 (1.2%)	269 (1.5%)	-0.03	N/A	N/A	#VALUE!	4,754 (8.2%)	3,715 (11.4%)	-0.11
Lab values- Total cholesterol (mg/dl) (within 3 months) v2; n (%)	2,738 (10.7%)	2,151 (14.5%)	-0.11	246 (0.8%)	180 (1.0%)	-0.02	N/A	N/A	#VALUE!	2,984 (5.1%)	2,331 (7.1%)	-0.08

Appendix B: Rivaroxaban vs Warfarin

Lab values- Total cholesterol (mg/dl) (within 6 months) v2; n (%)	4,382 (17.0%)	3,446 (23.2%)	-0.16	372 (1.2%)	269 (1.5%)	-0.03	N/A	N/A	#VALUE!	4,754 (8.2%)	3,715 (11.4%)	-0.11
Lab values- Triglyceride level (mg/dl); n (%)	4,300 (16.7%)	3,427 (23.0%)	-0.16	358 (1.1%)	271 (1.5%)	-0.04	N/A	N/A	#VALUE!	4,658 (8.0%)	3,698 (11.3%)	-0.11
Lab values- Triglyceride level (mg/dl) (within 3 months); n (%)	2,685 (10.4%)	2,139 (14.4%)	-0.12	240 (0.7%)	182 (1.0%)	-0.03	N/A	N/A	#VALUE!	2,925 (5.0%)	2,321 (7.1%)	-0.09
Lab values- Triglyceride level (mg/dl) (within 6 months); n (%)	4,300 (16.7%)	3,427 (23.0%)	-0.16	358 (1.1%)	271 (1.5%)	-0.04	N/A	N/A	#VALUE!	4,658 (8.0%)	3,698 (11.3%)	-0.11
Lab result number- HbA1c (%) mean (only 2 to 20 included) v4	3,412	2,685		365	233		N/A	N/A		3,777	2,918	
...mean (sd)	6.57 (1.15)	6.43 (1.14)	0.12	6.95 (1.39)	6.74 (1.22)	0.16	N/A	N/A	#VALUE!	6.61 (1.18)	6.45 (1.15)	0.14
...median [IQR]	6.30 [5.90, 7.00]	6.20 [5.70, 6.80]	0.09	6.55 [6.05, 7.50]	6.50 [6.00, 7.20]	0.04	N/A	N/A	#VALUE!	6.32 (1.18)	6.22 (1.15)	0.09
...Missing; n (%)	22,289 (86.7%)	12,184 (81.9%)	0.13	31,930 (98.9%)	17,515 (98.7%)	0.02	N/A	N/A	#VALUE!	54,219 (93.5%)	29,699 (91.1%)	0.09
Lab result number- BNP mean v2	401	281		35	28		N/A	N/A		436	309	
...mean (sd)	321.38 (381.79)	308.78 (481.63)	0.03	534.56 (854.48)	412.18 (586.24)	0.17	N/A	N/A	#VALUE!	338.49 (438.16)	318.15 (492.53)	0.04
...median [IQR]	217.00 [123.80, 376.80]	197.00 [93.20, 325.50]	0.05	187.50 [119.00, 531.25]	148.90 [93.00, 375.75]	0.05	N/A	N/A	#VALUE!	214.63 (438.16)	192.64 (492.53)	0.05
...Missing; n (%)	25,300 (98.4%)	14,588 (98.1%)	0.02	32,260 (99.9%)	17,720 (99.8%)	0.03	N/A	N/A	#VALUE!	57,560 (99.2%)	32,308 (99.1%)	0.01
Lab result number- BUN (mg/dl) mean v2	6,014	4,675		409	390		N/A	N/A		6,423	5,065	
...mean (sd)	18.98 (7.10)	17.84 (5.88)	0.17	19.26 (8.32)	1,005.73 (11,839.99)	-0.12	N/A	N/A	#VALUE!	19.00 (7.18)	93.91 (3282.21)	-0.03
...median [IQR]	18.00 [14.33, 22.00]	17.00 [14.00, 21.00]	0.15	18.00 [15.00, 22.00]	17.90 [15.00, 22.50]	0.00	N/A	N/A	#VALUE!	18.00 (7.18)	#VALUE!	#VALUE!
...Missing; n (%)	19,687 (76.6%)	10,194 (68.6%)	0.18	31,886 (98.7%)	17,358 (97.8%)	0.07	N/A	N/A	#VALUE!	51,573 (88.9%)	27,552 (84.5%)	0.13
Lab result number- Creatinine (mg/dl) mean (only 0.1 to 15 included) v3	6,060	4,790		413	403		N/A	N/A		6,473	5,193	
...mean (sd)	1.00 (0.26)	0.95 (0.23)	0.20	1.03 (0.29)	0.97 (0.23)	0.23	N/A	N/A	#VALUE!	1.00 (0.26)	0.95 (0.23)	0.20
...median [IQR]	0.96 [0.82, 1.12]	0.93 [0.80, 1.07]	0.12	0.99 [0.84, 1.17]	0.96 [0.81, 1.10]	0.11	N/A	N/A	#VALUE!	0.96 (0.26)	0.93 (0.23)	0.12
...Missing; n (%)	19,641 (76.4%)	10,079 (67.8%)	0.19	31,882 (98.7%)	17,345 (97.7%)	0.08	N/A	N/A	#VALUE!	51,523 (88.8%)	27,424 (84.1%)	0.14
Lab result number- HDL level (mg/dl) mean (only =<5000 included) v2	4,306	3,409		373	269		N/A	N/A		4,679	3,678	
...mean (sd)	51.05 (16.15)	52.83 (16.13)	-0.11	44.36 (16.11)	46.29 (16.99)	-0.12	N/A	N/A	#VALUE!	50.52 (16.15)	52.35 (16.20)	-0.11
...median [IQR]	48.50 [40.00, 60.00]	50.00 [41.67, 62.00]	-0.09	44.00 [34.75, 52.00]	45.00 [37.00, 55.00]	-0.06	N/A	N/A	#VALUE!	48.14 (16.15)	49.63 (16.20)	-0.09
...Missing; n (%)	21,395 (83.2%)	11,460 (77.1%)	0.15	31,922 (98.8%)	17,479 (98.5%)	0.03	N/A	N/A	#VALUE!	53,317 (91.9%)	28,939 (88.7%)	0.11
Lab result number- LDL level (mg/dl) mean (only =<5000 included) v2	4,420	3,473		367	269		N/A	N/A		4,787	3,742	
...mean (sd)	85.74 (33.20)	87.86 (33.40)	-0.06	81.43 (33.48)	87.95 (39.03)	-0.18	N/A	N/A	#VALUE!	85.41 (33.22)	87.87 (33.84)	-0.07
...median [IQR]	81.00 [64.00, 104.00]	84.00 [64.00, 106.00]	-0.09	79.00 [62.00, 101.00]	86.00 [64.00, 110.25]	-0.19	N/A	N/A	#VALUE!	80.85 (33.22)	84.14 (33.84)	-0.10
...Missing; n (%)	21,281 (82.8%)	11,396 (76.6%)	0.15	31,928 (98.9%)	17,479 (98.5%)	0.04	N/A	N/A	#VALUE!	53,209 (91.7%)	28,875 (88.5%)	0.11
Lab result number- Total cholesterol (mg/dl) mean (only =<5000 included) v2	4,379	3,443		372	267		N/A	N/A		4,751	3,710	
...mean (sd)	162.98 (40.62)	166.15 (40.57)	-0.08	153.52 (43.84)	161.18 (52.03)	-0.16	N/A	N/A	#VALUE!	162.24 (40.88)	165.79 (41.50)	-0.09
...median [IQR]	158.50 [135.50, 186.00]	162.00 [138.00, 189.00]	-0.09	154.00 [133.00, 176.00]	159.00 [131.00, 191.00]	-0.10	N/A	N/A	#VALUE!	158.15 (40.88)	161.78 (41.50)	-0.09
...Missing; n (%)	21,322 (83.0%)	11,426 (76.8%)	0.16	31,923 (98.8%)	17,481 (98.5%)	0.03	N/A	N/A	#VALUE!	53,245 (91.8%)	28,907 (88.6%)	0.11
Lab result number- Triglyceride level (mg/dl) mean (only =<5000 included) v2	4,300	3,427		358	270		N/A	N/A		4,658	3,697	
...mean (sd)	130.55 (80.73)	125.44 (72.65)	0.07	143.25 (85.57)	128.35 (78.86)	0.18	N/A	N/A	#VALUE!	131.53 (81.12)	125.65 (73.13)	0.08
...median [IQR]	113.00 [82.00, 154.00]	107.00 [80.00, 152.00]	0.08	126.00 [88.00, 179.00]	117.50 [79.75, 157.50]	0.10	N/A	N/A	#VALUE!	114.00 (81.12)	107.77 (73.13)	0.08
...Missing; n (%)	21,401 (83.3%)	11,442 (77.0%)	0.16	31,937 (98.9%)	17,478 (98.5%)	0.04	N/A	N/A	#VALUE!	53,338 (92.0%)	28,920 (88.7%)	0.11
Lab result number- Hemoglobin mean (only >0 included)	4,383	3,561		284	285		N/A	N/A		4,667	3,846	
...mean (sd)	13.66 (1.55)	13.78 (1.61)	-0.08	13.12 (2.32)	815.42 (10,013.02)	-0.11	N/A	N/A	#VALUE!	13.63 (1.61)	73.18 (2722.01)	-0.03
...median [IQR]	13.60 [12.70, 14.70]	13.80 [12.76, 14.82]	-0.13	13.40 [12.30, 14.47]	14.00 [12.80, 14.90]	0.00	N/A	N/A	#VALUE!	13.59 (1.61)	#VALUE!	#VALUE!
...Missing; n (%)	21,318 (82.9%)	11,308 (76.1%)	0.17	32,011 (99.1%)	17,463 (98.4%)	0.06	N/A	N/A	#VALUE!	53,329 (92.0%)	28,771 (88.2%)	0.13
Lab result number- Serum sodium mean (only > 90 and < 190 included)	5,895	4,582		341	365		N/A	N/A		6,236	4,947	
...mean (sd)	140.05 (2.96)	140.27 (2.94)	-0.07	139.62 (3.02)	139.71 (2.77)	-0.03	N/A	N/A	#VALUE!	140.03 (2.96)	140.23 (2.93)	-0.07
...median [IQR]	140.00 [138.50, 142.00]	140.50 [139.00, 142.00]	-0.17	140.00 [138.00, 141.00]	140.00 [138.00, 142.00]	0.00	N/A	N/A	#VALUE!	140.00 (2.96)	140.46 (2.93)	-0.16
...Missing; n (%)	19,806 (77.1%)	10,287 (69.2%)	0.18	31,954 (98.9%)	17,383 (97.9%)	0.08	N/A	N/A	#VALUE!	51,760 (89.2%)	27,670 (84.8%)	0.13
Lab result number- Albumin mean (only >0 and <=10 included)	5,206	4,061		263	286		N/A	N/A		5,469	4,347	
...mean (sd)	4.14 (0.32)	4.19 (0.33)	-0.15	4.01 (0.70)	4.09 (0.59)	-0.12	N/A	N/A	#VALUE!	4.13 (0.35)	4.18 (0.35)	-0.14
...median [IQR]	4.15 [3.95, 4.35]	4.20 [4.00, 4.40]	-0.15	4.10 [3.83, 4.35]	4.20 [4.00, 4.40]	-0.15	N/A	N/A	#VALUE!	4.15 (0.35)	4.20 (0.35)	-0.14
...Missing; n (%)	20,495 (79.7%)	10,808 (72.7%)	0.16	32,032 (99.2%)	17,462 (98.4%)	0.07	N/A	N/A	#VALUE!	52,527 (90.6%)	28,270 (86.7%)	0.12
Lab result number- Glucose (fasting or random) mean (only 10-1000 included)	5,816	4,563		336	362		N/A	N/A		6,152	4,925	
...mean (sd)	113.88 (37.92)	112.94 (36.12)	0.03	128.18 (55.83)	129.74 (45.68)	-0.03	N/A	N/A	#VALUE!	114.66 (39.11)	114.17 (36.91)	0.01
...median [IQR]	103.00 [92.00, 122.00]	103.00 [93.00, 121.00]	0.00	114.00 [97.00, 138.94]	117.00 [100.00, 143.08]	-0.06	N/A	N/A	#VALUE!	103.60 (39.11)	104.03 (36.91)	-0.01
...Missing; n (%)	19,885 (77.4%)	10,306 (69.3%)	0.18	31,959 (99.0%)	17,386 (98.0%)	0.08	N/A	N/A	#VALUE!	51,844 (89.4%)	27,692 (84.9%)	0.13
Lab result number- Potassium mean (only 1-7 included)	6,075	4,778		402	377		N/A	N/A		6,477	5,155	

Appendix B: Rivaroxaban vs Warfarin

...mean (sd)	4.35 (0.44)	4.38 (0.44)	-0.07	4.33 (0.42)	4.34 (0.41)	-0.02	N/A	N/A	#VALUE!	4.35 (0.44)	4.38 (0.44)	-0.07
...median [IQR]	4.30 [4.10, 4.60]	4.40 [4.10, 4.65]	-0.23	4.30 [4.10, 4.60]	4.30 [4.10, 4.60]	0.00	N/A	N/A	#VALUE!	4.30 (0.44)	4.39 (0.44)	-0.20
...Missing; n (%)	19,626 (76.4%)	10,091 (67.9%)	0.19	31,893 (98.8%)	17,371 (97.9%)	0.07	N/A	N/A	#VALUE!	51,519 (88.8%)	27,462 (84.2%)	0.13
Comorbidity Scores												
CCI (180 days)- ICD9 and ICD10 v2												
...mean (sd)	3.37 (1.73)	3.44 (1.71)	-0.04	3.01 (1.67)	3.08 (1.56)	-0.04	2.87 (2.10)	2.90 (2.09)	-0.01	2.99 (1.95)	3.05 (1.90)	-0.03
...median [IQR]	3.00 [2.00, 4.00]	3.00 [2.00, 5.00]	0.00	3.00 [2.00, 4.00]	3.00 [2.00, 4.00]	0.00	3.00 [1.00, 4.00]	3.00 [1.00, 4.00]	0.00	3.00 (1.95)	3.00 (1.90)	0.00
Non-Frailty; n (%)	13,921 (54.2%)	8,405 (56.5%)	-0.05	16,295 (50.5%)	9,068 (51.1%)	-0.01	2,130 (2.3%)	887 (2.2%)	0.01	32,346 (21.5%)	18,360 (25.1%)	-0.09
Frailty Score (mean): Empirical Version 365 days, v2												
...mean (sd)	0.19 (0.06)	0.19 (0.06)	0.00	0.19 (0.05)	0.18 (0.05)	0.20	18.75 (12.79)	17.17 (12.78)	0.12	11.59 (10.03)	9.61 (9.52)	0.20
...median [IQR]	0.18 [0.15, 0.22]	0.18 [0.15, 0.21]	0.00	0.18 [0.15, 0.21]	0.17 [0.15, 0.20]	0.20	16.16 [9.68, 25.10]	14.51 [8.15, 23.26]	0.13	10.00 (10.03)	8.13 (9.52)	0.19
Healthcare Utilization												
Any hospitalization; n (%)	5,289 (20.6%)	3,814 (25.7%)	-0.12	7,942 (24.6%)	5,601 (31.6%)	-0.16	35,792 (38.7%)	20,776 (51.1%)	-0.25	49,023 (32.6%)	30,191 (41.2%)	-0.18
Any hospitalization within prior 30 days; n (%)	3,558 (13.8%)	2,423 (16.3%)	-0.07	4,737 (14.7%)	3,876 (21.8%)	-0.18	21,828 (23.6%)	13,998 (34.4%)	-0.24	30123 (20.0%)	20297 (27.7%)	-0.18
Any hospitalization during prior 31-180 days; n (%)	2,003 (7.8%)	1,604 (10.8%)	-0.10	3,530 (10.9%)	1,982 (11.2%)	-0.01	16,767 (18.1%)	8,551 (21.0%)	-0.07	22300 (14.8%)	12137 (16.6%)	-0.05
Endocrinologist Visit; n (%)	745 (2.9%)	496 (3.3%)	-0.02	1,051 (3.3%)	737 (4.2%)	-0.05	4,770 (5.2%)	2,301 (5.7%)	-0.02	6566 (4.4%)	3534 (4.8%)	-0.02
Endocrinologist Visit (30 days prior); n (%)	254 (1.0%)	165 (1.1%)	-0.01	343 (1.1%)	253 (1.4%)	-0.03	1,441 (1.6%)	779 (1.9%)	-0.02	2038 (1.4%)	1197 (1.6%)	-0.02
Endocrinologist Visit (31 to 180 days prior); n (%)	614 (2.4%)	412 (2.8%)	-0.03	903 (2.8%)	621 (3.5%)	-0.04	4,153 (4.5%)	1,951 (4.8%)	-0.01	5670 (3.8%)	2984 (4.1%)	-0.02
Internal medicine/family medicine visits; n (%)	22,697 (88.3%)	12,893 (86.7%)	0.05	25,755 (79.7%)	14,625 (82.4%)	-0.07	79,393 (85.9%)	36,147 (88.9%)	-0.09	127845 (85.0%)	63665 (86.9%)	-0.05
Internal medicine/family medicine visits (30 days prior) v2; n (%)	16,026 (62.4%)	8,775 (59.0%)	0.07	16,896 (52.3%)	10,186 (57.4%)	-0.10	53,989 (58.4%)	26,439 (65.0%)	-0.14	86911 (57.8%)	45400 (62.0%)	-0.09
Internal medicine/family medicine visits (31 to 180 days prior) v2; n (%)	20,181 (78.5%)	11,309 (76.1%)	0.06	23,468 (72.7%)	12,754 (71.9%)	0.02	70,359 (76.1%)	31,172 (76.7%)	-0.01	114008 (75.8%)	55235 (75.4%)	0.01
Cardiologist visit; n (%)	17,320 (67.4%)	12,047 (81.0%)	-0.31	17,116 (53.0%)	11,195 (63.1%)	-0.21	71,688 (77.6%)	35,047 (86.2%)	-0.22	106124 (70.6%)	58289 (79.6%)	-0.21
Number of Cardiologist visits (30 days prior); n (%)	12,102 (47.1%)	9,678 (65.1%)	-0.37	10,270 (31.8%)	9,109 (51.3%)	-0.40	46,370 (50.2%)	27,902 (68.6%)	-0.38	68742 (45.7%)	46689 (63.7%)	-0.37
Number of Cardiologist visits (31 to 180 days prior); n (%)	11,899 (46.3%)	7,468 (50.2%)	-0.08	13,333 (41.3%)	6,899 (38.9%)	0.05	52,530 (56.8%)	21,981 (54.1%)	0.05	77762 (51.7%)	36348 (49.6%)	0.04
Electrocardiogram v2; n (%)	16,445 (64.0%)	12,125 (81.5%)	-0.40	19,397 (60.1%)	14,074 (79.3%)	-0.43	66,036 (71.5%)	35,363 (87.0%)	-0.39	101878 (67.7%)	61562 (84.0%)	-0.39
Use of glucose test strips; n (%)	348 (1.4%)	227 (1.5%)	-0.01	334 (1.0%)	217 (1.2%)	-0.02	1,863 (2.0%)	1,006 (2.5%)	-0.03	2545 (1.7%)	1450 (2.0%)	-0.02
Dialysis; n (%)	3 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	**	**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
number of different/distinct medication prescriptions												
...mean (sd)	8.98 (4.25)	9.52 (4.58)	-0.12	9.50 (4.46)	9.73 (4.60)	-0.05	10.36 (4.52)	11.16 (4.98)	-0.17	9.94 (4.46)	10.48 (4.81)	0.00
...median [IQR]	8.00 [6.00, 11.00]	9.00 [6.00, 12.00]	-0.23	9.00 [6.00, 12.00]	9.00 [6.00, 12.00]	0.00	10.00 [7.00, 13.00]	10.00 [8.00, 14.00]	0.00	5.45 (5.28)	6.43 (5.46)	0.00
Number of Hospitalizations												
...mean (sd)	0.23 (0.50)	0.29 (0.55)	-0.11	0.27 (0.50)	0.35 (0.54)	-0.15	0.49 (0.72)	0.64 (0.76)	-0.20	0.40 (0.64)	0.50 (0.67)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 1.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 1.00]	0.00	0.00 [0.00, 1.00]	1.00 [0.00, 1.00]	-1.35	0.00 (0.72)	0.24 (0.74)	0.00
Number of hospital days												
...mean (sd)	1.17 (3.39)	1.27 (3.31)	-0.03	1.47 (4.58)	1.48 (3.36)	0.00	2.99 (6.48)	3.45 (6.68)	-0.07	2.35 (5.68)	2.53 (5.45)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 1.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 2.00]	0.00	0.00 [0.00, 4.00]	2.00 [0.00, 5.00]	-0.30	0.00 (6.38)	0.48 (5.77)	0.00
Number of Emergency Department (ED) visits v3												
...mean (sd)	0.60 (1.20)	0.81 (1.47)	-0.16	0.43 (1.72)	0.69 (2.35)	-0.13	1.08 (1.75)	1.38 (1.98)	-0.16	0.86 (1.66)	1.10 (1.99)	0.00
...median [IQR]	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 2.00]	1.00 [0.00, 2.00]	-0.54	0.00 (1.99)	0.24 (2.38)	0.00
Number of Office visits												
...mean (sd)	5.56 (4.39)	5.73 (3.98)	-0.04	6.45 (5.08)	5.89 (4.11)	0.12	13.98 (13.90)	13.94 (13.20)	0.00	10.92 (11.29)	10.32 (10.20)	0.00
...median [IQR]	5.00 [2.00, 8.00]	5.00 [3.00, 8.00]	0.00	5.00 [3.00, 9.00]	5.00 [3.00, 8.00]	0.00	10.00 [5.00, 19.00]	11.00 [5.00, 18.00]	-0.07	4.08 (11.74)	4.89 (10.45)	0.00
Number of Endocrinologist visits												
...mean (sd)	0.11 (1.11)	0.13 (1.11)	-0.02	0.12 (1.01)	0.16 (1.25)	-0.04	0.26 (1.93)	0.27 (1.84)	-0.01	0.20 (1.65)	0.21 (1.58)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (1.77)	0.00 (1.73)	0.00
Number of internal medicine/family medicine visits												
...mean (sd)	10.42 (12.51)	9.05 (11.93)	0.11	8.01 (11.59)	7.29 (10.23)	0.07	9.70 (11.61)	9.63 (10.82)	0.01	9.46 (11.76)	8.95 (10.92)	0.00
...median [IQR]	7.00 [2.00, 14.00]	6.00 [2.00, 12.00]	0.08	4.00 [1.00, 10.00]	4.00 [1.00, 9.00]	0.00	6.00 [2.00, 13.00]	7.00 [3.00, 13.00]	-0.09	3.34 (13.86)	3.88 (12.32)	0.00
Number of Cardiologist visits												
...mean (sd)	4.23 (5.80)	5.24 (5.92)	-0.17	3.14 (5.45)	3.46 (4.82)	-0.06	5.69 (7.71)	6.37 (7.97)	-0.09	4.89 (6.97)	5.44 (6.93)	0.00
...median [IQR]	2.00 [0.00, 6.00]	4.00 [1.00, 7.00]	-0.34	1.00 [0.00, 4.00]	2.00 [0.00, 5.00]	-0.19	3.00 [1.00, 8.00]	4.00 [2.00, 9.00]	-0.13	1.20 (7.78)	2.27 (7.43)	0.00
Number electrocardiograms received v2												
...mean (sd)	1.62 (2.18)	2.42 (2.58)	-0.33	1.36 (1.88)	1.99 (2.05)	-0.32	2.05 (2.35)	2.85 (2.57)	-0.32	1.83 (2.23)	2.55 (2.46)	0.00
...median [IQR]	1.00 [0.00, 2.00]	2.00 [1.00, 3.00]	-0.42	1.00 [0.00, 2.00]	1.00 [1.00, 3.00]	0.00	1.00 [0.00, 3.00]	2.00 [1.00, 4.00]	-0.41	0.60 (2.53)	1.13 (2.71)	0.00
Number of HbA1c tests ordered												
...mean (sd)	0.46 (0.73)	0.49 (0.73)	-0.04	0.21 (0.54)	0.27 (0.59)	-0.11	0.57 (0.81)	0.59 (0.82)	-0.02	0.47 (0.75)	0.49 (0.75)	0.00
...median [IQR]	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.00	0.00 (0.82)	0.00 (0.82)	0.00
Number of glucose tests ordered												
...mean (sd)	0.19 (1.94)	0.20 (0.86)	-0.01	0.13 (0.81)	0.15 (0.84)	-0.02	0.20 (0.94)	0.23 (0.75)	-0.04	0.18 (1.15)	0.20 (0.80)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (1.26)	0.00 (0.92)	0.00
Number of lipid tests ordered												
...mean (sd)	0.63 (0.82)	0.71 (0.84)	-0.10	0.27 (0.68)	0.40 (0.88)	-0.17	0.66 (0.77)	0.72 (0.80)	-0.08	0.57 (0.76)	0.64 (0.83)	0.00

Appendix B: Rivaroxaban vs Warfarin

...median [IQR]	0.00 [0.00, 1.00]	1.00 [0.00, 1.00]	-1.20	0.00 [0.00, 0.00]	0.00 [0.00, 1.00]	0.00	1.00 [0.00, 1.00]	1.00 [0.00, 1.00]	0.00	0.21 (0.87)	0.45 (0.96)	0.00
Number of creatinine tests ordered												
...mean (sd)	0.07 (0.39)	0.07 (0.34)	0.00	0.06 (0.36)	0.05 (0.29)	0.03	0.12 (0.49)	0.11 (0.43)	0.02	0.10 (0.45)	0.09 (0.38)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.50)	0.00 (0.42)	0.00
Number of BUN tests ordered												
...mean (sd)	0.04 (0.32)	0.04 (0.26)	0.00	0.04 (0.27)	0.03 (0.23)	0.04	0.08 (0.40)	0.07 (0.33)	0.03	0.06 (0.36)	0.05 (0.29)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.40)	0.00 (0.32)	0.00
Number of tests for microalbuminuria												
...mean (sd)	0.22 (0.66)	0.22 (0.66)	0.00	0.09 (0.42)	0.11 (0.47)	-0.04	0.16 (0.48)	0.17 (0.49)	-0.02	0.16 (0.50)	0.17 (0.52)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.57)	0.00 (0.59)	0.00
Total N distinct ICD9/ICD10 diagnoses at the 3rd digit level Copy												
...mean (sd)	5.69 (7.91)	8.77 (9.30)	-0.36	2.78 (5.59)	4.42 (6.78)	-0.26	9.07 (11.13)	11.98 (12.28)	-0.25	7.14 (9.67)	9.50 (10.60)	0.00
...median [IQR]	3.00 [0.00, 9.00]	7.00 [0.00, 13.00]	-0.46	0.00 [0.00, 3.00]	1.00 [0.00, 7.00]	-0.16	5.00 [0.00, 15.00]	9.00 [0.00, 19.00]	-0.34	1.59 (10.30)	3.84 (11.26)	0.00
For PS												
Hemorrhagic stroke+Other cerebrovascular disease+Cerebrovascular procedure (for PS); n (%)	912 (3.5%)	691 (4.6%)	-0.06	986 (3.1%)	607 (3.4%)	-0.02	4,474 (4.8%)	2,233 (5.5%)	-0.03	6372 (4.2%)	3531 (4.8%)	-0.03
Occurrence of creatinine tests ordered (for PS); n (%)	1,338 (5.2%)	824 (5.5%)	-0.01	1,445 (4.5%)	732 (4.1%)	0.02	8,254 (8.9%)	3,521 (8.7%)	0.01	11037 (7.3%)	5077 (6.9%)	0.02
Occurrence of BUN tests ordered (for PS); n (%)	824 (3.2%)	492 (3.3%)	-0.01	873 (2.7%)	479 (2.7%)	0.00	5,372 (5.8%)	2,228 (5.5%)	0.01	7069 (4.7%)	3199 (4.4%)	0.01
Occurrence of chronic renal insufficiency w/o CKD (for PS) v2; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	682 (0.7%)	243 (0.6%)	0.01	682 (0.5%)	243 (0.3%)	0.03
Chronic kidney disease Stage 1-2 (for PS); n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	0	0	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Chronic kidney disease Stage 3-6 (for PS); n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	1,912 (2.1%)	547 (1.3%)	0.06	1912 (1.3%)	547 (0.7%)	0.06
Bladder stones+Kidney stones (for PS); n (%)	210 (0.8%)	179 (1.2%)	-0.04	313 (1.0%)	209 (1.2%)	-0.02	1,291 (1.4%)	685 (1.7%)	-0.02	1814 (1.2%)	1073 (1.5%)	-0.03
Diabetes with peripheral circulatory disorders+Gangrene+Osteomyelitis(for PS) v3 with ICD10 Copy; n (%)	943 (3.7%)	452 (3.0%)	0.04	939 (2.9%)	397 (2.2%)	0.04	5,228 (5.7%)	2,132 (5.2%)	0.02	7110 (4.7%)	2981 (4.1%)	0.03
Alcohol abuse or dependence+Drug abuse or dependence (for PS); n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	173 (0.2%)	139 (0.3%)	-0.02	173 (0.1%)	139 (0.2%)	-0.03
Diabetes with other ophthalmic manifestations+Retinal detachment, vitreous hemorrhage, vitrectomy+Retinal laser coagulation therapy (for PS); n (%)	115 (0.4%)	84 (0.6%)	-0.03	555 (1.7%)	220 (1.2%)	0.04	1,437 (1.6%)	593 (1.5%)	0.01	2107 (1.4%)	897 (1.2%)	0.02
Other atherosclerosis+Cardiac conduction disorders+Other CVD (for PS) v2 Copy; n (%)	10,167 (39.6%)	6,504 (43.7%)	-0.08	11,709 (36.3%)	6,953 (39.2%)	-0.06	37,639 (40.7%)	18,343 (45.1%)	-0.09	59515 (39.6%)	31800 (43.4%)	-0.08
Previous cardiac procedure (CABG or PTCA or Stent) + History of CABG or PTCA (for PS) v3; n (%)	2,140 (8.3%)	1,535 (10.3%)	-0.07	1,558 (4.8%)	947 (5.3%)	-0.02	12,496 (13.5%)	6,545 (16.1%)	-0.07	16194 (10.8%)	9027 (12.3%)	-0.05
Hyperthyroidism + Hypothyroidism + Other disorders of thyroid gland (for PS); n (%)	5,181 (20.2%)	3,309 (22.3%)	-0.05	4,641 (14.4%)	3,058 (17.2%)	-0.08	16,724 (18.1%)	6,901 (17.0%)	0.03	26546 (17.7%)	13268 (18.1%)	-0.01
Delirium + Psychosis (for PS); n (%)	679 (2.6%)	400 (2.7%)	-0.01	861 (2.7%)	369 (2.1%)	0.04	4,298 (4.7%)	2,093 (5.1%)	-0.02	5838 (3.9%)	2862 (3.9%)	0.00
Any use of Meglitinides (for PS); n (%)	56 (0.2%)	43 (0.3%)	-0.02	166 (0.5%)	80 (0.5%)	0.00	460 (0.5%)	200 (0.5%)	0.00	682 (0.5%)	323 (0.4%)	0.01
Any use of AGIs (for PS); n (%)	24 (0.1%)	10 (0.1%)	0.00	46 (0.1%)	12 (0.1%)	0.00	139 (0.2%)	57 (0.1%)	0.03	209 (0.1%)	79 (0.1%)	0.00
CKD stage 3-6 + dialysis (for PS); n (%)	3 (0.0%)	1 (0.0%)	#DIV/0!	1 (0.0%)	0 (0.0%)	#DIV/0!	1,917 (2.1%)	549 (1.4%)	0.05	1921 (1.3%)	550 (0.8%)	0.05
Use of thiazide- United; n (%)	3,246 (12.6%)	1,792 (12.1%)	0.02	3,732 (11.6%)	2,078 (11.7%)	0.00	11,852 (12.8%)	5,583 (13.7%)	-0.03	18830 (12.5%)	9453 (12.9%)	-0.01
Use of beta blockers; n (%)	17,651 (68.7%)	10,352 (69.6%)	-0.02	22,255 (68.9%)	12,673 (71.4%)	-0.05	67,017 (72.5%)	30,360 (74.7%)	-0.05	106923 (71.1%)	53385 (72.9%)	-0.04
Use of calcium channel blockers; n (%)	9,670 (37.6%)	6,047 (40.7%)	-0.06	12,176 (37.7%)	7,379 (41.6%)	-0.08	37,046 (40.1%)	18,250 (44.9%)	-0.10	58892 (39.2%)	31676 (43.2%)	-0.08
All antidiabetic medications except Insulin; n (%)	6,249 (24.3%)	3,472 (23.4%)	0.02	7,734 (23.9%)	4,459 (25.1%)	-0.03	26,614 (28.8%)	12,216 (30.1%)	-0.03	40597 (27.0%)	20147 (27.5%)	-0.01
DM Medications - Insulin Copy; n (%)	1,395 (5.4%)	653 (4.4%)	0.05	2,314 (7.2%)	1,089 (6.1%)	0.04	6,547 (7.1%)	2,810 (6.9%)	0.01	10256 (6.8%)	4552 (6.2%)	0.02
Use of Low Intensity Statins; n (%)	9,654 (37.6%)	4,898 (32.9%)	0.10	11,758 (36.4%)	5,834 (32.9%)	0.07	35,863 (38.8%)	14,698 (36.2%)	0.05	57275 (38.1%)	25430 (34.7%)	0.07
Use of High Intensity Statins; n (%)	5,758 (22.4%)	4,335 (29.2%)	-0.16	7,351 (22.8%)	4,764 (26.8%)	-0.09	21,260 (23.0%)	11,124 (27.4%)	-0.10	34369 (22.9%)	20223 (27.6%)	-0.11
Malignant hypertension; n (%)	1,402 (5.5%)	605 (4.1%)	0.07	14,434 (44.7%)	7,875 (44.4%)	0.01	24,773 (26.8%)	11,920 (29.3%)	-0.06	40609 (27.0%)	20400 (27.8%)	-0.02
Cardiovascular stress test; n (%)	119 (0.5%)	72 (0.5%)	0.00	232 (0.7%)	126 (0.7%)	0.00	901 (1.0%)	384 (0.9%)	0.01	1252 (0.8%)	582 (0.8%)	0.00
Echocardiogram; n (%)	9,046 (35.2%)	7,241 (48.7%)	-0.28	11,883 (36.8%)	9,419 (53.1%)	-0.33	41,768 (45.2%)	25,031 (61.6%)	-0.33	62697 (41.7%)	41691 (56.9%)	-0.31
Number of BNP tests												
...mean (sd)	0.13 (0.49)	0.16 (0.53)	-0.06	0.08 (0.45)	0.10 (0.40)	-0.05	0.24 (0.66)	0.27 (0.66)	-0.05	0.19 (0.59)	0.21 (0.58)	-0.03
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.66)	0.00 (0.62)	0.00
Number of Cardiac biomarkers tests (tropnin, CK-MBs, Myoglobin, CPK)												
...mean (sd)	0.37 (1.26)	0.57 (1.61)	-0.14	0.27 (1.17)	0.47 (1.53)	-0.15	0.31 (0.65)	0.42 (0.75)	-0.16	0.31 (0.91)	0.46 (1.19)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 1.00]	0.00	0.00 (1.17)	0.00 (1.46)	0.00
Number of Ambulatory Blood pressure monitoring tests												
...mean (sd)	0.00 (0.03)	0.00 (0.03)	0.00	0.00 (0.04)	0.00 (0.05)	0.00	0.00 (0.03)	0.00 (0.04)	0.00	0.00 (0.03)	0.00 (0.04)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.04)	0.00 (0.05)	0.00
N of days on antihypertensive medications during baseline							0	0				

Appendix B: Rivaroxaban vs Warfarin

...mean (sd)	138.54 (63.34)	137.54 (63.50)	0.02	140.38 (63.02)	137.96 (64.23)	0.04	147.39 (56.03)	147.97 (55.26)	-0.01	144.37 (58.88)	143.43 (59.26)	0.00
...median [IQR]	174.00 [120.00, 181.00]	173.00 [116.00, 181.00]	0.02	177.00 [126.00, 181.00]	174.00 [119.00, 181.00]	0.05	177.00 [144.00, 181.00]	0 [145.00, 181.00]	0.02	105.75 (71.09)	119.89 (69.29)	0.00
N of days in database anytime prior							0	0				
...mean (sd)	1,959.27 (1,297.23)	2,058.84 (1,433.06)	-0.07	2,420.20 (1,291.48)	2,541.09 (1,409.03)	-0.09	953.45 (634.65)	823.51 (522.94)	0.22	1440.28 (945.08)	1490.25 (1024.40)	0.00
...median [IQR]	1,776.00 [827.00, 2,836.00]	1,720.00 [832.00, 3,097.00]	0.04	56.00 [1,252.00, 3,479.00]	1.00 [1,278.00, 3,708.75]	0.04	716.00 [478.00, 1,286.00]	0 [490.00, 961.00]	0.09	1008.23 (1248.91)	1117.65 (1292.30)	0.00
Mean Copay for per prescription cost (charges in U.S. $) (180-1 day prior)							0	0				
...mean (sd)	28.47 (41.39)	29.22 (39.66)	-0.02	19.16 (19.36)	18.88 (20.59)	0.01	121.51 (113.74)	117.02 (103.79)	0.04	83.63 (91.22)	75.43 (79.99)	0.00
...median [IQR]	17.87 [8.00, 34.79]	18.85 [7.82, 36.19]	-0.02	15.00 [7.40, 25.46]	14.01 [6.55, 25.02]	0.05	99.09 [70.50, 141.51]	40 [68.67, 135.00]	0.03	27.55 (92.04)	30.33 (80.82)	0.00
...Missing; n (%)	697 (2.7%)	299 (2.0%)	0.05	831 (2.6%)	341 (1.9%)	0.05	1,655 (1.8%)	476 (1.2%)	0.05	3183 (2.1%)	1116 (1.5%)	0.05
Colonoscopy; n (%)	640 (2.5%)	432 (2.9%)	-0.02	868 (2.7%)	644 (3.6%)	-0.05	2,623 (2.8%)	1,364 (3.4%)	-0.03	4131 (2.7%)	2440 (3.3%)	-0.04
Fecal occult blood (FOB) test; n (%)	754 (2.9%)	493 (3.3%)	-0.02	598 (1.9%)	404 (2.3%)	-0.03	2,177 (2.4%)	1,058 (2.6%)	-0.01	3529 (2.3%)	1955 (2.7%)	-0.03
Flu vaccine; n (%)	5,240 (20.4%)	2,802 (18.8%)	0.04	4,338 (13.4%)	2,190 (12.3%)	0.03	30,438 (32.9%)	13,288 (32.7%)	0.00	40016 (26.6%)	18280 (24.9%)	0.04
Mammogram; n (%)	2,062 (8.0%)	1,374 (9.2%)	-0.04	1,495 (4.6%)	1,054 (5.9%)	-0.06	8,045 (8.7%)	3,965 (9.8%)	-0.04	11602 (7.7%)	6393 (8.7%)	-0.04
Pap smear; n (%)	305 (1.2%)	250 (1.7%)	-0.04	405 (1.3%)	358 (2.0%)	-0.05	1,287 (1.4%)	814 (2.0%)	-0.05	1997 (1.3%)	1422 (1.9%)	-0.05
Pneumonia vaccine; n (%)	3,034 (11.8%)	2,543 (17.1%)	-0.15	1,406 (4.4%)	1,266 (7.1%)	-0.12	14,621 (15.8%)	8,703 (21.4%)	-0.14	19061 (12.7%)	12512 (17.1%)	-0.12
PSA test or Prostate exam for DRE; n (%)	2,967 (11.5%)	2,054 (13.8%)	-0.07	1,970 (6.1%)	1,552 (8.7%)	-0.10	9,178 (9.9%)	4,445 (10.9%)	-0.03	14115 (9.4%)	8051 (11.0%)	-0.05
Bone mineral density; n (%)	805 (3.1%)	532 (3.6%)	-0.03	452 (1.4%)	276 (1.6%)	-0.02	3,027 (3.3%)	1,480 (3.6%)	-0.02	4284 (2.8%)	2288 (3.1%)	-0.02
Use of Sympatomimetic agents; n (%)	51 (0.2%)	60 (0.4%)	-0.04	104 (0.3%)	95 (0.5%)	-0.03	205 (0.2%)	119 (0.3%)	-0.02	360 (0.2%)	274 (0.4%)	-0.04
Use of CNS stimulants; n (%)	48 (0.2%)	45 (0.3%)	-0.02	111 (0.3%)	93 (0.5%)	-0.03	163 (0.2%)	109 (0.3%)	-0.02	322 (0.2%)	247 (0.3%)	-0.02
Use of estrogens, progestins, androgens; n (%)	559 (2.2%)	471 (3.2%)	-0.06	1,035 (3.2%)	806 (4.5%)	-0.07	2,155 (2.3%)	1,280 (3.1%)	-0.05	3749 (2.5%)	2557 (3.5%)	-0.06
Use of Angiogenesis inhibitors; n (%)	6 (0.0%)	4 (0.0%)	#DIV/0!	10 (0.0%)	5 (0.0%)	#DIV/0!	24 (0.0%)	14 (0.0%)	#DIV/0!	40 (0.0%)	23 (0.0%)	#DIV/0!
Use of Oral Immunosuppressants; n (%)	5 (0.0%)	1 (0.0%)	#DIV/0!	21 (0.1%)	7 (0.0%)	0.04	24 (0.0%)	**	#VALUE!	50 (0.0%)	#VALUE!	#VALUE!
Use of fondaparinux or Bivalirudin; n (%)	13 (0.1%)	1 (0.0%)	0.04	14 (0.0%)	3 (0.0%)	#DIV/0!	43 (0.0%)	11 (0.0%)	#DIV/0!	70 (0.0%)	15 (0.0%)	#DIV/0!
Use of other direct thrombin inhibitors (lepirudin, desirudin, argatroban); n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!
Use of Ticagrelor ON CED; n (%)	18 (0.1%)	40 (0.3%)	-0.04	29 (0.1%)	29 (0.2%)	-0.03	30 (0.0%)	19 (0.0%)	#DIV/0!	77 (0.1%)	88 (0.1%)	0.00
Use of Ticagrelor; n (%)	33 (0.1%)	68 (0.5%)	-0.07	38 (0.1%)	48 (0.3%)	-0.04	208 (0.2%)	143 (0.4%)	-0.04	279 (0.2%)	259 (0.4%)	-0.04
Number of D-dimer tests												
...mean (sd)	0.02 (0.17)	0.03 (0.21)	-0.05	0.01 (0.13)	0.03 (0.20)	-0.12	0.03 (0.19)	0.05 (0.23)	-0.09	0.02 (0.18)	0.04 (0.22)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.19)	0.00 (0.25)	0.00
Numbe of CRP, high-sensitivity CRP tests												
...mean (sd)	0.05 (0.33)	0.07 (0.36)	-0.06	0.03 (0.23)	0.04 (0.27)	-0.04	0.08 (0.42)	0.10 (0.47)	-0.04	0.06 (0.37)	0.08 (0.41)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.40)	0.00 (0.44)	0.00
Number of PT or aPTTt tests												
...mean (sd)	2.81 (4.00)	0.46 (1.30)	0.79	2.00 (3.43)	0.37 (1.15)	0.64	3.70 (4.84)	0.42 (1.13)	0.93	3.18 (4.43)	0.42 (1.17)	0.01
...median [IQR]	1.00 [0.00, 5.00]	0.00 [0.00, 0.00]	0.34	0.00 [0.00, 3.00]	0.00 [0.00, 0.00]	0.00	1.00 [0.00, 6.00]	0.00 [0.00, 1.00]	0.28	0.39 (4.94)	0.00 (1.34)	0.00
Number of Bleeding time tests												
...mean (sd)	0.00 (0.01)	0.00 (0.00)	0.00	0.00 (0.00)	0.00 (0.02)	0.00	0.00 (0.01)	0.00 (0.01)	0.00	0.00 (0.01)	0.00 (0.01)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.01)	0.00 (0.02)	0.00
HAS-BLED Score (ICD-9 and ICD-10), 180 days												
...mean (sd)	3.32 (0.71)	3.41 (0.80)	-0.12	3.23 (0.72)	3.24 (0.80)	-0.01	3.49 (0.71)	3.58 (0.74)	-0.12	3.41 (0.71)	3.46 (0.77)	0.00
...median [IQR]	3.00 [3.00, 4.00]	3.00 [3.00, 4.00]	0.00	3.00 [3.00, 4.00]	3.00 [3.00, 4.00]	0.00	3.00 [3.00, 4.00]	3.00 [3.00, 4.00]	0.00	1.80 (0.85)	2.06 (0.89)	0.00
N of Generic name drugs												
...mean (sd)	18.50 (14.88)	18.50 (15.49)	0.00	14.58 (9.95)	14.60 (10.87)	0.00	19.40 (13.61)	20.44 (15.43)	-0.07	18.21 (13.15)	18.63 (14.47)	0.00
...median [IQR]	15.00 [9.00, 23.00]	15.00 [8.00, 24.00]	0.00	13.00 [8.00, 19.00]	12.00 [7.00, 19.00]	0.10	16.00 [10.00, 25.00]	7.00 [10.00, 26.00]	-0.07	8.79 (14.58)	10.07 (15.70)	0.00
N of Brand name drugs												
...mean (sd)	3.32 (4.93)	4.72 (5.32)	-0.27	4.08 (4.53)	5.12 (4.82)	-0.22	3.85 (5.03)	5.57 (6.03)	-0.31	3.81 (4.91)	5.29 (5.62)	0.00
...median [IQR]	2.00 [0.00, 5.00]	3.00 [1.00, 6.00]	-0.19	3.00 [1.00, 6.00]	4.00 [2.00, 7.00]	-0.21	2.00 [0.00, 6.00]	4.00 [2.00, 7.00]	-0.36	1.42 (5.68)	2.55 (6.23)	0.00
Use of clopidogrel ; n (%)	2,022 (7.9%)	1,719 (11.6%)	-0.12	2,811 (8.7%)	2,115 (11.9%)	-0.11	9,421 (10.2%)	5,719 (14.1%)	-0.12	14254 (9.5%)	9553 (13.0%)	-0.11
Systemic embolism; n (%)	223 (0.9%)	121 (0.8%)	0.01	237 (0.7%)	128 (0.7%)	0.00	1,013 (1.1%)	386 (0.9%)	0.02	1473 (1.0%)	635 (0.9%)	0.01
DVT; n (%)	93 (0.4%)	40 (0.3%)	0.02	90 (0.3%)	33 (0.2%)	0.02	1,966 (2.1%)	738 (1.8%)	0.02	2149 (1.4%)	811 (1.1%)	0.03
PE; n (%)	1 (0.0%)	1 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	481 (0.5%)	186 (0.5%)	0.00	482 (0.3%)	187 (0.3%)	0.00
Diabetes: 1 inpatient or 2 outpatient claims within 183 days ; n (%)	9,210 (35.8%)	4,979 (33.5%)	0.05	10,556 (32.7%)	5,685 (32.0%)	0.01	41,545 (45.0%)	18,260 (44.9%)	0.00	61311 (40.8%)	28924 (39.5%)	0.03
Intracranial or retroperitoneal hemorrhage: 1 inpatient or 2 outpatient claims within 183 days ; n (%)	42 (0.2%)	20 (0.1%)	0.03	72 (0.2%)	20 (0.1%)	0.03	326 (0.4%)	114 (0.3%)	0.02	440 (0.3%)	154 (0.2%)	0.02
Peptic Ulcer Disease; n (%)	3,489 (13.6%)	2,703 (18.2%)	-0.13	2,889 (8.9%)	2,207 (12.4%)	-0.11	16,513 (17.9%)	9,656 (23.8%)	-0.15	22891 (15.2%)	14566 (19.9%)	-0.12
Upper GI bleed; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	86 (0.1%)	31 (0.1%)	0.00	86 (0.1%)	31 (0.0%)	0.04
Lower/ unspecified GI bleed; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	1,049 (1.1%)	509 (1.3%)	-0.02	1049 (0.7%)	509 (0.7%)	0.00
Urogenital bleed; n (%)	0 (0.0%)	1 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	1,725 (1.9%)	729 (1.8%)	0.01	1725 (1.1%)	730 (1.0%)	0.01
Other bleeds; n (%)	4 (0.0%)	3 (0.0%)	#DIV/0!	0 (0.0%)	1 (0.0%)	#DIV/0!	969 (1.0%)	399 (1.0%)	0.00	973 (0.6%)	403 (0.6%)	0.00
Prior cancer; n (%)	2,927 (11.4%)	2,127 (14.3%)	-0.09	3,033 (9.4%)	1,750 (9.9%)	-0.02	11,109 (12.0%)	5,640 (13.9%)	-0.06	17069 (11.3%)	9517 (13.0%)	-0.05
Aspirin; n (%)	139 (0.5%)	154 (1.0%)	-0.06	357 (1.1%)	314 (1.8%)	-0.06	418 (0.5%)	266 (0.7%)	-0.03	914 (0.6%)	734 (1.0%)	-0.04

Appendix B: Rivaroxaban vs Warfarin

Aspirin/dipyridamole; n (%)	73 (0.3%)	55 (0.4%)	-0.02	159 (0.5%)	118 (0.7%)	-0.03	374 (0.4%)	237 (0.6%)	-0.03	606 (0.4%)	410 (0.6%)	-0.03
Other antiplatelet agents; n (%)	151 (0.6%)	69 (0.5%)	0.01	182 (0.6%)	103 (0.6%)	0.00	601 (0.7%)	289 (0.7%)	0.00	934 (0.6%)	461 (0.6%)	0.00
PGP inhibitors; n (%)	10,770 (41.9%)	6,482 (43.6%)	-0.03	14,437 (44.7%)	8,199 (46.2%)	-0.03	44,650 (48.3%)	20,953 (51.5%)	-0.06	69857 (46.4%)	35634 (48.6%)	-0.04
Other gastroprotective agents; n (%)	182 (0.7%)	140 (0.9%)	-0.02	301 (0.9%)	204 (1.1%)	-0.02	1,082 (1.2%)	671 (1.7%)	-0.04	1565 (1.0%)	1015 (1.4%)	-0.04
Number of lipid tests ordered												
...mean (sd)	0.63 (0.82)	0.71 (0.84)	-0.10	0.27 (0.68)	0.40 (0.88)	-0.17	0.69 (0.83)	0.76 (0.89)	-0.08	0.59 (0.80)	0.66 (0.88)	0.00
...median [IQR]	0.00 [0.00, 1.00]	1.00 [0.00, 1.00]	-1.20	0.00 [0.00, 0.00]	0.00 [0.00, 1.00]	0.00	1.00 [0.00, 1.00]	1.00 [0.00, 1.00]	0.00	0.21 (0.91)	0.45 (1.01)	0.00
Proton pump inhibitor; n (%)	4,768 (18.6%)	3,236 (21.8%)	-0.08	6,352 (19.7%)	3,979 (22.4%)	-0.07	23,264 (25.2%)	11,663 (28.7%)	-0.08	34384 (22.9%)	18878 (25.8%)	-0.07
H2 receptor antagonist; n (%)	1,060 (4.1%)	632 (4.3%)	-0.01	1,125 (3.5%)	684 (3.9%)	-0.02	5,503 (6.0%)	2,836 (7.0%)	-0.04	7688 (5.1%)	4152 (5.7%)	-0.03
Vitamin K therapy; n (%)	20 (0.1%)	4 (0.0%)	0.04	57 (0.2%)	4 (0.0%)	0.06	119 (0.1%)	**	#VALUE!	196 (0.1%)	#VALUE!	#VALUE!
Number of neurologist visits												
...mean (sd)	0.29 (1.48)	0.36 (1.49)	-0.05	0.23 (1.34)	0.27 (1.34)	-0.03	0.49 (2.00)	0.54 (2.01)	-0.02	0.40 (1.79)	0.44 (1.77)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (1.98)	0.00 (1.92)	0.00
Number of INR (prothrombin) tests ordered												
...mean (sd)	2.68 (3.90)	0.29 (0.92)	0.84	1.90 (3.33)	0.23 (0.81)	0.69	3.68 (4.80)	0.39 (1.09)	0.95	3.13 (4.37)	0.33 (0.99)	0.01
...median [IQR]	1.00 [0.00, 5.00]	0.00 [0.00, 0.00]	0.35	0.00 [0.00, 2.00]	0.00 [0.00, 0.00]	0.00	1.00 [0.00, 6.00]	0.00 [0.00, 1.00]	0.29	0.39 (4.85)	0.00 (1.09)	0.00
Treating prescriber - Cardiologist; n (%)	12,149 (47.3%)	9,745 (65.5%)	-0.37	12,028 (37.2%)	10,681 (60.2%)	-0.47	46,370 (50.2%)	27,902 (68.6%)	-0.38	70547 (46.9%)	48328 (66.0%)	-0.39
Treating prescriber - Primary Care Physician; n (%)	16,835 (65.5%)	9,464 (63.6%)	0.04	9,639 (29.8%)	5,942 (33.5%)	-0.08	25,268 (27.3%)	12,084 (29.7%)	-0.05	51742 (34.4%)	27490 (37.5%)	-0.06
Treating prescriber - Other; n (%)	21,098 (82.1%)	12,821 (86.2%)	-0.11	24,503 (75.9%)	14,433 (81.3%)	-0.13	77,468 (83.8%)	36,185 (89.0%)	-0.15	123069 (81.8%)	63439 (86.6%)	-0.13
Alpha blockers; n (%)	3,114 (12.1%)	1,816 (12.2%)	0.00	4,170 (12.9%)	2,035 (11.5%)	0.04	11,524 (12.5%)	5,009 (12.3%)	0.01	18808 (12.5%)	8860 (12.1%)	0.01
CHADS2 score, 180 days, V												
...mean (sd)	2.22 (1.17)	1.98 (1.19)	0.20	2.23 (1.18)	2.05 (1.20)	0.15	3.80 (1.61)	3.62 (1.65)	0.11	3.19 (1.46)	2.91 (1.47)	0.00
...median [IQR]	2.00 [1.00, 3.00]	2.00 [1.00, 3.00]	0.00	2.00 [1.00, 3.00]	2.00 [1.00, 3.00]	0.00	4.00 [3.00, 5.00]	3.00 [2.00, 5.00]	0.61	1.63 (1.64)	1.62 (1.61)	0.00
Use of Prasugrel; n (%)	43 (0.2%)	58 (0.4%)	-0.04	69 (0.2%)	88 (0.5%)	-0.05	**	**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Use of Loop Diuretics+other diuretics+other hypertension drugs; n (%)	9,459 (36.8%)	4,643 (31.2%)	0.12	12,825 (39.7%)	5,131 (28.9%)	0.23	45,778 (49.5%)	17,784 (43.7%)	0.12	68062 (45.3%)	27558 (37.6%)	0.16
Commercial vs Medicare Advantage- Business Type Code - CORRECT ONE - OPTUM												
...Commercial; n (%)	3,292 (12.8%)	3244 (21.8%)	-0.24	27,877 (86.3%)	13,057 (73.6%)	0.32	-	-	#VALUE!	31,169 (53.7%)	16,301 (50.0%)	0.07
...Medicare Advantage; n (%)	22,409 (87.2%)	11625 (78.2%)	0.24	4,418 (13.7%)	4,691 (26.4%)	-0.32	-	-	#VALUE!	26,827 (46.3%)	16,316 (50.0%)	-0.07
Commercial vs Medicare Advantage- Business Type Code												
...COM = COMMERCIAL; n (%)	3,292 (12.8%)	3,244 (21.8%)	-0.24	-	-		-	-	#VALUE!	3,292 (12.8%)	3,244 (21.8%)	-0.24
...MCR = MEDICARE; n (%)	22,409 (87.2%)	11,625 (78.2%)	0.24	-	-		-	-	#VALUE!	22,409 (87.2%)	11,625 (78.2%)	0.24
...MCD = MEDICAID; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	-	-		-	-	#VALUE!	0 (0.0%)	0 (0.0%)	#DIV/0!
...NONE = NO BUSINESS LINE CODE (added in 2015); n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	-	-		-	-	#VALUE!	0 (0.0%)	0 (0.0%)	#DIV/0!
...UNK = UNKNOWN (added in 2015); n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	-	-		-	-	#VALUE!	0 (0.0%)	0 (0.0%)	#DIV/0!
Commercial vs Medicare Advantage- Data Type												
...1 - Fee For Service; n (%)	-	-		3,872 (12.0%)	4,189 (23.6%)	-0.31	-	-		3,872 (12.0%)	4,189 (23.6%)	-0.31
...2 - Encounter; n (%)	-	-		546 (1.7%)	502 (2.8%)	-0.07	-	-		546 (1.7%)	502 (2.8%)	-0.07
...3 - Medicare; n (%)	-	-		25,005 (77.4%)	12,039 (67.8%)	0.22	-	-		25,005 (77.4%)	12,039 (67.8%)	0.22
...4 - Medicare Encounter; n (%)	-	-		2,872 (8.9%)	1,018 (5.7%)	0.12	-	-		2,872 (8.9%)	1,018 (5.7%)	0.12
Metropolitan Statistical Area - Urban (any MSA) vs Rural (non-MSA)										0	0	0.00
...Urban; n (%)	-	-		24,996 (77.4%)	12,798 (72.1%)	0.12	-	-		24,996 (77.4%)	12,798 (72.1%)	0.12
...Rural; n (%)	-	-		490 (1.5%)	680 (3.8%)	-0.14	-	-		490 (1.5%)	680 (3.8%)	-0.14
...Unknown/Missing; n (%)	-	-		6,809 (21.1%)	4,270 (24.1%)	-0.07	-	-		6,809 (21.1%)	4,270 (24.1%)	-0.07

Due to CMS cell suppression policy, all values less than 11 are denoted with **

Appendix B: Rivaroxaban vs Warfarin

PS-matched												
	Optum			MarketScan			Medicare			POOLED		
Variable	Reference- warfarin	Exposure - rivaroxaban (15 or 20 mg)	St. Diff.	Reference- warfarin	Exposure - rivaroxaban (15 or 20 mg)	St. Diff.	Reference- warfarin	Exposure - rivaroxaban (15 or 20 mg)	St. Diff.	Reference- warfarin	Exposure - rivaroxaban (15 or 20 mg)	St. Diff.
Number of patients	**8,950**	**8,950**		**11,300**	**11,300**		**31,068**	**31,068**		**51,318**	**51,318**	
Age												
...mean (sd)	75.84 (8.34)	75.85 (8.57)	0.00	75.02 (10.73)	75.15 (10.38)	-0.01	78.73 (8.21)	78.77 (8.02)	0.00	77.41 (8.85)	77.46 (8.69)	-0.01
...median [IQR]	77.00 [71.00, 82.00]	77.00 [71.00, 82.00]	0.00	77.00 [68.00, 83.00]	77.00 [68.00, 83.00]	0.00	79.00 [74.00, 84.00]	79.00 [74.00, 84.00]	0.00	78.21 (8.85)	78.21 (8.69)	0.00
Age categories without zero category												
...18 - 54; n (%)	198 (2.2%)	212 (2.4%)	-0.01	484 (4.3%)	371 (3.3%)	0.05	310 (1.0%)	298 (1.0%)	0.00	992 (1.9%)	881 (1.7%)	0.02
...55 - 64; n (%)	682 (7.6%)	723 (8.1%)	-0.02	1,629 (14.4%)	1,717 (15.2%)	-0.02	998 (3.2%)	923 (3.0%)	0.01	3,309 (6.4%)	3,363 (6.6%)	-0.01
...65 - 74; n (%)	2,239 (25.0%)	2,150 (24.0%)	0.02	2,325 (20.6%)	2,352 (20.8%)	0.00	6,715 (21.6%)	6,584 (21.2%)	0.01	11,279 (22.0%)	11,086 (21.6%)	0.01
...>= 75; n (%)	5,831 (65.2%)	5,865 (65.5%)	-0.01	6,862 (60.7%)	6,860 (60.7%)	0.00	23,045 (74.2%)	23,263 (74.9%)	-0.02	35,738 (69.6%)	35,988 (70.1%)	-0.01
Gender without zero category- United												
...Males; n (%)	4,473 (50.0%)	4,535 (50.7%)	-0.01	6,033 (53.4%)	6,030 (53.4%)	0.00	12,637 (40.7%)	12,722 (40.9%)	0.00	23,143 (45.1%)	23,287 (45.4%)	-0.01
...Females; n (%)	4,477 (50.0%)	4,415 (49.3%)	0.01	5,267 (46.6%)	5,270 (46.6%)	0.00	18,431 (59.3%)	18,346 (59.1%)	0.00	28,175 (54.9%)	28,031 (54.6%)	0.01
Race												
...White; n (%)							28,382 (91.4%)	28,419 (91.5%)		28,382 (91.4%)	28,419 (91.5%)	0.00
...Black; n (%)							1,389 (4.5%)	1,354 (4.4%)		1,389 (4.5%)	1,354 (4.4%)	0.00
...Asian; n (%)							339 (1.1%)	333 (1.1%)		339 (1.1%)	333 (1.1%)	0.00
...Hispanic; n (%)							433 (1.4%)	421 (1.4%)		433 (1.4%)	421 (1.4%)	0.00
...North American Native; n (%)							133 (0.4%)	136 (0.4%)		133 (0.4%)	136 (0.4%)	0.00
...Other/Unknown; n (%)							392 (1.3%)	405 (1.3%)		392 (1.3%)	405 (1.3%)	0.00
Region without zero category- United v3 (lumping missing&other category with West)												
...Northeast; n (%)	1,313 (14.7%)	1,310 (14.6%)	0.00	2,698 (23.9%)	2,762 (24.4%)	-0.01	6,528 (21.0%)	6,476 (20.8%)	0.00	10,539 (20.5%)	10,548 (20.6%)	0.00
...South; n (%)	3,278 (36.6%)	3,242 (36.2%)	0.01	3,425 (30.3%)	3,431 (30.4%)	0.00	11,305 (36.4%)	11,225 (36.1%)	0.01	18,008 (35.1%)	17,898 (34.9%)	0.00
...Midwest; n (%)	1,900 (21.2%)	1,902 (21.3%)	0.00	3,502 (31.0%)	3,436 (30.4%)	0.01	8,521 (27.4%)	8,630 (27.8%)	-0.01	13,923 (27.1%)	13,968 (27.2%)	0.00
...West; n (%)	2,459 (27.5%)	2,496 (27.9%)	-0.01	1,619 (14.3%)	1,608 (14.2%)	0.00	4,714 (15.2%)	4,737 (15.2%)	0.00	8,792 (17.1%)	8,841 (17.2%)	0.00
...Unknown+missing; n (%)	N/A	N/A	#VALUE!	56 (0.5%)	63 (0.6%)	-0.01	N/A	N/A	#VALUE!	56 (0.5%)	63 (0.6%)	-0.01
CV Covariates												
Ischemic heart disease; n (%)	3,345 (37.4%)	3,391 (37.9%)	-0.01	4,174 (36.9%)	4,143 (36.7%)	0.00	13,673 (44.0%)	13,547 (43.6%)	0.01	21,192 (41.3%)	21,081 (41.1%)	0.00
Acute MI; n (%)	283 (3.2%)	286 (3.2%)	0.00	335 (3.0%)	321 (2.8%)	0.01	1,279 (4.1%)	1,279 (4.1%)	0.00	1897 (3.7%)	1886 (3.7%)	0.00
ACS/unstable angina; n (%)	260 (2.9%)	272 (3.0%)	-0.01	329 (2.9%)	314 (2.8%)	0.01	1,247 (4.0%)	1,204 (3.9%)	0.01	1836 (3.6%)	1790 (3.5%)	0.01
Old MI; n (%)	511 (5.7%)	520 (5.8%)	0.00	367 (3.2%)	368 (3.3%)	-0.01	2,737 (8.8%)	2,639 (8.5%)	0.01	3615 (7.0%)	3527 (6.9%)	0.00
Stable angina; n (%)	482 (5.4%)	502 (5.6%)	-0.01	456 (4.0%)	438 (3.9%)	0.01	1,541 (5.0%)	1,478 (4.8%)	0.01	2,479 (4.8%)	2,418 (4.7%)	0.00
Coronary atherosclerosis and other forms of chronic ischemic heart disease; n (%)	3,067 (34.3%)	3,086 (34.5%)	0.00	3,851 (34.1%)	3,793 (33.6%)	0.01	12,563 (40.4%)	12,456 (40.1%)	0.01	19,481 (38.0%)	19,335 (37.7%)	0.01
Other atherosclerosis with ICD10 v2 Copy; n (%)	142 (1.6%)	152 (1.7%)	-0.01	210 (1.9%)	212 (1.9%)	0.00	545 (1.8%)	561 (1.8%)	0.00	897 (1.7%)	925 (1.8%)	-0.01
Previous cardiac procedure (CABG or PTCA or Stent) v4; n (%)	119 (1.3%)	70 (0.8%)	0.05	164 (1.5%)	94 (0.8%)	0.07	581 (1.9%)	386 (1.2%)	0.06	864 (1.7%)	550 (1.1%)	0.05
History of CABG or PTCA; n (%)	862 (9.6%)	877 (9.8%)	-0.01	539 (4.8%)	614 (5.4%)	-0.03	4,822 (15.5%)	4,833 (15.6%)	0.00	6,223 (12.1%)	6,324 (12.3%)	-0.01
Any stroke; n (%)	1,763 (19.7%)	1,721 (19.2%)	0.01	2,030 (18.0%)	2,018 (17.9%)	0.00	6,768 (21.8%)	6,728 (21.7%)	0.00	10,561 (20.6%)	10,467 (20.4%)	0.00
Ischemic stroke (w and w/o mention of cerebral infarction); n (%)	1,763 (19.7%)	1,721 (19.2%)	0.01	2,030 (18.0%)	2,018 (17.9%)	0.00	6,754 (21.7%)	6,712 (21.6%)	0.00	10,547 (20.6%)	10,451 (20.4%)	0.00
Hemorrhagic stroke; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	84 (0.3%)	82 (0.3%)	0.00	084 (0.2%)	82 (0.2%)	0.00
TIA; n (%)	691 (7.7%)	671 (7.5%)	0.01	830 (7.3%)	826 (7.3%)	0.00	2,093 (6.7%)	2,090 (6.7%)	0.00	3614 (7.0%)	3587 (7.0%)	0.00
Other cerebrovascular disease; n (%)	373 (4.2%)	358 (4.0%)	0.01	361 (3.2%)	359 (3.2%)	0.00	1,630 (5.2%)	1,585 (5.1%)	0.00	2364 (4.6%)	2302 (4.5%)	0.00
Late effects of cerebrovascular disease; n (%)	364 (4.1%)	365 (4.1%)	0.00	300 (2.7%)	293 (2.6%)	0.01	1,876 (6.0%)	1,871 (6.0%)	0.00	2540 (4.9%)	2529 (4.9%)	0.00
Cerebrovascular procedure; n (%)	14 (0.2%)	11 (0.1%)	0.03	20 (0.2%)	22 (0.2%)	0.00	100 (0.3%)	89 (0.3%)	0.00	134 (0.3%)	122 (0.2%)	0.02
Heart failure (CHF); n (%)	2,372 (26.5%)	2,375 (26.5%)	0.00	2,676 (23.7%)	2,699 (23.9%)	0.00	11,720 (37.7%)	11,670 (37.6%)	0.00	16,768 (32.7%)	16,744 (32.6%)	0.00
Peripheral Vascular Disease (PVD) or PVD Surgery v2; n (%)	912 (10.2%)	920 (10.3%)	0.00	1,016 (9.0%)	1,004 (8.9%)	0.00	3,753 (12.1%)	3,694 (11.9%)	0.01	5,681 (11.1%)	5,618 (10.9%)	0.01
Atrial fibrillation; n (%)	8,698 (97.2%)	8,704 (97.3%)	-0.01	11,051 (97.8%)	11,001 (97.4%)	0.03	30,164 (97.1%)	30,159 (97.1%)	0.00	49,913 (97.3%)	49,864 (97.2%)	0.01
Other cardiac dysrhythmia; n (%)	5,962 (66.6%)	5,864 (65.5%)	0.02	4,868 (43.1%)	4,794 (42.4%)	0.01	17,844 (57.4%)	17,748 (57.1%)	0.01	28,674 (55.9%)	28,406 (55.4%)	0.01
Cardiac conduction disorders; n (%)	923 (10.3%)	893 (10.0%)	0.01	908 (8.0%)	884 (7.8%)	0.01	3,351 (10.8%)	3,266 (10.5%)	0.01	5182 (10.1%)	5043 (9.8%)	0.01
Other CVD; n (%)	3,376 (37.7%)	3,320 (37.1%)	0.01	3,973 (35.2%)	3,931 (34.8%)	0.01	12,375 (39.8%)	12,267 (39.5%)	0.01	19,724 (38.4%)	19,518 (38.0%)	0.01
Diabetes-related complications												
Diabetic retinopathy; n (%)	147 (1.6%)	162 (1.8%)	-0.02	161 (1.4%)	170 (1.5%)	-0.01	537 (1.7%)	554 (1.8%)	-0.01	#VALUE!	886 (1.7%)	#VALUE!
Diabetes with other ophthalmic manifestations; n (%)	15 (0.2%)	19 (0.2%)	0.00	139 (1.2%)	123 (1.1%)	0.01	356 (1.1%)	355 (1.1%)	0.00	510 (1.0%)	497 (1.0%)	0.00
Retinal detachment, vitreous hemorrhage, vitrectomy; n (%)	16 (0.2%)	21 (0.2%)	0.00	26 (0.2%)	21 (0.2%)	0.00	55 (0.2%)	65 (0.2%)	0.00	097 (0.2%)	107 (0.2%)	0.00
Retinal laser coagulation therapy; n (%)	12 (0.1%)	7 (0.1%)	0.00	27 (0.2%)	21 (0.2%)	0.00	61 (0.2%)	60 (0.2%)	0.00	100 (0.2%)	88 (0.2%)	0.00
Occurrence of Diabetic Neuropathy v2 Copy; n (%)	558 (6.2%)	583 (6.5%)	-0.01	534 (4.7%)	551 (4.9%)	-0.01	2,148 (6.9%)	2,163 (7.0%)	0.00	3240 (6.3%)	3297 (6.4%)	0.00
Occurrence of diabetic nephropathy V3 with ICD10 Copy; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	401 (1.3%)	415 (1.3%)	0.00	401 (0.8%)	415 (0.8%)	0.00
Hypoglycemia v2; n (%)	68 (0.8%)	85 (0.9%)	-0.01	146 (1.3%)	140 (1.2%)	0.01	850 (2.7%)	854 (2.7%)	0.00	1064 (2.1%)	1079 (2.1%)	0.00

Appendix B: Rivaroxaban vs Warfarin

Hyperglycemia; n (%)	506 (5.7%)	490 (5.5%)	0.01	309 (2.7%)	294 (2.6%)	0.01	2,020 (6.5%)	1,960 (6.3%)	0.01	2835 (5.5%)	2744 (5.3%)	0.01
Disorders of fluid electrolyte and acid-base balance; n (%)	1,013 (11.3%)	976 (10.9%)	0.01	959 (8.5%)	934 (8.3%)	0.01	4,247 (13.7%)	4,163 (13.4%)	0.01	6219 (12.1%)	6073 (11.8%)	0.01
Diabetic ketoacidosis; n (%)	12 (0.1%)	15 (0.2%)	-0.03	18 (0.2%)	16 (0.1%)	0.03	67 (0.2%)	61 (0.2%)	0.00	97 (0.2%)	92 (0.2%)	0.00
Hyperosmolar hyperglycemic nonketotic syndrome (HONK); n (%)	7 (0.1%)	15 (0.2%)	-0.03	11 (0.1%)	9 (0.1%)	0.00	55 (0.2%)	58 (0.2%)	0.00	73 (0.1%)	82 (0.2%)	-0.03
Diabetes with peripheral circulatory disorders with ICD-10 v2 Copy; n (%)	290 (3.2%)	248 (2.8%)	0.02	248 (2.2%)	241 (2.1%)	0.01	1,408 (4.5%)	1,448 (4.7%)	-0.01	1946 (3.8%)	1937 (3.8%)	0.00
Diabetic Foot; n (%)	199 (2.2%)	181 (2.0%)	0.01	245 (2.2%)	242 (2.1%)	0.01	1,221 (3.9%)	1,196 (3.8%)	0.01	1665 (3.2%)	1619 (3.2%)	0.00
Gangrene v2; n (%)	10 (0.1%)	18 (0.2%)	-0.03	15 (0.1%)	9 (0.1%)	0.00	73 (0.2%)	66 (0.2%)	0.00	098 (0.2%)	93 (0.2%)	0.00
Lower extremity amputation; n (%)	40 (0.4%)	36 (0.4%)	0.00	16 (0.1%)	21 (0.2%)	-0.03	193 (0.6%)	163 (0.5%)	0.01	249 (0.5%)	220 (0.4%)	0.01
Osteomyelitis; n (%)	31 (0.3%)	29 (0.3%)	0.00	42 (0.4%)	47 (0.4%)	0.00	194 (0.6%)	207 (0.7%)	-0.01	267 (0.5%)	283 (0.6%)	-0.01
Skin infections v2; n (%)	480 (5.4%)	496 (5.5%)	0.00	706 (6.2%)	697 (6.2%)	0.00	2,223 (7.2%)	2,259 (7.3%)	0.00	3409 (6.6%)	3452 (6.7%)	0.00
Erectile dysfunction; n (%)	161 (1.8%)	156 (1.7%)	0.01	172 (1.5%)	179 (1.6%)	-0.01	238 (0.8%)	233 (0.7%)	0.01	571 (1.1%)	568 (1.1%)	0.00
Diabetes with unspecified complication; n (%)	144 (1.6%)	150 (1.7%)	-0.01	137 (1.2%)	137 (1.2%)	0.00	545 (1.8%)	515 (1.7%)	0.01	826 (1.6%)	802 (1.6%)	0.00
Diabetes mellitus without mention of complications; n (%)	3,162 (35.3%)	3,150 (35.2%)	0.00	3,738 (33.1%)	3,747 (33.2%)	0.00	13,515 (43.5%)	13,644 (43.9%)	-0.01	20,415 (39.8%)	20,541 (40.0%)	0.00
Hypertension: 1 inpatient or 2 outpatient claims within 365 days; n (%)	7,782 (86.9%)	7,761 (86.7%)	0.01	8,716 (77.1%)	8,716 (77.1%)	0.00	29,357 (94.5%)	29,270 (94.2%)	0.01	45,855 (89.4%)	45,747 (89.1%)	0.01
Hyperlipidemia v2; n (%)	5,766 (64.4%)	5,800 (64.8%)	-0.01	5,868 (51.9%)	5,812 (51.4%)	0.01	19,778 (63.7%)	19,631 (63.2%)	0.01	31,412 (61.2%)	31,243 (60.9%)	0.01
Edema; n (%)	1,034 (11.6%)	1,057 (11.8%)	-0.01	1,013 (9.0%)	960 (8.5%)	0.02	3,510 (11.3%)	3,503 (11.3%)	0.00	5557 (10.8%)	5520 (10.8%)	0.00
Renal Dysfunction (non-diabetic) v2; n (%)	4 (0.0%)	4 (0.0%)	#DIV/0!	11 (0.1%)	12 (0.1%)	0.00	1,202 (3.9%)	1,189 (3.8%)	0.01	1217 (2.4%)	1205 (2.3%)	0.01
Occurrence of acute renal disease v2; n (%)	3 (0.0%)	3 (0.0%)	#DIV/0!	11 (0.1%)	12 (0.1%)	0.00	162 (0.5%)	150 (0.5%)	0.00	176 (0.3%)	165 (0.3%)	0.00
Occurrence of chronic renal insufficiency; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	666 (2.1%)	671 (2.2%)	-0.01	666 (1.3%)	671 (1.3%)	0.00
Chronic kidney disease v2; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	629 (2.0%)	629 (2.0%)	0.00	629 (1.2%)	629 (1.2%)	0.00
CKD Stage 3-4; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	458 (1.5%)	438 (1.4%)	0.01	458 (0.9%)	438 (0.9%)	0.00
Occurrence of hypertensive nephropathy; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	184 (0.6%)	174 (0.6%)	0.00	184 (0.4%)	174 (0.3%)	0.02
Occurrence of miscellaneous renal insufficiency v2; n (%)	1 (0.0%)	1 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	470 (1.5%)	471 (1.5%)	0.00	471 (0.9%)	472 (0.9%)	0.00
Glaucoma or cataracts v2; n (%)	1,894 (21.2%)	1,900 (21.2%)	0.00	2,536 (22.4%)	2,439 (21.6%)	0.02	6,537 (21.0%)	6,644 (21.4%)	-0.01	10,967 (21.4%)	10,983 (21.4%)	0.00
Cellulitis or abscess of toe; n (%)	118 (1.3%)	139 (1.6%)	-0.03	108 (1.0%)	111 (1.0%)	0.00	576 (1.9%)	566 (1.8%)	0.01	802 (1.6%)	816 (1.6%)	0.00
Foot ulcer; n (%)	202 (2.3%)	183 (2.0%)	0.02	254 (2.2%)	247 (2.2%)	0.00	1,089 (3.5%)	1,063 (3.4%)	0.01	1545 (3.0%)	1493 (2.9%)	0.01
Bladder stones; n (%)	4 (0.0%)	8 (0.1%)	-0.04	10 (0.1%)	11 (0.1%)	0.00	32 (0.1%)	38 (0.1%)	0.00	46 (0.1%)	57 (0.1%)	0.00
Kidney stones; n (%)	82 (0.9%)	90 (1.0%)	-0.01	115 (1.0%)	120 (1.1%)	-0.01	471 (1.5%)	470 (1.5%)	0.00	668 (1.3%)	680 (1.3%)	0.00
Urinary tract infections (UTIs); n (%)	863 (9.6%)	811 (9.1%)	0.02	866 (7.7%)	893 (7.9%)	-0.01	5,140 (16.5%)	5,099 (16.4%)	0.00	6,869 (13.4%)	6,803 (13.3%)	0.00
Dipstick urinalysis; n (%)	2,549 (28.5%)	2,577 (28.8%)	-0.01	2,309 (20.4%)	2,468 (21.8%)	-0.03	11,599 (37.3%)	12,095 (38.9%)	-0.03	16,457 (32.1%)	17,140 (33.4%)	-0.03
Non-dipstick urinalysis; n (%)	1,254 (14.0%)	1,189 (13.3%)	0.02	693 (6.1%)	660 (5.8%)	0.01	4,879 (15.7%)	4,740 (15.3%)	0.01	6,826 (13.3%)	6,589 (12.8%)	0.01
Urine function test; n (%)	241 (2.7%)	209 (2.3%)	0.03	443 (3.9%)	383 (3.4%)	0.03	1,175 (3.8%)	1,210 (3.9%)	-0.01	1859 (3.6%)	1802 (3.5%)	0.01
Cytology; n (%)	75 (0.8%)	105 (1.2%)	-0.04	128 (1.1%)	111 (1.0%)	0.01	613 (2.0%)	709 (2.3%)	-0.02	816 (1.6%)	925 (1.8%)	-0.02
Cystoscopy; n (%)	88 (1.0%)	77 (0.9%)	0.01	182 (1.6%)	136 (1.2%)	0.03	622 (2.0%)	648 (2.1%)	-0.01	892 (1.7%)	861 (1.7%)	0.00
Other Covariates												
Liver disease; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	366 (1.2%)	348 (1.1%)	0.01	366 (0.7%)	348 (0.7%)	0.00
Osteoarthritis; n (%)	1,847 (20.6%)	1,844 (20.6%)	0.00	1,933 (17.1%)	1,954 (17.3%)	-0.01	7,796 (25.1%)	7,776 (25.0%)	0.00	11576 (22.6%)	11574 (22.6%)	0.00
Other arthritis, arthropathies and musculoskeletal pain; n (%)	3,488 (39.0%)	3,487 (39.0%)	0.00	4,219 (37.3%)	4,209 (37.2%)	0.00	13,347 (43.0%)	13,256 (42.7%)	0.01	21054 (41.0%)	20952 (40.8%)	0.00
Dorsopathies; n (%)	1,992 (22.3%)	2,023 (22.6%)	-0.01	2,342 (20.7%)	2,342 (20.7%)	0.00	7,506 (24.2%)	7,495 (24.1%)	0.00	11840 (23.1%)	11860 (23.1%)	0.00
Fractures; n (%)	349 (3.9%)	340 (3.8%)	0.01	447 (4.0%)	480 (4.2%)	-0.01	1,787 (5.8%)	1,785 (5.7%)	0.00	2583 (5.0%)	2605 (5.1%)	0.00
Falls v2; n (%)	473 (5.3%)	478 (5.3%)	0.00	232 (2.1%)	227 (2.0%)	0.01	992 (3.2%)	1,011 (3.3%)	-0.01	1697 (3.3%)	1716 (3.3%)	0.00
Osteoporosis; n (%)	768 (8.6%)	746 (8.3%)	0.01	702 (6.2%)	709 (6.3%)	0.00	3,282 (10.6%)	3,320 (10.7%)	0.00	4752 (9.3%)	4775 (9.3%)	0.00
Hyperthyroidism; n (%)	124 (1.4%)	103 (1.2%)	0.02	109 (1.0%)	111 (1.0%)	0.00	430 (1.4%)	440 (1.4%)	0.00	663 (1.3%)	654 (1.3%)	0.00
Hypothyroidism v2; n (%)	1,709 (19.1%)	1,709 (19.1%)	0.00	1,606 (14.2%)	1,556 (13.8%)	0.01	4,788 (15.4%)	4,787 (15.4%)	0.00	8103 (15.8%)	8052 (15.7%)	0.00
Other disorders of thyroid gland V2; n (%)	334 (3.7%)	325 (3.6%)	0.01	373 (3.3%)	400 (3.5%)	-0.01	1,184 (3.8%)	1,157 (3.7%)	0.01	1891 (3.7%)	1882 (3.7%)	0.00
Depression; n (%)	753 (8.4%)	771 (8.6%)	-0.01	695 (6.2%)	716 (6.3%)	0.00	3,844 (12.4%)	3,846 (12.4%)	0.00	5292 (10.3%)	5333 (10.4%)	0.00
Anxiety; n (%)	874 (9.8%)	866 (9.7%)	0.00	659 (5.8%)	673 (6.0%)	-0.01	3,598 (11.6%)	3,556 (11.4%)	0.01	5131 (10.0%)	5095 (9.9%)	0.00
Sleep_Disorder; n (%)	726 (8.1%)	736 (8.2%)	0.00	1,294 (11.5%)	1,277 (11.3%)	0.01	2,776 (8.9%)	2,753 (8.9%)	0.00	4796 (9.3%)	4766 (9.3%)	0.00
Dementia; n (%)	684 (7.6%)	653 (7.3%)	0.01	618 (5.5%)	610 (5.4%)	0.00	3,305 (10.6%)	3,289 (10.6%)	0.00	4607 (9.0%)	4552 (8.9%)	0.00
Delirium; n (%)	171 (1.9%)	170 (1.9%)	0.00	164 (1.5%)	174 (1.5%)	0.00	1,074 (3.5%)	1,042 (3.4%)	0.01	1409 (2.7%)	1386 (2.7%)	0.00
Psychosis; n (%)	126 (1.4%)	117 (1.3%)	0.01	136 (1.2%)	142 (1.3%)	-0.01	734 (2.4%)	737 (2.4%)	0.00	996 (1.9%)	996 (1.9%)	0.00
Obesity; n (%)	1,384 (15.5%)	1,388 (15.5%)	0.00	1,122 (9.9%)	1,195 (10.6%)	-0.02	5,082 (16.4%)	4,996 (16.1%)	0.01	7588 (14.8%)	7579 (14.8%)	0.00
Overweight; n (%)	423 (4.7%)	421 (4.7%)	0.00	190 (1.7%)	179 (1.6%)	0.01	988 (3.2%)	1,015 (3.3%)	-0.01	1601 (3.1%)	1615 (3.1%)	0.00
Smoking; n (%)	1,515 (16.9%)	1,472 (16.4%)	0.01	801 (7.1%)	817 (7.2%)	0.00	8,813 (28.4%)	8,655 (27.9%)	0.01	11129 (21.7%)	10944 (21.3%)	0.01
Alcohol abuse or dependence; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	24 (0.1%)	22 (0.1%)	0.00	24 (0.0%)	22 (0.0%)	#DIV/0!
Drug abuse or dependence; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	72 (0.2%)	62 (0.2%)	0.00	72 (0.1%)	62 (0.1%)	0.00
COPD; n (%)	1,561 (17.4%)	1,567 (17.5%)	0.00	1,692 (15.0%)	1,671 (14.8%)	0.01	6,895 (22.2%)	6,863 (22.1%)	0.00	10148 (19.8%)	10101 (19.7%)	0.00
Asthma; n (%)	627 (7.0%)	613 (6.8%)	0.01	701 (6.2%)	692 (6.1%)	0.00	2,585 (8.3%)	2,551 (8.2%)	0.00	3913 (7.6%)	3856 (7.5%)	0.00
Obstructive sleep apnea; n (%)	1,002 (11.2%)	991 (11.1%)	0.00	1,245 (11.0%)	1,186 (10.5%)	0.02	3,001 (9.7%)	2,961 (9.5%)	0.01	5248 (10.2%)	5138 (10.0%)	0.01
Pneumonia; n (%)	583 (6.5%)	564 (6.3%)	0.01	757 (6.7%)	774 (6.8%)	0.00	3,435 (11.1%)	3,386 (10.9%)	0.01	4775 (9.3%)	4724 (9.2%)	0.00
Imaging; n (%)	13 (0.1%)	12 (0.1%)	0.00	17 (0.2%)	14 (0.1%)	0.03	166 (0.5%)	132 (0.4%)	0.01	196 (0.4%)	158 (0.3%)	0.02
Other Medications												

Appendix B: Rivaroxaban vs Warfarin

Use of ACE inhibitors; n (%)	3,302 (36.9%)	3,351 (37.4%)	-0.01	4,037 (35.7%)	4,053 (35.9%)	0.00	12,056 (38.8%)	12,104 (39.0%)	0.00	19395 (37.8%)	19508 (38.0%)	0.00
Use of ARBs; n (%)	2,148 (24.0%)	2,097 (23.4%)	0.01	2,946 (26.1%)	2,929 (25.9%)	0.00	7,885 (25.4%)	7,901 (25.4%)	0.00	12979 (25.3%)	12927 (25.2%)	0.00
Use of Loop Diuretics - United; n (%)	2,452 (27.4%)	2,457 (27.5%)	0.00	3,074 (27.2%)	2,962 (26.2%)	0.02	12,075 (38.9%)	12,145 (39.1%)	0.00	17601 (34.3%)	17564 (34.2%)	0.00
Use of other diuretics- United; n (%)	499 (5.6%)	452 (5.1%)	0.02	678 (6.0%)	628 (5.6%)	0.02	2,204 (7.1%)	2,206 (7.1%)	0.00	3381 (6.6%)	3286 (6.4%)	0.01
Use of nitrates-United; n (%)	721 (8.1%)	639 (7.1%)	0.04	1,067 (9.4%)	937 (8.3%)	0.04	3,909 (12.6%)	3,522 (11.3%)	0.04	5697 (11.1%)	5098 (9.9%)	0.04
Use of other hypertension drugs; n (%)	658 (7.4%)	690 (7.7%)	-0.01	798 (7.1%)	953 (8.4%)	-0.05	2,616 (8.4%)	2,741 (8.8%)	-0.01	4072 (7.9%)	4384 (8.5%)	-0.02
Use of digoxin- United; n (%)	1,060 (11.8%)	907 (10.1%)	0.05	1,932 (17.1%)	1,413 (12.5%)	0.13	4,898 (15.8%)	4,232 (13.6%)	0.06	7890 (15.4%)	6552 (12.8%)	0.07
Use of Anti-arrhythmics; n (%)	1,039 (11.6%)	1,022 (11.4%)	0.01	1,549 (13.7%)	1,578 (14.0%)	-0.01	3,969 (12.8%)	4,042 (13.0%)	-0.01	6557 (12.8%)	6642 (12.9%)	0.00
Use of COPD/asthma meds- United; n (%)	1,652 (18.5%)	1,660 (18.5%)	0.00	2,257 (20.0%)	2,211 (19.6%)	0.01	7,164 (23.1%)	6,884 (22.2%)	0.02	11073 (21.6%)	10755 (21.0%)	0.01
Use of statins; n (%)	5,403 (60.4%)	5,381 (60.1%)	0.01	6,725 (59.5%)	6,779 (60.0%)	-0.01	18,970 (61.1%)	19,049 (61.3%)	0.00	31098 (60.6%)	31209 (60.8%)	0.00
Use of other lipid-lowering drugs; n (%)	561 (6.3%)	570 (6.4%)	0.00	1,042 (9.2%)	1,077 (9.5%)	-0.01	2,197 (7.1%)	2,209 (7.1%)	0.00	3800 (7.4%)	3856 (7.5%)	0.00
Use of antiplatelet agents; n (%)	1,266 (14.1%)	1,275 (14.2%)	0.00	1,925 (17.0%)	1,862 (16.5%)	0.01	5,449 (17.5%)	5,400 (17.4%)	0.00	8640 (16.8%)	8537 (16.6%)	0.01
Use of heparin and other low-molecular weight heparins; n (%)	28 (0.3%)	48 (0.5%)	-0.03	1 (0.0%)	2 (0.0%)	#DIV/0!	191 (0.6%)	270 (0.9%)	-0.03	220 (0.4%)	320 (0.6%)	-0.03
Use of NSAIDs; n (%)	1,022 (11.4%)	1,003 (11.2%)	0.01	1,228 (10.9%)	1,245 (11.0%)	0.00	3,906 (12.6%)	3,909 (12.6%)	0.00	6156 (12.0%)	6157 (12.0%)	0.00
Use of oral corticosteroids; n (%)	1,770 (19.8%)	1,758 (19.6%)	0.01	2,198 (19.5%)	2,216 (19.6%)	0.00	7,748 (24.9%)	7,700 (24.8%)	0.00	11716 (22.8%)	11674 (22.7%)	0.00
Use of bisphosphonate (United); n (%)	341 (3.8%)	337 (3.8%)	0.00	381 (3.4%)	380 (3.4%)	0.00	1,209 (3.9%)	1,234 (4.0%)	-0.01	1931 (3.8%)	1951 (3.8%)	0.00
Use of opioids- United; n (%)	2,033 (22.7%)	2,065 (23.1%)	-0.01	2,709 (24.0%)	2,735 (24.2%)	0.00	9,005 (29.0%)	8,989 (28.9%)	0.00	13747 (26.8%)	13789 (26.9%)	0.00
Use of antidepressants; n (%)	1,849 (20.7%)	1,855 (20.7%)	0.00	2,139 (18.9%)	2,136 (18.9%)	0.00	8,280 (26.7%)	8,229 (26.5%)	0.00	12268 (23.9%)	12220 (23.8%)	0.00
Use of antipsychotics; n (%)	157 (1.8%)	157 (1.8%)	0.00	161 (1.4%)	157 (1.4%)	0.00	956 (3.1%)	931 (3.0%)	0.01	1274 (2.5%)	1245 (2.4%)	0.01
Use of anticonvulsants; n (%)	1,091 (12.2%)	1,112 (12.4%)	-0.01	1,164 (10.3%)	1,145 (10.1%)	0.01	4,966 (16.0%)	4,964 (16.0%)	0.00	7221 (14.1%)	7221 (14.1%)	0.00
Use of lithium- United; n (%)	4 (0.0%)	6 (0.1%)	-0.04	10 (0.1%)	12 (0.1%)	0.00	**	23 (0.1%)	#VALUE!	#VALUE!	41 (0.1%)	#VALUE!
Use of Benzos- United; n (%)	1,012 (11.3%)	1,061 (11.9%)	-0.02	1,532 (13.6%)	1,498 (13.3%)	0.01	4,482 (14.4%)	4,481 (14.4%)	0.00	7026 (13.7%)	7040 (13.7%)	0.00
Use of anxiolytics/hypnotics- United; n (%)	479 (5.4%)	469 (5.2%)	0.01	743 (6.6%)	762 (6.7%)	0.00	2,166 (7.0%)	2,139 (6.9%)	0.00	3388 (6.6%)	3370 (6.6%)	0.00
Use of dementia meds- United; n (%)	340 (3.8%)	346 (3.9%)	-0.01	407 (3.6%)	409 (3.6%)	0.00	1,688 (5.4%)	1,700 (5.5%)	0.00	2435 (4.7%)	2455 (4.8%)	0.00
Use of antiparkinsonian meds- United; n (%)	236 (2.6%)	245 (2.7%)	-0.01	317 (2.8%)	306 (2.7%)	0.01	1,223 (3.9%)	1,253 (4.0%)	-0.01	1776 (3.5%)	1804 (3.5%)	0.00
Any use of pramlintide; n (%)	1 (0.0%)	3 (0.0%)	#DIV/0!	2 (0.0%)	1 (0.0%)	#DIV/0!	**	**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Any use of 1st generation sulfonylureas; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	1 (0.0%)	0 (0.0%)	#DIV/0!	**	**	#VALUE!	#VALUE!	#VALUE!	0.00
Entresto (sacubitril/valsartan); n (%)	38 (0.4%)	22 (0.2%)	0.04	15 (0.1%)	6 (0.1%)	0.00	35 (0.1%)	43 (0.1%)	0.00	88 (0.2%)	71 (0.1%)	0.00
Labs										20,250	20,250	
Lab values- HbA1c (%) v3; n (%)	1,433 (16.0%)	1,474 (16.5%)	-0.01	137 (1.2%)	124 (1.1%)	0.01	N/A	N/A	#VALUE!	1,570 (7.8%)	1,598 (7.9%)	0.00
Lab values- HbA1c (%) (within 3 months) v3; n (%)	941 (10.5%)	955 (10.7%)	-0.01	98 (0.9%)	89 (0.8%)	0.01	N/A	N/A	#VALUE!	1,039 (5.1%)	1,044 (5.2%)	0.00
Lab values- HbA1c (%) (within 6 months) v3; n (%)	1,433 (16.0%)	1,474 (16.5%)	-0.01	137 (1.2%)	124 (1.1%)	0.01	N/A	N/A	#VALUE!	1,570 (7.8%)	1,598 (7.9%)	0.00
Lab values- BNP; n (%)	154 (1.7%)	168 (1.9%)	-0.02	18 (0.2%)	16 (0.1%)	0.03	N/A	N/A	#VALUE!	172 (0.8%)	184 (0.9%)	-0.01
Lab values- BNP (within 3 months); n (%)	114 (1.3%)	132 (1.5%)	-0.02	16 (0.1%)	11 (0.1%)	0.00	N/A	N/A	#VALUE!	130 (0.6%)	143 (0.7%)	-0.01
Lab values- BNP (within 6 months); n (%)	154 (1.7%)	168 (1.9%)	-0.02	18 (0.2%)	16 (0.1%)	0.03	N/A	N/A	#VALUE!	172 (0.8%)	184 (0.9%)	-0.01
Lab values- BUN (mg/dl); n (%)	2,374 (26.5%)	2,650 (29.6%)	-0.07	167 (1.5%)	206 (1.8%)	-0.02	N/A	N/A	#VALUE!	2,541 (12.5%)	2,856 (14.1%)	-0.05
Lab values- BUN (mg/dl) (within 3 months); n (%)	1,640 (18.3%)	1,900 (21.2%)	-0.07	121 (1.1%)	156 (1.4%)	-0.03	N/A	N/A	#VALUE!	1,761 (8.7%)	2,056 (10.2%)	-0.05
Lab values- BUN (mg/dl) (within 6 months); n (%)	2,374 (26.5%)	2,650 (29.6%)	-0.07	167 (1.5%)	206 (1.8%)	-0.02	N/A	N/A	#VALUE!	2,541 (12.5%)	2,856 (14.1%)	-0.05
Lab values- Creatinine (mg/dl) v2; n (%)	2,429 (27.1%)	2,743 (30.6%)	-0.08	171 (1.5%)	220 (1.9%)	-0.03	N/A	N/A	#VALUE!	2,600 (12.8%)	2,963 (14.6%)	-0.05
Lab values- Creatinine (mg/dl) (within 3 months) v2; n (%)	1,676 (18.7%)	1,980 (22.1%)	-0.08	124 (1.1%)	168 (1.5%)	-0.04	N/A	N/A	#VALUE!	1,800 (8.9%)	2,148 (10.6%)	-0.06
Lab values- Creatinine (mg/dl) (within 6 months) v2; n (%)	2,429 (27.1%)	2,743 (30.6%)	-0.08	171 (1.5%)	220 (1.9%)	-0.03	N/A	N/A	#VALUE!	2,600 (12.8%)	2,963 (14.6%)	-0.05
Lab values- HDL level (mg/dl); n (%)	1,739 (19.4%)	1,872 (20.9%)	-0.04	123 (1.1%)	132 (1.2%)	-0.01	N/A	N/A	#VALUE!	1,862 (9.2%)	2,004 (9.9%)	-0.02
Lab values- HDL level (mg/dl) (within 3 months); n (%)	1,100 (12.3%)	1,168 (13.1%)	-0.02	87 (0.8%)	90 (0.8%)	0.00	N/A	N/A	#VALUE!	1,187 (5.9%)	1,258 (6.2%)	-0.01
Lab values- HDL level (mg/dl) (within 6 months); n (%)	1,739 (19.4%)	1,872 (20.9%)	-0.04	123 (1.1%)	132 (1.2%)	-0.01	N/A	N/A	#VALUE!	1,862 (9.2%)	2,004 (9.9%)	-0.02
Lab values- LDL level (mg/dl) v2; n (%)	1,819 (20.3%)	1,948 (21.8%)	-0.04	146 (1.3%)	140 (1.2%)	0.01	N/A	N/A	#VALUE!	1,965 (9.7%)	2,088 (10.3%)	-0.02
Lab values- LDL level (mg/dl) (within 3 months) v2; n (%)	1,160 (13.0%)	1,220 (13.6%)	-0.02	104 (0.9%)	94 (0.8%)	0.01	N/A	N/A	#VALUE!	1,264 (6.2%)	1,314 (6.5%)	-0.01
Lab values- LDL level (mg/dl) (within 6 months) v2; n (%)	1,819 (20.3%)	1,948 (21.8%)	-0.04	146 (1.3%)	140 (1.2%)	0.01	N/A	N/A	#VALUE!	1,965 (9.7%)	2,088 (10.3%)	-0.02
Lab values- NT-proBNP; n (%)	15 (0.2%)	22 (0.2%)	0.00	5 (0.0%)	2 (0.0%)	#DIV/0!	N/A	N/A	#VALUE!	20 (0.1%)	24 (0.1%)	0.00
Lab values- NT-proBNP (within 3 months); n (%)	13 (0.1%)	19 (0.2%)	-0.03	2 (0.0%)	1 (0.0%)	#DIV/0!	N/A	N/A	#VALUE!	15 (0.1%)	20 (0.1%)	-
Lab values- NT-proBNP (within 6 months); n (%)	15 (0.2%)	22 (0.2%)	0.00	5 (0.0%)	2 (0.0%)	#DIV/0!	N/A	N/A	#VALUE!	20 (0.1%)	24 (0.1%)	-
Lab values- Total cholesterol (mg/dl) v2; n (%)	1,765 (19.7%)	1,886 (21.1%)	-0.03	119 (1.1%)	131 (1.2%)	-0.01	N/A	N/A	#VALUE!	1,884 (9.3%)	2,017 (10.0%)	-0.02
Lab values- Total cholesterol (mg/dl) (within 3 months) v2; n (%)	1,122 (12.5%)	1,179 (13.2%)	-0.02	83 (0.7%)	89 (0.8%)	-0.01	N/A	N/A	#VALUE!	1,205 (6.0%)	1,268 (6.3%)	-0.01
Lab values- Total cholesterol (mg/dl) (within 6 months) v2; n (%)	1,765 (19.7%)	1,886 (21.1%)	-0.03	119 (1.1%)	131 (1.2%)	-0.01	N/A	N/A	#VALUE!	1,884 (9.3%)	2,017 (10.0%)	-0.02
Lab values- Triglyceride level (mg/dl); n (%)	1,734 (19.4%)	1,874 (20.9%)	-0.04	121 (1.1%)	132 (1.2%)	-0.01	N/A	N/A	#VALUE!	1,855 (9.2%)	2,006 (9.9%)	-0.02
Lab values- Triglyceride level (mg/dl) (within 3 months); n (%)	1,100 (12.3%)	1,170 (13.1%)	-0.02	86 (0.8%)	90 (0.8%)	0.00	N/A	N/A	#VALUE!	1,186 (5.9%)	1,260 (6.2%)	-0.01
Lab values- Triglyceride level (mg/dl) (within 6 months); n (%)	1,734 (19.4%)	1,874 (20.9%)	-0.04	121 (1.1%)	132 (1.2%)	-0.01	N/A	N/A	#VALUE!	1,855 (9.2%)	2,006 (9.9%)	-0.02
Lab result number- HbA1c (%) mean (only 2 to 20 included) v4	1,416	1,466		122	122		N/A	N/A		1,538	1,588	

Appendix B: Rivaroxaban vs Warfarin

...mean (sd)	6.48 (1.08)	6.51 (1.20)	-0.03	6.91 (1.38)	6.62 (1.12)	0.23	N/A	N/A	#VALUE!	6.51 (1.11)	6.52 (1.19)	-0.01
...median [IQR]	6.20 [5.80, 6.90]	6.20 [5.80, 6.90]	0.00	6.50 [6.00, 7.53]	6.50 [6.00, 7.20]	0.00	N/A	N/A	#VALUE!	6.22 (1.11)	6.22 (1.19)	0.00
...Missing; n (%)	7,534 (84.2%)	7,484 (83.6%)	0.02	11,178 (98.9%)	11,178 (98.9%)	0.00	N/A	N/A	#VALUE!	18,712 (92.4%)	18,662 (92.2%)	0.01
Lab result number- BNP mean v2	154	168		18	16		N/A	N/A		172	184	
...mean (sd)	341.80 (493.50)	331.40 (517.59)	0.02	513.00 (1,035.89)	408.20 (481.08)	0.13	N/A	N/A	#VALUE!	359.72 (573.09)	338.08 (516.10)	0.04
...median [IQR]	208.70 [104.59, 362.50]	225.62 [98.17, 371.25]	-0.03	148.50 [52.00, 353.00]	237.25 [100.00, 415.75]	-0.11	N/A	N/A	#VALUE!	202.40 (573.09)	226.63 (516.10)	-0.04
...Missing; n (%)	8,796 (98.3%)	8,782 (98.1%)	0.02	11,282 (99.8%)	11,284 (99.9%)	-0.03	N/A	N/A	#VALUE!	20,078 (99.2%)	20,066 (99.1%)	0.01
Lab result number- BUN (mg/dl) mean v2	2,374	2,650		167	206		N/A	N/A		2,541	2,856	
...mean (sd)	18.15 (6.34)	18.15 (6.10)	0.00	17.73 (6.63)	20.03 (6.83)	-0.34	N/A	N/A	#VALUE!	18.12 (6.36)	18.29 (6.16)	-0.03
...median [IQR]	17.00 [14.00, 21.00]	17.00 [14.00, 21.00]	0.00	17.50 [14.00, 21.00]	18.38 [16.00, 23.00]	-0.13	N/A	N/A	#VALUE!	17.03 (6.36)	17.10 (6.16)	-0.01
...Missing; n (%)	6,576 (73.5%)	6,300 (70.4%)	0.07	11,133 (98.5%)	11,094 (98.2%)	0.02	N/A	N/A	#VALUE!	17,709 (87.5%)	17,394 (85.9%)	0.05
Lab result number- Creatinine (mg/dl) mean (only 0.1 to 15 included) v3	2,407	2,715		166	218		N/A	N/A		2,573	2,933	
...mean (sd)	0.97 (0.24)	0.96 (0.24)	0.04	0.98 (0.22)	1.00 (0.24)	-0.09	N/A	N/A	#VALUE!	0.97 (0.24)	0.96 (0.24)	0.04
...median [IQR]	0.94 [0.80, 1.10]	0.94 [0.81, 1.09]	0.00	0.98 [0.82, 1.11]	0.99 [0.81, 1.14]	-0.04	N/A	N/A	#VALUE!	0.94 (0.24)	0.94 (0.24)	0.00
...Missing; n (%)	6,543 (73.1%)	6,235 (69.7%)	0.08	11,134 (98.5%)	11,082 (98.1%)	0.03	N/A	N/A	#VALUE!	17,677 (87.3%)	17,317 (85.5%)	0.05
Lab result number- HDL level (mg/dl) mean (only =<5000 included) v2	1,739	1,872		123	132		N/A	N/A		1,862	2,004	
...mean (sd)	51.74 (16.26)	52.61 (16.33)	-0.05	44.07 (17.47)	48.84 (15.34)	-0.29	N/A	N/A	#VALUE!	51.23 (16.35)	52.36 (16.27)	-0.07
...median [IQR]	49.50 [40.00, 60.00]	50.00 [41.00, 62.00]	-0.03	43.00 [34.00, 52.00]	48.75 [37.00, 57.00]	-0.35	N/A	N/A	#VALUE!	49.07 (16.35)	49.92 (16.27)	-0.05
...Missing; n (%)	7,211 (80.6%)	7,078 (79.1%)	0.04	11,177 (98.9%)	11,168 (98.8%)	0.01	N/A	N/A	#VALUE!	18,388 (90.8%)	18,246 (90.1%)	0.02
Lab result number- LDL level (mg/dl) mean (only =<5000 included) v2	1,776	1,911		120	137		N/A	N/A		1,896	2,048	
...mean (sd)	88.73 (32.54)	86.79 (32.88)	0.06	83.58 (33.64)	88.09 (35.90)	-0.13	N/A	N/A	#VALUE!	88.40 (32.62)	86.88 (33.10)	0.05
...median [IQR]	85.00 [67.00, 108.00]	83.00 [64.00, 104.00]	0.06	81.00 [62.25, 103.38]	84.00 [64.00, 113.00]	-0.09	N/A	N/A	#VALUE!	84.75 (32.62)	83.07 (33.10)	0.05
...Missing; n (%)	7,174 (80.2%)	7,039 (78.6%)	0.04	11,180 (98.9%)	11,163 (98.8%)	0.01	N/A	N/A	#VALUE!	18,354 (90.6%)	18,202 (89.9%)	0.02
Lab result number- Total cholesterol (mg/dl) mean (only =<5000 included) v2	1,763	1,884		119	131		N/A	N/A		1,882	2,015	
...mean (sd)	165.93 (40.58)	165.05 (40.64)	0.02	155.14 (47.10)	162.30 (41.22)	-0.16	N/A	N/A	#VALUE!	165.25 (41.03)	164.87 (40.69)	0.01
...median [IQR]	161.00 [139.00, 190.00]	161.00 [137.00, 188.00]	0.00	158.00 [134.00, 184.00]	159.00 [131.00, 194.00]	-0.02	N/A	N/A	#VALUE!	160.81 (41.03)	160.87 (40.69)	0.00
...Missing; n (%)	7,187 (80.3%)	7,066 (78.9%)	0.03	11,181 (98.9%)	11,169 (98.8%)	0.01	N/A	N/A	#VALUE!	18,368 (90.7%)	18,235 (90.0%)	0.02
Lab result number- Triglyceride level (mg/dl) mean (only =<5000 included) v2	1,734	1,874		121	132		N/A	N/A		1,855	2,006	
...mean (sd)	128.92 (81.96)	125.55 (76.48)	0.04	134.40 (74.12)	124.14 (58.72)	0.15	N/A	N/A	#VALUE!	129.28 (81.50)	125.46 (75.47)	0.05
...median [IQR]	112.00 [82.38, 151.62]	107.00 [79.00, 149.25]	0.06	116.50 [84.50, 179.00]	117.00 [78.25, 150.00]	-0.01	N/A	N/A	#VALUE!	112.29 (81.50)	107.66 (75.47)	0.06
...Missing; n (%)	7,216 (80.6%)	7,076 (79.1%)	0.04	11,179 (98.9%)	11,168 (98.8%)	0.01	N/A	N/A	#VALUE!	18,395 (90.8%)	18,244 (90.1%)	0.02
Lab result number- Hemoglobin mean (only >0 included)	1,772	2,003		127	147		N/A	N/A		1,899	2,150	
...mean (sd)	13.68 (1.53)	13.75 (1.63)	-0.04	13.23 (2.25)	13.71 (1.67)	-0.24	N/A	N/A	#VALUE!	13.65 (1.59)	13.75 (1.63)	-0.06
...median [IQR]	13.65 [12.70, 14.70]	13.80 [12.75, 14.80]	-0.09	13.40 [12.30, 14.60]	13.80 [12.70, 14.70]	-0.20	N/A	N/A	#VALUE!	13.63 (1.59)	13.80 (1.63)	-0.11
...Missing; n (%)	7,178 (80.2%)	6,947 (77.6%)	0.06	11,173 (98.9%)	11,153 (98.7%)	0.02	N/A	N/A	#VALUE!	18,351 (90.6%)	18,100 (89.4%)	0.04
Lab result number- Serum sodium mean (only > 90 and < 190 included)	2,338	2,577		154	188		N/A	N/A		2,492	2,765	
...mean (sd)	140.09 (3.01)	140.14 (2.99)	-0.02	139.54 (2.88)	139.92 (2.69)	-0.14	N/A	N/A	#VALUE!	140.06 (3.00)	140.13 (2.97)	-0.02
...median [IQR]	140.00 [138.50, 142.00]	140.00 [139.00, 142.00]	0.00	140.00 [138.00, 141.00]	140.00 [138.00, 142.00]	0.00	N/A	N/A	#VALUE!	140.00 (3.00)	140.00 (2.97)	0.00
...Missing; n (%)	6,612 (73.9%)	6,373 (71.2%)	0.06	11,146 (98.6%)	11,112 (98.3%)	0.02	N/A	N/A	#VALUE!	17,758 (87.7%)	17,485 (86.3%)	0.04
Lab result number- Albumin mean (only >0 and <=10 included)	2,092	2,243		112	146		N/A	N/A		2,204	2,389	
...mean (sd)	4.17 (0.32)	4.18 (0.33)	-0.03	4.01 (0.84)	4.12 (0.36)	-0.17	N/A	N/A	#VALUE!	4.16 (0.36)	4.18 (0.33)	-0.06
...median [IQR]	4.20 [4.00, 4.40]	4.20 [4.00, 4.40]	0.00	4.20 [3.90, 4.40]	4.10 [3.90, 4.40]	0.15	N/A	N/A	#VALUE!	4.20 (0.36)	4.19 (0.33)	0.03
...Missing; n (%)	6,858 (76.6%)	6,707 (74.9%)	0.04	11,188 (99.0%)	11,154 (98.7%)	0.03	N/A	N/A	#VALUE!	18,046 (89.1%)	17,861 (88.2%)	0.03
Lab result number- Glucose (fasting or random) mean (only 10-1000 included)	2,309	2,565		153	186		N/A	N/A		2,462	2,751	
...mean (sd)	113.45 (35.98)	113.73 (37.41)	-0.01	126.15 (58.00)	126.78 (41.66)	-0.01	N/A	N/A	#VALUE!	114.24 (37.72)	114.61 (37.72)	-0.01
...median [IQR]	103.00 [93.00, 121.00]	103.00 [93.00, 122.50]	0.00	113.00 [95.00, 135.00]	116.00 [100.00, 142.00]	-0.06	N/A	N/A	#VALUE!	103.62 (37.72)	103.88 (37.72)	-0.01
...Missing; n (%)	6,641 (74.2%)	6,385 (71.3%)	0.07	11,147 (98.6%)	11,114 (98.4%)	0.02	N/A	N/A	#VALUE!	17,788 (87.8%)	17,499 (86.4%)	0.04
Lab result number- Potassium mean (only 1-7 included)	2,403	2,703		159	203		N/A	N/A		2,562	2,906	
...mean (sd)	4.37 (0.43)	4.37 (0.46)	0.00	4.36 (0.45)	4.36 (0.43)	0.00	N/A	N/A	#VALUE!	4.37 (0.43)	4.37 (0.46)	0.00
...median [IQR]	4.40 [4.10, 4.60]	4.40 [4.10, 4.60]	0.00	4.30 [4.10, 4.60]	4.37 [4.10, 4.70]	-0.16	N/A	N/A	#VALUE!	4.39 (0.43)	4.40 (0.46)	-0.02
...Missing; n (%)	6,547 (73.2%)	6,247 (69.8%)	0.08	11,141 (98.6%)	11,097 (98.2%)	0.03	N/A	N/A	#VALUE!	17,688 (87.3%)	17,344 (85.6%)	0.05
Comorbidity Scores												
CCI (180 days)- ICD9 and ICD10 v2												
...mean (sd)	3.47 (1.71)	3.48 (1.74)	-0.01	3.15 (1.62)	3.13 (1.62)	0.01	2.92 (2.09)	2.91 (2.09)	0.00	3.07 (1.93)	3.06 (1.94)	0.01
...median [IQR]	3.00 [2.00, 5.00]	3.00 [2.00, 5.00]	0.00	3.00 [2.00, 4.00]	3.00 [2.00, 4.00]	0.00	3.00 [1.00, 4.00]	3.00 [1.00, 4.00]	0.00	3.00 (1.93)	3.00 (1.94)	0.00
Non-Frailty; n (%)	4,818 (53.8%)	4,943 (55.2%)	-0.03	5,684 (50.3%)	5,645 (50.0%)	0.01	834 (2.7%)	697 (2.2%)	0.03	11,336 (22.1%)	11,285 (22.0%)	0.00
Frailty Score (mean): Empirical Version 365 days, v2												
...mean (sd)	0.19 (0.06)	0.19 (0.06)	0.00	0.19 (0.05)	0.19 (0.05)	0.00	17.22 (12.51)	17.23 (12.93)	0.00	10.50 (9.73)	10.51 (10.06)	0.00
...median [IQR]	0.18 [0.15, 0.22]	0.18 [0.15, 0.22]	0.00	0.18 [0.15, 0.21]	0.18 [0.15, 0.21]	0.00	14.67 [8.34, 23.41]	14.52 [8.06, 23.40]	0.01	8.95 (9.73)	8.86 (10.06)	0.01

Appendix B: Rivaroxaban vs Warfarin

Healthcare Utilization												
Any hospitalization; n (%)	2,257 (25.2%)	2,314 (25.9%)	-0.02	3,579 (31.7%)	3,582 (31.7%)	0.00	15,976 (51.4%)	15,922 (51.2%)	0.00	21,812 (42.5%)	21,818 (42.5%)	0.00
Any hospitalization within prior 30 days; n (%)	1,520 (17.0%)	1,514 (16.9%)	0.00	2,456 (21.7%)	2,479 (21.9%)	0.00	11,249 (36.2%)	11,049 (35.6%)	0.01	15225 (29.7%)	15042 (29.3%)	0.01
Any hospitalization during prior 31-180 days; n (%)	866 (9.7%)	932 (10.4%)	-0.02	1,279 (11.3%)	1,268 (11.2%)	0.00	6,194 (19.9%)	6,196 (19.9%)	0.00	8339 (16.2%)	8396 (16.4%)	-0.01
Endocrinologist Visit; n (%)	286 (3.2%)	266 (3.0%)	0.01	424 (3.8%)	440 (3.9%)	-0.01	1,662 (5.3%)	1,637 (5.3%)	0.00	2372 (4.6%)	2343 (4.6%)	0.00
Endocrinologist Visit (30 days prior); n (%)	101 (1.1%)	81 (0.9%)	0.02	153 (1.4%)	150 (1.3%)	0.01	557 (1.8%)	540 (1.7%)	0.01	811 (1.6%)	771 (1.5%)	0.01
Endocrinologist Visit (31 to 180 days prior); n (%)	232 (2.6%)	224 (2.5%)	0.01	361 (3.2%)	372 (3.3%)	-0.01	1,406 (4.5%)	1,384 (4.5%)	0.00	1999 (3.9%)	1980 (3.9%)	0.00
Internal medicine/family medicine visits; n (%)	7,789 (87.0%)	7,872 (88.0%)	-0.03	9,294 (82.2%)	9,180 (81.2%)	0.03	27,136 (87.3%)	27,571 (88.7%)	-0.04	44219 (86.2%)	44623 (87.0%)	-0.02
Internal medicine/family medicine visits (30 days prior) v2; n (%)	5,509 (61.6%)	5,525 (61.7%)	0.00	6,399 (56.6%)	6,455 (57.1%)	-0.01	20,182 (65.0%)	20,407 (65.7%)	-0.01	32090 (62.5%)	32387 (63.1%)	-0.01
Internal medicine/family medicine visits (31 to 180 days prior) v2; n (%)	6,784 (75.8%)	6,904 (77.1%)	-0.03	8,254 (73.0%)	8,060 (71.3%)	0.04	23,086 (74.3%)	23,526 (75.7%)	-0.03	38124 (74.3%)	38490 (75.0%)	-0.02
Cardiologist visit; n (%)	6,799 (76.0%)	6,934 (77.5%)	-0.04	6,695 (59.2%)	6,471 (57.3%)	0.04	26,281 (84.6%)	26,471 (85.2%)	-0.02	39775 (77.5%)	39876 (77.7%)	0.00
Number of Cardiologist visits (30 days prior); n (%)	5,531 (61.8%)	5,397 (60.3%)	0.03	4,970 (44.0%)	4,973 (44.0%)	0.00	21,163 (68.1%)	20,800 (66.9%)	0.03	31664 (61.7%)	31170 (60.7%)	0.02
Number of Cardiologist visits (31 to 180 days prior); n (%)	4,189 (46.8%)	4,233 (47.3%)	-0.01	4,502 (39.8%)	4,157 (36.8%)	0.06	16,385 (52.7%)	16,402 (52.8%)	0.00	25076 (48.9%)	24792 (48.3%)	0.01
Electrocardiogram v2; n (%)	6,802 (76.0%)	7,027 (78.5%)	-0.06	8,084 (71.5%)	8,613 (76.2%)	-0.11	26,290 (84.6%)	26,741 (86.1%)	-0.04	41176 (80.2%)	42381 (82.6%)	-0.06
Use of glucose test strips; n (%)	109 (1.2%)	124 (1.4%)	-0.02	114 (1.0%)	136 (1.2%)	-0.02	685 (2.2%)	746 (2.4%)	-0.01	908 (1.8%)	1006 (2.0%)	-0.01
Dialysis; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	**	**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
number of different/distinct medication prescriptions												
...mean (sd)	9.41 (4.42)	9.45 (4.50)	-0.01	9.77 (4.56)	9.76 (4.56)	0.00	10.93 (4.76)	10.95 (4.85)	0.00	10.41 (4.66)	10.43 (4.73)	0.00
...median [IQR]	9.00 [6.00, 12.00]	9.00 [6.00, 12.00]	0.00	9.00 [7.00, 12.00]	9.00 [7.00, 12.00]	0.00	10.00 [8.00, 14.00]	10.00 [8.00, 14.00]	0.00	5.75 (5.45)	5.75 (5.51)	0.00
Number of Hospitalizations												
...mean (sd)	0.29 (0.55)	0.29 (0.54)	0.00	0.35 (0.54)	0.35 (0.55)	0.00	0.65 (0.76)	0.64 (0.76)	0.01	0.52 (0.68)	0.52 (0.68)	0.00
...median [IQR]	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.00	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.00	1.00 [0.00, 1.00]	1.00 [0.00, 1.00]	0.00	0.22 (0.76)	0.22 (0.76)	0.00
Number of hospital days												
...mean (sd)	1.34 (3.03)	1.35 (3.73)	0.00	1.66 (3.30)	1.62 (3.81)	0.01	3.67 (5.72)	3.57 (7.18)	0.02	2.82 (4.88)	2.75 (6.07)	0.01
...median [IQR]	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.00	0.00 [0.00, 3.00]	0.00 [0.00, 3.00]	0.00	2.00 [0.00, 5.00]	2.00 [0.00, 5.00]	0.00	0.44 (5.29)	0.44 (6.51)	0.00
Number of Emergency Department (ED) visits v3												
...mean (sd)	0.74 (1.32)	0.75 (1.35)	-0.01	0.64 (2.28)	0.63 (2.03)	0.00	1.31 (1.95)	1.31 (1.82)	0.00	1.06 (1.94)	1.06 (1.80)	0.00
...median [IQR]	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	1.00 [0.00, 2.00]	1.00 [0.00, 2.00]	0.00	0.22 (2.40)	0.22 (2.20)	0.00
Number of Office visits												
...mean (sd)	5.46 (4.17)	5.47 (3.88)	0.00	5.89 (4.44)	5.82 (4.17)	0.02	13.22 (13.02)	13.19 (12.41)	0.00	10.25 (10.49)	10.22 (9.98)	0.00
...median [IQR]	5.00 [3.00, 7.00]	5.00 [3.00, 7.00]	0.00	5.00 [3.00, 8.00]	5.00 [3.00, 8.00]	0.00	10.00 [5.00, 17.00]	10.00 [5.00, 17.75]	0.00	4.17 (10.84)	4.17 (10.31)	0.00
Number of Endocrinologist visits												
...mean (sd)	0.13 (1.20)	0.11 (0.94)	0.02	0.15 (1.19)	0.16 (1.21)	-0.01	0.26 (1.91)	0.25 (1.78)	0.01	0.21 (1.66)	0.21 (1.55)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (1.82)	0.00 (1.72)	0.00
Number of internal medicine/family medicine visits												
...mean (sd)	9.10 (11.33)	9.29 (12.40)	-0.02	7.60 (11.04)	7.50 (10.85)	0.01	9.55 (10.63)	9.49 (10.61)	0.01	9.04 (10.85)	9.02 (10.99)	0.00
...median [IQR]	6.00 [2.00, 12.00]	6.00 [2.00, 12.00]	0.00	4.00 [1.00, 9.00]	4.00 [1.00, 9.00]	0.00	7.00 [2.00, 13.00]	7.00 [3.00, 13.00]	0.00	3.47 (12.83)	3.47 (12.89)	0.00
Number of Cardiologist visits												
...mean (sd)	4.73 (5.69)	4.68 (5.48)	0.01	3.10 (4.72)	3.09 (4.65)	0.00	6.14 (7.31)	6.06 (6.74)	0.01	5.22 (6.55)	5.17 (6.12)	0.01
...median [IQR]	3.00 [1.00, 7.00]	3.00 [1.00, 7.00]	0.00	1.00 [0.00, 4.00]	1.00 [0.00, 4.00]	0.00	4.00 [1.00, 8.00]	4.00 [2.00, 8.00]	0.00	1.62 (7.18)	1.62 (6.77)	0.00
Number electrocardiograms received v2												
...mean (sd)	2.14 (2.51)	2.15 (2.32)	0.00	1.78 (2.15)	1.77 (1.83)	0.01	2.70 (2.61)	2.69 (2.43)	0.00	2.40 (2.50)	2.39 (2.29)	0.00
...median [IQR]	1.00 [1.00, 3.00]	2.00 [1.00, 3.00]	-0.41	1.00 [0.00, 2.00]	1.00 [1.00, 2.00]	0.00	2.00 [1.00, 4.00]	2.00 [1.00, 4.00]	0.00	0.83 (2.83)	1.01 (2.56)	-0.07
Number of HbA1c tests ordered												
...mean (sd)	0.46 (0.73)	0.46 (0.72)	0.00	0.21 (0.54)	0.22 (0.55)	-0.02	0.57 (0.81)	0.57 (0.80)	0.00	0.47 (0.74)	0.47 (0.74)	0.00
...median [IQR]	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.00	0.00 (0.82)	0.00 (0.81)	0.00
Number of glucose tests ordered												
...mean (sd)	0.21 (2.91)	0.19 (0.82)	0.01	0.13 (0.61)	0.14 (0.89)	-0.01	0.22 (1.26)	0.22 (0.72)	0.00	0.20 (1.59)	0.20 (0.78)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (1.63)	0.00 (0.95)	0.00
Number of lipid tests ordered												
...mean (sd)	0.66 (0.84)	0.65 (0.79)	0.01	0.29 (0.74)	0.30 (0.70)	-0.01	0.69 (0.77)	0.69 (0.78)	0.00	0.60 (0.78)	0.60 (0.76)	0.00
...median [IQR]	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	1.00 [0.00, 1.00]	1.00 [0.00, 1.00]	0.00	0.22 (0.90)	0.22 (0.88)	0.00
Number of creatinine tests ordered												
...mean (sd)	0.07 (0.36)	0.07 (0.32)	0.00	0.05 (0.32)	0.05 (0.29)	0.00	0.12 (0.45)	0.11 (0.43)	0.02	0.10 (0.41)	0.09 (0.39)	0.02
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.46)	0.00 (0.43)	0.00
Number of BUN tests ordered												
...mean (sd)	0.04 (0.28)	0.04 (0.24)	0.00	0.03 (0.25)	0.03 (0.23)	0.00	0.08 (0.37)	0.07 (0.33)	0.03	0.06 (0.33)	0.06 (0.30)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.37)	0.00 (0.33)	0.00
Number of tests for microalbuminuria												
...mean (sd)	0.22 (0.66)	0.22 (0.66)	0.00	0.09 (0.43)	0.09 (0.41)	0.00	0.17 (0.50)	0.16 (0.47)	0.02	0.16 (0.52)	0.16 (0.50)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.58)	0.00 (0.56)	0.00
Total N distinct ICD9/ICD10 diagnoses at the 3rd digit level Copy												
...mean (sd)	7.69 (8.86)	7.57 (8.88)	0.01	3.87 (6.60)	3.82 (6.57)	0.01	11.49 (12.00)	11.34 (12.10)	0.01	9.15 (10.51)	9.03 (10.58)	0.01
...median [IQR]	5.00 [0.00, 12.00]	5.00 [0.00, 11.00]	0.00	0.00 [0.00, 5.00]	0.00 [0.00, 5.00]	0.00	8.00 [0.00, 19.00]	8.00 [0.00, 18.00]	0.00	2.63 (11.28)	2.63 (11.34)	0.00

Appendix B: Rivaroxaban vs Warfarin

For PS												
Hemorrhagic stroke+Other cerebrovascular disease+Cerebrovascular procedure (for PS); n (%)	381 (4.3%)	367 (4.1%)	0.01	377 (3.3%)	377 (3.3%)	0.00	1,762 (5.7%)	1,706 (5.5%)	0.01	2520 (4.9%)	2450 (4.8%)	0.00
Occurrence of creatinine tests ordered (for PS); n (%)	464 (5.2%)	473 (5.3%)	0.00	438 (3.9%)	457 (4.0%)	-0.01	2,763 (8.9%)	2,675 (8.6%)	0.01	3665 (7.1%)	3605 (7.0%)	0.00
Occurrence of BUN tests ordered (for PS); n (%)	267 (3.0%)	278 (3.1%)	-0.01	277 (2.5%)	302 (2.7%)	-0.01	1,749 (5.6%)	1,667 (5.4%)	0.01	2293 (4.5%)	2247 (4.4%)	0.00
Occurrence of chronic renal insufficiency w/o CKD (for PS) v2; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	189 (0.6%)	195 (0.6%)	0.00	189 (0.4%)	195 (0.4%)	0.00
Chronic kidney disease Stage 1-2 (for PS); n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	0	0	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Chronic kidney disease Stage 3-6 (for PS); n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	463 (1.5%)	446 (1.4%)	0.01	463 (0.9%)	446 (0.9%)	0.00
Bladder stones+Kidney stones (for PS); n (%)	84 (0.9%)	97 (1.1%)	-0.02	122 (1.1%)	126 (1.1%)	0.00	487 (1.6%)	494 (1.6%)	0.00	693 (1.4%)	717 (1.4%)	0.00
Diabetes with peripheral circulatory disorders+Gangrene+Osteomyelitis(for PS) v3 with ICD10 Copy; n (%)	318 (3.6%)	275 (3.1%)	0.03	291 (2.6%)	284 (2.5%)	0.01	1,587 (5.1%)	1,640 (5.3%)	-0.01	2196 (4.3%)	2199 (4.3%)	0.00
Alcohol abuse or dependence+Drug abuse or dependence (for PS); n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	95 (0.3%)	84 (0.3%)	0.00	95 (0.2%)	84 (0.2%)	0.00
Diabetes with other ophthalmic manifestations+Retinal detachment, vitreous hemorrhage, vitrectomy+Retinal laser coagulation therapy (for PS); n (%)	42 (0.5%)	46 (0.5%)	0.00	174 (1.5%)	156 (1.4%)	0.01	458 (1.5%)	465 (1.5%)	0.00	674 (1.3%)	667 (1.3%)	0.00
Other atherosclerosis+Cardiac conduction disorders+Other CVD (for PS) v2 Copy; n (%)	3,857 (43.1%)	3,825 (42.7%)	0.01	4,510 (39.9%)	4,497 (39.8%)	0.00	14,213 (45.7%)	14,081 (45.3%)	0.01	22580 (44.0%)	22403 (43.7%)	0.01
Previous cardiac procedure (CABG or PTCA or Stent) + History of CABG or PTCA (for PS) v3; n (%)	905 (10.1%)	895 (10.0%)	0.00	640 (5.7%)	662 (5.9%)	-0.01	5,079 (16.3%)	4,997 (16.1%)	0.01	6624 (12.9%)	6554 (12.8%)	0.00
Hyperthyroidism + Hypothyroidism + Other disorders of thyroid gland (for PS); n (%)	1,955 (21.8%)	1,944 (21.7%)	0.00	1,893 (16.8%)	1,850 (16.4%)	0.01	5,526 (17.8%)	5,502 (17.7%)	0.00	9374 (18.3%)	9296 (18.1%)	0.01
Delirium + Psychosis (for PS); n (%)	279 (3.1%)	261 (2.9%)	0.01	275 (2.4%)	274 (2.4%)	0.00	1,619 (5.2%)	1,599 (5.1%)	0.00	2173 (4.2%)	2134 (4.2%)	0.00
Any use of Meglitinides (for PS); n (%)	23 (0.3%)	20 (0.2%)	0.02	55 (0.5%)	62 (0.5%)	0.00	155 (0.5%)	145 (0.5%)	0.00	233 (0.5%)	227 (0.4%)	0.01
Any use of AGIs (for PS); n (%)	10 (0.1%)	7 (0.1%)	0.00	19 (0.2%)	12 (0.1%)	0.03	42 (0.1%)	42 (0.1%)	0.00	71 (0.1%)	61 (0.1%)	0.00
CKD stage 3-6 + dialysis (for PS); n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	1 (0.0%)	0 (0.0%)	#DIV/0!	466 (1.5%)	448 (1.4%)	0.01	467 (0.9%)	448 (0.9%)	0.00
Use of thiazide; n (%)	1,119 (12.5%)	1,137 (12.7%)	-0.01	1,374 (12.2%)	1,344 (11.9%)	0.01	4,321 (13.9%)	4,262 (13.7%)	0.01	6814 (13.3%)	6743 (13.1%)	0.01
Use of beta blockers; n (%)	6,279 (70.2%)	6,292 (70.3%)	0.00	8,046 (71.2%)	7,986 (70.7%)	0.01	23,273 (74.9%)	23,216 (74.7%)	0.00	37598 (73.3%)	37494 (73.1%)	0.00
Use of calcium channel blockers; n (%)	3,638 (40.6%)	3,637 (40.6%)	0.00	4,634 (41.0%)	4,646 (41.1%)	0.00	13,887 (44.7%)	13,904 (44.8%)	0.00	22159 (43.2%)	22187 (43.2%)	0.00
All antidiabetic medications except Insulin; n (%)	2,126 (23.8%)	2,148 (24.0%)	0.00	2,739 (24.2%)	2,739 (24.2%)	0.00	9,074 (29.2%)	9,159 (29.5%)	-0.01	13939 (27.2%)	14046 (27.4%)	0.00
DM Medications - Insulin Copy; n (%)	430 (4.8%)	441 (4.9%)	0.00	738 (6.5%)	730 (6.5%)	0.00	2,444 (7.9%)	1,954 (6.3%)	0.06	3612 (7.0%)	3125 (6.1%)	0.04
Use of Low Intensity Statins; n (%)	3,159 (35.3%)	3,116 (34.8%)	0.01	3,741 (33.1%)	3,933 (34.8%)	-0.04	11,556 (37.2%)	11,429 (36.8%)	0.01	18456 (36.0%)	18478 (36.0%)	0.00
Use of High Intensity Statins; n (%)	2,354 (26.3%)	2,408 (26.9%)	-0.01	2,939 (26.0%)	2,814 (24.9%)	0.03	7,959 (25.6%)	8,167 (26.3%)	-0.02	13252 (25.8%)	13389 (26.1%)	-0.01
Malignant hypertension; n (%)	463 (5.2%)	450 (5.0%)	0.01	5,386 (47.7%)	5,398 (47.8%)	0.00	9,493 (30.6%)	9,631 (31.0%)	-0.01	15342 (29.9%)	15479 (30.2%)	-0.01
Cardiovascular stress test; n (%)	38 (0.4%)	40 (0.4%)	0.00	84 (0.7%)	73 (0.6%)	0.01	312 (1.0%)	270 (0.9%)	0.01	434 (0.8%)	383 (0.7%)	0.01
Echocardiogram; n (%)	3,953 (44.2%)	4,195 (46.9%)	-0.05	5,226 (46.2%)	5,820 (51.5%)	-0.11	18,321 (59.0%)	19,059 (61.3%)	-0.05	27500 (53.6%)	29074 (56.7%)	-0.06
Number of BNP tests												
...mean (sd)	0.15 (0.52)	0.15 (0.53)	0.00	0.08 (0.40)	0.09 (0.40)	-0.03	0.25 (0.65)	0.27 (0.66)	-0.03	0.20 (0.58)	0.21 (0.59)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.63)	0.00 (0.64)	0.00
Number of Cardiac biomarkers tests (tropnin, CK-MBs, Myoglobin, CPK)												
...mean (sd)	0.45 (1.43)	0.49 (1.47)	-0.03	0.32 (1.24)	0.39 (1.40)	-0.05	0.36 (0.71)	0.41 (0.73)	-0.07	0.37 (1.00)	0.42 (1.06)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.00	0.00 (1.26)	0.00 (1.37)	0.00
Number of Ambulatory Blood pressure monitoring tests												
...mean (sd)	0.00 (0.04)	0.00 (0.04)	0.00	0.00 (0.03)	0.00 (0.04)	0.00	0.00 (0.03)	0.00 (0.04)	0.00	0.00 (0.03)	0.00 (0.04)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.04)	0.00 (0.05)	0.00
N of days on antihypertensive medications during baseline												
...mean (sd)	139.61 (62.26)	137.95 (63.30)	0.03	139.79 (63.30)	139.00 (63.70)	0.01	147.57 (55.78)	147.35 (55.84)	0.00	144.47 (58.67)	143.87 (58.99)	0.00
...median [IQR]	174.00 [123.00, 181.00]	174.00 [117.00, 181.00]	0.00	176.00 [125.00, 181.00]	175.00 [121.00, 181.00]	0.02	176.00 [144.00, 181.00]	176.00 [144.00, 181.00]	0.00	107.85 (70.61)	107.63 (71.01)	0.00
N of days in database anytime prior												
...mean (sd)	2,041.05 (1,371.23)	2,042.84 (1,399.19)	0.00	2,552.38 (1,366.73)	2,530.20 (1,365.03)	0.02	811.15 (547.72)	817.84 (520.25)	-0.01	1409.06 (959.60)	1408.54 (956.85)	0.00
...median [IQR]	1,782.50 [856.75, 3,039.00]	1,747.50 [822.00, 3,082.00]	0.03	2,168.50 [1,338.00, 3,690.00]	2,134.00 [1,285.00, 3,667.00]	0.01	634.00 [462.00, 963.00]	649.00 [484.00, 971.00]	-0.03	1022.66 (1280.79)	1016.66 (1278.03)	0.00
Mean Copay for per prescription cost (charges in U.S. $) (180-1 day prior)												
...mean (sd)	29.02 (37.48)	29.19 (41.67)	0.00	18.71 (20.72)	18.78 (20.05)	0.00	117.00 (89.10)	118.16 (110.23)	-0.01	80.01 (71.73)	80.76 (88.02)	0.00
...median [IQR]	18.33 [7.69, 36.56]	18.77 [8.00, 35.85]	-0.01	14.04 [6.59, 24.85]	14.11 [6.77, 25.00]	0.00	95.83 [68.28, 137.63]	95.81 [68.80, 135.71]	0.00	27.39 (72.88)	27.48 (88.90)	0.00
...Missing; n (%)	194 (2.2%)	201 (2.2%)	0.00	227 (2.0%)	242 (2.1%)	-0.01	403 (1.3%)	429 (1.4%)	-0.01	824 (1.6%)	872 (1.7%)	-0.01
Colonoscopy; n (%)	235 (2.6%)	238 (2.7%)	-0.01	344 (3.0%)	357 (3.2%)	-0.01	1,007 (3.2%)	974 (3.1%)	0.01	1586 (3.1%)	1569 (3.1%)	0.00
Fecal occult blood (FOB) test; n (%)	274 (3.1%)	282 (3.2%)	-0.01	218 (1.9%)	214 (1.9%)	0.00	787 (2.5%)	777 (2.5%)	0.00	1279 (2.5%)	1273 (2.5%)	0.00
Flu vaccine; n (%)	1,648 (18.4%)	1,646 (18.4%)	0.00	1,355 (12.0%)	1,349 (11.9%)	0.00	10,078 (32.4%)	10,060 (32.4%)	0.00	13081 (25.5%)	13055 (25.4%)	0.00
Mammogram; n (%)	810 (9.1%)	798 (8.9%)	0.01	591 (5.2%)	554 (4.9%)	0.01	2,951 (9.5%)	2,947 (9.5%)	0.00	4352 (8.5%)	4299 (8.4%)	0.00
Pap smear; n (%)	131 (1.5%)	130 (1.5%)	0.00	179 (1.6%)	183 (1.6%)	0.00	515 (1.7%)	531 (1.7%)	0.00	825 (1.6%)	844 (1.6%)	0.00

Appendix B: Rivaroxaban vs Warfarin

Pneumonia vaccine; n (%)	1,307 (14.6%)	1,287 (14.4%)	0.01	660 (5.8%)	672 (5.9%)	0.00	6,181 (19.9%)	6,107 (19.7%)	0.01	8148 (15.9%)	8066 (15.7%)	0.01
PSA test or Prostate exam for DRE; n (%)	1,089 (12.2%)	1,079 (12.1%)	0.00	739 (6.5%)	749 (6.6%)	0.00	3,184 (10.2%)	3,210 (10.3%)	0.00	5012 (9.8%)	5038 (9.8%)	0.00
Bone mineral density; n (%)	309 (3.5%)	299 (3.3%)	0.01	168 (1.5%)	158 (1.4%)	0.01	1,103 (3.6%)	1,076 (3.5%)	0.01	1580 (3.1%)	1533 (3.0%)	0.01
Use of Sympatomimetic agents; n (%)	23 (0.3%)	24 (0.3%)	0.00	50 (0.4%)	51 (0.5%)	-0.01	76 (0.2%)	91 (0.3%)	-0.02	149 (0.3%)	166 (0.3%)	0.00
Use of CNS stimulants; n (%)	23 (0.3%)	25 (0.3%)	0.00	49 (0.4%)	49 (0.4%)	0.00	82 (0.3%)	68 (0.2%)	0.02	154 (0.3%)	142 (0.3%)	0.00
Use of estrogens, progestins, androgens; n (%)	250 (2.8%)	225 (2.5%)	0.02	456 (4.0%)	456 (4.0%)	0.00	856 (2.8%)	904 (2.9%)	-0.01	1562 (3.0%)	1585 (3.1%)	-0.01
Use of Angiogenesis inhibitors; n (%)	1 (0.0%)	1 (0.0%)	#DIV/0!	4 (0.0%)	3 (0.0%)	#DIV/0!	**	12 (0.0%)	#VALUE!	#VALUE!	16 (0.0%)	#VALUE!
Use of Oral Immunosuppressants; n (%)	1 (0.0%)	1 (0.0%)	#DIV/0!	6 (0.1%)	2 (0.0%)	0.04	**	**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Use of fondaparinux or Bivalirudin; n (%)	4 (0.0%)	1 (0.0%)	#DIV/0!	3 (0.0%)	3 (0.0%)	#DIV/0!	**	11 (0.0%)	#VALUE!	#VALUE!	15 (0.0%)	#VALUE!
Use of other direct thrombin inhibitors (lepirudin, des	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!
Use of Ticagrelor ON CED; n (%)	10 (0.1%)	14 (0.2%)	-0.03	21 (0.2%)	13 (0.1%)	0.03	12 (0.0%)	15 (0.0%)	#DIV/0!	43 (0.1%)	42 (0.1%)	0.00
Use of Ticagrelor; n (%)	22 (0.2%)	26 (0.3%)	-0.02	24 (0.2%)	18 (0.2%)	0.00	110 (0.4%)	101 (0.3%)	0.02	156 (0.3%)	145 (0.3%)	0.00
Number of D-dimer tests												
...mean (sd)	0.03 (0.21)	0.03 (0.19)	0.00	0.02 (0.16)	0.02 (0.17)	0.00	0.05 (0.23)	0.05 (0.23)	0.00	0.04 (0.21)	0.04 (0.21)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.23)	0.00 (0.24)	0.00
Numbe of CRP, high-sensitivity CRP tests												
...mean (sd)	0.06 (0.35)	0.06 (0.30)	0.00	0.03 (0.22)	0.03 (0.24)	0.00	0.09 (0.41)	0.09 (0.45)	0.00	0.07 (0.37)	0.07 (0.39)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.39)	0.00 (0.42)	0.00
Number of PT or aPTTt tests												
...mean (sd)	0.52 (1.32)	0.48 (1.43)	0.03	0.39 (1.18)	0.37 (1.20)	0.02	0.49 (1.24)	0.48 (1.25)	0.01	0.47 (1.24)	0.46 (1.27)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.00	0.00 (1.44)	0.00 (1.47)	0.00
Number of Bleeding time tests												
...mean (sd)	0.00 (0.00)	0.00 (0.00)	#DIV/0!	0.00 (0.00)	0.00 (0.00)	#DIV/0!	0.00 (0.01)	0.00 (0.01)	0.00	0.00 (0.01)	0.00 (0.01)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	#DIV/0!	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	#DIV/0!	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (0.01)	0.00 (0.01)	0.00
HAS-BLED Score (ICD-9 and ICD-10), 180 days												
...mean (sd)	3.41 (0.76)	3.40 (0.76)	0.01	3.29 (0.77)	3.29 (0.76)	0.00	3.56 (0.74)	3.55 (0.73)	0.01	3.47 (0.75)	3.47 (0.74)	0.00
...median [IQR]	3.00 [3.00, 4.00]	3.00 [3.00, 4.00]	0.00	3.00 [3.00, 4.00]	3.00 [3.00, 4.00]	0.00	3.00 [3.00, 4.00]	3.00 [3.00, 4.00]	0.00	1.84 (0.89)	1.84 (0.88)	0.00
N of Generic name drugs												
...mean (sd)	19.22 (14.62)	19.38 (16.57)	-0.01	14.89 (10.15)	14.82 (11.14)	0.01	20.43 (14.14)	20.47 (15.60)	0.00	19.00 (13.45)	19.04 (14.92)	0.00
...median [IQR]	16.00 [10.00, 24.00]	15.00 [9.00, 25.00]	0.06	13.00 [8.00, 19.00]	12.00 [7.00, 19.00]	0.09	17.00 [11.00, 26.00]	17.00 [10.00, 26.00]	0.00	9.40 (14.86)	9.00 (16.44)	0.00
N of Brand name drugs												
...mean (sd)	4.15 (6.18)	4.22 (4.32)	-0.01	4.70 (5.32)	4.76 (4.21)	-0.01	4.78 (6.13)	4.92 (5.14)	-0.02	4.65 (5.97)	4.76 (4.81)	0.00
...median [IQR]	2.00 [0.00, 6.00]	3.00 [1.00, 6.00]	-0.19	3.00 [1.00, 7.00]	4.00 [2.00, 7.00]	-0.21	3.00 [1.00, 7.00]	3.00 [1.00, 7.00]	0.00	1.67 (6.82)	2.06 (5.48)	0.00
Use of clopidogrel ; n (%)	1,027 (11.5%)	1,017 (11.4%)	0.00	1,382 (12.2%)	1,356 (12.0%)	0.01	4,482 (14.4%)	4,428 (14.3%)	0.00	6891 (13.4%)	6801 (13.3%)	0.00
Systemic embolism; n (%)	70 (0.8%)	67 (0.7%)	0.01	87 (0.8%)	86 (0.8%)	0.00	324 (1.0%)	306 (1.0%)	0.00	481 (0.9%)	459 (0.9%)	0.00
DVT; n (%)	23 (0.3%)	29 (0.3%)	0.00	25 (0.2%)	24 (0.2%)	0.00	562 (1.8%)	559 (1.8%)	0.00	610 (1.2%)	612 (1.2%)	0.00
PE; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	144 (0.5%)	141 (0.5%)	0.00	144 (0.3%)	141 (0.3%)	0.00
Diabetes: 1 inpatient or 2 outpatient claims within 18	3,058 (34.2%)	3,112 (34.8%)	-0.01	3,583 (31.7%)	3,591 (31.8%)	0.00	13,784 (44.4%)	13,855 (44.6%)	0.00	20425 (39.8%)	20558 (40.1%)	-0.01
Intracranial or retroperitoneal hemorrhage: 1 inpatier	13 (0.1%)	12 (0.1%)	0.00	15 (0.1%)	17 (0.2%)	-0.03	101 (0.3%)	99 (0.3%)	0.00	129 (0.3%)	128 (0.2%)	0.02
Peptic Ulcer Disease; n (%)	1,514 (16.9%)	1,506 (16.8%)	0.00	1,294 (11.5%)	1,278 (11.3%)	0.01	7,115 (22.9%)	7,038 (22.7%)	0.00	9923 (19.3%)	9822 (19.1%)	0.01
Upper GI bleed; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	22 (0.1%)	26 (0.1%)	0.00	22 (0.0%)	26 (0.1%)	-0.04
Lower/ unspecified GI bleed; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	395 (1.3%)	385 (1.2%)	0.01	395 (0.8%)	385 (0.8%)	0.00
Urogenital bleed; n (%)	0 (0.0%)	1 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	527 (1.7%)	533 (1.7%)	0.00	527 (1.0%)	534 (1.0%)	0.00
Other bleeds; n (%)	1 (0.0%)	1 (0.0%)	#DIV/0!	0 (0.0%)	0 (0.0%)	#DIV/0!	328 (1.1%)	314 (1.0%)	0.01	329 (0.6%)	315 (0.6%)	0.00
Prior cancer; n (%)	1,130 (12.6%)	1,119 (12.5%)	0.00	1,106 (9.8%)	1,063 (9.4%)	0.01	4,090 (13.2%)	4,060 (13.1%)	0.00	6326 (12.3%)	6242 (12.2%)	0.00
Aspirin; n (%)	68 (0.8%)	71 (0.8%)	0.00	186 (1.6%)	184 (1.6%)	0.00	201 (0.6%)	201 (0.6%)	0.00	455 (0.9%)	456 (0.9%)	0.00
Aspirin/dipyridamole; n (%)	37 (0.4%)	32 (0.4%)	0.00	79 (0.7%)	75 (0.7%)	0.00	180 (0.6%)	185 (0.6%)	0.00	296 (0.6%)	292 (0.6%)	0.00
Other antiplatelet agents; n (%)	48 (0.5%)	46 (0.5%)	0.00	62 (0.5%)	71 (0.6%)	-0.01	215 (0.7%)	224 (0.7%)	0.00	325 (0.6%)	341 (0.7%)	-0.01
PGP inhibitors; n (%)	3,868 (43.2%)	3,887 (43.4%)	0.00	5,184 (45.9%)	5,203 (46.0%)	0.00	15,745 (50.7%)	15,746 (50.7%)	0.00	24797 (48.3%)	24836 (48.4%)	0.00
Other gastroprotective agents; n (%)	81 (0.9%)	86 (1.0%)	-0.01	125 (1.1%)	122 (1.1%)	0.00	461 (1.5%)	459 (1.5%)	0.00	667 (1.3%)	667 (1.3%)	0.00
Number of lipid tests ordered												
...mean (sd)	0.66 (0.84)	0.65 (0.79)	0.01	0.29 (0.74)	0.30 (0.70)	-0.01	0.72 (0.84)	0.72 (0.84)	0.00	0.61 (0.82)	0.62 (0.80)	0.00
...median [IQR]	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	1.00 [0.00, 1.00]	1.00 [0.00, 1.00]	0.00	0.22 (0.94)	0.22 (0.91)	0.00
Proton pump inhibitor; n (%)	1,891 (21.1%)	1,928 (21.5%)	-0.01	2,511 (22.2%)	2,460 (21.8%)	0.01	8,637 (27.8%)	8,657 (27.9%)	0.00	13039 (25.4%)	13045 (25.4%)	0.00
H2 receptor antagonist; n (%)	406 (4.5%)	402 (4.5%)	0.00	429 (3.8%)	425 (3.8%)	0.00	2,128 (6.8%)	2,152 (6.9%)	0.00	2963 (5.8%)	2979 (5.8%)	0.00
Vitamin K therapy; n (%)	4 (0.0%)	3 (0.0%)	#DIV/0!	5 (0.0%)	4 (0.0%)	#DIV/0!	**	**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Number of neurologist visits												
...mean (sd)	0.32 (1.39)	0.31 (1.36)	0.01	0.25 (1.17)	0.25 (1.37)	0.00	0.55 (2.12)	0.54 (2.05)	0.00	0.44 (1.83)	0.44 (1.81)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 (1.97)	0.00 (2.00)	0.00
Number of INR (prothrombin) tests ordered												
...mean (sd)	0.37 (1.01)	0.33 (1.10)	0.04	0.28 (0.89)	0.26 (0.93)	0.02	0.47 (1.19)	0.46 (1.21)	0.01	0.41 (1.10)	0.39 (1.13)	0.00
...median [IQR]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.00	0.00 (1.23)	0.00 (1.27)	0.00
Treating prescriber - Cardiologist; n (%)	5,550 (62.0%)	5,429 (60.7%)	0.03	5,961 (52.8%)	5,881 (52.0%)	0.02	21,163 (68.1%)	20,800 (66.9%)	0.03	32674 (63.7%)	32110 (62.6%)	0.02
Treating prescriber - Primary Care Physician; n (%)	5,841 (65.3%)	5,877 (65.7%)	-0.01	3,792 (33.6%)	3,789 (33.5%)	0.00	9,315 (30.0%)	9,328 (30.0%)	0.00	18948 (36.9%)	18994 (37.0%)	0.00
Treating prescriber - Other; n (%)	7,646 (85.4%)	7,591 (84.8%)	0.02	9,048 (80.1%)	8,979 (79.5%)	0.01	27,784 (89.4%)	27,618 (88.9%)	0.02	44478 (86.7%)	44188 (86.1%)	0.02

Appendix B: Rivaroxaban vs Warfarin

Alpha blockers; n (%)	1,102 (12.3%)	1,081 (12.1%)	0.01	1,377 (12.2%)	1,405 (12.4%)	-0.01	3,766 (12.1%)	3,807 (12.3%)	-0.01	6245 (12.2%)	6293 (12.3%)	0.00
CHADS2 score, 180 days, V												
...mean (sd)	2.10 (1.19)	2.11 (1.19)	-0.01	2.19 (1.18)	2.20 (1.19)	-0.01	3.73 (1.65)	3.73 (1.64)	0.00	3.11 (1.48)	3.11 (1.48)	0.00
...median [IQR]	2.00 [1.00, 3.00]	2.00 [1.00, 3.00]	0.00	2.00 [1.00, 3.00]	2.00 [1.00, 3.00]	0.00	3.00 [3.00, 5.00]	3.00 [3.00, 5.00]	0.00	1.45 (1.65)	1.45 (1.65)	0.00
Use of Prasugrel; n (%)	25 (0.3%)	24 (0.3%)	0.00	40 (0.4%)	30 (0.3%)	0.02	**	**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Use of Loop Diuretics+other diuretics+other hyperten:	3,023 (33.8%)	3,035 (33.9%)	0.00	3,753 (33.2%)	3,790 (33.5%)	-0.01	13,931 (44.8%)	14,150 (45.5%)	-0.01	20707 (40.4%)	20975 (40.9%)	-0.01
Commercial vs Medicare Advantage- Business Type Code - CORRECT ONE - OPTUM							0	0				
...Commercial; n (%)	1461 (16.3%)	1463 (16.3%)	0.00	9,248 (81.8%)	9,258 (81.9%)	0.00	-	-	#VALUE!	10,709 (52.9%)	10,721 (52.9%)	0.00
...Medicare Advantage; n (%)	7,489 (83.7%)	7487 (83.7%)	0.00	2,052 (18.2%)	2,042 (18.1%)	0.00	-	-	#VALUE!	9,541 (47.1%)	9,529 (47.1%)	0.00
Commercial vs Medicare Advantage- Business Type Code												
...COM = COMMERCIAL; n (%)	1,461 (16.3%)	1,463 (16.3%)	0.00	-	-	#VALUE!	-	-	#VALUE!	1,461 (16.3%)	1,463 (16.3%)	0.00
...MCR = MEDICARE; n (%)	7,489 (83.7%)	7,487 (83.7%)	0.00	-	-	#VALUE!	-	-	#VALUE!	7,489 (83.7%)	7,487 (83.7%)	0.00
...MCD = MEDICAID; n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	-	-	#VALUE!	-	-	#VALUE!	0 (0.0%)	0 (0.0%)	#DIV/0!
...NONE = NO BUSINESS LINE CODE (added in 2015); n (	0 (0.0%)	0 (0.0%)	#DIV/0!	-	-	#VALUE!	-	-	#VALUE!	0 (0.0%)	0 (0.0%)	#DIV/0!
...UNK = UNKNOWN (added in 2015); n (%)	0 (0.0%)	0 (0.0%)	#DIV/0!	-	-	#VALUE!	-	-	#VALUE!	0 (0.0%)	0 (0.0%)	#DIV/0!
Commercial vs Medicare Advantage- Data Type	-	-		0	0		-	-				
...1 - Fee For Service; n (%)	-	-		1,803 (16.0%)	1,817 (16.1%)		-	-		1,803 (16.0%)	1,817 (16.1%)	0.00
...2 - Encounter; n (%)	-	-		249 (2.2%)	225 (2.0%)		-	-		249 (2.2%)	225 (2.0%)	0.00
...3 - Medicare; n (%)	-	-		8,539 (75.6%)	8,523 (75.4%)		-	-		8,539 (75.6%)	8,523 (75.4%)	0.00
...4 - Medicare Encounter; n (%)	-	-		709 (6.3%)	735 (6.5%)		-	-		709 (6.3%)	735 (6.5%)	0.00
Metropolitan Statistical Area - Urban (any MSA) vs Rural (non-MSA)										0	0	0.00
...Urban; n (%)	-	-		8,353 (73.9%)	8,402 (74.4%)		-	-		8,353 (73.9%)	8,402 (74.4%)	0.00
...Rural; n (%)	-	-		295 (2.6%)	286 (2.5%)		-	-		295 (2.6%)	286 (2.5%)	0.00
...Unknown/Missing; n (%)	-	-		2,652 (23.5%)	2,612 (23.1%)		-	-		2,652 (23.5%)	2,612 (23.1%)	0.00

Due to CMS cell suppression policy, all values less than 11 are denoted with **